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## Asparaginase from *Bacillus subtilis*

An application to amend the *Australia New Zealand Food Standards Code* with  
an asparaginase preparation produced by a genetically modified *Bacillus subtilis*

**Novozymes A/S**  
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Regulatory Affairs



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## EXECUTIVE SUMMARY

The present application seeks to amend Standard 1.3.3. - Processing Aids of the Australia New Zealand Food Standards Code (the Code) to approve an asparaginase enzyme preparation produced by Novozymes A/S.

### ***Proposed change to Standard 1.3.3 - Processing Aids***

The table to clause 17, Permitted enzymes of Microbial Origin, is proposed to be amended to include a genetically modified strain of *Bacillus subtilis* as permitted source for asparaginase.

The application is applied for assessment by the general procedure.

### ***Description of enzyme preparation***

The enzyme is an asparaginase (EC 3.5.1.1), which catalyze hydrolysis of the amide in asparagine to the corresponding acid, aspartic acid, thereby reducing the risk for acrylamide formation in various food applications during manufacture.

The enzyme is produced by submerged fermentation of a *Bacillus subtilis* microorganism expressing the wildtype, thermotolerant asparaginase from *Pyrococcus furiosus*.

The commercial enzyme product, Acrylaway HighT, is available in a liquid or granulated preparation complying with the JECFA recommended purity specifications for food-grade enzymes.

The producing micro-organism, *Bacillus subtilis*, is absent from the commercial enzyme product.

### ***Use of the enzyme***

The asparaginase enzyme preparation is intended to be used as a processing aid during manufacture of various food products. Typical applications include production of breakfast cereals, potato based snacks, sliced potato chips and pre-treatment of green coffee beans.

### ***Benefits***

Acrylaway HighT is technologically justified. The enzyme is to be used to reduce potential acrylamide formation in various food applications. Acrylamide is formed as a reaction product in between asparagine and reducing sugars when food products are baked or fried at temperatures above 120°C. Both asparagine and reducing sugars are commonly found in many food raw materials. By using the asparaginase the asparagine content will be reduced, resulting in a reduced acrylamide formation and thereby a reduced acrylamide content in the final product.



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## **Safety evaluation**

The safety of the strain has been thoroughly assessed:

- the production organism has a long history of safe use as production strain for food grade enzyme preparations and is known not to produce any toxic metabolites.
- the recombinant DNA is stably integrated into the production organism and unlikely to pose a safety concern.
- the enzyme preparation complies with international specifications
- there is no evidence of toxicity in the 90-day toxicity study in rats; and
- the enzyme preparation produced no evidence of genotoxic potential in *in vitro* assays.

Furthermore, the safety of the asparaginase preparation was confirmed by external expert groups, as follows:

- Denmark: The enzyme preparation was safety assessed according to the Guidelines for the evaluation of food enzymes (the Scientific Committee for Food, Commission of the European Communities, 1992<sup>1</sup>). This resulted in the authorisation of the enzyme product by the Danish authorities.
- USA: A GRAS determination was done and notified to the US FDA in June 2013 (GRN000476). In the reply letter from FDA dated February 3rd, 2014, the agency has no questions regarding Novozymes' determination that the asparaginase enzyme preparation is GRAS for its intended use.
- Brazil: Dossier was positively evaluated by ANVISA and the enzyme included in the amendment to the positive list, gazetted October 2014.
- Mexico: Dossier was positively evaluated by COFEPRIS and the enzyme included in the amendment to the positive list, gazetted June 2014.

## **Conclusion**

Based on the Novozymes safety evaluation (confirmed by the above-mentioned bodies), we respectfully request the inclusion of this enzyme in the Table to clause 17 of Standard 1.3.3.; Permitted enzymes of Microbial origin.

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# INTRODUCTION

The present dossier describes an asparaginase enzyme preparation produced by submerged fermentation of a *Bacillus subtilis* microorganism expressing a thermotolerant asparaginase from *Pyrococcus furiosus*. The Novozymes A/S trade name used for the asparaginase enzyme preparation is Acrylaway® HighT.

The enzyme is an asparaginase (L-asparagine amidohydrolase, EC 3.5.1.1). The enzyme hydrolyzes the amino acid asparagine to aspartic acid by hydrolyzing the amide in asparagine to the corresponding acid (=aspartic acid).

The asparaginase enzyme preparation is intended to be used as a processing aid during food manufacture to convert asparagine to aspartic acid in order to reduce the risk for acrylamide formation in various food applications.

The following sections describe in detail the construction of the genetically modified *Bacillus subtilis* used as the production organism, the production process, the product specification, the application of the enzyme preparation and finally the safety evaluation of the product including the toxicology program, which has been carried out confirming the safety of the product for its intended use.

The documentation has been elaborated according to the Application Handbook from Food Standards Australia New Zealand as of September 1<sup>st</sup> 2013, applied as relevant for an enzyme application, i.e. outlining the following section:

- SECTION 3.1 – GENERAL REQUIREMENTS
- SECTION 3.3.2 – PROCESSING AIDS, subsections A, C, D, E, F.

**NB!** When reading this document it should be noticed that in some reports, the asparaginase enzyme preparation is described by its commercial name, Acrylaway HighT or by the internal production batch code PPV33595.

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## SECTION 3.1, GENERAL REQUIREMENTS

### 3.1.1 Executive Summary

An Executive Summary is provided as a separate copy together with this application.

### 3.1.2 Applicant details

- (a) ***Applicant's name/s***  
[REDACTED]
- (b) ***Company/organisation name***  
Novozymes Australia Pty Ltd
- (c) ***Address (street and postal)***  
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- (f) ***Nature of applicant's business***  
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- (g) ***Details of other individuals, companies or organisations associated with the application.***  
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### 3.1.3 Purpose of the application

This application is submitted to provide for amendment of the Australia New Zealand Food Standards Code - Standard 1.3.3 - Processing Aids, Table to clause 17 to include a genetically modified strain of *Bacillus subtilis* as permitted source for asparaginase.

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## 3.1.4 Justification for the application

### ***The need for the proposed change***

The Table to clause 17 of Standard 1.3.3 contains a list of permitted enzymes of microbial origin. There are two approved sources of the enzyme, asparaginase EC 3.5.1.1, but not from the source *Bacillus subtilis*.

*Bacillus subtilis* is an approved host and production strain for a number of enzymes in the Standard 1.3.3, i.e.  $\alpha$ -Acetolactate decarboxylase,  $\alpha$ -Amylase,  $\beta$ -Amylase,  $\beta$ -Glucanase, Hemicellulase endo-1,4- $\beta$ -xylanase, Hemicellulase multicomponent enzyme, Maltogenic  $\alpha$ -amylase, Metalloproteinase, Pullulanase, and Serine proteinase.

### ***The advantages of the proposed change over the status quo***

The asparaginase preparation is technologically justified as a processing aid to be used during food manufacture to convert asparagine to aspartic acid in order to reduce the risk for acrylamide formation in various food applications. The interest of local customers is evidenced by the customer support letter attached as Appendix 1.1.

As a response to international customer interests, registration activities have been done globally. The asparaginase preparation is approved in Denmark under the commercial name, Acrylaway HighT. Also, the asparaginase is the subject of a GRAS determination and notification to US FDA as well as approvals obtained in Brazil and Mexico.

#### **A. Regulatory impact information**

The application is not likely to place costs or regulatory restrictions on industry or consumers. Inclusion of the asparaginase enzyme in Standard 1.3.3 will provide the food industry with an option to effectively reduce the risk for acrylamide formation during food manufacture for applications where a more thermotolerant enzyme compared to the current asparaginases in Standard 1.3.3 are needed. For government, the burden is limited to necessary activities for a variation of Standard 1.3.3.

## 3.1.5 Information to support the application

### ***Public health and safety issues related to the proposed change***

No public health and safety issues related to the proposed change are foreseen. As outlined in sections D, E, F, the asparaginase is produced by submerged fermentation of a genetically modified *Bacillus subtilis* strain.

- the production organism has a long history of safe use as production strain for food-grade enzyme preparations and is known not to produce any toxic metabolites.
- the introduced DNA is well characterized, it is stably integrated in the production organism and it is unlikely to pose a safety concern
- the enzyme preparation complies with international specifications
- there is no evidence of toxicity in the 90-day toxicity study in rats; and
- the enzyme preparation produced no evidence of genotoxic potential in *in vitro* assays

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### ***Consumer choice issues related to the proposed change***

No consumer choice issues related to the proposed change are foreseen. The enzyme is to be used in the food industry as a processing aid to reduce the risk for acrylamide formation during food manufacture for applications where a more thermotolerant enzyme compared to the current asparaginases in Standard 1.3.3 are needed.

### ***Evidence that the food industry generally or other specific companies have an interest in, or support, the proposed change to the Code.***

The support letter from an Australian customer is attached as Appendix 1.1.

## **3.1.6 Assessment procedure**

Because the application is for a new source organism for an existing enzyme in the Code, it is considered appropriate that the assessment procedure is characterized as “General Procedure, Level 1”.

## **3.1.7 Confidential commercial information (CCI)**

Detailed information on the construction and characteristics of the genetically modified production strain is provided in Appendix 6. A summary of this information is given in section E. The formal request for treatment of selected parts of Appendix 6 as confidential commercial information (CCI) is included as Appendix 1.2.

## **3.1.8 Exclusive capturable commercial benefit (ECCB)**

This application is not expected to confer an Exclusive Capturable Commercial Benefit.

## **3.1.9 International and other national standards**

### ***A. International Standards***

Use of enzymes as processing aids for food production is not restricted by any Codex Alimentarius Commission (Codex) Standards.

### ***B. Other national standards or regulations***

With few exceptions on national, commodity standards, use of enzymes as processing aids for food production is in general not restricted by standards or regulations in other countries.

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### **3.1.10 Statutory declaration**

The Statutory Declaration is included as Appendix 1.3.

### **3.1.11 Checklist**

This application concerns an enzyme product intended to be used as a processing aid. Therefore, the relevant documentation according to the Application Handbook from Food Standards Australia New Zealand as of September 1<sup>st</sup> 2013, are the following sections:

- SECTION 3.1 – GENERAL REQUIREMENTS
- SECTION 3.3.2 – PROCESSING AIDS, subsections A, C, D, E, F

Accordingly, the checklist for General Requirements as well as the Processing Aids part of the checklist for Standards related to Substances added to Food was used and is included as Appendix 1.4 and 1.5.

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## SECTION 3.3, STANDARDS RELATED TO SUBSTANCES ADDED TO FOOD

### 3.3.2 PROCESSING AIDS

The asparaginase enzyme preparation described in this application is representative of the commercial food enzyme product, Acrylaway HighT, on which approval is sought.

#### A. Technical information on the processing aid

##### A.1. Information on the type of processing aid

Acrylaway HighT belongs to the category of processing aids described in Clause 17 of Standard 1.3.3., Enzymes of microbial origin.

Acrylaway HighT is to be used in the food industry as a processing aid during food manufacture to convert asparagine to aspartic acid in order to reduce the risk for acrylamide formation in various food applications. Examples of benefits when applying Acrylaway HighT in the production of breakfast cereals, is provided in the Acrylaway HighT application sheet, Appendix 2.1.

##### A.2. Information on the identity of the processing aid

###### A.2.1. Enzyme

|                   |                             |
|-------------------|-----------------------------|
| Generic name:     | Asparaginase                |
| IUB nomenclature: | L-Asparagine amidohydrolase |
| IUB No.:          | EC 3.5.1.1                  |
| CAS No.:          | 9015-68-3                   |

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### A.2.2. Enzyme preparation

Commercial name: Acrylaway HighT

The asparaginase enzyme preparation is available under the commercial name Acrylaway HighT as a single enzyme formulation in 2 product variants, a liquid enzyme preparation, Acrylaway HighT L, and a granulate formulation, Acrylaway HighT BG.

The Product Data Sheets for Acrylaway HighT L and Acrylaway HighT BG are enclosed as Appendix 2.2 and 2.3. The typical compositions of Acrylaway HighT L and Acrylaway HighT BG are shown below:

|                                   | <u>Acrylaway HighT L</u> | <u>Acrylaway HighT BG</u> |
|-----------------------------------|--------------------------|---------------------------|
| Enzyme solids (TOS <sup>a</sup> ) | approx. 0.8 %            | approx. 0.8 %             |
| Sodium chloride                   | approx. 5 %              | approx. 3 %               |
| Sorbitol                          | approx. 46.7 %           |                           |
| Water                             | approx. 47 %             | approx. 4 %               |
| Sodium benzoate                   | approx. 0.3 %            |                           |
| Potassium sorbate                 | approx. 0.2 %            |                           |
| Corn flour                        |                          | approx. 91.9 %            |
| Dextrin                           |                          | approx. 0.3 %             |

Acrylaway HighT L and Acrylaway HighT BG are standardized in asparaginase units to an activity of 6000 TASU/g. The Novozymes method used to determine the TASU activity is enclosed in Appendix 3.1.

Asparaginase converts L-Asparagine into L-Aspartate and ammonia. The produced ammonia is combined with alfa-ketoglutarate to form L-Glutamic acid by glutamate dehydrogenase, whereby NADH is oxidised to NAD<sup>+</sup>. The consumption of NADH is measured by photometry at 340 nm in a Kinetic measurement.

### A.2.3. Host organism

The host strain is derived from *Bacillus subtilis* strain ATCC 6051a, the deposited type strain of *Bacillus subtilis*. The taxonomic classification is as follows:

Name: *Bacillus subtilis*  
Class: Bacilli  
Order: *Bacillales*  
Genus: *Bacillus*  
Species: *subtilis*

For a more detailed description of the host organism and the genetic modifications, please see section E.

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<sup>a</sup> TOS = Total Organic Solids, defined as: 100% - water - ash - diluents



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#### A.2.4. Donor organism

The asparaginase gene is chemically synthesized based on sequence data from a public database. The asparaginase is from the extremophile *Pyrococcus furiosus* from thermal marine sediments and is not protein engineered.

For a more detailed description of the donor and the donor gene, please see section E.

#### A.3. **Information on the chemical and physical properties of the processing aid**

The active enzyme is an asparaginase (EC 3.5.1.1) which hydrolyzes the amino acid asparagine to aspartic acid. The asparaginase preparation is used to reduce potential acrylamide formation in various food applications. Acrylamide is formed as a reaction product in between asparagine and reducing sugars when food products are baked or fried at temperatures above 120°C. Both asparagine and reducing sugars are commonly found in many food raw materials. By using the asparaginase the asparagine content will be reduced, resulting in a reduced acrylamide formation and thereby a reduced acrylamide content in the final product.

No reaction products, which could not be considered normal constituents of the diet, are formed during the production or storage of the enzyme treated food.

Acrylaway HighT is available in 2 product variants, a liquid enzyme preparation, Acrylaway HighT L, and a granulate formulation, Acrylaway HighT BG. The asparaginase enzyme preparation is intended to be used as a processing aid during production of various food products such as breakfast cereals, potato based snacks, sliced potato chips and pre-treatment of green coffee beans.

In these applications, the enzyme treatment takes place upstream in the food production process and the enzyme is largely heat inactivated during subsequent steps where the heat treatment is excessive, i.e. extrusion and toasting of breakfast cereals, frying of potato based snacks or chips and roasting of coffee beans.

#### A.4. **Manufacturing process**

The manufacturing process is composed of a fermentation process, a purification process, a formulation process and finally a quality control of the finished product, as outlined by Aunstrup et al. 1979<sup>2</sup>. This section describes the processes used in manufacturing of the asparaginase enzyme product.

The enzyme preparation is manufactured in accordance with current Good Manufacturing Practices, Food. The quality management system used in the manufacturing process complies with ISO 9001:2008 (Appendix 4).

The raw materials are Food Grade Quality and have been subjected to appropriate analysis to ensure their conformity with the specifications.

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#### A.4.1. Fermentation

The asparaginase is produced by submerged fed-batch pure culture fermentation of the genetically modified strain of *Bacillus subtilis*, described in section E.

##### A.4.1.1. Raw materials for fermentation

The production strain is grown in a medium consisting of compounds providing an adequate supply of carbon and nitrogen plus minerals and vitamins necessary for growth. The choice of raw materials used in the fermentation process (the feed, the seed fermenter, the main fermenter and dosing) is listed below.

Carbohydrates (e.g. sucrose, glucose, maltose, starch hydrolysates)  
Vegetable protein (e.g. potato protein, soy bean meal, corn steep liquor)  
Yeast extract  
Citric acid  
Ammonia  
Urea  
Salts (e.g.  $K_2HPO_4$ ,  $(NH_4)_2SO_4$ ,  $CaCO_3$ ,  $MgSO_4$ ,  $Na_2HPO_4$ )  
Vitamins (e.g. vitamin B complex)  
Trace metals (e.g.  $MnSO_4$ ,  $FeSO_4$ ,  $CuSO_4$ ,  $ZnSO_4$ )  
Alkali and acid for pH adjustments (e.g. Acetic acid,  $H_3PO_4$ ,  $NH_3$ ,  $NaOH$ )  
Antifoaming agents (if necessary, e.g. P2000 and Clerol FBA 3003<sup>b</sup>)  
Potable water

##### A.4.1.2. Hygienic precautions

All equipment is designed and constructed to prevent contamination by foreign micro-organisms.

All valves and connections not in use for the fermentation are sealed by steam at more than 120°C.

After sterilization a positive pressure of more than 0.2 atmosphere is maintained in the fermentation tank.

The air used for aeration is sterilized by passing a sterile filter.

The inside of each fermentation tank is cleaned between fermentations by means of a high-pressure water jet and inspected after the cleaning procedures have been completed.

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<sup>b</sup> **P2000** is a polypropyleneglycol, which in USA is permitted for use in processing of beet sugar and yeast (21 CFR § 173.340 (a)(3)).

**Clerol FBA 3003** is a polyalkoxyether which is permitted in France in the production of crystalized sugar.

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#### A.4.1.3. *Preparation of the inoculum*

The inoculum flask containing the prepared medium is autoclaved and checked. Only approved flasks are used for inoculation.

The stock culture suspension is injected aseptically into the inoculum flask and spread onto the medium in the flask. Once growth has taken place in the inoculum flask (typically after a few days at 30°C), the following operations are performed:

- Strain identity and traceability: ampoule number is registered
- Microbial purity: a sample from the inoculum flask is controlled microscopically for absence of microbial contaminants.

When sufficient amount of biomass is obtained and when the microbiological analyses are approved, the inoculum flask can be used for inoculating the seed fermentor.

#### A.4.1.4. *The seed fermentation*

The raw materials for the fermentation medium are mixed with water in a mixing tank. The medium is transferred to the seed fermenter and heat sterilized (e.g. 120°C / 60 min).

The seed fermentation tank is inoculated by transferring aseptically a suspension of cells from the inoculum flask.

The seed fermentation is run aerobically (sterile airflow), under agitation. The overpressure is kept above 0.2 atmosphere at all times, to prevent contamination.

Once a sufficient amount of biomass has developed, microbiological analyses are performed to ensure absence of contamination. The seed fermentation can then be transferred to the main fermentation tank.

#### A.4.1.5. *The main fermentation*

The raw materials for the medium are mixed with water in a mixing tank. The medium is transferred to the main fermenter and heat sterilized (e.g. 120°C / 60 min). If necessary, the pH is adjusted after sterilization, with sterile pH adjustment solutions.

The fermentation in the main tank is run as normal submerged fed-batch fermentation.

The main fermentation is run aerobically (sterile airflow), under vigorous agitation. The overpressure is kept above 0.2 atmosphere at all times, to prevent contamination. The fermentation is run at a well-defined temperature.

Fresh medium is added aseptically when the pH increases above its set point, and the dissolved oxygen concentration rises. The feed rate is adjusted so that there is no accumulation of carbohydrates.

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Other parameters are measured at regular intervals

- Refractive index
- Enzyme productivity
- Residual glucose
- Residual ammonia.

Samples are also taken at regular intervals to check absence of microbial contamination.

#### *A.4.2. Recovery*

The recovery process is a multi-step operation designed to separate the enzyme from the microbial biomass and partially purify, concentrate, and stabilize the food enzyme.

The steps of this process involve a series of typical unit operations:

- Pre-treatment
- Primary separation
- Concentration
- Pre and germ filtration
- Preservation and stabilization
- Pre and germ filtration (if needed)

##### *A.4.2.1. Raw materials for recovery*

The raw materials typically used in the recovery process are as follows:

Diatomite or Perlite

Acids and bases for pH adjustment

Flocculants (e.g. Calcium chloride, poly-aluminium chloride, Superfloc C591<sup>c</sup>, Superfloc A130<sup>d</sup>)

##### *A.4.2.2. Pre-treatment*

To facilitate the separation, flocculants (calcium chloride, aluminate and/or Superfloc C521 & A 130) are used in a pH-controlled process.

##### *A.4.2.3. Primary separation*

The cell mass and other solids are separated from the broth by well-established techniques such as pre-coat vacuum drum filtration or centrifugation. The precoat used in the filter and the filter aid used in the process is diatomaceous earth (diatomite or perlite).

The primary separation is performed at well-defined pH and temperature range.

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<sup>c</sup> Superfloc C591 is a dimethyl diallyl ammonium chloride polymer

<sup>d</sup> Superfloc A130 is an acrylate acrylamide copolymer

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#### A.4.2.4. *Concentration*

Ultrafiltration and/or evaporation are applied for concentration and further purification. The ultrafiltration is applied to fractionate high molecular weight components from low molecular weight impurities and is used to increase the activity/dry matter ratio. Evaporation is used to increase the activity while maintaining the activity/dry matter ratio.

The pH and temperature are controlled during the concentration step, which is performed until the desired activity and activity/dry matter ratio has been obtained.

#### A.4.2.5. *Pre and germ filtration*

For removal of residual cells of the production strain and as a general precaution against microbial degradation, filtration on dedicated germ filtration media is applied. Pre-filtration is included when needed.

The filtrations are performed at well-defined pH and temperature intervals, and result in an enzyme concentrate solution free of the production strain and insoluble substrate components from the fermentation.

#### A.4.2.6. *Preservation and stabilization*

For enzymatic, physical and microbial stabilization sodium chloride is added to the enzyme concentrate.

#### A.4.2.7. *Final concentration*

In case the concentration is too low to reach the target yield for the final product, a further concentration may be carried out by evaporation and/or ultra filtration.

#### A.4.2.8. *Process control*

Apart from the process controls performed during the various fermentation steps and described above, the following microbial controls are also performed.

Samples are withdrawn from both the seed fermenter and the main fermenter:

- a) before inoculation
- b) at regular interval during cultivation
- c) before transfer/harvest

The samples during all steps are examined by:

- a) microscopy
- b) plating culture broth on a nutrient agar and incubating for 24-48 hours.

Growth characteristics are observed macroscopically and microscopically.

During the microbiological control steps, the number of foreign micro-organisms should be insignificant. The fermentation parameters, i.e. enzyme activity, temperature and oxygen as well as pH are also monitored closely. A deviation from the normal course of the fermentation may signal a contamination.

If a significant contamination develops, the fermentation is terminated. The fermentation is regarded as “significantly contaminated” if two independent samples show presence of contaminating organisms after growth on nutrient agar.

Any contaminated fermentation is rejected for enzyme preparations to be used in a food grade application.

#### **A.5. Specification for identity and purity**

The asparaginase enzyme product complies with the purity criteria recommended for Enzyme Preparations in Food, Food Chemical Codex, 8th edition, 2012.

In addition to this, the asparaginase enzyme product also conforms to the General Specifications for Enzyme Preparations Used in Food Processing as proposed by the Joint FAO/WHO Expert Committee on Food Additives in Compendium of Food Additive Specifications, available online at: <http://www.fao.org/ag/agn/jecfa-additives/search.html?lang=en>

Analytical data for an unstandardized, representative batch of the asparaginase enzyme product is shown in the table below. These data show compliance with the purity criteria of the specification.

| Control parameter            | Unit   | Specification       | Batch PPV33595  |
|------------------------------|--------|---------------------|-----------------|
| Asparaginase enzyme activity | TASU/g |                     | 55200           |
| Heavy Metals <sup>a</sup>    | ppm    | Max 30              | 4.6             |
| Pb                           | ppm    | Max 5               | <0.5            |
| As                           | ppm    | Max 3               | <0.1            |
| Cd                           | ppm    | Max 0.5             | <0.05           |
| Hg                           | ppm    | Max 0.5             | <0.03           |
| Total viable count           | /g     | Not more than 50000 | <100            |
| Total coliforms              | /g     | Not more than 30    | <10             |
| Enteropathogenic E. coli     | /25g   | Not detected        | ND <sup>b</sup> |
| Salmonella                   | /25g   | Not detected        | ND              |
| Antibiotic activity          |        | Not detected        | ND              |
| Production strain            | /g     | Not detected        | ND              |

<sup>a)</sup> Heavy Metals =  $\Sigma$  of Ag, As, Bi, Cd, Cu, Hg, Mo, Ni, Pb, Sb, Sn

<sup>b)</sup> ND = Not Detected

The methods of analysis used to determine compliance with the specifications are enclosed (Appendix 3).

The asparaginase enzyme preparation is available under the commercial name Acrylaway HighT as a single enzyme formulation in 2 product variants, a liquid enzyme preparation, Acrylaway HighT L, and a granulate formulation, Acrylaway HighT BG.

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The Product Data Sheets for Acrylaway HighT L and Acrylaway HighT BG are enclosed in Appendix 2. The typical compositions of Acrylaway HighT L and Acrylaway HighT BG are shown below:

|                                   | <u>Acrylaway HighT L</u> | <u>Acrylaway HighT BG</u> |
|-----------------------------------|--------------------------|---------------------------|
| Enzyme solids (TOS <sup>e</sup> ) | approx. 0.8 %            | approx. 0.8 %             |
| Sodium chloride                   | approx. 5 %              | approx. 3 %               |
| Sorbitol                          | approx. 46.7 %           |                           |
| Water                             | approx. 47 %             | approx. 4 %               |
| Sodium benzoate                   | approx. 0.3 %            |                           |
| Potassium sorbate                 | approx. 0.2 %            |                           |
| Corn flour                        |                          | approx. 91.9 %            |
| Dextrin                           |                          | approx. 0.3 %             |

Acrylaway HighT L and Acrylaway HighT BG are standardized in asparaginase units to an activity of 6000 TASU/g. The Novozymes method used to determine the TASU activity is enclosed in Appendix 3.1.

Acrylaway HighT intended to be used as a processing aid during production of various food products such as breakfast cereals, potato based snacks, sliced potato chips and pre-treatment of green coffee beans.

In these applications, the enzyme treatment takes place upstream in the food production process and the enzyme is largely heat inactivated during subsequent steps where the heat treatment is excessive, i.e. extrusion and toasting of breakfast cereals, frying of potato based snacks or chips and roasting of coffee beans.

#### **A.6. Analytical method for detection**

The asparaginase enzyme preparation is to be used in the food industry as a processing aid. This information is not required in the case of an enzymatic processing aid.

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<sup>e</sup> TOS = Total Organic Solids, defined as: 100% - water - ash - diluents

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## **B. Information related to the safety of a chemical processing aid**

Not applicable - this application does not concern a chemical processing aid.

## **C. Information related to the safety of an enzyme processing aid**

### **C.1. General information on the use of the enzyme as a food processing aid in other countries**

Acrylaway HighT is used as a processing aid in the food industry in a range of countries globally. Based on country specific dossiers the enzyme has been approved in several countries, e.g.:

- Denmark: The enzyme preparation was safety assessed according to the Guidelines for the evaluation of food enzymes (the Scientific Committee for Food, Commission of the European Communities, 1992<sup>1</sup>). This resulted in the authorisation of the enzyme product by the Danish authorities.
- USA: A GRAS determination was done and notified to the US FDA in June 2013 (GRN000476). In the reply letter from FDA dated February 3rd, 2014, the agency has no questions regarding Novozymes' determination that the asparaginase enzyme preparation is GRAS for its intended use, cf.
- <http://www.accessdata.fda.gov/scripts/fcn/fcnDetailNavigation.cfm?rpt=grasListing&id=476>).
- Brazil: Dossier was positively evaluated by ANVISA and the enzyme included in the amendment to the positive list, gazetted October 2014.
- Mexico: Dossier was positively evaluated by COFEPRIS and the enzyme included in the amendment to the positive list, gazetted June 2014.

### **C.2. Information on the potential toxicity of the enzyme processing aid**

#### **(a) Information on the enzyme's prior history of human consumption and/or its similarity to proteins with a history of safe human consumption**

A wide variety of enzymes are used in food processing. Enzymes in general have a long history of safe use in food (Pariza and Foster, 1983<sup>3</sup>; Pariza and Johnson, 2001<sup>4</sup>). Asparaginases are produced by a variety of microbes, including both bacteria and fungi (Imada *et al*<sup>5</sup>; Cedar and Schwartz<sup>6</sup>; Dunlop *et al*<sup>7</sup>; Yao *et al*<sup>8</sup>).



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(b) *Information on any significant similarity between the amino acid sequence of the enzyme and that of known protein toxins*

Based on the amino acid sequence of the asparaginase enzyme (provided in the confidential Appendix 6), a homology assessment of the asparaginase enzyme to known toxins and allergens was conducted (Appendix 5.1). No homologies to toxins or allergens were found.

Furthermore, safety studies as described below were performed on a test-batch (Asparaginase, PPV33595) that was produced according to the description given in section A.4, omitting stabilization and standardization.

The following studies were performed:

- Ames Test. Test for mutagenic activity with strains of *S. typhimorium* and *E.coli*
- *In vitro* micronucleus test
- Subchronic (90 days) oral toxicity study in rats

The main conclusions of the safety studies can be summarized as follows:

- Asparaginase, PPV33595 did not induce gene mutations in the Ames test, neither in the presence or absence of S-9 mix.
- Asparaginase, PPV33595 did not cause an increase in the induction of micronuclei in cultured human lymphocytes in this *in vitro* test using human lymphocytes either in the presence or absence of S-9 mix.
- In a 13 weeks oral toxicity study in rats Asparaginase, PPV33595 was well tolerated and did not cause any toxicologically significant changes at any dose level. In conclusion, 90 days of oral (gavage) treatment of rats with Asparaginase, PPV33595, at dose levels of up to 1207 mg TOS/kg bw/day or 584568 TASU/kg administered at a dose volume of 10 mL/kg did not cause any treatment related changes. The NOAEL (No Observed Adverse Effect Level) for both female and male animals for Asparaginase, PPV33595, was 1207 mg TOS/kg bw/day corresponding to 584568 TASU/kg bw/day.

Based on the present toxicity data it can be concluded that the asparaginase enzyme preparation, represented by batch PPV33595, exhibits no toxicological effects under the experimental conditions described. A summary of the safety studies is enclosed in Appendix 5.2.

### **C.3. *Information on the potential allergenicity of the enzyme processing aid***

(a) *Information of the source of the enzyme processing aid*

The asparaginase enzyme is produced by a *Bacillus subtilis* microorganism expressing the asparaginase from *Pyrococcus furiosus*. *Bacillus subtilis* is a soil and plant living saprophyte, recognized as non-pathogenic species for humans, animals and plants (see Section D).

(b) *Analysis of similarity between the amino acid sequence of the enzyme and that of known allergens*

Enzymes have a long history of safe use in food, with no indication of adverse effects or reactions. Moreover a wide variety of enzyme classes (and structures) are naturally present in food.

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The allergenicity potential of enzymes was studied by Bindslev-Jensen et al (2006<sup>9</sup>) and reported in the publication: "Investigation on possible allergenicity of 19 different commercial enzymes used in the food industry". The investigation comprised enzymes produced by wild-type and genetically modified strains as well as wild-type enzymes and protein engineered variants and comprised 400 patients with a diagnosed allergy to inhalation allergens, food allergens, bee or wasp. It was concluded from this study that ingestion of food enzymes in general is not likely to be a concern with regard to food allergy.

Additionally, food enzyme are used in small amounts during food processing resulting in very small amounts of the enzyme protein in the final food. A high concentration generally equals a higher risk of sensitization, whereas a low level in the final food equals a lower risk (Goodman et al, 2008<sup>10</sup>).

Based on the amino acid sequence of the asparaginase enzyme (provided in the confidential Appendix 6), a homology assessment of the asparaginase enzyme to known toxins and allergens was conducted (Appendix 5.1). No homologies to toxins or allergens were found.

Consequently, oral intake of the asparaginase is not anticipated to pose any food allergenic concern.

#### **C.4. Safety assessment reports prepared by international agencies or other national government agencies, if available**

A document certifying approval of Acrylaway HighT by the Danish authorities following their safety evaluation according to the Guidelines for food enzymes by the Scientific Committee for Food is enclosed as Appendix 2.4.

In addition, the US FDA did not question the conclusion that the asparaginase enzyme preparation object of the present dossier is GRAS for its intended use, cf. <http://www.accessdata.fda.gov/scripts/fcn/fcnDetailNavigation.cfm?rpt=grasListing&id=476>).

Evidence of positive evaluation in Brazil is provided in Appendix 2.5. Acrylaway HighT is covered by the listing of **Asparaginase** produced by **Pyrococcus furiosus** **expresso em Bacillus subtilis**, cf. page 4 in the amended BR positive list, gazetted October 2014.

In Mexico, the enzyme is listed as **L-Asparaginasa, Producida por Bacillus subtilis a partir del gen de asparaginasa de Pyrococcus furiosus**, in the amendment to the positive list, gazetted June 2014, cf. page 1 in Appendix 2.6.

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## **D. Additional information related to the safety of an enzyme processing aid derived from a microorganism**

### **D.1. Information on the source microorganism**

The asparaginase enzyme is produced by a *Bacillus subtilis* microorganism expressing the asparaginase from *Pyrococcus furiosus*. The host strain is derived from *Bacillus subtilis* strain ATCC 6051a, the deposited type strain of *Bacillus subtilis*.

### **D.2. Information on the pathogenicity and toxicity of the source microorganism**

*Bacillus subtilis* is a soil and plant living saprophyte, recognized as non-pathogenic species for humans, animals and plants (de Boer and Diderichsen, 1991<sup>11</sup>; Priest FG, 1993<sup>12</sup>;) The microorganism is a common contaminant in foods eaten by humans and animals and it is consumed in large quantities when eating the Japanese food natto (OECD, 1986<sup>13</sup>; de Boer and Diderichsen, 1991).

*B. subtilis* is classified as a group 1 microorganism according to EU Directive 2000/54/EC of the European Parliament and of the Council of 18 September 2000 on the protection of workers from risks related to exposure to biological agents at work. A group 1 biological agent means one that is unlikely to cause human disease.

The recipient strain is sporulation deficient due to a deletion in the *spoIIAC* gene.

*Bacillus subtilis* species have been used for centuries for production of natto by solid-state fermentation of soybeans. Industrial strains belonging to the *B. subtilis* species have been used for decades in the production of enzymes, and in more than a decade as recombinant organisms for the production of a variety of bio-industrial products like food grade enzymes, vitamins, antibiotics, and additives (Schallmeyer M et al, 2004<sup>14</sup>).

JECFA has evaluated alpha-amylase and mixed carbohydrase and protease from *B. subtilis*, as well as a range of food enzymes derived from genetically modified strains of *B. subtilis*, and concluded that these food enzymes do not constitute a toxicological hazard (JECFA Monographs 2006).

Carbohydrases and proteases from *B. subtilis* are affirmed as GRAS by the US FDA and are covered in the regulations under 21 CFR 184.1148 and 21 CFR 184.1150. *Bacillus subtilis* is described as the production organism for different enzymes in GRAS notifications 20, 114, 205, 274 and 406.

Because *B. subtilis* meets the US Environmental Protection Agency (EPA) criteria for nontoxigenicity and nonpathogenicity, it is one of 10 host organisms eligible for Tier I exemption under the EPA regulations (EPA, 1996<sup>15</sup>).

The non-pathogenicity and non-toxicity of *B. subtilis* is thus strongly supported by the historic record of this organism.

---

### **D.3. Information on the genetic stability of the source organism**

The inserted recombinant DNA is genetically stable during fermentation, as the inserted DNA is integrated into the chromosome.

The genetic stability of the production strain was tested at large-scale fermentation. The strain stability during fermentation was analyzed by Southern blotting. No instability of the strain was observed.

For a more detailed description of the strain construction and characteristics, please see section E.

## **E. Additional information related to the safety of an enzyme processing aid derived from a genetically-modified microorganism**

### **E.1. Information on the methods used in the genetic modification of the source organism**

This section contains summarized information on the modifications of the host strain, on the content and nature of the introduced DNA and on the construction of the final production strain, as well as the stability of the inserted gene. The detailed information is provided in the confidential Appendix 6.

#### *E.1.1. Host organism*

The host strain, designated *B. subtilis* PP2982, is derived from *Bacillus subtilis* strain ATCC 6051a, the deposited type strain of *Bacillus subtilis*. The following comprises the taxonomy of the host strain:

Name: *Bacillus subtilis*  
Class: Bacilli  
Order: *Bacillales*  
Genus: *Bacillus*  
Species: *subtilis*

The host strain used in the construction of the asparaginase production strain, was modified at several chromosomal loci to cause deletion of genes encoding a number of proteases. Also a gene essential for sporulation was deleted, eliminating the ability to sporulate, together with a gene essential for formation of surfactin. The lack of these peptides and proteins represents improvements in product safety and stability.

---

### E.1.2. Introduced DNA

The expression plasmid, pMOL2930, used to transform the *B. subtilis* host strain, PP2982, is based on the well-known *Bacillus* vectors pE194 and pUB110 from *Staphylococcus aureus*. No elements of these vectors are left in the production strain. The plasmid contains the expression cassette consisting of a fragment of a hybrid *Bacillus* promoter with promoter elements from *B. licheniformis*, *B. amyloliquefaciens* and *B. thuringiensis*. This promoter is followed by a chemically synthesized asparaginase gene (*asnPfu*) based on sequence data from a public database. According to Maeder *et. al.*, 1999<sup>16</sup>, the gene codes for an L-asparaginase and is derived from the extremophile *Pyrococcus furiosus* (ATCC 43587) from thermal marine sediments. Finally a *B. licheniformis* terminator sequence is inserted to terminate transcription. Following the terminator, an integration fragment is inserted that enables site specific integration on the genome of the recipient strain. Only the expression cassette with elements between the promoter fragment and the integration element are present in the final production strain. This has been confirmed by Southern blot analysis and PCR analysis followed by DNA sequencing.

### E.1.3. Construction of the Recombinant Microorganism

The production strain, *B. subtilis* MOL2940, was constructed from the recipient strain PP2982 through the following steps:

- 1) A conjugation donor strain harbouring pMOL2930 was used to mobilize pMOL2930 into the recipient strain PP2982.
- 2) Plasmid pMOL2930 was integrated into three specific loci in strain PP2982 by targeted homologous recombination to these loci using a two-step integration approach. Integration of the expression cassettes at these loci allows the expression of the asparaginase gene *asnPfu* from the hybrid promoter and the transcriptional terminator.
- 3) The resulting three-copy asparaginase strain was named MOL2940.

Sequence confirmation of the inserted expression cassettes and the flanking regions at the integration loci was performed in the production strain.

### E.1.4. Antibiotic Resistance Gene

The introduced DNA does not contain any genes encoding antibiotic resistance. The absence of these genes in the production strain was verified by Southern blot analysis using the relevant antibiotic resistance gene probes.

### E.1.5. Stability of the Introduced Genetic Sequences

The presence of the introduced DNA sequences was also determined by Southern hybridization to assess the stability and potential for transfer of genetic material as a component of the safety evaluation of the production microorganism. The transforming DNA is stably integrated into the *B. subtilis* chromosome and, as such, is poorly mobilizable for genetic transfer to other organisms and is mitotically stable.

---

## **F. Information related to the dietary exposure to the processing aid**

### ***F.1. A list of foods or food groups likely to contain the processing aid or its metabolites***

The asparaginase enzyme is used as processing aid during manufacture of various food products. Typical applications include production of breakfast cereals, potato based snacks, sliced potato chips and pre-treatment of green coffee beans.

### ***F.2. The levels of residues of the processing aid or its metabolites for each food or food group***

The asparaginase enzyme preparation is used at minimum levels necessary to achieve the desired effect and according to requirements for normal production following cGMP.

In general, the recommended usage level is up to 15000 TASU/kg dry matter.

#### ***F.2.1. Estimates of human consumption***

In to provide an estimate for human consumption, an exaggerated “worst case” calculation is made assuming that all organic matter originating from the enzyme is retained in the final food product.

Acrylaway HighT has an activity of 6000 TASU/g and an approximate content of 0.8% TOS (Total Organic Substances from the fermentation, mainly protein and carbohydrate components). This corresponds to an activity/TOS ratio of 750 TASU/mg TOS.

In order to demonstrate a worst case calculation, an exaggerated human intake is estimated using on the Budget method<sup>f</sup> to estimate the intake associated with breakfast cereals, snacks and chips, and using consumption data to estimate the intake associated with coffee.

#### ***Intake associated with breakfast cereals, snacks and chips***

- a) According to the Budget method, a conservative estimate for the food intake is 25 g per kg body weight per day (g/kg bw/day) of which processed food is 50% of the food intake or 12.5 g/kg bw/day. Processed foods is considered = breakfast cereals, snacks and chips.
- b) It is assumed that all processed foods are produced using Acrylaway HighT as a processing aid, used at the highest recommended dosage.
- c) The calculation is made assuming that all TOS remains in the final product.

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<sup>f</sup> ILSI Europe Food Chemical Intake Task Force, April 1997. An Evaluation of the Budget Method for Screening Food Additive Intake.

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The maximum recommended dosage is 15000 TASU/kg dry matter. Acrylaway HighT has an activity/TOS ratio of 750 TASU/mg TOS, giving an overestimate of 20 mg TOS/kg processed food.

Based on the estimate for processed food intake of 12.5 g/kg bw/day, the intake of Acrylaway HighT corresponds to  $20 \times 0.0125 = 0.25$  mg TOS/kg bw/day.

#### ***Intake associated with coffee***

According to the annual coffee report of the German coffee federation and customer information, 10 kg of roasted coffee per person per year represents a high-end consumption of coffee. Additional information on coffee consumption from the internet<sup>9</sup> confirms that 10 kg represents a high-end consumption of coffee. For a 60 kg person, the coffee intake is thus  $10 \times 1000 / (60 \times 365) = 0.46$  g coffee/kg bw/day.

The maximum recommended dosage is 15000 TASU/kg dry matter. Acrylaway HighT has an activity/TOS ratio of 750 TASU/mg TOS, giving an overestimate of 20 mg TOS/kg coffee.

Based on the above estimated coffee intake of 0.46 g/kg bw/day, the intake of Acrylaway HighT corresponds to  $20 \times 0.00046 = 0.01$  mg TOS/kg bw/day.

#### ***Total estimate of Human Consumption***

Estimated Intake =  $0.25 + 0.01 = 0.26$  mg TOS/kg bw/day.

#### ***F.2.2. Safety Margin Calculation***

The safety margin is calculated as dose level with no adverse effect (NOAEL) divided by the estimated human consumption. The NOAEL dose level in the 13 weeks oral toxicity study in rats was 10 ml/kg/day corresponding to 1207 mg TOS/kg/day.

The estimated human consumption is 0.26 mg TOS/kg/day

The safety margin can thus be calculated to be  $1207/0.26$  or approximately **4600**.

#### ***F.3. For foods or food groups not currently listed in the most recent Australian or New Zealand National Nutrition Surveys (NNSs), information on the likely level of consumption***

Not relevant.

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<sup>9</sup> [http://en.wikipedia.org/wiki/List\\_of\\_countries\\_by\\_coffee\\_consumption\\_per\\_capita](http://en.wikipedia.org/wiki/List_of_countries_by_coffee_consumption_per_capita)  
[http://www.nationmaster.com/graph/foo\\_cof\\_con-food-coffee-consumption](http://www.nationmaster.com/graph/foo_cof_con-food-coffee-consumption)  
<http://www.coffeeresearch.org/market/consumption.htm>

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***F.4. The percentage of the food group in which the processing aid is likely to be found or the percentage of the market likely to use the processing aid***

In the estimate on human consumption given in F.2.1 above, it is assumed that all processed food products are produced using Acrylaway HighT as a processing aid, used at the highest recommended dosage.

***F.5. Information relating to the levels of residues in foods in other countries***

As described in F.2.1 above, a “worst case” calculation is made assuming that all organic matter originating from the enzyme is retained in the processed food product and an exaggerated human intake is estimated using on the Budget method.

***F.6. For foods where consumption has changed in recent years, information on likely current food consumption***

No significant changes in recent years are observed.



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## LIST OF REFERENCES

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<sup>15</sup> EPA (Environmental Protection Agency) (1996) *Bacillus subtilis* TSCA Section 5(h)(4) Exemption: Final Decision Document. Biotechnology Program under the Toxic Substances Control Act (TSCA). [http://www.epa.gov/biotech\\_rule/pubs/fra/fd009.htm](http://www.epa.gov/biotech_rule/pubs/fra/fd009.htm)

<sup>16</sup> Maeder. D. L. et al., Divergence of the hyperthermophilic archaea *Pyrococcus furiosus* and *P. horikoshii* inferred from complete genomic sequences. *Genetics* 152: 1299-1305, 1999

## List of Appendices

- 1) General Requirements
- 2) Product information
- 3) Methods of analysis used to determine compliance with the specifications
- 4) Documentation regarding the manufacturing process
- 5) Safety documentation
- 6) Documentation regarding the production microorganism

# Appendix 1

## General Requirements

1. Evidence that the food industry generally or other specific companies have an interest in, or support, the proposed change to the Code
2. Formal request for treatment of confidential commercial information (CCI)
3. Statutory declaration
4. Checklist for GENERAL REQUIREMENT
5. Checklist for Standards related to Substances added to Food



**PEPSICO**

AUSTRALIA &  
NEW ZEALAND



SAKATA



[REDACTED]  
Business Development Manager

**Novozymes Australia Pty Ltd.**

3/22 Loyalty Road  
North Rocks NSW 2151

[REDACTED],  
I would like to advise you of our interest in the commercial availability of your Acrylaway High T liquid product.

Based on Initial review of this product we see this product to be advantageous in controlling Acrylamide formation in a number of our baked and fried snack food processes. The currently available enzyme based solution is not suitable for use on a number of our food platforms due to rapid thermal deactivation during processing.

The Acrylaway High T liquid product and its superior thermal stability would therefore provide a very useful tool for controlling Acrylamide formation across a number of our food products. Based on this need we would gladly support any application seeking FSANZ approval for use in Australia and New Zealand.

Please let me know if we can be of any further assistance.

Regards,

[REDACTED]  
R&D Manager

## Appendix 1.2

### Formal request for treatment of confidential commercial information (CCI)

Novozymes respectfully request that the selected and marked parts of Appendix 6 are treated as confidential commercial information (CCI).

The documents in Appendix 6 contain detailed description of the construction of the genetically modified production strain and the introduced DNA. While individual steps in the DNA construction might be well known or publicly available information, the exact steps and sequence of those constitutes information that represent the state-of-the-art of one of Novozymes' core technologies, which has been obtained as a result of substantial investment in research and development within rDNA technology. Therefore, the selected parts of Appendix 6 are claimed confidential for an unlimited period of time.

December 2014



Senior Science Manager  
Regulatory Affairs  
Novozymes A/S

**Statutory Declaration**  
OATHS ACT 1900, NSW, EIGHTH SCHEDULE

I, [REDACTED], do solemnly and sincerely declare that  
[name of declarant]

RE: APPLICATION FOR REGISTRATION OF ASPARAGINASE FROM BACILLUS  
SUBTILIS.

1. THE INFORMATION PROVIDED IN THIS APPLICATION IS TRUE TO THE  
BEST OF MY KNOWLEDGE AND BELIEF.

2. THE INFORMATION PROVIDED IN THIS APPLICATION FULLY SETS OUT THE  
MATTERS REQUIRED.

3. NO INFORMATION HAS BEEN WITHHELD THAT MIGHT PREJUDICE THIS  
APPLICATION TO THE BEST OF MY KNOWLEDGE AND BELIEF.

I UNDERSTAND THAT A PERSON WHO INTENTIONALLY MAKES A FALSE  
STATEMENT IN A STATUTORY DECLARATION IS GUILTY OF AN OFFENCE UNDER  
SECTION 11 OF THE STATUTORY DECLARATION ACT 1959 AND I BELIEVE THAT  
THE STATEMENTS IN THIS DECLARATION ARE TRUE IN EVERY PARTICULAR.

and I make this solemn declaration conscientiously believing the same to be true, and by virtue  
of the provisions of the Oaths Act 1900.

Declared at: NORTH ROCKS on 4TH DECEMBER 2014  
[place] [date]

[REDACTED]  
[signature of declarant]

in the presence of an authorised witness, who states:

I, [REDACTED], a NSW JUSTICE OF THE PEACE [REDACTED]  
[name of authorised witness] [qualification of authorised witness]

certify the following matters concerning the making of this statutory declaration by the person  
who made it: [\* please cross out any text that does not apply]

1. \*I saw the face of the person ~~OR \*I did not see the face of the person because the person~~  
~~was wearing a face covering, but I am satisfied that the person had a special justification~~  
~~for not removing the covering, and~~

2. \*I have known the person for at least 12 months ~~OR \*I have not known the person for at~~  
least 12 months, but I have confirmed the person's identity using an identification  
document and the document I relied on was NSW DRIVERS LICENCE [REDACTED]

[REDACTED]  
[describe identification document relied on]

4 December 2014

[date]



## Appendix 1.4

### Checklist for GENERAL REQUIREMENTS

| General requirements (3.1)  |  |
|---|--|
| <input checked="" type="checkbox"/> 3.1.1 Form of application<br><input checked="" type="checkbox"/> <i>Application, abstracts and other key documents in English</i><br><input checked="" type="checkbox"/> <i>Executive Summary (separated from main application electronically and in hard copy)</i><br><input checked="" type="checkbox"/> <i>Relevant sections of Part 3 clearly identified</i><br><input checked="" type="checkbox"/> <i>Pages sequentially numbered</i><br><input checked="" type="checkbox"/> <i>Electronic copy (searchable)</i><br><input checked="" type="checkbox"/> <i>1 hard copy</i><br><input checked="" type="checkbox"/> <i>Electronic and hard copy identical</i><br><input checked="" type="checkbox"/> <i>Hard copy capable of being laid flat</i><br><input checked="" type="checkbox"/> <i>All references provided (in electronic and hard copy)</i> | <input checked="" type="checkbox"/> 3.1.6 Assessment procedure<br><input checked="" type="checkbox"/> <i>General</i><br><input type="checkbox"/> <i>Major</i><br><input type="checkbox"/> <i>Minor</i><br><input type="checkbox"/> <i>High level health claim variation</i><br><input checked="" type="checkbox"/> 3.1.7 Confidential Commercial Information<br><input checked="" type="checkbox"/> <i>Confidential material separated in both electronic and hard copy</i><br><input checked="" type="checkbox"/> <i>Formal request including reasons</i><br><input checked="" type="checkbox"/> <i>Non-confidential summary provided</i> |
| <input checked="" type="checkbox"/> 3.1.2 Applicant details   | <input type="checkbox"/> 3.1.8 Exclusive Capturable Commercial Benefit<br><input type="checkbox"/> <i>Justification provided</i>   |
| <input checked="" type="checkbox"/> 3.1.3 Purpose of the application  | <input checked="" type="checkbox"/> 3.1.9 International and other national standards<br><input checked="" type="checkbox"/> <i>International standards</i><br><input checked="" type="checkbox"/> <i>Other national standards</i>  |
| <input checked="" type="checkbox"/> 3.1.4 Justification for the application<br><input checked="" type="checkbox"/> <i>Regulatory impact information</i><br><input checked="" type="checkbox"/> <i>Impact on international trade</i>   | <input checked="" type="checkbox"/> 3.1.10 Statutory Declaration   |
| <input checked="" type="checkbox"/> 3.1.5 Information to support the application<br><input checked="" type="checkbox"/> <i>Data requirements</i>  | <input checked="" type="checkbox"/> 3.1.11 Checklist/s provided with application<br><input checked="" type="checkbox"/> <i>3.1 Checklist</i><br><input checked="" type="checkbox"/> <i>Any other relevant checklists for Parts 3.2-3.7</i>   |



## Appendix 1.5

### Checklist for Standards related to Substances added to Food

| Processing Aids (3.3.2)  |   |
|--|---|
| <input checked="" type="checkbox"/> A.1 Type of processing aid                                     | <input checked="" type="checkbox"/> C.3. Allergenicity information of enzyme (enzyme only)                                      |
| <input checked="" type="checkbox"/> A.2 Identification information                                 | <input checked="" type="checkbox"/> C.4. Overseas safety Assessment Reports   |
| <input checked="" type="checkbox"/> A.3 Chemical and physical properties                           | <input checked="" type="checkbox"/> D.1 Information on source organism (enzyme from microorganism only)                         |
| <input checked="" type="checkbox"/> A.4 Manufacturing process                                      | <input checked="" type="checkbox"/> D.2 Pathogenicity and toxicity of source microorganism (enzyme from microorganism only)     |
| <input checked="" type="checkbox"/> A.5 Specification information                                  | <input checked="" type="checkbox"/> D.3 Genetic stability of source organism (enzyme from microorganism only)                   |
| <input type="checkbox"/> A.6 Analytical method for detection                                       | <input checked="" type="checkbox"/> E.1 Nature of genetic modification of source organism (enzyme from GM source microorganism) |
| <input type="checkbox"/> B.1 Industrial use information (chemical only)                            | <input checked="" type="checkbox"/> F.1 List of foods likely to contain the processing aid                                      |
| <input type="checkbox"/> B.2 Information on use in other countries (chemical only)                 | <input checked="" type="checkbox"/> F.2 Anticipated residue levels in foods   |
| <input type="checkbox"/> B.3 Toxicokinetics and metabolism information (chemical only)             | <input type="checkbox"/> F.3 Information on likely level of consumption   |
| <input type="checkbox"/> B.4 Toxicity information (chemical only)                                  | <input checked="" type="checkbox"/> F.4 Percentage of food group to use processing aid  |
| <input type="checkbox"/> B.5 Safety assessments from international agencies (chemical only)        | <input checked="" type="checkbox"/> F.5 Information on residues in foods in other countries (if available)                      |
| <input checked="" type="checkbox"/> C.1 Information on enzyme use on other countries (enzyme only) | <input checked="" type="checkbox"/> F.6 Where consumption has changed, information on likely consumption                        |
| <input checked="" type="checkbox"/> C.2 Toxicity information of enzyme (enzyme only)               |   |

## Appendix 2

### Product information

1. Acrylaway HighT application sheet
2. Product Data Sheet for Acrylaway HighT L
3. Product Data Sheet for Acrylaway HighT BG
4. Certificate of approval of Acrylaway HighT by the Danish authorities
5. BR positive list
6. Amendment to MX positive list

Baking

## Application sheet

## Acrylamide mitigation in breakfast cereals

Recent reports have indicated the presence of significant levels of acrylamide in various grain-based foods processed at high temperatures, including breakfast cereals. To reduce the level of acrylamide in such foods, Novozymes has developed Novozymes Acrylaway® HighT, which works by converting asparagine, a major precursor for acrylamide formation, into aspartic acid, thereby reducing the final acrylamide levels.

### Benefits

- Acrylaway® HighT can reduce the level of acrylamide by 50-75% compared to the control
- Acrylaway® HighT has no adverse effect on the quality of the final cereal
- Acrylaway® HighT is easy to use and requires little or no process modifications

### Products

| Enzyme name         | Activity    | Description |
|---------------------|-------------|-------------|
| Acrylaway® HighT L  | 6000 TASU/g | Liquid      |
| Acrylaway® HighT BG | 6000 TASU/g | Granulate   |

Table 1. Available product forms of Novozymes Acrylaway® HighT

### Process

Acrylaway® HighT is added during ingredient mixing and is most active during the cooking or pre-conditioning step. Acrylaway® HighT L can easily be incorporated in the flavor syrup or Acrylaway® HighT BG can be blended with the dry ingredients. During cooking or pre-conditioning, the enzyme converts asparagine present in the raw materials to aspartic acid. Lower asparagine levels reduce acrylamide formation during later steps, such as toasting.

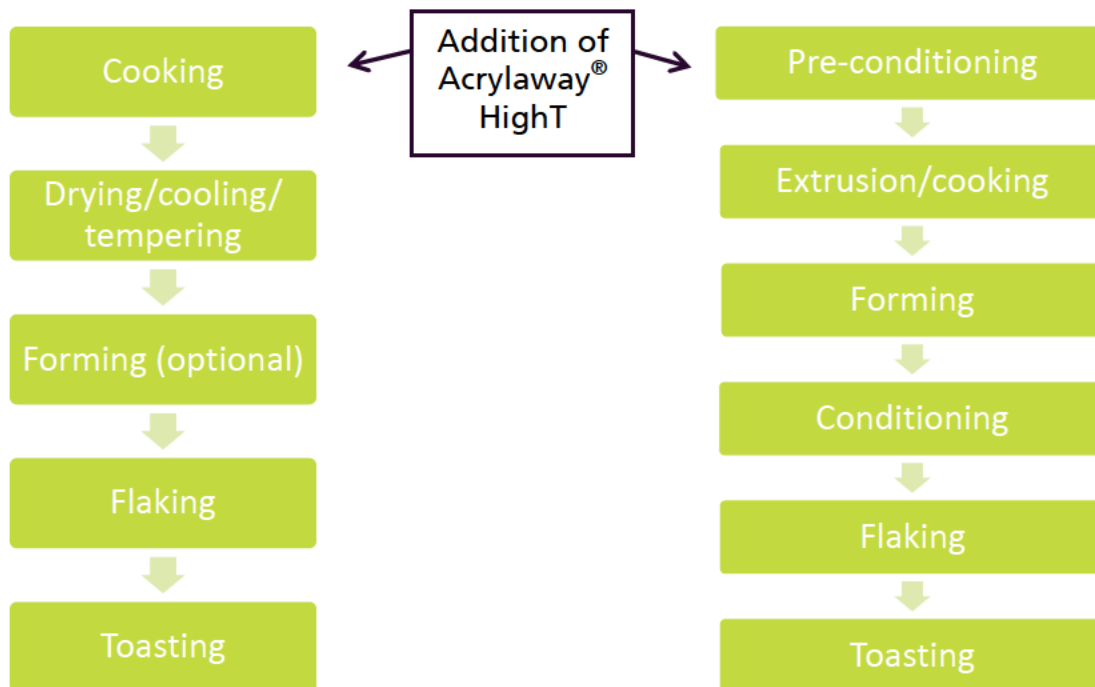


Fig. 1. Schematic of batch cooked cereal flake (left) and extruded cereal flake (right) processes. Novozymes Acrylaway® HighT is added just before cooking or pre-conditioning

The recommended dosage of Acrylaway® HighT is 250-5000 TASU/kg flour depending on process temperature, pH, moisture content, and holding time. Recommended process conditions are as follows:

- 80-110°C (176-230°F)
- pH 6-9
- >15% added water based on weight of dough
- Holding time of 10-30 minutes

To ensure that the enzyme is fully inactivated in the final product so that no risk of safety exposure during handling could be expected, the following minimum holding times/temperatures during processing are recommended:

| Temperature (°C) | Time (min) |
|------------------|------------|
| 140              | 1          |
| 120              | 5          |
| 110              | 15         |
| 105              | 20-25      |

Table 2. Recommended conditions for enzyme inactivation

## Performance

### Batch cooked wheat flakes

A reduction in acrylamide formation of up to 54% was obtained during lab scale testing of batch cooked whole wheat flakes. The following recipe was used:

- 750 g whole wheat grits
- 72.6 g sugar
- 15.7 g malt syrup
- 8.5 g salt
- 280 g water +/- Acrylaway® HighT

The cooking temperature was 104-105°C (219-221°F), the cooking time was 25 minutes, and the analyzed moisture content was 33% (including added water, water from ingredients, and steam). Toasting temperatures were 230-245°C (446-473°F).

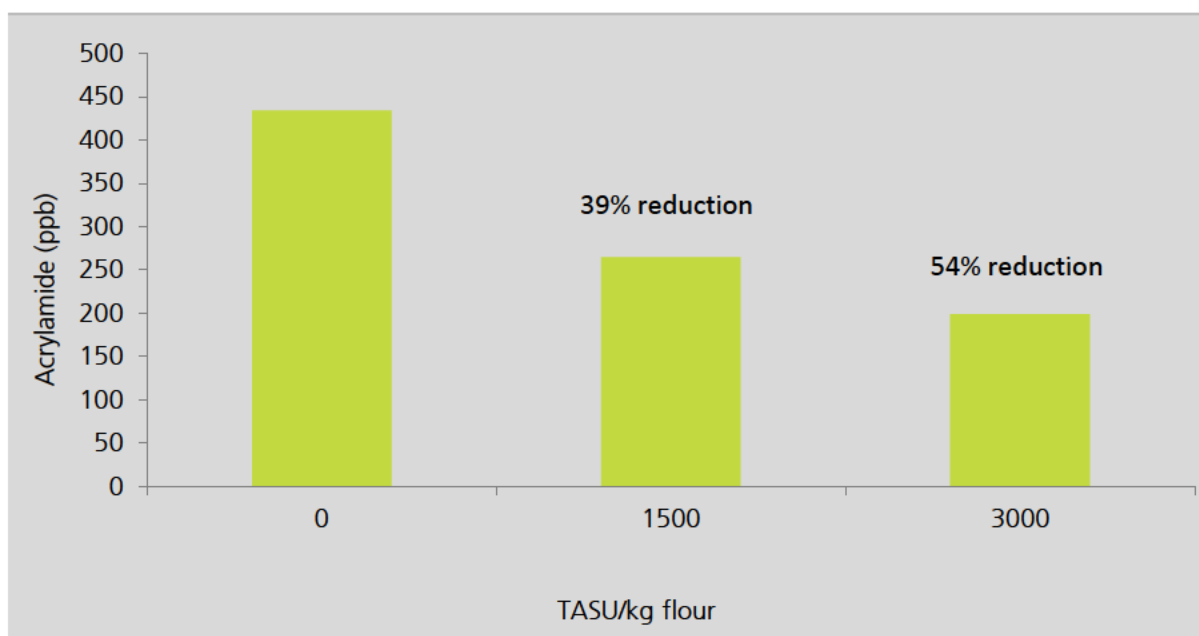


Fig. 2. Acrylamide content of batch cooked wheat flakes. Treatment with Novozymes Acrylaway® HighT during cooking reduced acrylamide levels in the final product by up to 54%

### Batch cooked corn flakes

A reduction in acrylamide formation of up to 58% was obtained during lab scale testing of batch cooked corn flakes made with corn grits. The cooking temperature was 102-105°C (216-221°F), the cooking time was 120 minutes, and the analyzed moisture content was 33-34.5% (including added water, water from ingredients, and steam). Toasting temperatures were 230-245°C (446-473°F).

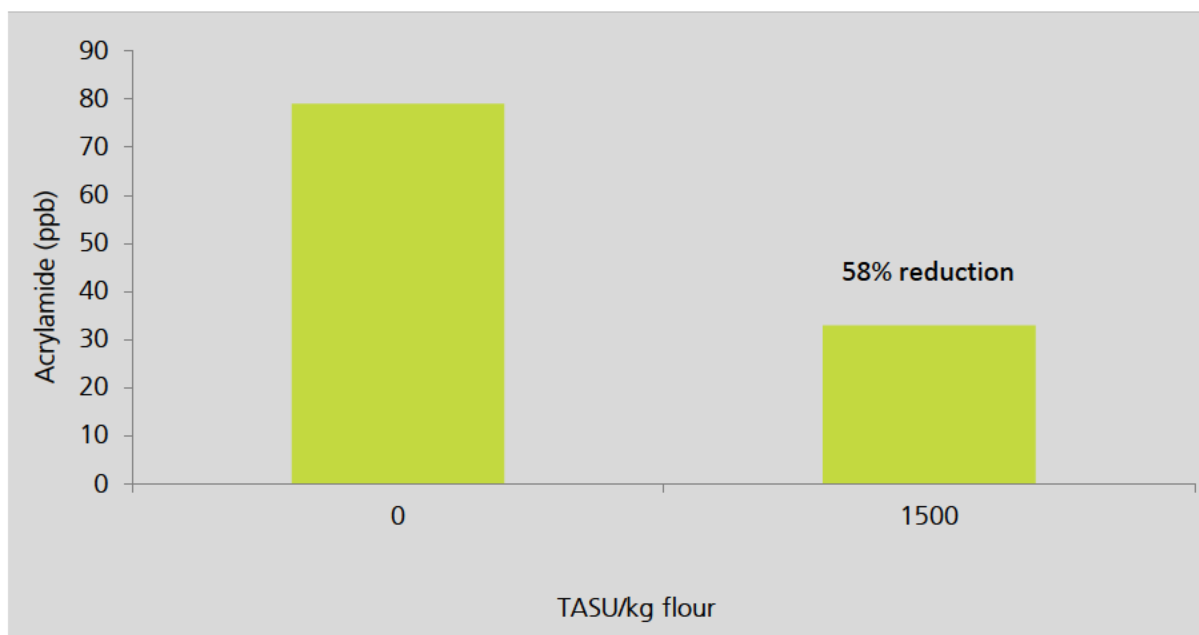


Fig. 3. Acrylamide content of batch cooked corn flakes. Treatment with Novozymes Acrylaway® HighT during cooking reduced acrylamide levels in the final product by 58%

#### Whole wheat and bran extruded flakes

A reduction in acrylamide formation of up to 75% was obtained during pilot scale testing of whole wheat and bran extruded flakes. The pre-conditioning temperature was 90-100°C (194-212°F) and the holding time was 10-12 minutes. The analyzed moisture content was 27% (including added water, water from ingredients, and steam). The extrusion temperature was 100-140°C (212-284°F).

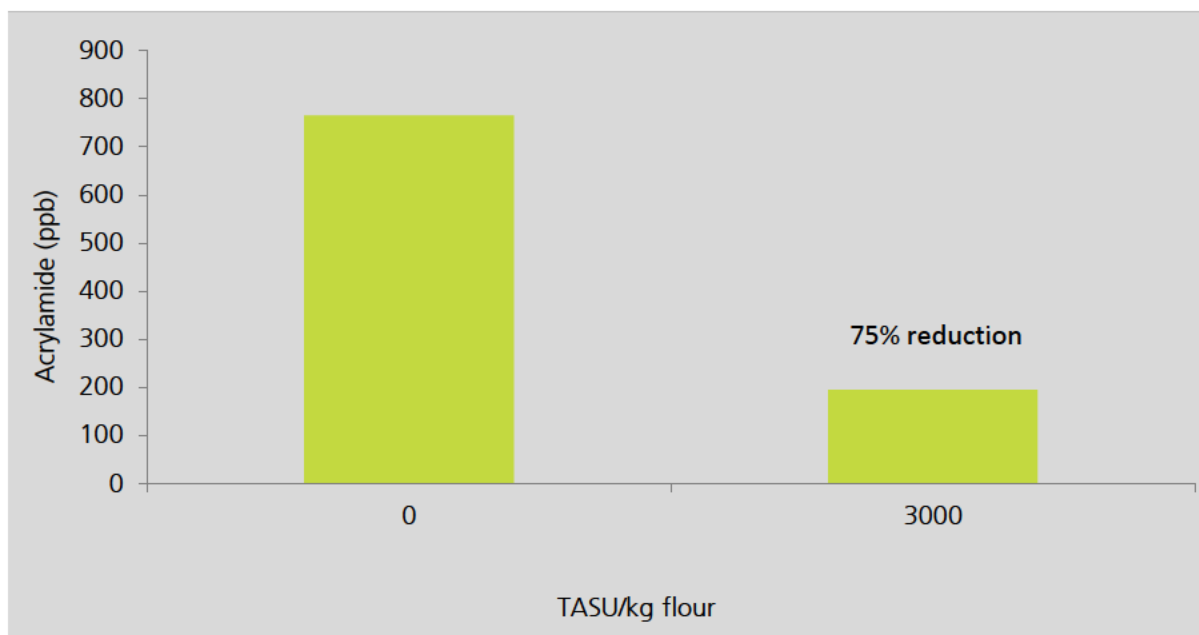


Fig. 4. Acrylamide content of extruded whole wheat and bran flakes. Treatment with Novozymes Acrylaway® HighT during pre-conditioning reduced acrylamide levels in the final product by up to 75%

### Whole wheat and rice extruded flakes

A reduction in acrylamide formation of up to 56% was obtained during pilot scale testing of whole wheat and rice extruded flakes. The pre-conditioning temperature was 90-100°C (194-212°F) and the holding time was 10-12 minutes. The analyzed moisture content was 27% (including added water, water from ingredients, and steam). The extrusion temperature was 100-110°C (212-230°F).

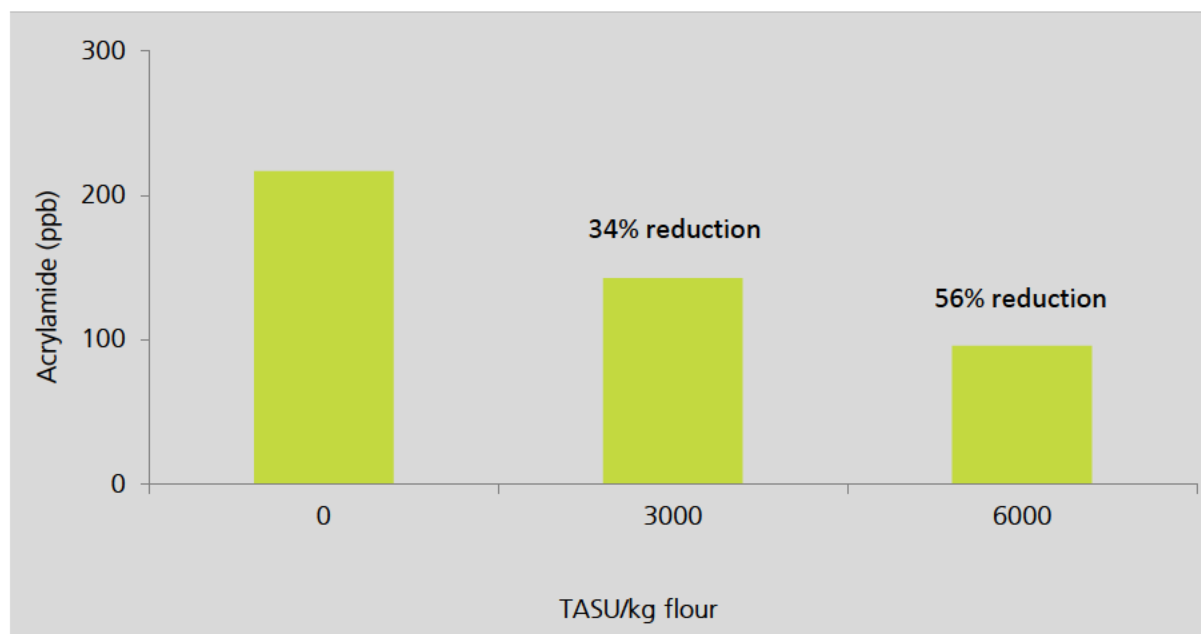


Fig. 5. Acrylamide content of extruded whole wheat and rice flakes. Treatment with Novozymes Acrylaway® HighT during pre-conditioning reduced acrylamide levels in the final product by up to 56%

### Safety, handling and storage

Safety, handling and storage guidelines are provided with all products.

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*Novozymes is the world leader in bioinnovation. Together with customers across a broad array of industries we create tomorrow's industrial biosolutions, improving our customers' business, and the use of our planet's resources. Read more at [www.novozymes.com](http://www.novozymes.com).*

# Acrylaway® HighT L

In this product the key enzyme activity is provided by  
asparaginase that hydrolyzes L-asparagine to L-asparatate and ammonia

## PRODUCT CHARACTERISTICS/PROPERTIES

|   |              |
|---|--------------|
| Declared enzyme   | Asparaginase |
| Declared activity   | 6000 TASU/g  |
| Color   | Light brown  |
| Physical form   | Liquid       |
| <i>Color can vary from batch to batch. Color intensity is not an indication of enzyme activity.</i> |              |

## PRODUCT SPECIFICATION

|                                | Lower Limit  | Upper Limit | Unit  |
|--------------------------------|--------------|-------------|-------|
| Thermostable Asparaginase TASU | 6000         |             | /g    |
| Total viable count             | -            | 50000       | /g    |
| E.coli                         | Not Detected |             | /25 g |
| Coliform bacteria              |              | 30          | /g    |
| Salmonella                     | Not Detected |             | /25 g |
| Heavy metals                   |              | Max 30      | mg/kg |
| Lead                           |              | Max 5       | mg/kg |
| Arsenic                        |              | Max 3       | mg/kg |
| Cadmium                        |              | Max 0.5     | mg/kg |
| Mercury                        |              | Max 0.5     | mg/kg |

The enzyme analytical method is available from the Customer Center or sales representative.

## COMPOSITION

| Ingredients                          | Appr. % (w/w) |
|--------------------------------------|---------------|
| Sorbitol CAS no. 50-70-4             | 46.70         |
| Water CAS no. 7732-18-5              | 47            |
| Sodium chloride CAS no. 7647-14-5    | 5             |
| Asparaginase CAS no. 9015-68-3*      | 0.80          |
| Sodium benzoate CAS no. 532-32-1     | 0.30          |
| Potassium sorbate CAS no. 24634-61-5 | 0.20          |

\*Defined as enzyme conc. (dry matter basis)

## ALLERGEN

| Allergen                               | Substance contained <sup>1</sup> | Allergen  | Substance contained <sup>1</sup> |
|--|----------------------------------|---|----------------------------------|
| Beef                                   | no                               | Lactose   | no                               |
| Carrot                                 | no                               | Legumes   | no                               |
| Celery                                 | no                               | Lupin   | no                               |
| Cereals containing gluten <sup>2</sup> | no                               | Milk  | no                               |
| Chicken meat                           | no                               | Molluscs  | no                               |
| Cocoa                                  | no                               | Mustard   | no                               |
| Coriander                              | no                               | Nuts <sup>3</sup>                                     | no                               |
| Corn/maize                             | no                               | Peanuts   | no                               |
| Crustaceans                            | no                               | Pork  | no                               |
| Egg                                    | no                               | Sesame  | no                               |
| Fish                                   | no                               | Soy   | no                               |
| Glutamate                              | no                               | Sulphur dioxide/sulphites more than 10 mg per kg or l | no                               |

<sup>1</sup>Definition of substances according to LeDa/ALBA and EU Regulation 1169/2011 as amended

<sup>2</sup>i.e. wheat rye barley oats spelt kamut

<sup>3</sup>i.e. almond hazelnut walnut cashew pecan nut Brazil nut pistachio nut macadamia nut and Queensland nut

## NUTRITIONAL VALUES

The product has a typical nutritional value of approximately 489 kJ/100 g enzyme product.

|                |                |
|----------------|----------------|
| • Protein      | 1 g/100 g      |
| • Polyols      | 47 g/100 g     |
| • Organic acid | 0 g/100 g      |
| • Ash          | 5 g/100 g      |
| - Sodium       | (2.00 g/100 g) |
| • Moisture     | 47 g/100 g     |

## GM STATUS

This product is not a GMO

Production organism

Bacillus subtilis

The enzyme product is manufactured by fermentation of a micro organism that is not present in the final product. The production organism is improved by means of modern biotechnology.



# Acrylaway® HighT L

## STORAGE CONDITION

**Recommended storage:** 0-10 °C (32-50 °F)

Packaging must be kept intact dry and away from sunlight. Please follow the recommendations and use the product before the best before date to avoid the need for a higher dosage.

**Best before:** You will find the best before date in the certificate of analysis or on the product label.

The product gives optimal performance if stored at 0–10 °C/32–50 °F and used prior to the best-before date. If stored at max. 25 °C/77 °F the product should be used within 3 months after delivery.

Novozymes guarantees delivery at least 6 months prior to the best-before date.

## SAFETY AND HANDLING PRECAUTIONS

Enzymes are proteins. Inhalation of dust or aerosols may induce sensitization and may cause allergic reactions in sensitized individuals. Some enzymes may irritate the skin eyes and mucous membranes upon prolonged contact. See the MSDS or Safety Manual for further information regarding safe handling of the product and spills.

## COMPLIANCE

The product complies with the recommended purity specifications for food-grade enzymes given by the Joint FAO/WHO Expert Committee on Food Additives (JECFA) and the Food Chemical Codex (FCC).

Kosher and Halal certificates are available from the Customer Center or sales representative.

## CERTIFICATIONS

Novozymes is a signatory to United Nations Global Compact United Nations Convention on Biological Diversity and report on our sustainability performance through Global Reporting Initiative (GRI). See all our commitments under sustainability on [www.novozymes.com](http://www.novozymes.com).



## FOOD SAFETY

The product is controlled by Novozymes' Quality Management System and is produced according to an HACCP plan supported by a comprehensive prerequisite program.

The product complies with FAO/WHO JECFA- and FCC-recommended purity requirements regarding mycotoxins. The product complies with EU legislation regarding pesticides.

The product is produced under FSSC 22000 certification.



## PACKAGING

The product is available in different types of packaging. Please contact the sales representative for more information.



## Acrylaway® HighT BG

In this product the key enzyme activity is provided by asparaginase that hydrolyzes L-asparagine to L-asparatate and ammonia

### PRODUCT CHARACTERISTICS/PROPERTIES

|                   |                         |
|-------------------|-------------------------|
| Declared enzyme   | Asparaginase            |
| Declared activity | 6000 TASU/g             |
| Color             | Light yellow            |
| Physical form     | Granulate               |
| Properties        | Freeflowing low-dusting |
| Particle size     | Approx. 50-212 microns  |

This product is standardized by Documented Addition in a process controlled by Novozymes ISO 9001 quality system. See Documented Addition Info Sheet for further information.

Solubility Active component is readily soluble in water at all concentrations that occur in normal usage. Standardisation components can cause turbidity in solution.

Color can vary from batch to batch. Color intensity is not an indication of enzyme activity.

### PRODUCT SPECIFICATION

|                                | Lower Limit  | Upper Limit | Unit  |
|--------------------------------|--------------|-------------|-------|
| Thermostable Asparaginase TASU | 6000         |             | /g    |
| Total viable count             | -            | 50000       | /g    |
| Coliform bacteria              | -            | 30          | /g    |
| E.coli                         | Not Detected |             | /25 g |
| Salmonella                     | Not Detected |             | /25 g |
| Heavy metals                   |              | Max 30      | mg/kg |
| Lead                           |              | Max 5       | mg/kg |
| Arsenic                        |              | Max 3       | mg/kg |
| Cadmium                        |              | Max 0.5     | mg/kg |
| Mercury                        |              | Max 0.5     | mg/kg |

The enzyme analytical method is available from the Customer Center or sales representative.

### COMPOSITION

| Ingredients                       | Appr. % (w/w) |
|-----------------------------------|---------------|
| Corn flour CAS no. 68525-86-0     | 95.70         |
| Sodium chloride CAS no. 7647-14-5 | 3             |
| Asparaginase CAS no. 9015-68-3*   | 0.90          |
| Dextrin CAS no. 9004-53-9         | 0.40          |

\*Defined as enzyme conc. (dry matter basis)

### ALLERGEN

| Allergen                               | Substance contained <sup>1</sup> | Allergen  | Substance contained <sup>1</sup> |
|--|----------------------------------|---|----------------------------------|
| Beef                                   | no                               | Lactose   | no                               |
| Carrot                                 | no                               | Legumes   | no                               |
| Celery                                 | no                               | Lupin   | no                               |
| Cereals containing gluten <sup>2</sup> | no                               | Milk  | no                               |
| Chicken meat                           | no                               | Molluscs  | no                               |
| Cocoa                                  | no                               | Mustard   | no                               |
| Coriander                              | no                               | Nuts <sup>3</sup>                                     | no                               |
| Corn/maize                             | yes                              | Peanuts   | no                               |
| Crustaceans                            | no                               | Pork  | no                               |
| Egg                                    | no                               | Sesame  | no                               |
| Fish                                   | no                               | Soy   | no                               |
| Glutamate                              | no                               | Sulphur dioxide/sulphites more than 10 mg per kg or l | no                               |

<sup>1</sup>Definition of substances according to LeDa/ALBA and EU Regulation 1169/2011 as amended

<sup>2</sup>i.e. wheat rye barley oats spelt kamut

<sup>3</sup>i.e. almond hazelnut walnut cashew pecan nut Brazil nut pistachio nut macadamia nut and Queensland nut

### NUTRITIONAL VALUES

The product has a typical nutritional value of approximately 1526 kJ/100 g enzyme product.

|                |                |
|----------------|----------------|
| • Protein      | 8 g/100 g      |
| • Fat          | 3 g/100 g      |
| • Carbohydrate | 75 g/100 g     |
| - Fiber        | (3 g/100 g)    |
| • Ash          | 3 g/100 g      |
| - Sodium       | (1.21 g/100 g) |
| • Moisture     | 11 g/100 g     |

### GM STATUS

This product is not a GMO.

Production organism *Bacillus subtilis*

The enzyme product is manufactured by fermentation of a micro organism that is not present in the final product. The production organism is improved by means of modern biotechnology.

# Acrylaway® HighT BG

## STORAGE CONDITION

**Recommended storage:** 0-10 °C (32-50 °F)

Packaging must be kept intact dry and away from sunlight. Please follow the recommendations and use the product before the best before date to avoid the need for a higher dosage.

**Best before:** You will find the best before date in the certificate of analysis or on the product label.

The product gives optimal performance when stored as recommended and used within 24 months of the production date.

Novozymes guarantees delivery at least 6 months prior to the best-before date.

## SAFETY AND HANDLING PRECAUTIONS

Enzymes are proteins. Inhalation of dust or aerosols may induce sensitization and may cause allergic reactions in sensitized individuals. Some enzymes may irritate the skin eyes and mucous membranes upon prolonged contact. See the MSDS or Safety Manual for further information regarding safe handling of the product and spills.

## COMPLIANCE

The product complies with the recommended purity specifications for food-grade enzymes given by the Joint FAO/WHO Expert Committee on Food Additives (JECFA) and the Food Chemical Codex (FCC).

Kosher and Halal certificates are available from the Customer Center or sales representative.

## CERTIFICATIONS

Novozymes is a signatory to United Nations Global Compact United Nations Convention on Biological Diversity and report on our sustainability performance through Global Reporting Initiative (GRI). See all our commitments under sustainability on [www.novozymes.com](http://www.novozymes.com).



## FOOD SAFETY

Novozymes has carried out a hazard analysis and prepared an HACCP plan describing the critical control points (CCPs). The HACCP plan is supported by a comprehensive prerequisite program implemented in Novozymes' GMP practices.

The product is produced according to Novozymes' HACCP plan GMP practices and additional requirements controlled by Novozymes' Quality Management System.

The product complies with FAO/WHO JECFA- and FCC-recommended purity requirements regarding mycotoxins. The product complies with EU legislation regarding pesticides.

The product is produced under FSSC 22000 certification.



## PACKAGING

The product is available in different types of packaging. Please contact the sales representative for more information.

Novozymes A/S  
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For more information or for more office addresses visit [www.novozymes.com](http://www.novozymes.com)

Laws regulations and/or third party rights may prevent customers from importing using processing and/or reselling the products described herein in a given manner. Without separate written agreement between the customer and Novozymes to such effect this document does not constitute a representation or warranty of any kind and is subject to change without further notice.

# Ministry of Food, Agriculture and Fisheries

Danish Veterinary and Food Administration



2013-09568-05

DIVISION OF

FOOD QUALITY, TECHNOLOGY

AND MARKETING PRACTICES

TO WHOM IT MAY CONCERN

19.09.2013

## Acrylaway HighT

The Danish Veterinary and Food Administration hereby certify having accepted in 2013 the enzyme product Acrylaway HighT from Novozymes A/S. The product, produced by a *Bacillus subtilis* expressing an aspariganse from *Pyrococcus furiosus*, has been accepted to be used to reduce acylamide formation in various food application up to a level of 15.000 TASU/kg dry matter.

The evaluation of the safety of Acrylaway HighT has been made in accordance with the principles laid down in the Guidelines for the presentation of data on food enzymes, "cf. Reports of the Scientific Committee of Food, 27th Series, EUR 14181, 1992.

Yours faithfully



## RESOLUÇÃO DA DIRETORIA COLEGIADA – RDC Nº 53, DE 07 DE OUTUBRO DE 2014

(Publicada no Diário Oficial da União nº 194 - Brasília-DF, quarta-feira, 08 de outubro de 2014)

Dispõe sobre a lista de enzimas, aditivos alimentares e veículos autorizados em preparações enzimáticas para uso na produção de alimentos em geral.

A Diretoria Colegiada da Agência Nacional de Vigilância Sanitária, no uso da atribuição que lhe conferem os incisos III e IV, do art. 15, da Lei nº 9.782, de 26 de janeiro de 1999, inciso V e §§ 1º e 3º do art. 5º do Regimento Interno aprovado nos termos do Anexo I da Portaria nº 650 da ANVISA, de 29 de maio de 2014, publicada no DOU de 02 de junho de 2014, tendo em vista o disposto nos incisos III, do art. 2º, III e IV, do art. 7º da Lei nº 9.782 de 1999, e o Programa de Melhoria do Processo de Regulamentação da Agência, instituído por Portaria nº 422, de 16 de abril de 2008, em reunião realizada em 23 de setembro de 2014, adota a seguinte Resolução da Diretoria Colegiada e eu, Diretor-Presidente, determino a sua publicação:

Art. 1º Fica aprovada, nos termos desta Resolução, a lista de enzimas com suas respectivas fontes de obtenção, aditivos alimentares e veículos autorizados em preparações enzimáticas para uso como coadjuvante de tecnologia na produção de alimentos em geral.

Art. 2º As enzimas e suas respectivas fontes de obtenção autorizadas em preparações enzimáticas para uso na produção de alimentos em geral são as listadas no Anexo I desta Resolução.

Art. 3º As preparações enzimáticas podem ser adicionadas dos aditivos alimentares listados no Anexo II desta Resolução, em limite *quantum satis* (q.s.).

§1º O uso de aditivos alimentares na produção de preparações enzimáticas deve atender aos princípios de transferência de aditivos alimentares estabelecidos em Regulamento Técnico específico sobre Aditivos Alimentares - definições, classificação e emprego.

§2º As preparações enzimáticas também podem ser adicionadas de aditivos alimentares e coadjuvantes de tecnologia permitidos para os alimentos aos quais se destinam, conforme Regulamentos Técnicos específicos.

Art. 4º Os veículos autorizados na elaboração de preparações enzimáticas constam do Anexo III desta Resolução.

Parágrafo único. Os ingredientes autorizados para os alimentos aos quais se destinam as preparações enzimáticas também podem ser utilizados como veículos.

Art. 5º A inclusão de enzimas não constantes nesta Resolução pode ocorrer mediante autorização da ANVISA, a pedido da parte interessada (importador ou fabricante), com base no estabelecido no Regulamento Técnico sobre enzimas e preparações enzimáticas para uso na produção de alimentos em geral.

Art. 6º As empresas têm o prazo de 12 (doze) meses, contados a partir da data de publicação desta Resolução, para promover as adequações necessárias.

Art. 7º O descumprimento das disposições contidas nesta Resolução constitui infração sanitária, nos termos da Lei n. 6.437, de 20 de agosto de 1977, sem prejuízo das responsabilidades civil, administrativa e penal cabíveis.

Art. 8º Revogam-se a Resolução RDC n. 26, de 26 de maio de 2009, que aprova a lista de enzimas permitidas para uso em alimentos destinados ao consumo humano conforme a sua origem em substituição ao Anexo I da Resolução RDC nº 205 de 14 de novembro de 2006, e a tabela referente aos coadjuvantes de tecnologia para alimentos à base de cereais para alimentação infantil, anexa à Resolução RDC n. 27, de 13 de fevereiro de 2004, que aprova para alimentos à base de cereais para alimentação infantil a extensão de uso de aditivos alimentares coadjuvantes de tecnologia.

Art. 9º Esta Resolução entra em vigor na data de sua publicação.

DIRCEU BRAS APARECIDO BARBANO

## ANEXO I

### ENZIMAS PERMITIDAS PARA USO EM ALIMENTOS EM GERAL DESTINADOS AO CONSUMO HUMANO, CONFORME A SUA ORIGEM

#### - ENZIMAS DE ORIGEM ANIMAL

| Nome da Enzima ou Complexo  | Fonte(s)   |
|-----------------------------|--|
| Alfa-amilase                | Pâncreas suíno e bovino                                      |
| Catalase                    | Fígado de cavalo ou bovino                                   |
| Quimosina                   | Abomaso de bezerro e caprino                                 |
| Lactoperoxidase             | Leite bovino   |
| Lipase                      | Abomaso e glândula salivar de bovino, suíno, caprino e ovino |
|                             | Estômago bovino  |
|                             | Pâncreas suíno e bovino                                      |
| Lisozima                    | Clara de ovo   |
| Pepsina bovina              | Abomaso (4ª parte do estômago)                               |
| Pepsina suína               | Mucosa vermelha (como mucosa gástrica)                       |
| Pepsina ave                 | <i>Proventricum</i> de frango                                |
| Fosfolipase A2              | Pâncreas suíno   |
|                             | Pâncreas suíno expresso em <i>Aspergillus niger</i>          |
| Pancreatina                 | Pâncreas suíno e bovino                                      |
| Proteases - coalho complexo | Abomaso de ruminantes  |
| Tripsina ou quimotripsina   | Pâncreas suíno e bovino                                      |

#### - ENZIMAS DE ORIGEM VEGETAL

| Nome da Enzima ou Complexo | Fonte(s)   |
|----------------------------|--|
| Alfa-amilase               | Malte, cereais e leguminosas maltadas  |
| Beta-amilase               | Malte, cereais e leguminosas maltadas  |
|                            | Batata doce ( <i>Ipomoea batatas</i> )   |
| Bromelina                  | Caule, folhas e frutos da família Bromeliaceae ( <i>Ananas sativus</i> e <i>Ananas comosus</i> ) |

|                   |   |
|-------------------|---|
| Coagulase vegetal | Cardo <i>Cynara cardunculus</i><br>Figo <i>Ficus carica</i>   |
| Ficina            | Caules, folhas e frutos da família Ficus ( <i>Ficus glabrata</i> e <i>Ficus carica</i> )                |
| Lipoxigenase      | Farinha de soja   |
| Papaína           | Caule, folhas e frutos de plantas da família Carica ( <i>Carica papaya</i> e <i>Ananas bracteatus</i> ) |
| Peroxidase        | Raiz forte, farinha de soja, farinha de trigo   |

## - ENZIMAS DE ORIGEM MICROBIANA

| Nome da Enzima ou Complexo       | Fonte(s)   |
|----------------------------------|--|
| Alfa-acetolactato decarboxilase  | <i>Bacillus brevis</i> expresso em <i>Bacillus subtilis</i>  |
| Alfa-amilase                     | <i>Aspergillus niger</i><br><i>Aspergillus oryzae</i><br><i>Bacillus licheniformis</i><br><i>Bacillus licheniformis</i> expresso em <i>Bacillus licheniformis</i><br><i>Bacillus licheniformis</i> e <i>Bacillus amyloliquefaciens</i> expresso em <i>Bacillus licheniformis</i><br><i>Bacillus megaterium</i> expresso em <i>Bacillus subtilis</i><br><i>Bacillus stearothermophilus</i><br><i>Bacillus stearothermophilus</i> expresso em <i>Bacillus licheniformis</i><br><i>Bacillus stearothermophilus</i> expresso em <i>Bacillus subtilis</i><br><i>Bacillus subtilis</i><br><i>Rhizopus deleamar</i><br><i>Rhizopus oryzae</i><br><i>Thermococcales</i> expresso em <i>Pseudomonas fluorescens</i> |
| Alfa-galactosidase               | <i>Aspergillus niger</i><br><i>Mortierella vinacea</i><br><i>Saccharomyces carlsbergensis</i>  |
| Amilase maltogênica              | <i>Bacillus stearothermophilus</i> expresso em <i>Bacillus licheniformis</i><br><i>Bacillus stearothermophilus</i> expresso em <i>Bacillus subtilis</i><br><i>Pseudomonas stutzeri</i> expresso em <i>Bacillus licheniformis</i>   |
| Amiloglucosidase ou glucoamilase | <i>Aspergillus awamori</i><br><i>Aspergillus niger</i><br><i>Aspergillus niger</i> expresso em <i>Aspergillus niger</i><br><i>Aspergillus oryzae</i><br><i>Rhizopus arrhizus</i><br><i>Rhizopus deleamar</i><br><i>Rhizopus niveus</i><br><i>Rhizopus oryzae</i><br><i>Talaromyces emersonii</i> expresso em <i>Aspergillus niger</i><br><i>Trichoderma reesei</i><br><i>Trichoderma reesei</i> expresso em <i>Trichoderma reesei</i>  |
| Aminopeptidase leucina           | <i>Lactococcus lactis</i>  |
| Arabinofuranosidase              | <i>Aspergillus niger</i>   |



|  |  |
|--|--|
| Asparaginase                               | <i>Aspergillus niger</i> expresso em <i>Aspergillus niger</i><br><i>Aspergillus oryzae</i> expresso em <i>Aspergillus oryzae</i><br><i>Pyrococcus furiosus</i> expresso em <i>Bacillus subtilis</i>  |
| Beta-amilase                               | <i>Bacillus cereus</i><br><i>Bacillus megaterium</i><br><i>Bacillus subtilis</i>   |
| Beta-glucanase                             | <i>Aspergillus aculeatus</i><br><i>Aspergillus niger</i><br><i>Bacillus subtilis</i><br><i>Disporotrichum dimorphosporum</i><br><i>Humicola insolens</i><br><i>Penicillium emersonii</i><br><i>Talaromyces mersonii</i><br><i>Trichoderma harzianum</i><br><i>Trichoderma longibrachiatum</i><br><i>Trichoderma reesei</i> |
| Beta-glucosidase ou celobiose              | <i>Aspergillus niger</i><br><i>Trichoderma harzianum</i><br><i>Trichoderma reesei</i>  |
| Catalase                                   | <i>Aspergillus niger</i><br><i>Micrococcus lysodeicticus</i>   |
| Celulase                                   | <i>Aspergillus niger</i><br><i>Aspergillus oryzae</i><br><i>Penicillium funiculosum</i><br><i>Rhizopus delemar</i><br><i>Rhizopus oryzae</i><br><i>Sporotrichum dimorphosporum</i><br><i>Thielavia terrestris</i><br><i>Trichoderma longibrachiatum</i><br><i>Trichoderma reesei</i>                                       |
| Dextranase                                 | <i>Bacillus subtilis</i><br><i>Chaetomium erraticum</i><br><i>Chaetomium gracile</i><br><i>Klebsiella aerogenes</i><br><i>Penicillium funiculosum</i><br><i>Penicillium lilacinum</i>  |
| Esterase                                   | <i>Aspergillus niger</i><br><i>Mucor miehei</i><br><i>Trichoderma reesei</i>   |
| Enzima ramificadora                        | <i>Rhodothermus obamensis</i> expresso em <i>Bacillus subtilis</i>   |
| Fitase                                     | <i>Aspergillus niger</i><br><i>Aspergillus niger</i> expresso em <i>Aspergillus niger</i>  |
| Fosfatidilcolina esterol o-aciltransferase | <i>Aeromonas salmonicida</i> expresso em <i>Bacillus licheniformis</i>   |
| Fosfolipase A1                             | <i>Fusarium venenatum</i> expresso em <i>Aspergillus oryzae</i>  |
| Fosfolipase A2                             | <i>Streptomyces violaceoruber</i>  |
| Fosfolipase C                              | <i>Pichia pastoris</i>   |



|                                       |  |
|---------------------------------------|--|
| Glucose isomerase ou xilose isomerase | <i>Actinoplanes missourienses</i><br><i>Bacillus coagulans</i><br><i>Microbacterium arborensens</i><br><i>Streptomyces albus</i><br><i>Streptomyces murinus</i><br><i>Streptomyces olivaceus</i><br><i>Streptomyces olivochromogenes</i><br><i>Streptomyces rubiginosus</i><br><i>Streptomyces violaceoniger</i> |
| Glucose-oxidase                       | <i>Aspergillus niger</i><br><i>Aspergillus niger</i> expresso em <i>Aspergillus niger</i><br><i>Aspergillus niger</i> expresso em <i>Aspergillus oryzae</i><br><i>Penicillium amagasakiense</i>  |
| Hemicelulase                          | <i>Aspergillus niger</i><br><i>Aspergillus oryzae</i><br><i>Bacillus subtilis</i><br><i>Rhizopus delemar</i><br><i>Rhizopus oryzae</i><br><i>Sporotrichum dimorphosporum</i><br><i>Trichoderma reesei</i>  |
| Hexose oxidase                        | <i>Chondrus crispus</i> expresso em <i>Hansenula polymorpha</i>  |
| Inulinase                             | <i>Aspergillus niger</i><br><i>Kluyveromyces fragilis</i><br><i>Sporotrichum dimorphosporum</i>  |
| Invertase ou beta-frutofuranosidase   | <i>Aspergillus niger</i><br><i>Bacillus subtilis</i><br><i>Kluyveromyces fragilis</i><br><i>Saccharomyces carlsbergensis</i><br><i>Saccharomyces cerevisiae</i>  |
| Isomaltulose sintase                  | <i>Protaminobacter rubrum</i>  |
| Lacase                                | <i>Myceliphthora thermophila</i> expresso em <i>Aspergillus oryzae</i>   |
| Lactase ou beta-galactosidase         | <i>Aspergillus niger</i><br><i>Aspergillus oryzae</i><br><i>Aspergillus oryzae</i> expresso em <i>Aspergillus niger</i><br><i>Candida pseudotropicalis</i><br><i>Kluyveromyces fragilis</i><br><i>Kluyveromyces lactis</i><br><i>Kluyveromyces marxianus</i><br><i>Saccharomyces sp</i>                          |

|                             |   |
|-----------------------------|---|
| Lipase                      | <i>Aspergillus niger</i><br><i>Aspergillus oryzae</i><br><i>Brevibacterium lineus</i><br><i>Candida antarctica</i> expresso em <i>Aspergillus niger</i><br><i>Candida lipolytica</i><br><i>Candida rugosa</i><br><i>Fusarium culmorum</i> expresso em <i>Aspergillus niger</i><br><i>Fusarium heterosporum</i> expresso em <i>Hansenula polymorpha</i> ( <i>Pichia angusta</i> )<br><i>Fusarium oxysporum</i> expresso em <i>Aspergillus oryzae</i><br><i>Humicola lanuginosa</i> expresso em <i>Aspergillus oryzae</i><br><i>Mucor javanicus</i><br><i>Mucor pusillus</i><br><i>Penicillium camembertii</i><br><i>Rhizomucor miehei</i><br><i>Rhizopus rhizus</i><br><i>Rhizopus delemar</i><br><i>Rhizomucor miehei</i> expresso em <i>Aspergillus oryzae</i><br><i>Rhizopus nigrican</i><br><i>Rhizopus niveus</i><br><i>Thermomyces lanuginosus</i> expresso em <i>Aspergillus oryzae</i><br><i>Thermomyces lanuginosus</i> e <i>Fusarium oxysporum</i> expresso em <i>Aspergillus oryzae</i> |
| Lisofosfolipase             | <i>Aspergillus niger</i> expresso em <i>Aspergillus niger</i>   |
| Maltase ou alfa-glucosidase | <i>Aspergillus niger</i><br><i>Aspergillus oryzae</i><br><i>Rhizopus oryzae</i><br><i>Trichoderma reesei</i>  |
| Nitrato redutase            | <i>Micrococcus violagabriella</i>   |
| Pectina esterase            | <i>Aspergillus aculeatus</i> ou <i>Aspergillus Níger</i> expresso em <i>Aspergillus oryzae</i><br><i>Aspergillus niger</i><br><i>Aspergillus níger</i> expresso em <i>Aspergillus niger</i>   |
| Pectinaliase                | <i>Aspergillus aculeatus</i> ou <i>Aspergillus niger</i> expresso em <i>Aspergillus niger</i><br><i>Aspergillus niger</i><br><i>Aspergillus níger</i> expresso em <i>Trichoderma reesei</i>   |
| Pectinase                   | <i>Aspergillus awamori</i><br><i>Aspergillus foetidus</i><br><i>Aspergillus niger</i><br><i>Aspergillus oryzae</i><br><i>Penicillium simplicissium</i><br><i>Rhizopusoryzae</i><br><i>Trichoderma reesei</i>  |
| Poligalacturonase           | <i>Aspergillus niger</i><br><i>Aspergillus niger</i> expresso em <i>Aspergillus niger</i>   |

|                  |  |
|------------------|--|
| Protease         | <i>Aspergillus melleus</i><br><i>Aspergillus niger</i><br><i>Aspergillus niger</i> expresso em <i>Aspergillus niger</i><br><i>Aspergillus oryzae</i><br><i>Bacillus amyloliquefaciens</i><br><i>Bacillus amyloliquefaciens</i> expresso em <i>Bacillus subtilis</i><br><i>Bacillus cereus</i><br><i>Bacillus licheniformis</i><br><i>Bacillus subtilis</i><br><i>Endothia parasítica</i><br><i>Fusarium oxysporum</i> expresso em <i>Fusarium venenatum</i><br><i>Lactobacillus casei</i><br><i>Micrococcus caseolyticus</i><br><i>Mucor pusillus</i><br><i>Nocardiosis prasina</i> expresso em <i>Bacillus licheniformis</i><br><i>Rhizomucor miehei</i><br><i>Rhizomucor miehei</i> expresso em <i>Aspergillus oryzae</i><br><i>Streptomyces fradiae</i> |
| Pululanase       | <i>Bacillus acidopullulyticus</i><br><i>Bacillus acidopullulyticus</i> expresso em <i>Bacillus subtilis</i><br><i>Bacillus deramificans</i> expresso em <i>Bacillus licheniformis</i><br><i>Bacillus deramificans</i> expresso em <i>Bacillus subtilis</i><br><i>Bacillus naganoensis</i> expresso em <i>Bacillus subtilis</i><br><i>Bacillus subtilis</i><br><i>Klebsiella aerogenes</i><br><i>Klebsiella pneumonia</i>   |
| Quimosina        | <i>Aspergillus niger</i> var. <i>awamori</i><br><i>Escherichia coli</i> K-12 contendo gene de Proquimosina A<br><i>Kluyvero myceslactis</i> contendo gene de Proquimosina B  |
| Renina           | <i>Bacillus cereus</i><br><i>Endothia parasitica</i><br><i>Rhizomucor miehei</i><br><i>Rhizomucor pusillus</i>   |
| Tanase           | <i>Aspergillus niger</i><br><i>Aspergillus oryzae</i>  |
| Transglutaminase | <i>Strepto verticillium mobaraense</i><br><i>Streptomyces mobaraense</i>   |
| Xilanase         | <i>Aspergillus aculeatus</i> ou <i>Aspergillus niger</i> expresso em <i>Aspergillus oryzae</i><br><i>Aspergillus niger</i><br><i>Aspergillus niger</i> expresso em <i>Aspergillus niger</i><br><i>Bacillus licheniformis</i> expresso em <i>Bacillus licheniformis</i><br><i>Bacillus subtilis</i> expresso em <i>Bacillus subtilis</i><br><i>Humicola insolens</i><br><i>Pseudoalteromonas haloplanktis</i> expresso em <i>Bacillus subtilis</i><br><i>Sporotrichum dimorphosporum</i><br><i>Thermomyces lanuginosus</i> expresso em <i>Aspergillus oryzae</i><br><i>Thermomyces lanuginosus</i> expresso em <i>Fusarium venenatum</i><br><i>Trichoderma reesei</i>   |

## ANEXO II

### ADITIVOS ALIMENTARES COM SUAS RESPECTIVAS FUNÇÕES PERMITIDOS NA ELABORAÇÃO DE PREPARAÇÕES ENZIMÁTICAS

| INS   | NOME  |
|---|---|
| <b>ANTIOXIDANTES</b>  |   |
| Todos os autorizados como BPF – Boas Práticas de Fabricação |   |
| 310   | Galato de propila   |
| 320   | Butilhidroxianisol, BHA   |
| 321   | Butilhidroxitolueno, BHT  |
| <b>ANTIUMECTANTES</b>                                       |   |
| Todos os autorizados como BPF                               |   |
| <b>CONSERVADORES</b>  |   |
| Todos os autorizados como BPF                               |   |
| 200   | Ácido sórbico   |
| 201   | Sorbato de sódio  |
| 202   | Sorbato de potássio   |
| 203   | Sorbato de cálcio   |
| 210   | Ácido benzoico  |
| 211   | Benzoato de sódio   |
| 213   | Benzoato de cálcio  |
| 214   | Para-hidroxibenzoato de etila, etilparabeno   |
| 215   | Para-hidroxibenzoato de etila de sódio, etilparabeno de sódio   |
| 218   | Para-hidroxibenzoato de metila, metilparabeno   |
| 219   | Para-hidroxibenzoato de metila de sódio, metilparabeno de sódio   |
| 221   | Sulfito de sódio  |
| 222   | Bissulfito de sódio, sulfito ácido de sódio   |
| 223   | Metabissulfito de sódio   |
| <b>ESTABILIZANTES</b>                                       |   |
| Todos os autorizados como BPF                               |   |
| 339iii  | Fosfato trissódico, monofosfato trissódico, ortofosfato trissódico, fosfato de sódio tribásico, fosfato de sódio  |
| 450i  | Pirofosfato ácido de sódio, dihidrogênio difosfato dissódico, dihidrogênio pirofosfatodissódico, pirofosfatodissódico   |
| 452iii  | Polifosfato de cálcio e sódio   |
| 473   | Ésteres graxos de sacarose, sacaroésteres, ésteres de ácidos graxos com sacarose  |
| 475   | Ésteres de ácidos graxos com poliglicerol, ésteres de ácidos graxos com glicerina   |
| <b>REGULADORES DE ACIDEZ</b>                                |   |
| Todos os autorizados como BPF                               |   |
| 339i  | Fosfato de sódio monobásico, monofosfato monossódico, fosfato ácido de sódio, bifosfato de sódio, dihidrogênio fosfato de sódio, dihidrogênio ortofosfatomonossódico, dihidrogênio monofosfatomonossódico |
| 339ii   | Fosfato dissódico, fosfato de sódio dibásico, fosfato ácido dissódico, fosfato de sódio secundário, hidrogênio fosfato dissódico, hidrogênio ortofosfatodissódico, hidrogênio monofosfatodissódico        |
| <b>SEQUESTRANTES</b>  |   |
| Todos os autorizados como BPF                               |   |

### **ANEXO III**

#### **VEÍCULOS PERMITIDOS NA ELABORAÇÃO DE PREPARAÇÕES ENZIMÁTICAS**

Água  
Amido  
Amido modificado  
Arginina  
Carbonato de cálcio  
Caseinato de sódio  
Citrato de sódio  
Cloreto de cálcio  
Cloreto de potássio  
Cloreto de sódio  
Dextrinas  
Dextrose  
Etanol  
Extrato de levedura  
Farinha de cereais  
Farinha de leguminosas  
Fécula de mandioca  
Fibra vegetal  
Gelatina  
Glicerol  
Glucose  
Glutamato monoamônio  
Glúten  
Hidrolisado de Caseína  
Lactose  
Levedura seca inativa  
Maltodextrina  
Óleos Vegetais  
Polidextrose  
Polietilenoglicol  
Propilenoglicol  
Proteína de trigo  
Proteína hidrolisada de leguminosas  
Proteína isolada de leguminosas  
Proteína isolada de soja  
Proteínas lácteas  
Resina acrílica  
Resina fenólica  
Sacarose  
Sorbitol  
Soro de leite em pó  
Sulfato de sódio  
Terra diatomácea

Xarope de glucose

Xarope de milho

## ADICIONES AL ANEXO VI ENZIMAS

Con fundamento en lo establecido en los artículos 1, 3 fracciones I (incisos c, d, l, s) V, XI y XII, 4 fracción II inciso a, 11 y 12 fracción I del Reglamento de la Comisión Federal para la Protección contra Riesgos Sanitarios; 1, 2, 7, 11, 12, 13, 14, 22, 201, 202, 203, 208 y 208bis del Reglamento de Control Sanitario de Productos y Servicios, Primero del Acuerdo por el que se delegan las facultades que se señalan, en los órganos administrativos que en el mismo indican de la Comisión Federal para la Protección contra Riesgos Sanitarios, y PRIMERO al CUARTO, OCTAVO, DECIMOTERCERO al DECIMOQUINTO del Acuerdo por el que se determinan las sustancias permitidas como aditivos y coadyuvantes en alimentos, bebidas y suplementos alimenticios, su uso y disposiciones sanitarias, se publica la siguiente lista de aditivos o coadyuvantes, los cuales se podrán utilizar de manera inmediata, toda vez que han sido evaluados y aprobados por la Secretaría, en tanto se actualiza este último Acuerdo, de conformidad con el artículo 208 bis del Reglamento de Control Sanitario de Productos y Servicios publicado en el Diario Oficial de la Federación el 28 de noviembre de 2012.

30 de mayo de 2014

| No. | Nombre Común    | Fuente  | Número EC | Nombres químicos y sinónimos        | Observaciones  |
|-----|-----------------|---|-----------|-------------------------------------|--|
| 54  | Proteasa serina | Producida por <i>Fusarium venenatum</i> a partir del gen de serine proteasa de <i>Fusarium oxysporum</i>              | 3.4.21.4  | Proteasa                            | Para la hidrólisis de proteínas de origen vegetal y animal en alimentos y bebidas. Concentración máxima de uso de hasta 12g/Kg de proteínas procesada del producto que contiene hasta un 4% de enzima, equivalente a 0.48g de enzima por Kg de proteína procesada.   |
| 55  | Proteasa serina | Proteasa producida por <i>Bacillus licheniformis</i> a partir del gen de quimotripsina de <i>Nocardiopsis prasina</i> | 3.4.21.1  | Proteasa                            | Para la hidrólisis de proteínas de origen vegetal y animal en alimentos y bebidas. Concentración máxima de uso de hasta 1.54g de TOS(Total Organic Solids) /Kg de hidrolizado de proteína procesada .  |
| 56  | Alfa amilasa    | Alfa amilasa producida por <i>Aspergillus niger</i> a partir del gen de alfa amilasa de <i>Rhizomucor pusillus</i>    | 3.2.1.1   | 1,4-alfa-D-glucan glucano-hidrolasa | Para la endohidrólisis de enlaces 1,4 alfa glucosídicos en polisacáridos almidón de amilosa y amilopectina. Para su uso en alimentos y bebidas en una concentración máxima de uso de hasta 150FAU/Kg de materia seca en almidón en panadería y 200FAU/Kg de materia seca en almidón en almidón procesado para la industria alimentaria   |
| 57  | L-Asparaginasa  | Producida por <i>Bacillus subtilis</i> a partir del gen de asparaginasa de <i>Pyrococcus furiosus</i>                 | 3.5.1.1   | L-asparaginasa amidohidrolasa       | Para la hidrólisis de asparagina a ácido aspártico, como un proceso de ayuda para disminuir los niveles de acrilamida en alimentos y bebidas (principalmente a base de papá y cereales, granos de café, etc.) procesadas a altas temperaturas (p.ej. horneado, fritura, rostizado, etc.), en una concentración máxima de hasta 15,000 TASU/Kg de materia seca, equivalente a 20mg TOS/Kg de alimento final procesado para consumo de la población. |



| No. | Nombre Común    | Fuente  | Número EC | Nombres químicos y sinónimos  | Observaciones  |
|-----|-----------------|---|-----------|---|--|
| 58  | Proteasa        | Proteasa producida por <i>Bacillus subtilis</i> a partir del gen de metaloproteasa de <i>Bacillus amyloliquefaciens</i> | 3.4.24.28 | Endometalopectidasa, proteasa neutra, bacilolisina                    | Para la hidrólisis de proteínas de origen vegetal y animal en alimentos y bebidas en una concentración máxima de uso de hasta 0.25 AU/Kg de harina en panadería, hasta 1.0 AU/Kg cebada en la elaboración de cerveza y hasta 15 AU/Kg de proteína seca en la producción de proteína hidrolizada para la industria alimentaria. |
| 59  | Lisofosfolipasa | Producida por <i>Aspergillus niger</i> que expresa un gen modificado de <i>Aspergillus niger</i>                        | 3.1.1.5   | Acilhidrolasa del lisofosfatidilcolina 2, Lecitinasa B; Fosfolipasa B | Para la hidrólisis de lisofosfolípidos en alimentos y bebidas. Concentración máxima de uso de hasta 0.1-0.5Kg/tonelada de trigo seco del producto que contiene hasta 50LLU/g   |





## Appendix 3

### Methods of analysis used to determine compliance with the specifications

|                                |               |
|--------------------------------|---------------|
| 1. Enzyme activity, TASU/g     | 2013-17938    |
| 2. Total aerobic viable count  | EB-SM-3001.02 |
| 3. Total coliforms             | 2011-18492    |
| 4. Escherichia coli (E. coli). | 2011-27232    |
| 5. Salmonella                  | 2011-28477    |
| 6. Antimicrobial activity      | EB-SM-3018.02 |
| 7. Production strain           | EB-SM-3000.02 |

Analysis of Heavy Metals, Lead, Arsenic, Cadmium, and Mercury are performed at an external laboratory, Technological Institute (TI), Denmark.

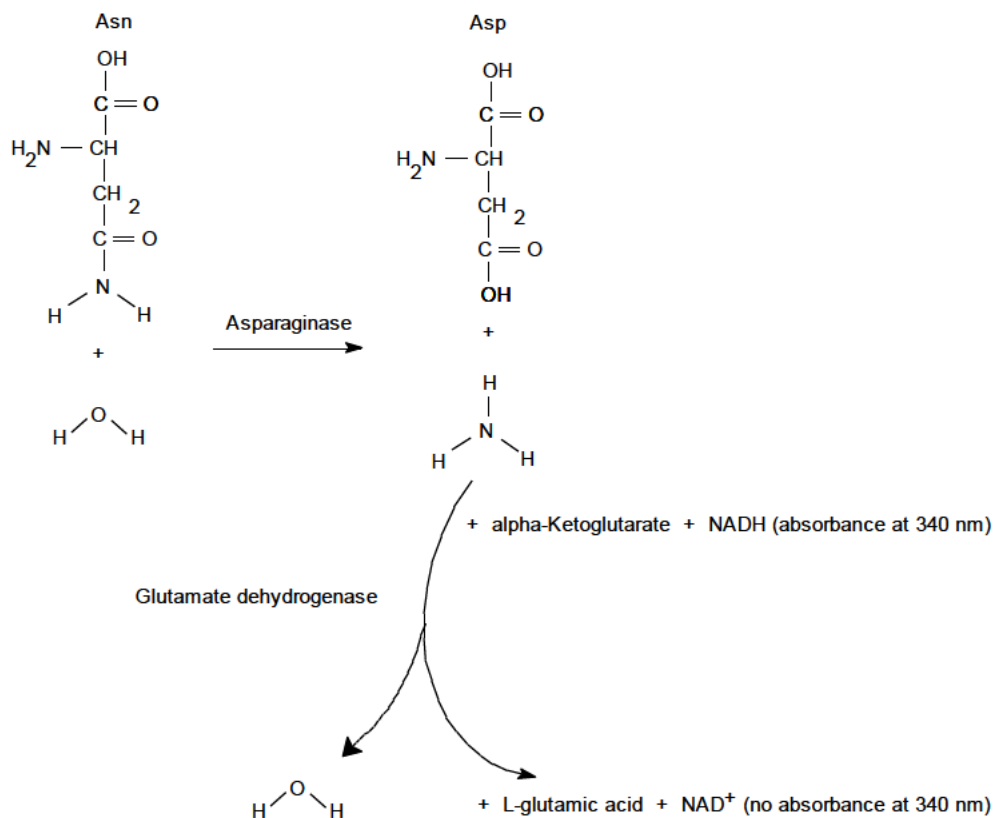
## Analytical methods

### Thermostable asparaginase activity, photometric by Konelab (TASU)

#### Principle

Asparaginase (EC 3.5.1.1) is an enzyme that converts L-asparagine into L-aspartate and ammonia. In the analysis of asparaginase activity the ammonia produced is combined with  $\alpha$ -ketoglutarate to form L-glutamic acid, whereby NADH is oxidized to NAD<sup>+</sup>. The consumption of NADH is measured by photometry at 340 nm.

#### Reaction scheme:



## Reaction conditions

| Parameter                       | Reaction conditions                               |
|---------------------------------|---|
| Temperature                     | 37.0 ± 0.5°C                                      |
| pH                              | 7.00 (at room temperature)                        |
| L-asparagine                    | 9.2 mg/mL   |
| Enzyme working range            | 0.8728-3.272 TASU/mL                              |
| Interval kinetic measuring time | 2 minutes<br>Incubate 1½ minutes before measuring |
| Wavelength                      | 340 nm  |
| α-ketoglutarate                 | 2.3 mg/mL   |
| NADH                            | 0.405 mg/mL                                       |

## Definition of unit

The activity is determined relative to an asparaginase standard

## Method parameters

### Intermediate precision

The intermediate precision (CV% of a single determination) is 3.6%.

### Specificity

All types of asparaginase activity will be measured in the assay.

### Range

The range is 10.91 – 40.90 TASU/ml identical of the entire standard curve range.

### Limit of determination

The limit of determination is 272.8 TASU/g, for a minimum preparation of 1 g in 10 ml.

## Equipment

| Equipment               |                          |
|-------------------------|--------------------------|
| Konelab 30 Analyzer     | Thermo Fisher Scientific |
| Diluter                 | e.g. Hamilton Microlab   |
| Analytical balance      | e.g. Sartorius, Mettler  |
| Balance                 | e.g. Sartorius           |
| pH meter                | e.g. Radiometer, Metrohm |
| Pipettes                | e.g. Biohit proline      |
| Magnetic stirrer plates | -                        |

## Chemicals

| Name  | Chemical formula   | Brand                   |
|---|--|-------------------------|
| MOPS<br>(3-mor-pholino-propane-sulfonic acid)             | $C_7H_{15}NO_4S$   | e.g. Sigma M-1254       |
| Brij 35, 30% w/v<br>(Polyoxyethyleneglycol dodecyl ether) | $CH_3(CH_2)_{10}CH_2(OCH_2CH_2)_nOH$                                 | e.g. Sigma B4184        |
| 4 M Sodium hydroxide                                      | NaOH   | e.g. Fluka 35274        |
| L-asparagine monohydrate                                  | $C_4H_8N_2O_3 \bullet H_2O$  | e.g. Sigma A-7094       |
| NADH (disodium salt)                                      | $C_{21}H_{27}N_7O_{14}P_2 Na_2$                                      | e.g. Roche 10107735     |
| $\alpha$ -ketoglutarate (disodium salt hydrate)           | $C_5H_4O_5Na_2 \bullet xH_2O$  | e.g. Sigma K-3752       |
| Glutamate dehydrogenase (GIDH)                            | Enzyme, EC 1.4.1.3   | e.g. Sigma 2626         |
| Sodium acetate* 3 H <sub>2</sub> O                        | $C_2H_3NaO_2 \bullet 3H_2O$  | e.g Sigma Aldrich 32318 |
| Acetic acid, conc.  | $C_2H_4O_2$  | e.g. Fluka 33209        |
| Ultrapure water   | H <sub>2</sub> O with resistivity $\geq 18.2$ M $\Omega$ *cm at 25°C | e.g. MilliPore          |

Always check the Material Safety Data Sheet (MSDS) for every chemical.

## Reagents

### Brij 35 solution 15 % w/v

EXAMPLE: Preparation of 2 L Brij 35 15 %:

| Step | Action  |
|------|---|
| 1    | Measure out 1 L of Brij 35 30 %.<br>Brij 35 30 % can be heated to 35 – 45°C |
| 2    | Transfer the Brij 35 30 % quantitatively to a 2000 mL measuring flask       |
| 3    | Fill up to 2 L with demineralized water and mix vigorous                    |

### Acetate buffer 1.0 M

EXAMPLE: Preparation of 2 L Acetate buffer, 1.0 M

| Step | Action   |
|------|--|
| 1    | Add approx. 1800 ml ultrapure water to a beaker                              |
| 2    | Weigh out 88.8 g sodium acetate*3H <sub>2</sub> O and transfer to the beaker |
| 3    | Stir until fully dissolved   |
| 4    | Add 77 ml acetic acid to the solution and stir                               |
| 5    | Transfer the solution quantitatively to a 2000 mL measuring flask            |
| 6    | Make up to the mark with ultrapure water and stir                            |
| 7    | Storability: 1 month at room temperature                                     |

**Acetate buffer 0.10 M, pH 5.0 with 225 mg/l Brij 35**

Example: Preparation of 5000 mL acetate buffer

| Step | Action   |
|------|--|
| 1    | Add approximately 3500 mL ultrapure water to a 5000 mL measuring flask |
| 2    | Add 500 mL 1.0 M acetate buffer to the flask                           |
| 3    | Add 7.5 mL 15 % Brij 35 to the flask                                   |
| 4    | Stir the solution  |
| 5    | Adjust to pH 5.00 $\pm$ 0.05 with approx 43 ml 4 M NaOH                |
| 6    | Fill up to the mark with ultrapure water and stir                      |
| 7    | Storability: 7 days at room temperature                                |

**MOPS buffer 0.1 M, pH 7.0:**

EXAMPLE: Preparation of 500 ml MOPS buffer

| Step | Action  |
|------|---|
| 1    | Weigh out 10.45 $\pm$ 0.5 g of MOPS (e.g. Sigma M-1254) in a 500 mL measuring flask and dissolve by app. 450 mL ultrapure water |
| 2    | Adjust pH to 7.00 $\pm$ 0.05 with approx 4.85 ml 4M NaOH  |
| 3    | Make up to 500 mL by ultrapure water and stir until fully dissolved.<br>Storability: Use on the day of preparation              |

**ASNU-A without NADH:**

EXAMPLE: Preparation of 100 ml reagent

| Step | Action   |
|------|--|
| 1    | Weigh out 1.00 $\pm$ 0.005 g of L-asparagine (e.g. Sigma A-7094). Transfer quantitatively to a 100 mL measuring flask with MOPS buffer 0.1 M pH 7.00   |
| 2    | Weigh out 0.252 $\pm$ 0.005 g of $\alpha$ -ketoglutarate (e.g. Sigma K-3752). Transfer quantitatively to the 100 mL measuring flask with MOPS buffer 0.1 M pH 7.00   |
| 3    | Measure out 1680 Units of GIDH and transfer quantitatively to the 100 mL measuring flask with MOPS buffer 0.1 M pH 7.00  |
| 4    | Make up to the mark with MOPS buffer 0.1 M, pH 7.00 and stir for 45 – 60 minutes until fully dissolved.<br>IMPORTANT: Use a brown measuring flask or wrap in foil to protect from light.<br>Storability: The reagent is stable for 7 days at 2-8°C |

**ASNU-A:**

EXAMPLE: Preparation of 25 ml reagent

| Step | Action   |
|------|--|
| 1    | Weigh out 0.011 g $\pm$ 0.0005 g of NADH   |
| 2    | Add the NADH to 25 ml of the ASNU-A without NADH and stir for 5-15 minutes until fully dissolved.<br>IMPORTANT: Use a brown measuring flask or wrap in foil to protect from light.<br>Storability: The reagent is made fresh every day |

## Standard

The standard is available upon request.

The standard is available upon request.

| Step         | Action  |                 |               |                         |               |                         |                        |                 |   |    |      |    |       |   |    |      |    |       |   |    |      |    |       |   |     |      |    |       |   |     |      |   |       |  |  |  |  |  |
|--------------|---|-----------------|---------------|-------------------------|---------------|-------------------------|------------------------|-----------------|---|----|------|----|-------|---|----|------|----|-------|---|----|------|----|-------|---|-----|------|----|-------|---|-----|------|---|-------|--|--|--|--|--|
| 1            | Weigh out an amount of enzyme standard corresponding to 32723 TASU units  |                 |               |                         |               |                         |                        |                 |   |    |      |    |       |   |    |      |    |       |   |    |      |    |       |   |     |      |    |       |   |     |      |   |       |  |  |  |  |  |
| 2            | Dissolve the standard in acetate buffer 0.10 M pH 5.0 with Brij in a 100 mL measuring flask   |                 |               |                         |               |                         |                        |                 |   |    |      |    |       |   |    |      |    |       |   |    |      |    |       |   |     |      |    |       |   |     |      |   |       |  |  |  |  |  |
| 3            | Stir on a magnetic stirrer for 15-30 minutes.<br>Storability: 26 hours at room temperature  |                 |               |                         |               |                         |                        |                 |   |    |      |    |       |   |    |      |    |       |   |    |      |    |       |   |     |      |    |       |   |     |      |   |       |  |  |  |  |  |
| 4            | <p>Working solutions:<br/>The standard solutions are prepared by diluting the stock solution with acetate buffer 0.10 M pH 5.0 with Brij on a diluter directly into the sample cups. The standard curve is a 5 point curve with a factor 3.75 between lowest and highest standard point, according to this table:</p> <table><tr><th rowspan="2">Standard no.</th><th colspan="2">Example</th><th rowspan="2">Dilution rate</th><th rowspan="2">Concentration (TASU/ml)</th></tr><tr><th>Stock solution <math>\mu</math>l</th><th>Diluent <math>\mu</math>l</th></tr><tr><td>1</td><td>40</td><td>1160</td><td>30</td><td>10.91</td></tr><tr><td>2</td><td>60</td><td>1140</td><td>20</td><td>16.36</td></tr><tr><td>3</td><td>80</td><td>1120</td><td>15</td><td>21.82</td></tr><tr><td>4</td><td>120</td><td>1080</td><td>10</td><td>32.72</td></tr><tr><td>5</td><td>150</td><td>1050</td><td>8</td><td>40.90</td></tr><tr><td></td><td></td><td></td><td></td><td></td></tr></table> <p>Storability: To be analyzed immediately after diluted (within 1 hour)</p> | Standard no.    | Example       |                         | Dilution rate | Concentration (TASU/ml) | Stock solution $\mu$ l | Diluent $\mu$ l | 1 | 40 | 1160 | 30 | 10.91 | 2 | 60 | 1140 | 20 | 16.36 | 3 | 80 | 1120 | 15 | 21.82 | 4 | 120 | 1080 | 10 | 32.72 | 5 | 150 | 1050 | 8 | 40.90 |  |  |  |  |  |
| Standard no. | Example   |                 | Dilution rate | Concentration (TASU/ml) |               |                         |                        |                 |   |    |      |    |       |   |    |      |    |       |   |    |      |    |       |   |     |      |    |       |   |     |      |   |       |  |  |  |  |  |
|              | Stock solution $\mu$ l  | Diluent $\mu$ l |               |                         |               |                         |                        |                 |   |    |      |    |       |   |    |      |    |       |   |    |      |    |       |   |     |      |    |       |   |     |      |   |       |  |  |  |  |  |
| 1            | 40  | 1160            | 30            | 10.91                   |               |                         |                        |                 |   |    |      |    |       |   |    |      |    |       |   |    |      |    |       |   |     |      |    |       |   |     |      |   |       |  |  |  |  |  |
| 2            | 60  | 1140            | 20            | 16.36                   |               |                         |                        |                 |   |    |      |    |       |   |    |      |    |       |   |    |      |    |       |   |     |      |    |       |   |     |      |   |       |  |  |  |  |  |
| 3            | 80  | 1120            | 15            | 21.82                   |               |                         |                        |                 |   |    |      |    |       |   |    |      |    |       |   |    |      |    |       |   |     |      |    |       |   |     |      |   |       |  |  |  |  |  |
| 4            | 120   | 1080            | 10            | 32.72                   |               |                         |                        |                 |   |    |      |    |       |   |    |      |    |       |   |    |      |    |       |   |     |      |    |       |   |     |      |   |       |  |  |  |  |  |
| 5            | 150   | 1050            | 8             | 40.90                   |               |                         |                        |                 |   |    |      |    |       |   |    |      |    |       |   |    |      |    |       |   |     |      |    |       |   |     |      |   |       |  |  |  |  |  |
|              |   |                 |               |                         |               |                         |                        |                 |   |    |      |    |       |   |    |      |    |       |   |    |      |    |       |   |     |      |    |       |   |     |      |   |       |  |  |  |  |  |

## QC sample

It is advised to include a control sample in each run. Prepare the control sample in the same way as described for samples below always using the same preparation procedure.

## Samples

The lowest dilution of samples is 25 times.

| Step | Action  |
|------|---|
| 1    | Weigh out approximately 0.5-1.0 g of sample precisely and dissolve in a measuring flask with acetate buffer 0.10 M, pH 5.0 with Brij. |
| 2    | Stir on a magnetic stirrer for 15-30 minutes.<br>Storability: 26 hours at room temperature  |
| 3    | The samples are further diluted with acetate buffer 0.10 M, pH 5.0 with Brij to achieve an activity of approximately 22.72 TASU/mL    |
| 4    | Storability: To be analyzed immediately (within 1 hour)   |

## Blank

No reagent blank is used in the method.

## Procedure

| Procedure |   |                      |                          |               |                                |
|-----------|---|----------------------|--------------------------|---------------|--------------------------------|
| Step      | Action  |                      |                          |               |                                |
| 1         | Start the Konelab   |                      |                          |               |                                |
| 2         | Place the reagents in the Konelab:  |                      |                          |               |                                |
|           | Reagent   | Konelab reagent name | Reagent container volume | Syringe speed | Stability in reagent container |
|           | ASNU-A  | ASNU-A               | 60 ml                    | Normal        | ASNU-A                         |
| 3         | Place standards, QC sample and samples in the Konelab in the stated order<br>NOTE: 30 samples can be analyzed in one analytical run |                      |                          |               |                                |

## Calculation

| Step | Action  |
|------|---|
| 1    | The activity of the enzyme samples is determined relative to the standard curve   |
| 2    | On the basis of the results in Abs/min for the five enzyme standards, draw a standard curve with the activities of the standards in TASU/mL as the x-values and the Abs/min of the standards as the y-values. A linear algorithm is used  |
| 3    | <p>The enzyme activity of the diluted samples is read from the standard curve. The activity of the sample in TASU is calculated using the formula:</p> $\text{TASU/g} = \frac{S \times V \times F}{W}$ <p> S = reading from the standard curve in TASU/mL<br/> V = Volume of the measuring flask used for dissolution (mL)<br/> F = Dilution factor for further dilution<br/> W = Weight of sample (g) </p> |
| 4    | <p>EXAMPLE: 1.0054 g of sample is dissolved in a 100 mL measuring flask and further diluted 20 times using a diluter.</p> <p>From the standard curve an activity of 26.77 TASU/ml is calculated.</p> $\text{Activity} = \frac{26.77 \text{ TASU/ml} \cdot 100 \text{ ml} \cdot 20}{1.0054 \text{ g}} = 53252 \text{ TASU/g}$  |

## Approval of analytical run

### Standard curve:

| Parameter                                   | Requirement  |
|---|--|
| Quality of fit (lower r <sup>2</sup> limit) | r <sup>2</sup> ≥ 0.9945.<br>If r <sup>2</sup> < 0.9945 one standard point may be removed |
| Curve appearance                            | The standard curve must be linear  |

### QC sample:

The measured activity of the QC sample must be the declared value ±2 standard deviations.

**Samples:**

The analytical result, (=average of 2 weighings on two different standard curves) must be  $\leq 2.2\%$ .

**Statement of analysis results**

The analysis result is stated with 3 significant digits.



## Configurations

TASU Konelab test definition

na1000000  
Curve typ  
Nonlinear  
Conc. (Ab  
Time (sec

## TASU Konelab reagent definition

```
ASNU  
Z:ASNU  
  
Disk Pos  
-----
```

## Handling of enzymes and chemicals

Enzymes and enzyme solutions should be handled in a fume hood or in closed containers. Avoid inappropriate handling of enzymes and enzyme solutions, which may result in aerosol/dust generation.

Avoid inhalation of dust aerosols and contact with skin and eyes.

Handling of chemicals and disposal of waste must be performed according to valid procedures.

## Validity

Valid from December 2013.

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### **Novozymes A/S**

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# Enumeration of Total Viable Count

**Scope** All Novozymes Enzyme Business QC laboratories involved in analysis of samples from Novozymes production and GLP studies.

**Principle** **Total Viable Count (TVC)** is defined as the number of organisms which form colonies on a non-selective agar medium (Tryptic Soy Agar, TSA) after aerobic incubation for 3 days at 30-35°C. TSA is a rich non-selective agar medium.

The method outlined below conforms to the principles of (Ref. □) with the following exceptions:

- The test only covers the enumeration of microorganisms capable of growing on TSA (Total aerobic Microbial Count).
- The dilution water has an addition of 4% Tween 80.
- EP describes the use of duplicates. This method uses single tests.
- The agar plates are incubated for 3 days, not for 3-5 days.
- Growth promotion test of TSA is performed according to in-house procedures and not according to the description in EP.

Routine samples are analysed by the spiral plater (100 µl) or spread plate technique (100 µl or 1 ml) as described below:

| Sample type                              | Requested test (LIMS code) | Technique                        | Volume spread | Lowest Dilution  | No. of plates | Plate size | Detection limit   |
|--|----------------------------|----------------------------------|---------------|------------------|---------------|------------|-------------------|
| Enzyme samples and fluid hyaluronic acid | TVC                        | Spiral plating or spread plating | 100 µl        | 10 <sup>-1</sup> | 1 plate       | 9 cm       | 100 CFU / g or ml |
|  | TVC(100)                   | Spread plating                   | 1 ml          | 10 <sup>-1</sup> | 4 plates      | 14 cm      | 10 CFU / g or ml  |
| CIP-samples                              | CIP_TVC                    | Spiral plating or spread plating | 100 µl        | Undiluted        | 1 plate       | 9 cm       | 10 CFU / ml       |
|  |                            | Petrifilm                        | 1 ml          |                  | N/A           | N/A        | 1 CFU / ml        |
| FeF samples                              | FEF_TVC                    | Spread plating                   | 1 ml          | 10 <sup>-1</sup> | 4 plates      | 14 cm      | 10 CFU / g or ml  |

Depending on sample type, level of contamination and the detection limit needed for the specific sample, alternative procedures may be used.

**IMPORTANT:** Petrifilm must only be used to analyze CIP samples if pH of the CIP water is within range 6.6-8.5 (Ref. □ and □).

*Continued on next page*

## Enumeration of Total Viable Count, *Continued*

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**Definition of units**

The result is stated as:

- Total Viable Count (TVC) / g or ml
- 

**Samples**

All sample types.

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**Detection limit**

The detection limit of this method is dependent on the sample volume and the dilution in use (See "Principle").

---

**Equipment**

- Balance ( $\pm 0.1$  g)
  - Magnetic stirrer
  - Petri dishes (9 cm or 14 cm)
  - Suitable sterile pipettes for transfer of 100  $\mu$ l or 1 ml (4x0.25 ml)
  - Spiral plater (for the spiral plate technique)
  - Sterile Drigalski spreaders (for the spread plate technique)
  - Incubator (30-35°C)
  - Stereo microscope or microscope
  - Plastic spreader (*Petrifilm test*)
- 

**Media and reagents**

- Tween 80 buffer 4%, 90 ml (if necessary with a magnet) prepared acc. to [EB-ME-0052](#)
  - EP buffer, 90 ml buffered sodium chloride-peptone solution pH 7.0, prepared acc. to [EB-ME-0067](#)
  - TSA plates (9 or 14 cm) prepared acc. to [EB-ME-0041](#)
  - 3M™ Petrifilm™ Aerobic Count Plates (*Petrifilm test*)
- 

**Safety**

It is the responsibility of the laboratory leader, that all personnel are aware of the correct handling of enzymes and reagents.

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*Continued on next page*

## Enumeration of Total Viable Count, *Continued*

### Sample preparation

Enzyme samples and other solid samples are prepared as follows:

| Sample type   | Action  |
|---|---|
| <b>Enzyme samples</b><br><b>FeF samples</b><br><b>Other solid samples</b> | Transfer 10 g of solid sample or 10 ml of liquid sample to 90 ml Tween 80 buffer 4%.<br><br><i>NOTE:</i> Immediately homogenize the sample by stirring or by shaking. Solid samples are homogenized on a magnetic stirrer for app. 20 minutes though min. 1 hour for Sweetzyme (batch code 1A). |
| <b>Non-enzyme fluid samples (e.g. CIP samples)</b>                        | Non-enzyme fluid samples are analyzed undiluted. If needed, 10-fold dilutions may be prepared with Tween 80 buffer 4%.  |
| <b>Fluid hyaluronic acid (HA)</b>   | Transfer 10 ml of liquid sample to 90 ml EP buffer.<br><i>IMPORTANT:</i> Homogenize on a magnetic stirrer for min. 1 hour. It is recommended to shake the sample after approx. 30 min.  |

*TIP:* All enzyme products must be analyzed from at least a  $10^{-1}$  dilution due to possible inhibition of microorganisms in undiluted enzyme. If an enzyme product is known to contain growth inhibiting components (e.g. rodalone or proxel) consider analyzing further dilutions prepared with Tween 80 buffer 4% (e.g.  $10^{-2}$  and  $10^{-3}$  dilutions). In this case be aware that the quantification limit is lower than the spec. limit of the sample.

*IMPORTANT:* Valid for US laboratories: TVC analysis must also be performed using a  $10^{-2}$  dilution if the spec. limit of the sample is > 30.000 and/or for samples from Recovery 1 and 2.

*Continued on next page*

## Enumeration of Total Viable Count, *Continued*

### Plating

Plating must be done within 15 minutes from end of homogenisation. If this is not possible, the sample can be stored at 2-8°C for up to 4 hours.

| Test   | Action   |
|--|--|
| <b>TVC</b>                                     | Transfer 100 µl from the 10 <sup>-1</sup> dilution onto the surface of a TSA plate (9 cm). Repeat this for any of the necessary dilutions.<br><i>Or</i><br>Perform a spiral plating of 100 µl from the 10 <sup>-1</sup> dilution in accordance with the directions for the specific spiral plater. |
| <b>TVC(100)</b><br><i>or</i><br><b>TVC_FeF</b> | Transfer 1 ml from the 10 <sup>-1</sup> dilution onto the surface of 4 TSA plates (14 cm) with app. 0.25 ml onto each plate. Repeat this for any of the necessary dilutions.   |
| <b>TVC_CIP using TSA plates</b>                | Transfer 100 µl from the undiluted sample onto the surface of a TSA plate (9 cm). Repeat this for any of the necessary dilutions.<br><i>Or</i><br>Perform a spiral plating of 100 µl from the undiluted sample in accordance with the directions for the specific spiral plater.                   |

Leave the plates on the table with lid on until the sample has been soaked into the agar.

| Test                           | Action   |
|--------------------------------|--|
| <b>TVC_CIP using Petrifilm</b> | 1. Transfer 1 ml from the undiluted sample to the center of the film.<br>2. Place plastic spreader, recessed side down, on center of sample and press down, gently and firmly to distribute inoculum.<br>3. Wait at least one minute for gel to form |

### Incubation

Incubate the TSA agar plates at 30-35°C for 3 days.

Incubate the Petrifilm with clear side up at 35-39°C for 2 days.

*Continued on next page*

## Enumeration of Total Viable Count, *Continued*

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### Reading

#### **TSA agar plates – Spread plate technique:**

Count the number of colonies on the plates.

| Size of agar plate | Interval of reading      |
|--------------------|--------------------------|
| 9 cm               | 1–300 colonies per plate |
| 14 cm              | 1–750 colonies per plate |

#### **TSA agar plates – Spiral plate technique:**

The number of typical colonies on each plate is counted and the result is calculated in accordance with the directions for the specific spiral plater. Danish sites may refer to (Ref. □).

*IMPORTANT:* Small colonies, e.g. lactobacillus, may erroneously be misread as product crystallizations. If in doubt use stereo microscope for macroscopic observation and/or prepare a slide culture of a colony for light microscopy.

#### **Petrifilm**

Count the number of colonies on the film. Interval of reading is 1-250 colonies (Ref. □).

*IMPORTANT:* Discoloration from enzyme residues may occur. In case this is observed the result must be considered invalid.

*TIP:* Refer to (Ref. □) to get familiarized with reading Petrifilms.

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*Continued on next page*



## Enumeration of Total Viable Count, *Continued*

### Calculation

#### General principles:

The calculation is based on the number of colonies ( $C_x$ ) on the plate, and the sample volume analysed ( $V_x$ ).

The result is stated with two significant figures (e.g.  $2.2 \times 10^1$ ).

| When Using results from | Then the result is            | Where  |
|-------------------------|-------------------------------|--|
| One dilution            | $\frac{C_x}{V_x}$             | $C_x$ = no. of colonies<br>$V_x$ = volume analysed   |
| 2 or more dilutions     | $\frac{C_1 + C_2}{V_1 + V_2}$ | $C_1$ = no. of colonies in lowest dilution<br>$C_2$ = no. of colonies in next dilution<br>$V_1$ = volume analyzed in lowest dilution<br>$V_2$ = volume analyzed in next dilution |

**IMPORTANT:** When using more than one dilution, the numbers from each dilution are compared (the likelihood of product inhibitions, contamination of the sample, analytical errors etc. is considered). In general, the highest dilution is used. If the result is stated on the basis of other dilutions, the reason must be given in the raw data.

When the sample volume is 0.1 ml then  $V_x$  and  $C_x$  are:

| Dilution | Undiluted                    | $10^{-1}$                    | $10^{-2}$                    |
|----------|------------------------------|------------------------------|------------------------------|
| $V_x$    | 0.1 ml                       | 0.01 ml                      | 0.001 ml                     |
| $C_x$    | No. of colonies on the plate | No. of colonies on the plate | No. of colonies on the plate |

EXAMPLE:

EXAMPLE: Examples of calculating spread plate of 0.1 ml sample:

| $C_x$     | $V_x$<br>(g or ml) | Dilution               | Result  |
|-----------|--------------------|------------------------|---|
| 0         | 0.01               | $10^{-1}$              | < 100 / g or ml   |
| 123       | 0.1                | $10^0$                 | $\frac{123}{0.1} = 1.2 \times 10^3$ / g or ml           |
| 334       | 0.01               | $10^{-1}$              | > $3.0 \times 10^4$ / g or ml                           |
| 253<br>24 | 0.01<br>0.001      | $10^{-1}$<br>$10^{-2}$ | $\frac{253+24}{0.01+0.001} = 2.5 \times 10^4$ / g or ml |

*Continued on next page*

## Enumeration of Total Viable Count, *Continued*

### Calculation (*continued*)

When the sample volume is 1 ml (four 14 cm agar plates with 0.25 ml on each plate) then  $V_x$  and  $C_x$  are:

| Dilution | Undiluted                       | $10^{-1}$                       | $10^{-2}$                       |
|----------|---------------------------------|---------------------------------|---------------------------------|
| $V_x$    | 1 ml                            | 0.1 ml                          | 0.01 ml                         |
| $C_x$    | sum of colonies on the 4 plates | sum of colonies on the 4 plates | sum of colonies on the 4 plates |

EXAMPLE: Examples of calculating spread plate of 1 ml sample:

| $C_x$     | $V_x$<br>(g or ml) | Dilution               | Result   |
|-----------|--------------------|------------------------|--|
| 0         | 0.1                | $10^{-1}$              | $< 10 / \text{g or ml}$                                      |
| 123       | 1                  | $10^0$                 | $\frac{123}{1} = 1.2 \times 10^2 / \text{g or ml}$           |
| 426       | 0.1                | $10^{-1}$              | $\frac{426}{0.1} = 4.3 \times 10^3 / \text{g or ml}$         |
| 3134      | 0.1                | $10^{-1}$              | $> 3.0 \times 10^4 / \text{g or ml}$                         |
| 853<br>84 | 0.1<br>0.01        | $10^{-1}$<br>$10^{-2}$ | $\frac{853+84}{0.1+0.01} = 8.5 \times 10^3 / \text{g or ml}$ |

NOTE: Calculation at Danish laboratories may follow:

- Spread plating of 1 ml: [PSL-MSP-0069](#)
- Spread plating of 100  $\mu\text{l}$ : [PSL-MSP-0082](#)
- Spiral plating of 100  $\mu\text{l}$ : [PSL-MSP-0075](#)

### Accuracy and precision

CV% (surface plating) = 25%

CV% (spiral plating) = 29%

REFERENCE: LUNA no. [2003-34435](#)

### Filing

All documentation should be filed in accordance with the local filing SOP.

*Continued on next page*

## Enumeration of Total Viable Count, *Continued*

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**Contingencies** All deviations from this SOP should be discussed with the Method Responsible Scientist and should be documented.

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**References**

- European Pharmacopoeia, Chapter 2.6.12. Microbiological examination of non-sterile products (Total viable aerobic count).
- [PSL-MSP-0075](#): Beregning ved anvendelse af spiralplater (In Danish).
- [PSL-TE-3001](#): Spiralplater (In Danish).
- LUNA No. [2010-19643-01](#): Validation of pH Range Adjustment for Water Samples Using Petrifilm.
- [3M Petrifilm Interpretation Guide](#)
- [3M Petrifilm™ Aerobic Count Plates](#)

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**Revision** Removed TVC-AIR samples. Analysis of air samples performed according to EB-SM-5001. Specified that Tween 80 is used throughout the document cf. [CISAR-PSL-Mik.Ba-64777](#). In the section "Principle", the amount analyzed and the detection limit when using Petrifilm have been corrected from 100 ul to 1 ml and from 10 to 1 CFU/ml, respectively.

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## Analytical methods

### Enumeration of coliform bacteria using violet red bile agar

#### IMPORTANT

This method is used for the analysis of glucose isomerase and liquid products (with the exception of liquid xylanase).

#### Principle

Coliform bacteria (coliforms) are broadly defined as gram-negative, oxidase-negative, nonsporogenous rods which grow in aerobic or facultative anaerobic conditions. More specifically, coliforms are capable of fermenting lactose (due to the production of galactosidase) in the presence of bile at 37°C. Coliforms are not a taxonomically defined group of bacteria, and consequently there is no common agreement on which microorganisms truly belong to the coliforms. However, Novozymes defines coliforms as organisms belonging to the genera *Escherichia*, *Citrobacter*, *Enterobacter*, *Klebsiella*, *Serratia*, and *Hafnia*. The presence of coliforms, especially *E. coli*, can be used as an indicator of the bacteriological hygiene of an enzyme product.

Violet Red Bile Agar (VRBA) is a selective and indicative agar:

| Principle            | Description   |
|----------------------|---|
| Selective principle  | Crystal violet and bile salts inhibit growth, primarily of the gram-positive accompanying flora. This favors growth of the fast-growing gram-negative enterobacteria.                         |
| Indicative principle | Degradation of lactose to acid is indicated by the pH indicator neutral red, which changes its color to red and in some cases also by precipitation of bile acids. Coliforms degrade lactose. |

Routine testing is performed in the following way:

| Sample type    | Requested test (LIMS code) | Technique                   | Volume spread | Lowest dilution  | No. of plates | Plate size | Detection limit |
|----------------|----------------------------|-----------------------------|---------------|------------------|---------------|------------|-----------------|
| Enzyme samples | COLIFORM                   | Pour plate with cover layer | 2.5 ml        | 10 <sup>-1</sup> | 1 plate       | 14 cm      | 4 CFU/g or ml   |

Depending on the sample type, the level of contamination, and the detection limit needed for the specific sample, alternative procedures may be used.

The method outlined below conforms to ISO 4832 with the following deviations:

- ISO 4832 and ISO 6887-1 describe the use of a peptone salt solution or buffered peptone water as diluent. This Novozymes method uses Tween buffer 4%
- ISO 4832 describes the use of duplicates. This Novozymes method uses single tests

### Definition of units

The result is stated as:

- Coliform bacteria/g or ml

### Detection limit

The detection limit of this method is dependent on the sample volume and the dilution in use (see "Principle").

### Equipment

- Balance ( $\pm 0.1$  g)
- Magnetic stirrer
- Petri dishes (14 cm)
- Suitable sterile pipette for transfer of 1 ml or 10 ml (2.5 ml)
- Incubator (34–38°C)

### Media and reagents

- Tween buffer, 90 ml buffered sodium chloride-peptone solution pH 7.0 (if necessary with a magnet) containing 4% Tween 80, pH 7.0
- Violet Red Bile Agar (VRBA), Merck 1.01406

NOTE: If the agar is freshly prepared in the laboratory, suspend the media with 200 ml of exchanged water and leave for 15 min. Ensure that the media are thoroughly dissolved before the melting procedure by regular shaking. In addition, stir the agar immediately before cooling in the water bath and again before pouring into the Petri dishes.

### Sample preparation

The samples are prepared as follows:

| Step | Action  |
|------|---|
| 1    | Transfer 10 g of solid sample or 10 ml of liquid sample into 90 ml of Tween buffer 4%   |
| 2    | Immediately homogenize the sample by stirring or shaking.<br>Solid samples are homogenized on a magnetic stirrer for approx. 20 minutes |

IMPORTANT: All enzyme products must be analyzed from a 10<sup>-1</sup> dilution due to possible inhibition of microorganisms in undiluted enzyme.

TIP: Further 10-fold dilutions can be prepared with Tween buffer 4%.

## Plating

Plating is performed using the pour plate technique:

| Description   |
|---|
| 1. Transfer 2.5 ml from the $10^{-1}$ dilution into an empty Petri dish (14 cm).  |
| 2. Pour approx. 40–45 ml of VRBA ( $47 \pm 2^{\circ}\text{C}$ ) into the Petri dish (= bottom layer) and mix carefully. Leave this to solidify. |
| 3. Pour approx. 10 ml of VRBA ( $47 \pm 2^{\circ}\text{C}$ ) onto the bottom layer (= covering layer). Leave this to solidify.                  |

IMPORTANT: Agar used for BB samples must be cooled to  $45 \pm 2^{\circ}\text{C}$ .

## Incubation

Incubate the plates at  $34\text{--}38^{\circ}\text{C}$  (target =  $36^{\circ}\text{C}$ ) for 1 day under aerobic conditions:

## Reading

Count the number of typical colonies:

| Count colonies on plates with | Typical colonies  |
|-------------------------------|---|
| 1–375 colonies per plate      | Purplish red with a diameter of $\geq 0.5$ mm, sometimes surrounded by a reddish zone of precipitated bile. |

## Calculation

### General principles:

The calculation is based on the number of colonies ( $C_x$ ) on the plate and the sample volume analyzed ( $V_x$ ).

The result is stated with two significant figures (e.g.,  $2.2 \times 10^1$ ).

| When using results from | Then the result is            | Where  |
|-------------------------|-------------------------------|--|
| 1 dilution              | $\frac{C_x}{V_x}$             | $C_x$ = no. of colonies<br>$V_x$ = volume analyzed   |
| 2 or more dilutions     | $\frac{C_1 + C_2}{V_1 + V_2}$ | $C_1$ = no. of colonies in lowest dilution<br>$C_2$ = no. of colonies in next dilution<br>$V_1$ = volume analyzed in lowest dilution<br>$V_2$ = volume analyzed in next dilution |

IMPORTANT: When using more than one dilution, the numbers from each dilution are compared (the likelihood of product inhibitions, contamination of the sample, analytical errors, etc., is considered). In general, the highest dilution is used. If the result is stated on the basis of other dilutions, the reason must be given in the raw data.

When the sample volume is 2.5 ml, then  $V_x$  and  $C_x$  are:

| Dilution | $10^{-1}$                    | $10^{-2}$                    |
|----------|------------------------------|------------------------------|
| $V_x$    | 0.25 ml                      | 0.025 ml                     |
| $C_x$    | No. of colonies on the plate | No. of colonies on the plate |

EXAMPLE: Examples of calculating pour plate of 2.5 ml of sample on a 14 cm agar plate:

| $C_x$   | $V_x$<br>(g or ml) | Dilution               | Result   |
|---------|--------------------|------------------------|--|
| 0       | 0.25               | $10^{-1}$              | $\frac{0}{0.25} = < 4/\text{g or ml}$                      |
| 3       | 0.25               | $10^{-1}$              | $\frac{3}{0.25} = 12/\text{g or ml}$                       |
| 412     | 0.25               | $10^{-1}$              | $\frac{375}{0.25} = 1.5 \times 10^3/\text{g or ml}$        |
| 53<br>8 | 0.25<br>0.025      | $10^{-1}$<br>$10^{-2}$ | $\frac{53+8}{0.25+0.025} = 2.2 \times 10^2/\text{g or ml}$ |

## Accuracy and precision

CV% = 29%

## References

1. ISO 4832, 2nd ed. (1991) Microbiology – General Guidelines for the enumeration of coliforms – colony count technique.
2. ISO 6887-1, 1st ed. (1999) Microbiology of food and animal feeding stuffs – Preparation of test samples, initial suspensions and decimal dilutions for microbiological examination – Part 1: General rules for the preparation of the initial suspension and decimal dilutions

## Handling of enzymes and chemicals

Enzymes and enzyme solutions should be handled in a fume hood or in closed containers.

Avoid inappropriate handling of enzymes and enzyme solutions, which may result in aerosol/dust generation.

Avoid inhalation of dust aerosols and contact with skin and eyes.

Handling of chemicals and disposal of waste must be performed according to valid procedures.

## Validity

Valid from December 2011.

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## Analytical methods

### Detection of *Escherichia coli* (*E. coli*) in 25 g

#### Principle

*E. coli* is a Gram-negative, indole-positive, facultative anaerobic rod. It is considered to be a fecal indicator.

Detection of *E. coli* in 25 g is carried out as a qualitative analysis using nonselective enrichment in buffered peptone water (BPW) followed by isolation of  $\beta$ -D-glucuronidase-positive *E. coli* on a selective indicative agar medium (TBX agar).  $\beta$ -glucuronidase-negative *E. coli* strains (3–4%) form colorless colonies on TBX agar (e.g., *E. coli* O157). The detection of *E. coli* O157 is performed as ImmunoMagnetic Separation (IMS) using Dynabeads® anti-O157 and plating onto two selective indicative agar media (CT-SMAC agar and CHROMagar O157). Suspect *E. coli* O157 colonies are verified using the *E. coli* O157 latex test.

Suspect colonies from TBX agar and/or *E. coli* O157 latex-positive isolates from CT-SMAC agar and/or CHROMagar O157 are reported as *E. coli* detected in 25 g.



Important: The media used have the following characteristics:

| Media                                     | Characteristics  |
|---|--|
| BPW broth                                 | Nonselective broth.  |
| TBX agar                                  | <b>Selective properties:</b><br>Growth of accompanying Gram-positive flora is largely inhibited by the use of bile salts.<br><b>Indicative properties:</b><br>The presence of the enzyme $\beta$ -D-glucuronidase differentiates most <i>E. coli</i> spp. from other coliforms. <i>E. coli</i> absorbs the chromogenic substrate 5-bromo-4-chloro-3-indolyl- $\beta$ -D-glucuronide (X- $\beta$ -D-glucuronide). The enzyme $\beta$ -glucuronidase splits the bond between the chromophore 5-bromo-4-chloro-3-indolyl and the $\beta$ -D-glucuronide. <i>E. coli</i> colonies are colored blue-green.<br><b>NOTE:</b> For the recovery of sublethally injured <i>E. coli</i> , plates are incubated at 34–38 °C and not 44 °C as recommended by Merck (inhibits growth of accompanying Gram-positive flora). |
| CT-SMAC agar<br>(Sorbitol MacConkey agar) | Polypeptone favors the growth of <i>E. coli</i> O157:H7.<br>Sorbitol-negative bacterial (in particular O157:H7) colonies are colorless.<br>Sorbitol-positive bacteria give rise to red colonies due to the change of the color of the pH indicator (neutral red).<br>Contaminating bacteria are inhibited by the association of bile salts, crystal violet, cefixime, and potassium tellurite.   |
| CHROMagar O157 and CT-CHROMagar O157      | A typical <i>E. coli</i> O157 will grow as a pink-mauve colony, whereas most other microorganisms are either inhibited or grow as blue or colorless colonies.  |

## Definition of units

The result is stated as:

- DET (*E. coli* detected in 25 g) or
- ND (*E. coli* not detected in 25 g)

## Standards

A positive reference strain can be used (e.g., *E. coli* ATCC 11229).

If a reference strain of *E. coli* O157 is included, it must be *E. coli* O157 without the genes coding for verotoxins (e.g., ATCC 43888).

## Detection limit

Theoretical detection limit: 1 *E. coli* in 25 g

## Equipment

Balance ( $\pm 0.1$  g)

Magnetic stirrer

Incubator (34–38°C)

Sterile inoculation loops (1- $\mu$ l)

Sterile swabs

Vortex mixer

Pipettes and sterile tips

For ImmunoMagnetic Separation (either mIMS or aIMS):

- For manual ImmunoMagnetic Separation (mIMS):

- MPC-S rack and magnet (Invitrogen cat. no. 120.20) + Eppendorf tubes, 1.5-ml (Eppendorf cat. no. 0030 10.086) + MX-3 mixer (Dynal cat. no. 159.09) – mixer is optional.
- For automatic ImmunoMagnetic Separation (aIMS):
  - BeadRetriever™ (Invitrogen cat. no. 159-50) + tubes and tips (Invitrogen cat. no. 150-51)

## Media and reagents

Buffered peptone water (BPW) (450 ml)

Chromocult® TBX agar plates (9-cm)

Cefixime-tellurite Sorbitol MacConkey agar (CT-SMAC agar plates, 9-cm)

CHROMagar O157 agar plates (9-cm) or CT-CHROMagar O157 (app. 5- or 9-cm)

Tryptone soya agar plates (TSA)

Dynabeads® anti-O157, Dynal cat. no. 710.04

Washing buffer (PBS-Tween 20 buffer), Sigma no. P-3563

*E. coli* O157 Latex Test Kit (for verification), Oxoid no. DR620

## Safety

The *E. coli* O157 Latex Test Kit (Oxoid DR0620) is labeled R22 – Harmful if swallowed due to 0.1% sodium azide.

## Transfer of sample to BPW

25 g of sample is transferred to 450–900 ml of BPW, depending on the sample type

## Enrichment

The nonselective enrichment is performed as follows:

Incubate BPW at 34–38°C for 16–20 hr (minimum 16 hr).

## Detection of $\beta$ -D-glucuronidase-positive *E. coli*

Detection of  $\beta$ -D-glucuronidase-positive *E. coli* is performed as follows:

- Streak the enriched sample onto the surface of a TBX agar plate using a sterile 10- $\mu$ l inoculation loop. If using two BPW bottles, streak on one agar plate from each bottle
- Incubate the plate at 34–38°C for 18–24 hours
- Examine the plate for growth of typical *E. coli* colonies:

| Organism                        | Growth on Chromocult® TBX agar   |
|---------------------------------|--|
| <i>E. coli</i>                  | Blue-green or dark-blue-to-violet colonies (Salmon-GAL and X-glucuronide reaction)   |
| Coliforms (not <i>E. coli</i> ) | Salmon-to-red colonies (Salmon-GAL reaction but no X-glucuronide reaction)   |
| Other Gram-negatives            | Colorless colonies, except for some organisms which possess $\beta$ -D-glucuronidase activity. These colonies appear light-blue to turquoise |


## Detection of *E. Coli* O157

ImmunoMagnetic Separation (IMS) is performed either as manual IMS (mIMS) or automated IMS (aIMS):

**Manual IMS (mIMS):**

| Step | Action   |
|------|--|
| 1    | Place one Eppendorf tube per sample in the rack without the magnet inserted. Gently vortex the Dynabeads® anti-O157 and add 20 µl of Dynabeads® anti-O157 to each tube. Use a lid opener to open the lids of the Eppendorf tubes   |
| 2    | Gently add 1 ml of the pre-enriched sample to the Eppendorf tube. Use a new pipette/tip for each sample. Close the lid.<br><i>NOTE:</i> If the sample is divided between two BPW bottles, take 500 µl from each bottle   |
| 3    | Incubate the tubes for approx. 10 min at room temperature. Gently rotate the rack without the magnet on an MX-3 mixer (Dyna) or by hand  |
| 4    | Insert the magnet into the rack. Tilt the rack frequently for approx. 3 minutes to ensure complete collection of beads. With correct capture, a distinct circular-to-oval brownish pellet is formed at the tube site halfway between the top and bottom of the tube  |
| 5    | Open the tubes gently using the lid opener. Place a Pasteur pipette at the water surface opposite the pellet. Gently pipette up the supernatant and liquid in the cap of the tube. Slow down pipetting when the surface of the liquid passes the pellet in order to make sure that no beads leave the tube through the pipette. If beads leave the sample, return the supernatant to the tube and repeat step 4. Use a new pipette/tip for each sample |
| 6    | Carefully add 1 ml of washing buffer to each sample. Do not touch the tube with the pipette/ tip as this can cross-contaminate the samples as well as the buffer.<br>Close the lids and remove the magnet from the rack. Wash the bead complex by rotating the rack three times. Repeat steps 4 to 6 twice, but the last time only resuspending the pellet in 100 µl of washing buffer   |

**Automatic ImmunoMagnetic Separation (aIMS):**

| Step | Action  |
|------|---|
| 1    | Load one sample tube for each sample into a sample rack.<br><br><br><i>NOTE:</i> Each sample tube consists of five tubes called tubes 1 to 5 (tube 1 is to the left (= slip end) and tube 5 is to the right) |
| 2    | Gently vortex the Dynabeads® anti-O157 until the pellet in the bottom of the tube disappears, then aseptically add 10 µl of properly mixed Dynabeads® anti-O157 into sample tubes 1 and 2   |
| 3    | Aseptically add 500 µl of washing buffer to sample tubes 1 and 2.<br>Aseptically add 1000 µl of washing buffer to sample tubes 3 and 4.<br>Aseptically add 100 µl of washing buffer to sample tube 5  |
| 4    | Add 500 µl of the enriched test sample to sample tubes 1 and 2; be careful not to contaminate other tubes.  |

|          |  |
|----------|--|
|          | If the sample is divided between two BPW bottles, take 500 µl from each bottle                     |
| <b>5</b> | Repeat step 4 for the remaining samples  |
| <b>6</b> | Aseptically insert the sterile protective sample tip combs into the instrument                     |
| <b>7</b> | Insert the rack of filled tubes into the instrument and lock it in place                           |
| <b>8</b> | Check that everything is properly aligned. Close the instrument door                               |
| <b>9</b> | Select the EPEC/VTEC program sequence by scrolling with the arrow key, then press the Start button |

### Streaking onto selective indicative agar plates:

Each IMS product (from mIMS or aIMS) is tested for the presence of *E. coli* O157 using selective indicative agar plates:

| Step | Action  |
|------|---|
| 1    | Gently vortex the pellet (IMS product)  |
| 2    | Streak 50 µl of IMS product onto the surface of a CT-SMAC agar plate, then streak another 50 µl of IMS product onto the surface of a CHROMagar O157 plate (or a CT-CHROMagar O157 plate) as follows:<br>Spread the bead-bacteria complex over one half of the plate with a sterile cotton swab. This ensures the break-up of the bead-bacteria complexes. Dilute further by streaking with a loop |
| 3    | Incubate the plates at 34–38°C for 18–24 hours  |

### Reading:

| Agar                                 | Description  |
|--------------------------------------|--|
| CT-SMAC agar                         | On CT-SMAC agar, typical <i>E. coli</i> O157 colonies are transparent and almost colorless with a pale yellowish-brown appearance and a diameter of approx. 1 mm.<br>Sorbitol-positive organisms form bright-red (pink) colonies.<br>In some cases, suspect colonies are so few that they can only be recognized in the bacterial lawn in the primary streaking zone. In this case, subculture suspect colony material onto a new CT-SMAC agar plate.<br>If the growth is too weak after 18–24 hr, the plates can be reincubated for up to 24 hr. In this case, representative sorbitol-negative colonies (transparent) should be verified using the <i>E. coli</i> O157 Latex Test Kit from Oxoid (see below) |
| CHROMagar O157 and CT-CHROMagar O157 | A typical <i>E. coli</i> O157 will grow as a pink-mauve colony, whereas most other microorganisms are either inhibited or grow as blue or colorless colonies   |

### Verification of *E. coli* O157:

Suspect colonies on CT-SMAC agar and CHROMagar O157 (or CT-CHROMagar O157) are verified as *E. coli* O157 using the *E. coli* O157 Latex Test Kit from Oxoid. The verification is performed according to the manufacturer's description.

### Interpretation of results

*E. coli* detected (DET) in 25 g

- Presence of typical colonies on TBX agar
- Presence of O157 latex-positive colonies from CT-SMAC agar and CHROMagar O157 (or CT-CHROMagar O157), i.e., suspect *E. coli* O157

*E. coli* not detected (ND) in 25 g

- Absence of typical colonies on TBX agar

- Absence of O157 latex-positive colonies from CT-SMAC agar and CHROMagar O157 (or CT-CHROMagar O157), i.e., suspect *E. coli* O157

## Sensitivity and specificity

Sensitivity: 100%

Specificity: 100%

## References

ISO 16649-2, 1st ed. (2001) Microbiology of food and animal feeding stuffs – Horizontal method for the enumeration of presumptive *Escherichia coli* – Part 2: Colony-count technique at 44°C using 5-bromo-4-chloro-3-indolyl- $\beta$ -D-glucuronic acid.

ISO 16654, 1st ed. (2001): Microbiology of food and animal feeding stuffs – Horizontal method for the detection of *Escherichia coli* O157.

The detection of *E. coli* O157 is in accordance with ISO 16654 with the following exception:

- Enrichment is performed using buffered peptone water at 34–38°C for 16–20 hours. ISO 16654 uses a modified TSB + novobiocin at 41.5°C  $\pm$  1°C for 18–24 hours
- ImmunoMagnetic Separation is only performed after 16–20 hours  
ISO 16654 states after 6 hr and again, if necessary, after 12–18 hours (i.e., a total elapsed time of 18–24 hours)
- Verification is performed using the *E. coli* O157 latex test. ISO 16654 states the indole test and serological test

## Handling of enzymes and chemicals

Enzymes and enzyme solutions should be handled in a fume hood or in closed containers.

Avoid inappropriate handling of enzymes and enzyme solutions, which may result in aerosol/dust generation.

Avoid inhalation of dust aerosols and contact with skin and eyes.

Handling of chemicals and disposal of waste must be performed according to valid procedures.

## Validity

Valid from November 2011.

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## Analytical methods

### Detection of *Salmonella* spp.

#### Principle

Detection of *Salmonella* spp. is carried out as a qualitative test.

The test is based on a non-selective enrichment of 25 g of sample in 450 ml of buffered peptone water for 18-24 hours followed by *Salmonella* specific PCR. Optionally, a secondary enrichment in the selective RVs broth may be added after enrichment in BPW. The methods are in-house methods evaluated and validated at Novozymes.

#### Definition of unit

The result is stated as:

DET (*Salmonella* detected in 25 g)

ND (*Salmonella* not detected in 25 g)

#### Standards

A positive reference strain can be included in the test, e.g., *Salmonella adabraka*, *Salmonella havana*, or *Salmonella senftenberg*.

#### Detection limit

Theoretical detection limit: 1 *Salmonella* sp. in 25 g.

#### Equipment

| General equipment                   |                                  |
|-------------------------------------|----------------------------------|
| Balance                             | -                                |
| Incubator for BPW and agar plates   | (34–38°C)                        |
| Incubator or water bath for RVs     | (40.0–42.0°C)                    |
| Vortex mixer                        |                                  |
| Automatic pipettes and sterile tips | 10-100 µl, 100-1000 µl, and 1 ml |



| <b>PCR specific equipment and materials</b>       |                                  |
|---|----------------------------------|
| AB 7500 Fast Real-Time PCR System                 | -                                |
| Microcentrifuge                                   | E.g. Ole Dich microcentrifuge    |
| Heating block                                     | E.g. Stuart Block Heater SBH200D |
| Automatic pipette dedicated to PCR                | 10-100 µl                        |
| Automatic pipette dedicated to PCR                | 100-1000 µl                      |
| Pipette tips dedicated to PCR, DNA and DNase free | 100 µl and 1000 µl               |
| Sterile pasteur pipettes                          | -                                |
| Powder free gloves (PCR)                          | -                                |
| FastReactionTubes 0,1ml 8/strip                   | -                                |
| Tube Cap Strips 8 Caps/Strip                      | -                                |
| Tubes RNase-Free 1.5mL                            | -                                |

Mesia and reagents

#### **Enrichment broths**

Buffered Peptone Water (BPW) (450 ml)

Optional: Rappaport Vassiliadis soya peptone broth (RVs broth) (Oxoid CM0866)

#### **PCR specific reagents**

MicroSEQ® *Salmonella* spp. Detection Kit (Life Technologies Cat. No. 4403930).

PrepSEQ™ Rapid Spin Sample Preparation Kit (Life Technologies Cat. No. 4407760)

EP buffer, 90 ml buffered sodium chloride-peptone solution pH 7.0.

Nuclease-Free Water (e.g. Sigma Cat. No. 101210442)

#### **Nonselective enrichment**

The nonselective enrichment is performed in the following way:

| <b>Step</b> | <b>Action</b>   |
|-------------|---|
| 1           | Transfer 25 g or 25 ml of sample to 450-ml BPW preheated to 40-42°C |
| 2           | Incubate BPW at 34-38°C for 18-24 hours                             |

#### **Optional: Selective enrichment in RVs broth**

The selective enrichment in RVs is performed in the following way:

- Transfer 500 µl or 0.5 ml from BPW to 10-ml RVs tubes equilibrated to minimum room temperature
- Incubate the RVs broth at 40.0–42.0°C for 22-26 hours

Note: If a water bath is used to incubate the RVs, there is no need to equilibrate the temperature of the broth.

#### **DNA purification**

Cautions: When performing DNA purification there is a cross contamination risk, therefore, the following precautions should be taken:

- Set up only the materials and reagents needed for the particular work process in the LAF bench
- Always use a new pipette tip for each sample at each step
- Always handle one sample at a time keeping the remaining samples physically separated
- When opening reagent bottles put lids/caps upside down behind the bottle

- Always keep open bottles/reagents separate from the waste bin and not in the path where the pipette is transferred
- Always close (eppendorf) tubes when they are not handled
- Avoid passing your hands and pipettes above open bottles/tubes

IMPORTANT: Work in LAF bench when performing DNA purification and use gloves when performing lysis procedure.

IMPORTANT: Mix any reagents before use.

1. Mix BPW or RVs broth

CAUTION: Be careful that the broth does not touch the lid when mixing.

2. Transfer 2 ml BPW broth (or optionally RVs broth) to a 2 ml eppendorf tube and microcentrifuge (hereafter named centrifuge) for 3 minutes at max speed, e.g. 15.000g

TIP: Store the BPW or RVs broth at a cool temperature (2-8°C) until PCR has been successfully completed. The RVs broth may be stored for max. 2 days at a cool temperature (Ref.**Error! Reference source not found.**).

3. Discard the supernatant without touching the pellet, e.g. using a sterile pasteur pipette

4. Add 650 µl EP buffer and re-suspend the pellet thoroughly

5. Insert a spin column into a labeled tube

6. Load 650 µl of sample onto the spin column and cap the column

7. Load the tube into the centrifuge. Make sure the lid points toward the center of the centrifuge. Then centrifuge for 3 minutes at max speed, e.g. 15.000g

8. Remove the tube from the centrifuge, and then discard the used spin column

CAUTION: Make sure that any liquid on the outside of the spin column is scraped off on the edge of the eppendorf tube.

9. Aspirate, and then discard the supernatant

10. Add 50 µl of Lysis Buffer to the pellet. Re-suspend by pipetting up and down, or vortex until the pellet is re-suspended

11. Cap the tube, and then incubate at 95±3°C for 10 minutes

12. Allow the sample to cool for 2 minutes at room temp, then centrifuge for 1 minute at max. speed, e.g. 15.000g

13. Add 250 µl of Nuclease-Free water, then centrifuge for 1 minute at max. speed, e.g. 15.000g

14. Proceed with PCR, or store the tube at ±18°C. *Remark:* Avoid loading the black pellet when transferring to the lyophilized qPCR strip sample



TIP: Material may be stored at cool (2-8°C) for max. 2 hours after completion of step 3, 8 or 13.

### **PCR preparation**

IMPORTANT: Use gloves or wash your hands thoroughly after the PCR preparation. The negative control contains 0 – 0.01 % Na-azide.

IMPORTANT: Use a Pathogen Detection Negative Control for each PCR run.

1. Open the storage pouch containing the assay beads (MicroSEQ® *Salmonella* spp. Detection Kit)

IMPORTANT: Do not remove the desiccant from the storage pouch.

2. Remove the appropriate number of individual tubes or 8-tube strips

3: *NOTE:* Frozen samples and/or controls only: thaw these completely, vortex, then briefly spin them down using a microcentrifuge

4. Examine the assay beads in the 8-tube strips. Gently tap the tubes as needed to settle all assay beads to the bottom of each tube

5. Gently remove, and then discard the concave caps. Avoid disturbing the beads from the bottom of the tubes

6. For each sample or control, transfer 30 µl into a tube containing the appropriate assay beads. Beads dissolve in 1 to 5 seconds.

IMPORTANT: Dispense all unknown samples first followed by the negative control

7. Add additional tubes as needed so that each strip contains a full set of 8 tubes

8. Cap the tubes, sealing each tube with the flat (transparent) optical strip caps provided in the kit. Cap the tubes firmly with the strip cap tool to avoid collapsing, bending, or misaligning the tubes.

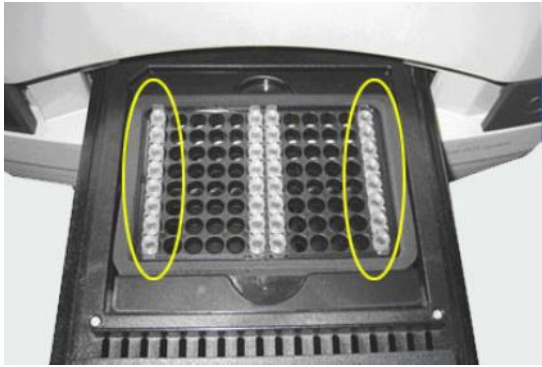
IMPORTANT: Avoid scratching the optical strip caps as this will interfere with the reading of fluorescence

9. Confirm that the strips are straight and that each tube is in line with the adjacent tube

10. Make sure reagents are thoroughly mixed and at the bottom of the tubes

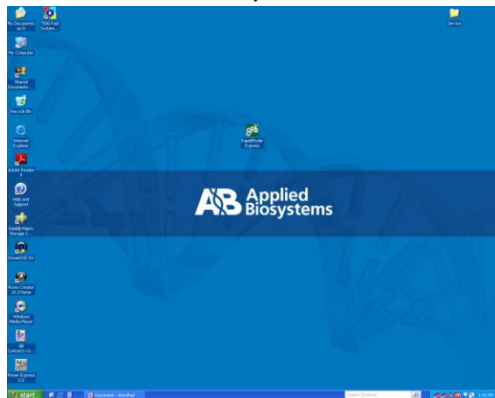
11. Carefully insert two or more 8-tube strips containing samples, starting from the center of the plate holder and moving out. This layout minimizes bending or misaligning the tube strips

12. If column 1 (leftmost) and column 12 (rightmost) of the Plate Holder are not used, insert two fully capped, empty, 8-tube strips into these columns (see below photo)

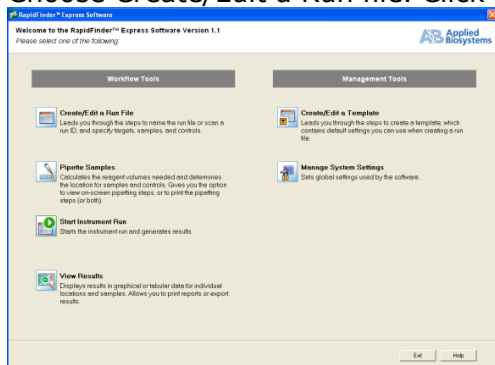


## Run PCR reactions

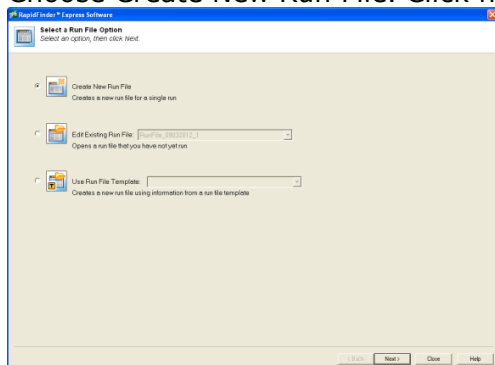
1. Turn on the PCR system first. Then turn on computer and open "RapidFinder Express"



2. Choose Create/Edit a Run file. Click next



3. Choose Create New Run File. Click next



4. Enter Run File Information. Use default Run File Name and enter initials for Setup Operator. Click next

**Enter Run File Information**  
Use the auto-generated run file name or type a new name, type or scan the run ID (optional), type the Setup Operator name (optional), type a Comment (optional), then click Next.

Run File Name: RunFile\_1002012\_1  
Run ID:  
Setup Operator:  
Comments:

The red asterisk (\*) denotes a required field.

Back Next Close Help

5. Select Targets: Choose *Salmonella* spp. Enter number of samples. Enter '1' for replicates, negative and positive controls, respectively. Click next

**Select Targets**  
Select the target pathogens to test for; then enter the number of samples, replicates, and positive and negative controls for each target. At least one negative control is required for each target pathogen. Click Next to continue.

File Name: RunFile\_1002012\_1

| Target   | # Samples | # Replicates | # Negative Controls | # Positive Controls |
|--|-----------|--------------|---------------------|---------------------|
| <input type="checkbox"/> <i>Escherichia coli</i> O157:H7   |           |              |                     |                     |
| <input type="checkbox"/> <i>Listeria monocytogenes</i>     |           |              |                     |                     |
| <input checked="" type="checkbox"/> <i>Salmonella</i> spp. | 20        | 1            | 1                   | 1                   |

Sample Count  
Count: 22 / 96

This illustration shows only the total sample count and does not indicate sample locations.

Back Next Close Help

6. Enter LIMS numbers as Sample Names. Click next

**Enter Sample Names**  
Enter or import sample names and information for each target. To change the number of samples or replicates for a target, click Back as needed.

File Name: RunFile\_1002012\_1

To add additional targets or samples, click Back to return to the previous page.

| Target                    | Sample Name | # Replicates | User Defined R1 | User Defined R2 | User Defined R3 |
|---------------------------|-------------|--------------|-----------------|-----------------|-----------------|
| 1. <i>Salmonella</i> spp. | 1010054488  | 1            |                 |                 |                 |
| 2. <i>Salmonella</i> spp. |             | 1            |                 |                 |                 |
| 3. <i>Salmonella</i> spp. |             | 1            |                 |                 |                 |
| 4. <i>Salmonella</i> spp. |             | 1            |                 |                 |                 |
| 5. <i>Salmonella</i> spp. |             | 1            |                 |                 |                 |
| 6. <i>Salmonella</i> spp. |             | 1            |                 |                 |                 |
| 7. <i>Salmonella</i> spp. |             | 1            |                 |                 |                 |
| 8. <i>Salmonella</i> spp. |             | 1            |                 |                 |                 |
| 9. <i>Salmonella</i> spp. |             | 1            |                 |                 |                 |

The asterisk (\*) denotes a required field.

Back Close Delete Selected Import Samples Export Samples

Target Control Information

| Target                    | Control  | Replicates |
|---------------------------|----------|------------|
| 1. <i>Salmonella</i> spp. | Negative | 1          |
| 2. <i>Salmonella</i> spp. | Positive | 1          |

Sample Count  
Count: 22 / 96

This illustration shows only the total sample count and does not indicate sample locations.

Back Next Close Help

7. Confirm Run Layout: Make a layout of the program securing equilibrium on the 96-well plate, i.e. using empty PCR tubes. Click next

**Confirm Run Layout**  
Review the Run Layout; if the run file is set up correctly, click Next. If the run file is not set up correctly, click Back, then change information as needed. IMPORTANT! The run file is not saved until you click Next on this page.

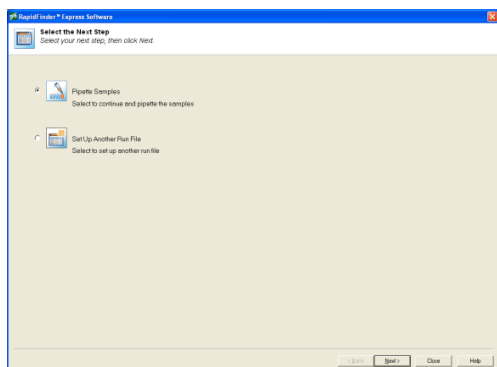
File Name: RunFile\_1002012\_1

|   | 1               | 2 | 3 | 4 | 5 | 6               | 7               | 8 | 9 | 10 | 11 | 12 |
|---|-----------------|---|---|---|---|-----------------|-----------------|---|---|----|----|----|
| A | Salmonella spp. |   |   |   |   | Salmonella spp. | Salmonella spp. |   |   |    |    |    |
| B | Salmonella spp. |   |   |   |   | Salmonella spp. | Salmonella spp. |   |   |    |    |    |
| C | Salmonella spp. |   |   |   |   | Salmonella spp. | Salmonella spp. |   |   |    |    |    |
| D | Salmonella spp. |   |   |   |   | Salmonella spp. | Salmonella spp. |   |   |    |    |    |
| E | Salmonella spp. |   |   |   |   | Salmonella spp. | Salmonella spp. |   |   |    |    |    |
| F | Salmonella spp. |   |   |   |   | Salmonella spp. | Salmonella spp. |   |   |    |    |    |
| G | Salmonella spp. |   |   |   |   | Salmonella spp. | Salmonella spp. |   |   |    |    |    |
| H | Salmonella spp. |   |   |   |   | Salmonella spp. | Salmonella spp. |   |   |    |    |    |

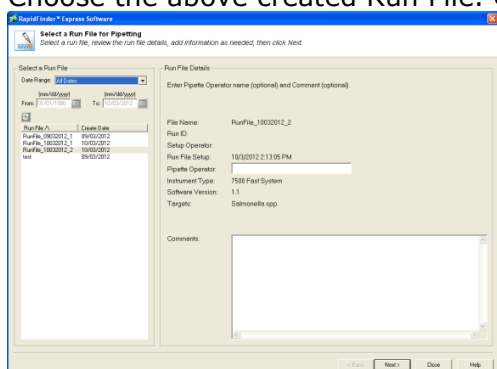
Run Run Layout

Back Next Close Help

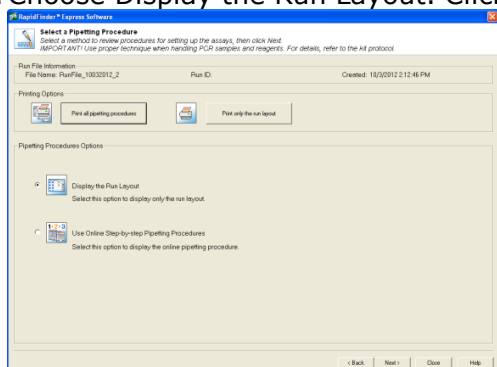
8. Choose Pipette Samples. Click next



9. Choose the above created Run File. Click next

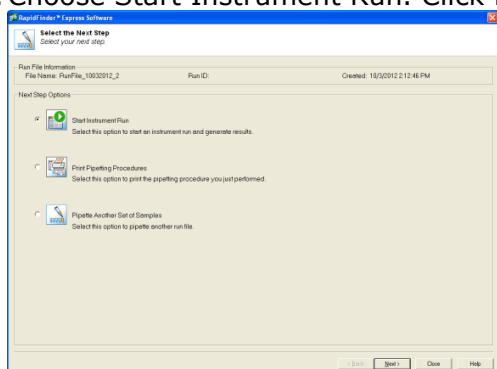


10. Choose Display the Run Layout. Click next



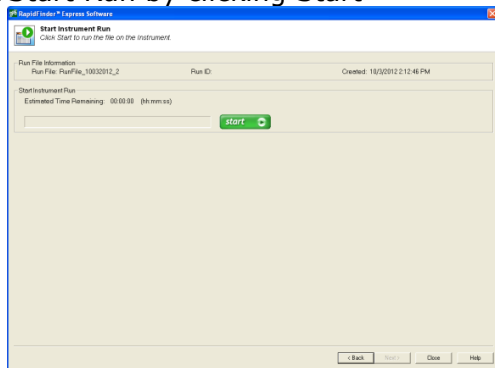
11. Confirm Run Layout. Click next

12. Choose Start Instrument Run. Click next

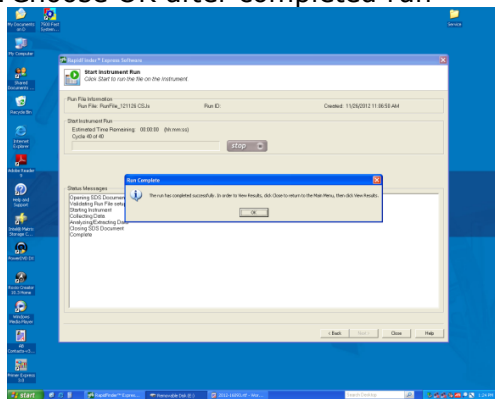


13. Load PCR tubes

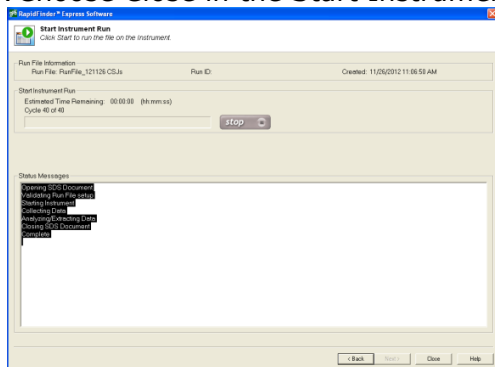
#### 14. Start Run by clicking Start



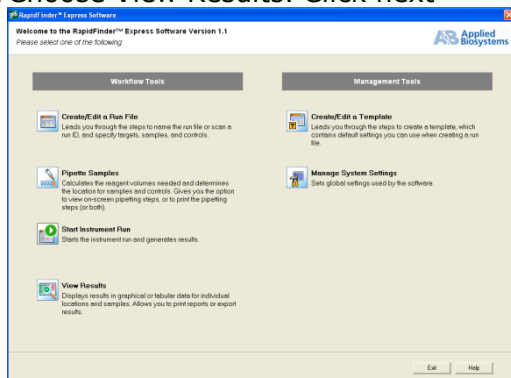
#### 15. Choose OK after completed run



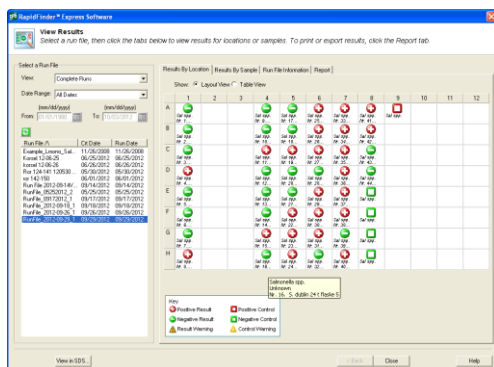
#### 16. Choose Close in the Start Instrument Run window



#### 17. Choose View Results. Click next



#### 18. Choose relevant Run File and the sheet "Results By Location"



## 19. Interpretation of results

| If...                             | Then report result as...  |
|-----------------------------------|---|
| Negative control is marked as "+" | Re-perform PCR procedure with all "+" samples and negative controls |
| Sample is marked as "-"           | <i>Salmonella</i> spp. not detected (ND)                            |
| Sample is marked as "+"           | <i>Salmonella</i> spp. detected (DET)                               |

TIP: The threshold value for a *Salmonella* positive sample is 35.69 cycles.

Note: If a positive PCR result is obtained, cultivation may be performed from the BPW or RVs broth if verification of the *Salmonella* type is desired. See flow chart or (Ref. **Error! eference source not found.**).

20. Click Close then Exit to close the RapidFinder Express software

21. Choose Shutdown to turn computer off, then turn off PCR system

**IMPORTANT:** AFTER PCR run:

- **NEVER EVER** open tubes
- Throw tubes in the trash in the PCR room. Do not re-use tubes
- Before leaving the room:
  - Remove and throw gloves in the trash
  - Wash hands

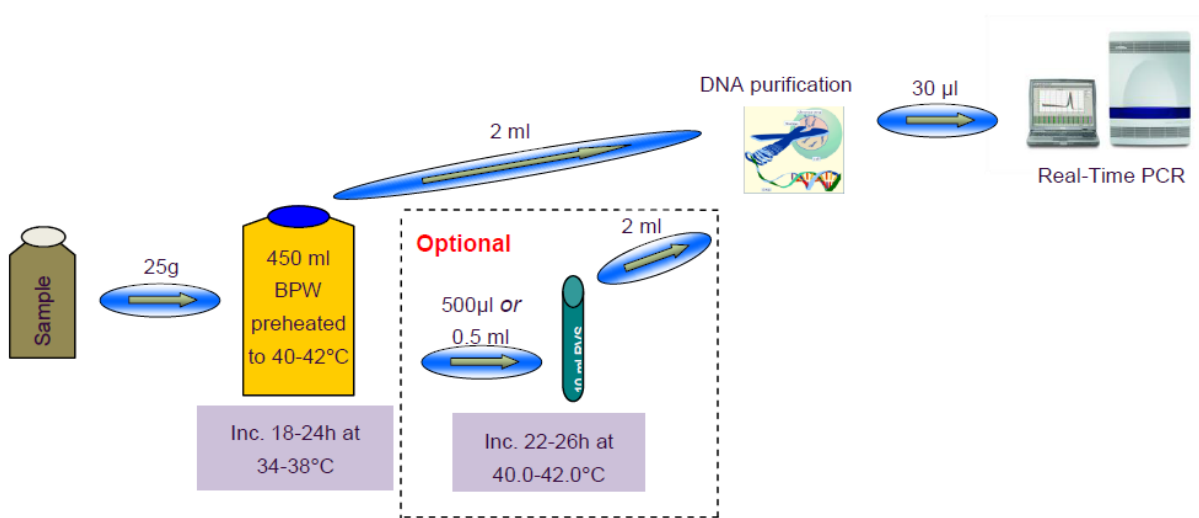
## Accuracy, sensitivity and specificity

Accuracy: 100%

Sensitivity: 100%

Specificity: 100%

## Flow chart:



## Handling of enzymes and chemicals

Enzymes and enzyme solutions should be handled in a fume hood or in closed containers. Avoid inappropriate handling of enzymes and enzyme solutions, which may result in aerosol/dust generation.

Avoid inhalation of dust aerosols and contact with skin and eyes.

Handling of chemicals and disposal of waste must be performed according to valid procedures.

## Validity

Valid from March 2013.

---

### Novozymes A/S

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## Detection of Antimicrobial activity

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**Scope** All Novozymes QC laboratories involved in analysis of samples from Novozymes production and GLP studies.

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**Principle** **Detection of Antimicrobial activity** is based on the measurement of inhibition of bacterial growth under specific circumstances.  
The method is in accordance with JECFA (1992)

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**LIMS code** ANTIMIC

---

**Definition of units** The result is stated as:

- DET (Antimicrobial activity detected) or
- ND (Antimicrobial activity not detected)

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**Samples** All sample types.

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**Standards** *Staphylococcus aureus*, ATCC 6538  
*Escherichia coli*, ATCC 11229  
*Bacillus cereus*, ATCC 2  
*Bacillus circulans*, ATCC 4516  
*Streptococcus pyogenes*, ATCC 12344  
*Serratia marcescens*, ATCC 14041  
**NOTE:** The test organisms must be traceable.

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**Detection limit** Not known.

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*Continued on next page*

## Detection of Antimicrobial activity, *Continued*

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### Equipment

Balance ( $\pm 0.1$  g)  
Sterile pipettes for transfer of 100  $\mu$ l, 1 ml and 10 ml  
Inoculation loops 1 $\mu$ l  
Paper discs, e.g. S&S Analytical Filter Papers No. 740-E (12.7 mm in diameter), autoclaved  
Bio Safety Cabinet, Class II  
Sterile gloves  
Refrigerator (2-8°C)  
Incubator (34-38°C)  
-80°C freezer  
Ruler or Vernier gauge  
Petri dishes, 9 cm

---

### Media and reagents

Tween buffer 4%  
Tryptone Soya agar (TSA), 90 ml in 250 ml Blue cap bottles  
Tryptone Soya agar plates, 9 cm with app. 15 ml agar (TSA)  
CASO broth, 50 ml  
*IMPORTANT:* Preparation in the local laboratory shall be done according to the current valid WW Media direction.  
Ciprofloxacin discs (5  $\mu$ g or 10  $\mu$ g) (bought ready to use).

---

### Safety

It is the responsibility of the laboratory leader that all personnel are aware of the correct handling of enzymes and reagents.

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*Continued on next page*

## Detection of Antimicrobial activity, *Continued*

**Day 1:** Handling the test organisms must be performed in a Bio Safety Cabinet, Class II.  
**Preparation of test organisms in CASO**

| Step | Action  |
|------|---|
| 1    | Inoculate each of the 6 test organisms using a 1 µl inoculation loop (the strains are taken directly from a Cryo tube that has been stored in a -80°C freezer) in separate CASO broth, 50 ml. |
| 2    | Contemporary, streak out each test organism, using the same inoculation loop as in step 1, on the surface of a TSA plate to look for purity.  |
| 3    | Incubate the CASO broth and TSA plates overnight at 34-38°C.  |

**Day 2:** The number of test organisms is tested in each of the CASO broths.  
**Number of test organisms in CASO**

| Step | Action  |
|------|---|
| 1    | Make a 10 <sup>-4</sup> dilutions of the following test organisms: <ul style="list-style-type: none"><li>• Bacillus cereus</li><li>• Bacillus cirkulans</li></ul>   |
| 2    | Make a 10 <sup>-5</sup> dilutions of the following test organisms: <ul style="list-style-type: none"><li>• Staphylococcus aureus</li><li>• Escherichia coli</li><li>• Streptococcus pyrogenes</li><li>• Serratia marcescens</li></ul> |
| 3    | Determine the Total viable count of each dilution by spread plate or spiral plate on TSA plates.<br>Incubate overnight at 34-38°C   |

*Continued on next page*

## Detection of Antimicrobial activity, *Continued*

### Day 2: Infection control (purity of the Cryo tubes)

Purity of the test organisms from the Cryo tubes are controlled the following way:

| Step | Action  |
|------|---|
| 1    | Control the purity of the 6 test organisms on TSA plates from the day before. |
| 2    | Write down the result (+ or – infection).                                     |

### Day 2: Preparation of test plates and purity of the test organisms in CASO broth

Preparation of test plates must be done in a Bio Safety Cabinet, Class II and wearing sterile gloves.

| Step | Action  |
|------|---|
| 1    | For each test organism a bottle containing 90 ml of Tryptone Soya agar (TSA) is melted and cooled (to app. 47°C)  |
| 2    | Transfer 10 ml of CASO broth inoculated with <i>S. aureus</i> to a 250 ml Blue cap bottle with 90 ml melted and cooled Tryptone Soya agar (TSA). Mix carefully.   |
| 3    | Pour app. 10 ml of the TSA-microorganism mixture onto an already prepared TSA plates (containing app. 15 ml TSA). Distribute the TSA-microorganism mixture evenly on the surface of the TSA plate, and allow solidifying. |
| 4    | Make another 9 plates as described in step 3.   |
| 5    | Control the purity of the CASO broth by streaking out from the last drop of the bottle with a 1 µl inoculation loop onto the surface of one TSA plate.  |
| 6    | Repeat step 2-5 for the rest of the microorganisms.<br><i>IMPORTANT:</i> Transfer only 5 ml of the CASO broth containing <i>Streptococcus pyogenes</i> to 90 ml of melted and cooled TSA.                                 |
| 7    | Incubate the TSA plates prepared in step 5 overnight at 34-38°C.  |

*Continued on next page*

## Detection of Antimicrobial activity, *Continued*

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### Day 2: Control of test plates with Ciprofloxacin

Control the test plates with Ciprofloxacin to determine whether the test organisms are capable of making an inhibition zone on the test plate.  
The control must be done on one test plate per test organism.

| Step | Action   |
|------|--|
| 1    | Put one disc of Ciprofloxacin onto the middle of a test plate. |
| 2    | Place the test plate overnight at 2-8°C.                       |
| 3    | Incubate the test plate overnight at 34-38°C.                  |

---

### Day 3: Purity in CASO broth

Check the purity of the TSA plates from the day before.  
Write down the result of the purity test for each of the test organisms (+ or – infection).

---

### Day 3: Number of colonies on TSA plates

Count the number of colonies on the TSA plates from the day before.  
Write down the results.  
*IMPORTANT:* To approve the test plates all readings must be  $>10^6$  CFU.

---

### Day 3: Reading of in- hibition zone

Reading of the TSA plates with Ciprofloxacin from the day before is done by measuring the diameter of the inhibition zone on each of the test plates using a ruler or a Vernier gauge.  
Write down the results.  
*IMPORTANT:* Each zone must be  $\geq 25$  mm.

---

### Sample preparation

The samples are prepared as followed:

- Transfer 10 g of solid sample or 10 ml of liquid sample to 90 ml Tween buffer 4%
- Immediately homogenize the sample by stirring or by shaking. Solid samples are homogenized on a magnetic stirrer for app. 20 minutes

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*Continued on next page*

## Detection of Antimicrobial activity, *Continued*

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### Test procedure

The test is performed in the following way:

*TIP:* It is recommended to work with dry plates, and to place the disc on the test plate immediately before addition of sample so the filters do not absorb moisture from the plates and thus cannot absorb the sample.

| Step | Action  |
|------|---|
| 1    | Place a sterile paper disc on each of the 6 test plates (one test plate per micro organism).<br><i>NOTE:</i> Up till 5 sterile paper discs can be placed on one plate (giving the possibility of analysing up to 5 samples per set of 6 test plates). |
| 2    | Inoculate each paper disc with 100 µl of the 10 <sup>-1</sup> dilution of the sample prepared above.  |
| 3    | Place the plates overnight at 2-8°C.  |
| 4    | Incubate the plates overnight at 34-38°C.   |
| 5    | Measure the diameter of the inhibition zone on each of the plates using a ruler or a Vernier gauge.   |
| 6    | Write down the results (inhibition zone in mm.).  |

---

*Continued on next page*

## Detection of Antimicrobial activity, *Continued*

### Interpretation of results

Results are given according to the sheet below:

| Is there...        | with a zone measuring... | ...the result is  |
|--------------------|--------------------------|-------------------|
| 0 inhibition zones | 0 mm                     | Not detected (ND) |
| X inhibition zones | <16 mm                   | Not detected (ND) |
| 1 inhibition zones | ≥16 mm                   | Not detected (ND) |
| 2 inhibition zones | ≥16 mm                   | Not detected (ND) |
| 3 inhibition zones | ≥16 mm                   | Detected (DET)    |

If the result is Detected (DET) a remark is given on which of the test organisms that shows obvious antimicrobial activity in the sample and the size of the zone is stated.

**IMPORTANT:** If the result is Detected (DET) the Responsible Scientist is contacted.

### Accuracy and precision

Not validated.

### Archiving

All documentation should be archived in accordance with the local archiving SOP.

### Contingencies

All deviations from this SOP should be discussed with the Method Responsible Scientist and should be documented.

### References

Joint FAO/WHO Expert Committee on Food Additives (JECFA). Compendium of food additive specifications, Volume 1, Rome 1992, appendix A to annex 1.

### Revision

Both 5 µg and 10 µg Ciprofloxacin discs can be used (Luna no. 2008-31511)

## Detection of production strains

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### Scope

All Novozymes QC laboratories involved in analysis of samples from Novozymes production and GLP studies.

---

### Principle

**The production strain** is defined as the organism used for fermentation of a given Novozymes product. Agar media and incubation conditions used for detection of a specific production strain is listed in [BD 001-IN-000](#)

**The reference strain** is defined as an isolate of the production strain used in the laboratory as a reference during the analysis.

Strains not listed in [BD 001-IN-000](#) are detected according to specific **Analytical Directions** prepared and approved by the EB Method Responsible Scientist. Analytical Directions are typically used in connection with GLP studies.

When analyzing samples from Novozymes production, the detection is carried out by spread plating of 0.1 g or 0.1 ml of sample.

When analyzing samples from GLP studies, the detection is carried out by spread plating or enrichment of 1 g of sample acc. to the specific Analytical Direction.

Detection of morphologically typical colonies (compared with the reference strain) indicates the presence of the production strain.

---

### Definition of units

When analyzing samples from Novozymes production, the result is stated as:

- DET (The productions strain detected in 0.1 g or 0.1 ml) *or*
- ND (The productions strain not detected in 0.1 g or 0.1 ml)

When analyzing samples from GLP studies, the result is stated as:

- DET (The productions strain detected in 1 g) *or*
- ND (The productions strain not detected in 1 g)

*IMPORTANT:* When detected, the app. number of production strain / g or ml is stated.

---

### Samples

Novozymes products

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*Continued on next page*



## Detection of production strains, *Continued*

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### Detection limit

The detection limit of this method is dependent on the sample volume and the dilution in use.

| Sample volume       | Size and number of agar plates | Dilution         | Detection limit       |
|---------------------|--------------------------------|------------------|-----------------------|
| 1 ml, spread plate  | 14 cm (4 plates)               | 10 <sup>-1</sup> | 10 colonies / g or ml |
| 10 ml, spread plate | 14 cm (40 plates)              | 10 <sup>-1</sup> | 1 colonies / g or ml  |

---

### Equipment

Balance (± 0.1 g)  
Magnetic stirrer  
Petri dishes (14 cm and 9 cm)  
Suitable sterile pipettes for transfer of 10 ml, 1 ml (4x0.25 ml) and 0.25 ml  
Sterile Drigalski spatula  
Incubator  
(relevant incubation temperatures are listed in [BD 001-IN-000](#))

---

*Continued on next page*

## Detection of production strains, *Continued*

### Media and reagents for Bacterial strains

Dilution buffer: Tween buffer 4%, 90 ml (If necessary, with a magnet) prepared acc. to [EB-ME-0052](#)

Agar media:

| Abbreviation | Full name  | Prepared acc. to EB Media direction (link) | Purpose                  |
|--------------|--|--|--------------------------|
| AT-2         | AT-2 agar  | <a href="#">EB-ME-0001</a>                 | Detection & verification |
| B-TSA        | Basic Tryptic Soy Agar   | <a href="#">EB-ME-0055</a>                 | Detection                |
| B-TSA w.CAM  | Basic Tryptic Soy Agar with or without Chloramphenicol (CAM)<br><i>NOTE: The addition of CAM is optional</i> | <a href="#">EB-ME-0056</a>                 | Detection                |
| Schaeffers   | Schaeffers agar  | <a href="#">EB-ME-0036</a>                 | Verification             |
| Sch.starch   | Schaeffers agar with 1% starch   | <a href="#">EB-ME-0037</a>                 | Verification             |
| Skim milk    | Tryptic Soy Agar with 1 % skim milk  | <a href="#">EB-ME-0038</a>                 | Verification             |
| TBX w.AMP    | Chromocult®TBX agar + ampicillin (100 mg/l)  | <a href="#">EB-ME-0066</a>                 | Detection                |
| TSA          | Tryptic Soy Agar   | <a href="#">EB-ME-0041</a>                 | Detection                |
| TSA w.CAM    | Tryptic Soy Agar with or without Chloramphenicol (CAM)<br><i>NOTE: The addition of CAM is optional</i>       | <a href="#">EB-ME-0057</a>                 | Detection                |
| TSA w.kana   | Tryptic Soy Agar with kanamycin  | <a href="#">EB-ME-0058</a>                 | Detection                |

*Continued on next page*

## Detection of production strains, *Continued*

**Media and reagents for Fungal strains**

Dilution buffer: Tween buffer 4%, 90 ml (If necessary, with a magnet) prepared acc. to [EB-ME-0052](#)  
Agar media:

| Abbreviation | Full name   | Prepared acc. to EB Media direction (link) | Purpose                  |
|--------------|---|--|--------------------------|
| Cove-T-2     | Cove-T-2 agar   | <a href="#">EB-ME-0013</a>                 | Detection & verification |
| DG-18        | DG-18 agar  | <a href="#">EB-ME-0017</a>                 | Verification             |
| Phytate      | Phytate agar  | <a href="#">EB-ME-0028</a>                 | Verification             |
| Sch.starch   | Schaeffers agar with 1% starch  | <a href="#">EB-ME-0037</a>                 | Verification             |
| YPG          | YPG agar with or without tetracycline<br><i>NOTE:</i> The addition of tetracycline is optional  | <a href="#">EB-ME-0044</a>                 | Detection                |
| YPSS         | YPSS agar with or without tetracycline<br><i>NOTE:</i> The addition of tetracycline is optional | <a href="#">EB-ME-0045</a>                 | Detection                |
| YSG          | Yeast/Soy Peptone/Glucose   | MSA-SUB-FS-0064                            | Verification             |

If verification on Schaeffers agar with starch is performed then Lugol's iodine solution (0.5%) is used. Lugol's solution is prepared acc. to [EB-ME-0021](#).

### Safety

It is the responsibility of the laboratory leader, that all personnel are aware of the correct handling of enzymes and reagents.

*Continued on next page*

## Detection of production strains, *Continued*

### Sample preparation

The samples are prepared as follows:

| Step | Action  |
|------|---|
| 1    | Transfer 10 g of solid sample or 10 ml of liquid sample to 90 ml Tween buffer 4%.   |
| 2    | Immediately homogenize the sample by stirring or by shaking. Solid samples are homogenized on a magnetic stirrer for app. 20 minutes. |

**IMPORTANT:** All enzyme products must be analyzed from a  $10^{-1}$  dilution due to possible inhibition of micro organisms in undiluted enzyme.

### Plating

Plating must be done within 15 minutes from end of homogenization. If this is not possible, the sample can be stored at 2-8°C for up to 4 hours.

**NOTE:** Relevant agar plates and incubation conditions (time and temperature) are listed in [BD 001-IN-000](#)

| Step | Action  |
|------|---|
| 1    | <b>NOTE:</b> Prepare the test plates: <ul style="list-style-type: none"><li>When analyzing samples from Novozymes production: Transfer 1 ml from the <math>10^{-1}</math> dilution onto the surface of 4 relevant agar plates (14 cm) with app. 0.25 ml on each plate.</li><li>When analyzing samples from Tox batches (GLP): Analyse according to the relevant Analytical Direction.</li></ul>   |
| 2    | Prepare the 2 positive control plates: <ul style="list-style-type: none"><li>Transfer 0.25 ml from the <math>10^{-1}</math> dilution onto the surface of 1 relevant agar plate (14 cm), and streak the bacteria reference strain or point inoculate the fungal production strain onto the inoculated plate.</li><li>Streak the bacteria reference strain or point inoculate the fungal strain onto another agar plate (not inoculated with sample).</li></ul> |
| 3    | Leave the plates on the table until the sample has been soaked into the agar.   |

*Continued on next page*

## Detection of production strains, *Continued*

### Reading

The colonies on the test-plates are compared morphologically with the colonies of the reference strain.

| If ...  | Then ...   |
|---|--|
| No suspect colonies are observed on the test-plates ... | The test is ended and the result is stated as: <b>ND</b> (the production strain is Not Detected) |
| Suspect colonies are observed on the test-plates ...    | The test is continued as described below (Verification).   |

**IMPORTANT:** The reference strain must grow on both of the two positive control plates. If not, the test is repeated.

### Verification

Suspect colonies from the test plates and the reference strain are streaked or point inoculated onto one or more of the agar plates (9 cm or 14 cm) listed in [BD 001-IN-000](#) (column "Verification"). Inoculation and reading of these agar media are described below. The plates are incubated as described in the column "Verification". If necessary, these media can be supplemented with other agar media, e.g. the agar medium used for the detection.

### AT-2 agar

Detection of pullulanase activity:

|                    | Description   |
|--------------------|---|
| <b>Principle</b>   | Pullulanase-producing strains degrade the amylopectin in the agar. As a result, blue zones (haloes) will surround the colonies of the isolate.  |
| <b>Inoculation</b> | Point inoculation   |
| <b>Reading</b>     | Colonies of the isolate are compared morphologically with the colonies of the reference strain. The surface of the plates is carefully flooded with Lugol's solution (0.5%). Blue zones surrounding the colonies in a reddish-brown medium indicate pullulanase activity.<br><br><i>NOTE:</i> If the production strain produces amylase in addition to pullulanase, clear zones will surround the colony. Between the clear zone and the reddish-brown medium a narrow blue zone might be seen. |

*Continued on next page*

## Detection of production strains, *Continued*

---

**Cove-T-2 agar** Detection of amdS-transformed fungi:

|                    | Description  |
|--------------------|--|
| <b>Principle</b>   | GMO strains transformed with the marker amdS grow well on the agar, while other strains appear with feeble or no growth.   |
| <b>Inoculation</b> | Point inoculation.   |
| <b>Reading</b>     | <i>NOTE:</i> Colonies of the isolate are compared morphologically with the colonies of the reference strain. Vigorous growth on Cove-T-2 indicates presence of an amdS-transformed strain. |

---

**DG-18 agar** Comparison of morphology of fungi:

|                    | Description   |
|--------------------|---|
| <b>Principle</b>   | DG-18 is a general growth medium for Fungi. The agar is used for comparison of morphology of fungal isolates with the reference strain. |
| <b>Inoculation</b> | Point inoculation   |
| <b>Reading</b>     | <i>NOTE:</i> Colonies of the isolate are compared morphologically with the colonies of the reference strain.                            |

---

**Phytate agar** Detection of phytase activity:

|                    | Description  |
|--------------------|--|
| <b>Principle</b>   | Phytase-producing strains degrade phytate in the agar. As a result, clear zones (haloes) will surround the colonies of the isolate.  |
| <b>Inoculation</b> | Point inoculation  |
| <b>Reading</b>     | <i>NOTE:</i> Colonies of the isolate are compared morphologically with the colonies of the reference strain. Before inoculation the plates are opaque. The presence of phytase activity is indicated by presence of clear zones (haloes) surrounding the colonies. |

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*Continued on next page*

## Detection of production strains, *Continued*

### Schaeffers agar

Sporulation test (*Bacillus* spp.):

|                    | Description   |
|--------------------|---|
| <b>Principle</b>   | Schaeffers agar induces sporulation of wild type strains, but the production strains show no sporulation on Schaeffers agar after incubation for 2-3 days.  |
| <b>Inoculation</b> | Point inoculation   |
| <b>Reading</b>     | <i>NOTE:</i> Colonies of the isolate are compared morphologically with the colonies of the reference strain. The colonies are examined by microscopy for sporulation. The production strain shows no sporulation after incubation for 2-3 days. |

### Schaeffers starch agar

Detection of amylase activity (all isolates) and sporulation test (*Bacillus* spp.):

|                    | Description   |
|--------------------|---|
| <b>Principle</b>   | <u><i>Bacillus</i> spp.:</u> Schaeffers agar induces sporulation of wild type <i>Bacillus</i> strains, but the <i>Bacillus</i> production strains show no sporulation on Schaeffers agar after incubation for 2-3 days.<br><u><i>Bacillus</i> spp. &amp; Fungi:</u> Amylase producing strains degrade the starch in the agar. As a result, in clear zones (haloes) will surround the colonies of the isolate.   |
| <b>Inoculation</b> | Point inoculation   |
| <b>Reading</b>     | Colonies of the isolate are compared morphologically with the colonies of the reference strain.<br><u><i>Bacillus</i> spp.:</u><br>The colonies are examined by microscopy for sporulation. The production strain shows no sporulation after incubation for 2-3 days.<br><u><i>Bacillus</i> spp. &amp; fungi:</u><br>The surface of the plates is carefully flooded with Lugol's solution (0.5%). Clear zones around the colonies in a blue (dark blue) indicates amylase activity. |

*Continued on next page*

## Detection of production strains, *Continued*

---

**Skim milk agar** Detection of proteolytic activity:

|                    | Description  |
|--------------------|--|
| <b>Principle</b>   | Protease-producing strains degrade the skim milk in the agar. As a result, clear zones (haloes) surround the colonies of the isolate.  |
| <b>Inoculation</b> | Point inoculation  |
| <b>Reading</b>     | <i>NOTE:</i> Colonies of the isolate are compared morphologically with the colonies of the reference strain. Before inoculation the plates are opaque. Presence of clear zones (haloes) surrounding the colonies of the isolate after end of incubation indicate the presence of a proteolytic activity. |

---

### Calculation

The result is stated on the basis of the number of typical colonies.

- No typical colonies: ND (Production strain not detected in 0.1 g or 0.1 ml)
- Typical colonies: DET (Production strain detected in 0.1 g or 0.1 ml).

If detected, the app. number of production strains / g or ml is stated.

*IMPORTANT:* If any production strain is detected, the Method Responsible Scientist is contacted immediately. In addition, QCC-cor is informed by mail.

---

### Accuracy and precision

The theoretical detection limit is:

- When analysing samples from Novozymes production:  
10 production strains / g or ml
  - When analysing samples from GLP studies:  
1 production strains / g
- 

### Archiving

All documentation should be archived in accordance with the local archiving SOP.

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*Continued on next page*



## Detection of production strains, *Continued*

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**Contingencies** All deviations from this SOP should be discussed with the Method Responsible Scientist and should be documented.

---

**References** [BD 001-IN-000](#)

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**Revision** “EB – Productions Strain list” changed to [BD 001-IN-000](#)

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## **Appendix 4**

### **Documentation regarding the manufacturing process**

1. Statement on compliance of Good Manufacturing Practices, Food
2. ISO 9001:2008 certificate

To Whom It May Concern

**Statement on Good Manufacturing Practice - GMP**  
- general description of production, control and hygiene

Novozymes A/S is a manufacturer of enzymes used in the food industry. We hereby certify that: The products are produced according to good manufacturing practices for manufacturing, packing, or holding human food in order to prevent serious food hazards. Furthermore, our documented quality system is ISO 9001<sup>1</sup> certified by Bureau Veritas Certification, accredited by UKAS. The quality system includes:

- Production operations are conducted in accordance with adequate sanitation principles.
- HACCP plan. Critical control points (CCPs) are identified and controlled, and the products are released if in compliance with these requirements.
- Critical measuring equipment is identified and calibrated at regular intervals.
- Instructions on cleaning of equipment, utensils and rooms are established and cleaning is documented.
- The personnel is trained in hygienic practices in order to prevent contamination of products and equipment.
- The personnel is trained in the quality system.
- The buildings and equipment are monitored periodically with special reference to maintenance.
- The production of our food enzymes complies with EC regulation 853/2004/EC, including amendments, on *the hygiene of foodstuffs*.
- The packaging materials used for our food enzyme products comply with EC regulation 1935/2004/EC, and related legislation including amendments on materials and articles intended to come into contact with foodstuffs.
- The production is under control of and inspected by the authorities according to EC regulation 853/2004/EC, including amendments, on *the official control of foodstuffs* as interpreted and implemented in Danish legislation.

<sup>1</sup>The scope of the 9001 certificate is: Development, Production and Sales of Biopolymers and Industrial Enzymes.

**BUREAU VERITAS**  
Certification



## Certification

Awarded to

**Novozymes A/S**

*Sites as to attached appendix*

**Bureau Veritas Certification certifies that the Management System of the above organisation has been audited and found to be in accordance with the requirements of the Management System standards detailed below.**

### STANDARD

**ISO 9001:2008**

### SCOPE OF SUPPLY

**Development, production and sales of industrial enzymes.**

*Original approval date:* 25-03-1996

*Subject to the continued satisfactory operation of the organisation's Management System, this certificate is valid until:* 25-03-2015

*To check the validity of this certificate, please call:* (+45) 77 311 000.

*Further clarification regarding the scope of this certificate and the applicability of the system requirements may be obtained by consulting the organisation.*

*Certificate Number:* DK003201-2

*Date:* 06-06-2013



Certification body address: Brandon House, 180 Borough High Street, London SE1 1LB, UK  
Certification office: Oldenborggade 1B, DK-7000 Fredericia

This certificate remains the property of Bureau Veritas Certification Holding SAS – UK Branch



**BUREAU VERITAS**  
Certification



## Certification

Awarded to

**Novozymes A/S**

**Bureau Veritas Certification has issued this appendix to the  
certificate of approval of the above organisation.**

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## Appendix 5

### Safety documentation

1. Sequence homology of Asparaginase from MOL2940 to known toxins and allergen analysis of Asparaginase from MOL2940. Novozymes Report No.: 2013-09763
2. Summary of toxicity data. Asparaginase PPV33595  
Novozymes Report No.: 2013-02837
3. Asparaginase, batch PPV33595: Test for mutagenic activity with strains of *Salmonella typhimurium* and *Escherichia coli*. Novozymes Study No. 20128071.  
Novozymes Report no.: 2013-01259
4. Asparaginase, batch PPV33595: In Vitro Micronucleus Test in Cultured Human Lymphocytes. HLS Study Number: LKG0062.  
Novozymes Reference No.: 2012-19300
5. Asparaginase, batch PPV33595. 90 Days Oral Gavage Toxicity Study in Rats.  
CiTox/Scantox No.: 74826.  
Novozymes Reference No.: 2012-18820

Sequence homology of Asparaginase from MOL2940 to  
known toxins  
and  
Allergen analysis of Asparaginase from MOL2940

Esben Friis  
LUNA# 2013-09763-01

June 27, 2013

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| G.1      | 35% or larger identity over any 80 amino acid window . . . . .   | 214        |
| G.2      | 35% or larger identity over any 80 amino acid window (with scaling) . . . . .  | 214        |
| G.3      | Identities calculated from Needleman-Wuncsh alignment . . . . .  | 214        |

# 1 Sequence homology of Asparaginase from MOL2940 to known toxins

## Uniprot database

Protein sequences that contain the word *toxin* in the description field were extracted from UNIPROT (Database date: 01-Mar-2013). This database contains entries from SWISSPROT and TREMBL. 31365 entries were found. Each of the sequences was placed in its uniquely named Fasta file. The Asparaginase from MOL2940 sequence was placed in a separate file "MOL2940.fasta". The awk script in appendix A was used to invoke the sequence alignment program ClustalW 2.0.10 to align each sequence to Asparaginase from MOL2940. A summary file containing the length of each sequence and number of identical residues is also created. From this, the identity percentage to the Asparaginase from MOL2940 sequence or the compared toxin sequence is calculated, whichever is longest. This is chosen because the toxin sequences have many different lengths, both much shorter and much longer than the Asparaginase from MOL2940 sequence. By always using the longest sequence, artificial high scores from very short or very long toxins are avoided. The largest homology encountered was 16.9%, indicating that the homology to any toxin sequence in this databas is indeed random and very low. The results are shown in appendix B.

## 2 Allergen analysis of Asparaginase from MOL2940

### Allergen Databases

The EFSA scientific opinion [1] recommend that searches are done in more than one allergen database, to ensure that as many known allergens as possible are considered. In this case, all available allergen sequences were downloaded from the following databases:

- <http://allergenonline.org>. This is the home page of the The Food Allergy Research and Resource Program (FARRP) allergen protein database. The present report use data downloaded 01-Mar-2013. Appendix D shows a list. A few of the entries were omitted, due to wrong accession codes, unpublished sequences or other errors, see appendix D.1.
- <http://www.allergen.org>. This is the official site for the systematic allergen nomenclature that is approved by the World Health Organization and International Union of Immunological Societies (WHO/IUIS) Allergen Nomenclature Sub-committee. The present report use data downloaded 01-Mar-2013. Appendix E shows a list. A few of the entries were omitted, due to wrong accession codes, unpublished sequences or other errors, see appendix E.1.

### Analyses

1. more than 35% identity in the amino acid sequence of the expressed protein (i.e.without the leader sequence, if any), using a window of 80 amino acids and a suitable gap penalty (using Clustal-type alignment programs or equivalent alignment programs). This is one of the recommended test methods of the EFSA scientific opinion [1], and also of the earlier publication from the FAO/WHO Expert group [2]. The queries were done using Fasta 3.4, using the scripts in appendix C
2. same as item 1, but with scaling enabled. In this way, matches with high identity, but over windows shorter than 80 amino acids can be identified. For example a match with 50% identity over 60 amino acids would still have enough identical amino acids to exceed the 35% threshold over 80 amino acids:  $60 \cdot 0.50 / 80 = 0.375 = 37.5\%$ .
3. Alignment of Asparaginase from MOL2940 to each of the allergens, and identify hits with more than 35% identity over the full length of the alignment. These queries were performed using the global alignment "needle", which is an implementation of the Needleman-Wunsch global alignment algorithm [3] in the program package EMBOSS [4].

The two first are in compliance with the recommendations in the EFSA scientific opinion [1]. The latter adds some more detailed information for hits identified by the two first methods.

## Results

**Database: allergenonline.org**

### **35% identity over 80 amino acids**

The following allergens had one or more matches using the method described in item 1 above (see appendix F for a complete list).

(No hits found)

### **35% identity over 80 amino acids with scaling**

The following allergens had one or more matches using the method described in item 2 above (see appendix F for a complete list).

(No hits found)

### **Identity over full length**

All allergens with more than 10% sequence identity to Asparaginase from MOL2940 are shown in appendix F.3. The identities to the allergens identified by the 35% identity over 80 amino acids method are shown below.

(No hits found)

**Database: allergen.org**

### **35% identity over 80 amino acids**

The following allergens had one or more matches using the method described in item 1 above (see appendix G for a complete list).

(No hits found)

### **35% identity over 80 amino acids with scaling**

The following allergens had one or more matches using the method described in item 2 above (see appendix G for a complete list).

(No hits found)

### Identity over full length

All allergens with more than 10% sequence identity to Asparaginase from MOL2940 are shown in appendix G.3. The identities to the allergens identified by the 35% identity over 80 amino acids method are shown below.

(No hits found)

### Conclusion

No significant homology was found between Asparaginase from MOL2940 and any of the allergens in the databases mentioned above.

### References

- [1] Scientific opinion on the assessment of allergenicity of GM plants and microorganisms and derived food and feed. EFSA panel on genetically Modified Organisms (GMO panel). European Food Safety Authority (EFSA), Parma 2010. (The document may be downloaded from <http://www.efsa.europa.eu/en/scdocs/scdoc/1700.htm>)
- [2] Evaluation of Allergenicity of Genetically Modified Foods (Report of a Joint FAO/WHO Expert Consultation on Allergenicity of Foods Derived from Biotechnology 22–25 January 2001), Food and Agriculture Organization of the United Nations (FAO), Rome 2001. [http://www.who.int/foodsafety/publications/biotech/ec\\_jan2001/en/](http://www.who.int/foodsafety/publications/biotech/ec_jan2001/en/)
- [3] Needleman, S. B. and Wunsch, C. D. (1970) *J. Mol. Biol.* **48**, p 443-453.
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## A Scripts for toxin homology search

Awk scripts for alignment of sequences to the Asparaginase from MOL2940 sequence and calculation of sequence lengths and identities. First the script used to run the alignments. The script is stored in a file called "runaligns".

```
#!/bin/tcsh
cat NZYM-CK.fasta $1 >tmp.txt
clustalw tmp.txt
grep -v ">" $1 | gawk '{printf "%s",$0} END {printf "\n"}' | wc | \
    gawk '{print $3-1}' > $1.len
cat tmp.aln | gawk '{printf "%s",$0} END {printf "\n"}' | \
    sed 's/[~*]//g' | wc | gawk '{print $3-1}' > $1.idt
echo $1 | gawk '{printf "%s ",$0}' >> summary
cat $1.len $1.idt | gawk '{printf "%s ",$0} END {printf "\n"}' >>summary
mv tmp.aln $1.out
```

Before start, the file "summary" must be deleted. The analysis is automatically done for all .fasta files in the current directory (and subdirectories, if present) by the command:

```
find . -name "*.fasta" -exec runaligns {} \;
```

Afterwards the sequence length and identity information can be found in the file summary. This file is processed through the following Python script, which calculates the percentages as described in the text.

```
#!/usr/bin/python
import string,commands

compare_length = 326
data = []

f = open ("summary","r")

buffer = "XX"
i=0

while buffer != "":
    buffer = f.readline()
    if buffer != "":
        data.append(string.split(buffer))
        data[i][1] = int(data[i][1])
        data[i][2] = int(data[i][2])

        i = i+1
f.close()
```

```

for i in range(len(data)):
    fullname = commands.getoutput("grep "+string.upper(data[i][0][2:-6])+" description.txt")
    percentid = 100.0*float(data[i][2])/float(max(data[i][1],compare_length))
    if (percentid >= 10.0):
        printlist = [data[i][0][2:-6], data[i][1], data[i][2], \
                      percentid, \
                      fullname[18:83] ]
        print '%-13s %4d %4d %5.1f    %-60s' % tuple(printlist)

```



## B Toxin homology results

UNIPROT entries, that contain the word "toxin", but not "fragment" in the description field and their identity to Asparaginase from MOL2940. The columns are

1. sequence database accession number
2. sequence length
3. number of identical residues after alignment to Asparaginase from MOL2940
4. percent identity compared to Asparaginase from MOL2940 or the sequence, whichever is longest.
5. sequence description

Matches  $\geq 10\%$  are shown

|        |     |    |      |   |
|--------|-----|----|------|---|
| g8mrb3 | 222 | 55 | 16.9 | SubName: Full=Cytolethal distending toxin protein A;            |
| e6i952 | 244 | 55 | 16.9 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| e1gyk1 | 333 | 56 | 16.8 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| b1hmi9 | 326 | 54 | 16.6 | SubName: Full=35.8-kilodalton mosquitocidal toxin protein;      |
| q57539 | 327 | 54 | 16.5 | SubName: Full=35.8-kilodalton mosquitocidal toxin;              |
| q57028 | 327 | 54 | 16.5 | SubName: Full=35.8-kilodalton mosquitocidal toxin;              |
| f7r1e6 | 363 | 60 | 16.5 | SubName: Full=Putative toxin regulator;                         |
| d9yfm4 | 244 | 53 | 16.3 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| c9m6s7 | 258 | 53 | 16.3 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| q5dz59 | 348 | 56 | 16.1 | SubName: Full=Toxin coregulated pilus biosynthesis protein T... |
| g8uqq1 | 373 | 60 | 16.1 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| q1w695 | 305 | 52 | 16.0 | RecName: Full=Sphingomyelin phosphodiesterase D LiSicTox-alp... |
| p20798 | 279 | 52 | 16.0 | RecName: Full=Toxin TxP-I; AltName: Full=Tox34; Flags: Precu... |
| i3i345 | 268 | 52 | 16.0 | SubName: Full=Multidrug and toxin extrusion protein 1;          |
| d4cxb9 | 285 | 52 | 16.0 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| d6jk12 | 395 | 63 | 15.9 | SubName: Full=Zona occludens toxin;                             |
| d4l0a1 | 353 | 56 | 15.9 | SubName: Full=Predicted membrane protein, putative toxin reg... |
| d4kji1 | 353 | 56 | 15.9 | SubName: Full=Predicted membrane protein, putative toxin reg... |
| c9n133 | 370 | 59 | 15.9 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| h0cir9 | 343 | 54 | 15.7 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| j5hu61 | 327 | 51 | 15.6 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| e9zb75 | 309 | 51 | 15.6 | SubName: Full=Zeta toxin protein;                               |
| d3huw1 | 327 | 51 | 15.6 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| c3wiu3 | 269 | 51 | 15.6 | SubName: Full=Zeta-toxin;                                       |
| b5g7c8 | 243 | 51 | 15.6 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| h3u5m1 | 343 | 53 | 15.5 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3trk8 | 343 | 53 | 15.5 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h1t5c9 | 343 | 53 | 15.5 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f9jmi3 | 343 | 53 | 15.5 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| e9fjv7 | 381 | 59 | 15.5 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| k2jmm3 | 358 | 55 | 15.4 | SubName: Full=RTX toxin;  |
| j8ycz5 | 395 | 61 | 15.4 | SubName: Full=Zonula occludens toxin family protein;            |
| d7k549 | 331 | 51 | 15.4 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |

|        |     |    |      |   |
|--------|-----|----|------|---|
| d7j5m9 | 331 | 51 | 15.4 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| j1ij08 | 278 | 50 | 15.3 | SubName: Full=Omega toxin-like domain protein;                  |
| h1swb0 | 313 | 50 | 15.3 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h1q9j8 | 385 | 59 | 15.3 | SubName: Full=Toxin component;                                  |
| h0da36 | 281 | 50 | 15.3 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f0jn72 | 311 | 50 | 15.3 | SubName: Full=Zeta toxin; poison-antidote element;              |
| e9uuu2 | 271 | 50 | 15.3 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| d6kau2 | 282 | 50 | 15.3 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| c8l058 | 307 | 50 | 15.3 | SubName: Full=Putative zeta toxin; poison-antidote element;     |
| c3wq02 | 299 | 50 | 15.3 | SubName: Full=Zeta-toxin;                                       |
| b7lkz6 | 311 | 50 | 15.3 | SubName: Full=Putative zeta toxin poison-antidote element;      |
| j8wmk0 | 395 | 60 | 15.2 | SubName: Full=Zonula occludens toxin family protein;            |
| h1snu7 | 343 | 52 | 15.2 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h0cc68 | 343 | 52 | 15.2 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h0au78 | 343 | 52 | 15.2 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f9jwd8 | 343 | 52 | 15.2 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| e0n6u2 | 395 | 60 | 15.2 | SubName: Full=Zonula occludens toxin family protein;            |
| d7j8c0 | 336 | 51 | 15.2 | SubName: Full=HipA family toxin-antitoxin system;               |
| d4wt87 | 336 | 51 | 15.2 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d4wbh1 | 336 | 51 | 15.2 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d4vhn9 | 336 | 51 | 15.2 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| h6nka0 | 457 | 69 | 15.1 | SubName: Full=RTX toxins and-related Ca2+-binding protein;      |
| h2fw35 | 358 | 54 | 15.1 | SubName: Full=Zonular occludens toxin;                          |
| f8fia0 | 457 | 69 | 15.1 | SubName: Full=RTX toxins and related Ca2+-binding protein;      |
| f0adp0 | 390 | 59 | 15.1 | SubName: Full=Zonula occludens toxin family protein;            |
| e9e531 | 332 | 50 | 15.1 | SubName: Full=Zeta toxin family protein;                        |
| d7jyf2 | 338 | 51 | 15.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| d4k266 | 352 | 53 | 15.1 | SubName: Full=Predicted membrane protein, putative toxin reg... |
| c2eu21 | 370 | 56 | 15.1 | SubName: Full=Possible toxin regulator;                         |
| q7bgc1 | 340 | 51 | 15.0 | SubName: Full=Toxin-coregulated pilus biosynthesis protein E... |
| p0c6c9 | 340 | 51 | 15.0 | RecName: Full=Toxin coregulated pilus biosynthesis protein E... |
| k2dgr0 | 285 | 49 | 15.0 | SubName: Full=Zonular occludens toxin;                          |
| j5tyc2 | 310 | 49 | 15.0 | SubName: Full=Zeta toxin;                                       |
| i3d783 | 310 | 49 | 15.0 | SubName: Full=Zeta toxin;                                       |
| i3cx32 | 259 | 49 | 15.0 | SubName: Full=Zeta toxin family protein;                        |
| h8jv63 | 340 | 51 | 15.0 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g8v0m9 | 232 | 49 | 15.0 | SubName: Full=Enterotoxin-like toxin;                           |
| g8qy33 | 346 | 52 | 15.0 | SubName: Full=Putative membrane protein, putative toxin regu... |
| g7zcp8 | 273 | 49 | 15.0 | SubName: Full=Putative Hemolysin-type calcium-binding RTX to... |
| f8gy52 | 408 | 61 | 15.0 | SubName: Full=Toxin coregulated pilus biosynthesis protein ...  |
| d7hla6 | 340 | 51 | 15.0 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| d6k6b8 | 278 | 49 | 15.0 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d1vrq6 | 290 | 49 | 15.0 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d0hrq7 | 340 | 51 | 15.0 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| d0h644 | 340 | 51 | 15.0 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| d0bl84 | 300 | 49 | 15.0 | SubName: Full=Exfoliative toxin;                                |
| c9mvl5 | 254 | 49 | 15.0 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| c6yew3 | 340 | 51 | 15.0 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| c6rw17 | 340 | 51 | 15.0 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| c3nt62 | 340 | 51 | 15.0 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| c3lt87 | 340 | 51 | 15.0 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| c2ja14 | 340 | 51 | 15.0 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| c2ign3 | 340 | 51 | 15.0 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| c0yyk0 | 393 | 59 | 15.0 | SubName: Full=Membrane protein toxin regulator family protei... |
| c0awj0 | 359 | 54 | 15.0 | SubName: Full=Anthrax toxin LF subunit;                         |
| a5f382 | 340 | 51 | 15.0 | RecName: Full=Toxin coregulated pilus biosynthesis protein E... |
| a3gys3 | 340 | 51 | 15.0 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| a3gmd5 | 340 | 51 | 15.0 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |

|        |     |    |      |   |
|--------|-----|----|------|---|
| a3eid4 | 340 | 51 | 15.0 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| a1f0z1 | 340 | 51 | 15.0 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| a1eib7 | 340 | 51 | 15.0 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| q6mdt7 | 362 | 54 | 14.9 | SubName: Full=Putative RTX-toxin, partial length;               |
| k4im55 | 342 | 51 | 14.9 | SubName: Full=Antitoxin transcriptional regulator of toxin-a... |
| f0yw76 | 350 | 52 | 14.9 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e5l9z0 | 362 | 54 | 14.9 | SubName: Full=40 kDa insecticidal toxin;                        |
| d4j6h1 | 355 | 53 | 14.9 | SubName: Full=Predicted membrane protein, putative toxin reg... |
| c0wv69 | 376 | 56 | 14.9 | SubName: Full=Possible toxin regulator;                         |
| b1mx04 | 349 | 52 | 14.9 | SubName: Full=Predicted membrane protein, putative toxin reg... |
| a5v1v0 | 369 | 55 | 14.9 | SubName: Full=Membrane protein putative toxin regulator-like... |
| k5r488 | 386 | 57 | 14.8 | SubName: Full=Zonula occludens toxin;                           |
| k5esx4 | 386 | 57 | 14.8 | SubName: Full=Zonula occludens toxin;                           |
| i3btz3 | 364 | 54 | 14.8 | SubName: Full=RTX toxin; Flags: Precursor;                      |
| h0udj3 | 337 | 50 | 14.8 | SubName: Full=Clostridium epsilon toxin ETX/Bacillus mosquit... |
| f0md38 | 332 | 49 | 14.8 | SubName: Full=RTX prokaryotic toxin family protein;             |
| a1w3y8 | 400 | 59 | 14.8 | SubName: Full=Zonular occludens toxin;                          |
| a1f0z2 | 338 | 50 | 14.8 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| q54327 | 326 | 48 | 14.7 | SubName: Full=Synergohymenotropic toxin;                        |
| q45422 | 292 | 48 | 14.7 | SubName: Full=Mosquitocidal toxin;                              |
| k4rak2 | 275 | 48 | 14.7 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| k3sls9 | 260 | 48 | 14.7 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| k3rts7 | 260 | 48 | 14.7 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| k3qwn5 | 260 | 48 | 14.7 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| k3dt46 | 260 | 48 | 14.7 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| k2dfx0 | 327 | 48 | 14.7 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| i6aay5 | 408 | 60 | 14.7 | SubName: Full=Zonular occludens toxin (Zot); Flags: Precurso... |
| i5rva5 | 260 | 48 | 14.7 | SubName: Full=Shiga toxin 2, subunit A; EC=3.2.2.22;            |
| i5qe19 | 260 | 48 | 14.7 | SubName: Full=Shiga toxin 2, subunit A; EC=3.2.2.22;            |
| i5qb70 | 260 | 48 | 14.7 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| i5ps55 | 260 | 48 | 14.7 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| i5k6a5 | 260 | 48 | 14.7 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| i2us64 | 260 | 48 | 14.7 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| h4edm1 | 241 | 48 | 14.7 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4e6m6 | 241 | 48 | 14.7 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4d386 | 241 | 48 | 14.7 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4c170 | 241 | 48 | 14.7 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4ccq9 | 241 | 48 | 14.7 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h3rx39 | 241 | 48 | 14.7 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h0cx24 | 315 | 48 | 14.7 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| g5k5h8 | 269 | 48 | 14.7 | SubName: Full=Toxin-antitoxin system, toxin component, MazF ... |
| g5bsr4 | 237 | 48 | 14.7 | SubName: Full=Anthrax toxin receptor-like protein;              |
| f4ac06 | 289 | 48 | 14.7 | SubName: Full=Putative epsilon-toxin type B;                    |
| e2kpg4 | 260 | 48 | 14.7 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| e2kl15 | 260 | 48 | 14.7 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| e2kk27 | 260 | 48 | 14.7 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| e2ka80 | 260 | 48 | 14.7 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| e2jzz3 | 260 | 48 | 14.7 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| e0pvj8 | 269 | 48 | 14.7 | SubName: Full=MazF family toxin-antitoxin system;               |
| d9y0j7 | 290 | 48 | 14.7 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d6krn4 | 374 | 55 | 14.7 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| c3wwq9 | 298 | 48 | 14.7 | SubName: Full=Zeta-toxin;                                       |
| b7wuk1 | 290 | 48 | 14.7 | SubName: Full=Zonular occludens toxin;                          |
| b6zxf5 | 260 | 48 | 14.7 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| b3ba08 | 260 | 48 | 14.7 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| b2pt79 | 260 | 48 | 14.7 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| b2pit5 | 260 | 48 | 14.7 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| a4cwg1 | 394 | 58 | 14.7 | SubName: Full=RTX toxins and related Ca2+-binding protein;      |

|        |     |    |      |   |
|--------|-----|----|------|---|
| a3png2 | 280 | 48 | 14.7 | SubName: Full=Hemolysin-type calcium-binding toxin;             |
| k1klc4 | 391 | 57 | 14.6 | SubName: Full=Cholera toxin secretion protein epsF;             |
| h0u5b4 | 362 | 53 | 14.6 | SubName: Full=Clostridium epsilon toxin ETX/Bacillus mosquit... |
| c7n1m0 | 357 | 52 | 14.6 | SubName: Full=Predicted membrane protein, putative toxin reg... |
| q4wv05 | 346 | 50 | 14.5 | SubName: Full=Toxin biosynthesis protein (GliH), putative;      |
| d8iim5 | 373 | 54 | 14.5 | SubName: Full=Possible toxin regulator;                         |
| d7hla5 | 338 | 49 | 14.5 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| d4kb50 | 352 | 51 | 14.5 | SubName: Full=Predicted membrane protein, putative toxin reg... |
| d2ght9 | 351 | 51 | 14.5 | SubName: Full=Leukocidin/hemolysin toxin subunit S;             |
| d2gbc9 | 351 | 51 | 14.5 | SubName: Full=Leukocidin/hemolysin toxin subunit S;             |
| d2g2w6 | 351 | 51 | 14.5 | SubName: Full=Leukocidin/hemolysin toxin subunit S;             |
| c3lt88 | 338 | 49 | 14.5 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| c2ja13 | 338 | 49 | 14.5 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| c2gsj2 | 393 | 57 | 14.5 | SubName: Full=Membrane protein toxin regulator family protei... |
| b8kcq9 | 414 | 60 | 14.5 | SubName: Full=Toxin secretion, membrane fusion protein;         |
| b0y0n1 | 346 | 50 | 14.5 | SubName: Full=Toxin biosynthesis protein (GliH), putative;      |
| a3gmd4 | 338 | 49 | 14.5 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| a1eib6 | 338 | 49 | 14.5 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| q8rsx9 | 234 | 47 | 14.4 | SubName: Full=Toxic shock syndrome toxin-1;                     |
| q46669 | 269 | 47 | 14.4 | RecName: Full=Cytolethal distending toxin subunit B; Short=C... |
| q3iyt5 | 280 | 47 | 14.4 | SubName: Full=Hemolysin-type calcium-binding toxin;             |
| q306l3 | 368 | 53 | 14.4 | SubName: Full=40kDa insecticidal toxin;                         |
| q306l2 | 362 | 52 | 14.4 | SubName: Full=40kDa insecticidal toxin;                         |
| q306l1 | 362 | 52 | 14.4 | SubName: Full=40kDa insecticidal toxin;                         |
| j0ezp9 | 238 | 47 | 14.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| i1zp90 | 301 | 47 | 14.4 | SubName: Full=Exfoliative toxin, putative;                      |
| h6c935 | 272 | 47 | 14.4 | SubName: Full=Toxin biosynthesis ketoreductase;                 |
| h4h2k6 | 234 | 47 | 14.4 | SubName: Full=Toxic shock syndrome toxin-1;                     |
| h4gti1 | 234 | 47 | 14.4 | SubName: Full=Toxic shock syndrome toxin-1;                     |
| h4e1w0 | 234 | 47 | 14.4 | SubName: Full=Toxic shock syndrome toxin-1;                     |
| h4dkt2 | 234 | 47 | 14.4 | SubName: Full=Toxic shock syndrome toxin-1;                     |
| h4csq3 | 234 | 47 | 14.4 | SubName: Full=Toxic shock syndrome toxin-1;                     |
| h4c3t0 | 234 | 47 | 14.4 | SubName: Full=Toxic shock syndrome toxin-1;                     |
| h4bjg4 | 234 | 47 | 14.4 | SubName: Full=Toxic shock syndrome toxin-1;                     |
| h3trj1 | 234 | 47 | 14.4 | SubName: Full=Toxin, OB domain protein;                         |
| h3s8l9 | 234 | 47 | 14.4 | SubName: Full=Toxic shock syndrome toxin-1;                     |
| h1tr68 | 279 | 47 | 14.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h1t3d1 | 234 | 47 | 14.4 | SubName: Full=Toxin, OB domain protein;                         |
| h0ewc2 | 231 | 47 | 14.4 | SubName: Full=Putative HC-toxin efflux carrier TOXA;            |
| f7l045 | 298 | 47 | 14.4 | SubName: Full=Putative zeta-toxin;                              |
| f5lzs5 | 280 | 47 | 14.4 | SubName: Full=Hemolysin-type calcium-binding toxin;             |
| f4fif0 | 311 | 47 | 14.4 | SubName: Full=Exfoliative toxin A/B;                            |
| f0xb50 | 289 | 47 | 14.4 | SubName: Full=Toxin biosynthesis proten;                        |
| f0p6u1 | 326 | 47 | 14.4 | SubName: Full=Synergohymenotropic toxin;                        |
| e9f2t5 | 309 | 47 | 14.4 | SubName: Full=HC-toxin synthetase;                              |
| e6n078 | 362 | 52 | 14.4 | SubName: Full=Zonular occludens toxin (Zot) family protein;     |
| e5xh27 | 209 | 47 | 14.4 | SubName: Full=Xre family Toxin-antitoxin system;                |
| e5thn5 | 234 | 47 | 14.4 | SubName: Full=Toxic shock syndrome toxin-1;                     |
| e5rm78 | 268 | 47 | 14.4 | SubName: Full=Cytolethal distending toxin B;                    |
| e4tx22 | 247 | 47 | 14.4 | SubName: Full=RTX toxins and related Ca2+-binding protein; F... |
| e0qm45 | 341 | 49 | 14.4 | SubName: Full=Toxin regulator;                                  |
| d9y153 | 295 | 47 | 14.4 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9wu32 | 276 | 47 | 14.4 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d7wvz9 | 299 | 47 | 14.4 | SubName: Full=Zeta toxin;                                       |
| d7hxx1 | 288 | 47 | 14.4 | SubName: Full=Cholera toxin transcriptional activator;          |
| d6lzm4 | 234 | 47 | 14.4 | SubName: Full=Toxic shock syndrome toxin-1;                     |
| d4brt7 | 259 | 47 | 14.4 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| d3aa91 | 317 | 47 | 14.4 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |

|        |     |    |      |   |
|--------|-----|----|------|---|
| d2yk20 | 273 | 47 | 14.4 | SubName: Full=Toxin coregulated pilus biosynthesis protein T... |
| d2utw0 | 234 | 47 | 14.4 | SubName: Full=Toxic shock syndrome toxin-1 (TSST-1);            |
| d2una2 | 311 | 47 | 14.4 | SubName: Full=Leukocidin/hemolysin toxin family protein;        |
| d2gtd1 | 234 | 47 | 14.4 | SubName: Full=Toxic shock syndrome toxin-1 (TSST-1);            |
| d2ghu7 | 234 | 47 | 14.4 | SubName: Full=Toxic shock syndrome toxin-1;                     |
| d2fn03 | 311 | 47 | 14.4 | SubName: Full=Leukocidin/hemolysin toxin family protein;        |
| d0vxy8 | 276 | 47 | 14.4 | SubName: Full=Exfoliative toxin;                                |
| c9lhj3 | 234 | 47 | 14.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| c4tiq7 | 269 | 47 | 14.4 | SubName: Full=Cytolethal distending toxin B;                    |
| b9kp49 | 280 | 47 | 14.4 | SubName: Full=Hemolysin-type calcium-binding toxin;             |
| b3ph10 | 418 | 60 | 14.4 | SubName: Full=Putative toxin secretion, membrane fusion prot... |
| b2u9y2 | 376 | 54 | 14.4 | SubName: Full=Zonular occludens toxin;                          |
| a1tpt2 | 478 | 69 | 14.4 | SubName: Full=Zonular occludens toxin;                          |
| q5dz58 | 497 | 71 | 14.3 | SubName: Full=Toxin coregulated pilus biosynthesis protein T... |
| q1q8i9 | 364 | 52 | 14.3 | SubName: Full=Putative toxin regulator PfoR;                    |
| p45780 | 406 | 58 | 14.3 | RecName: Full=Type II secretion system protein F; Short=T2SS... |
| i3ce08 | 349 | 50 | 14.3 | SubName: Full=Zonula occludens toxin;                           |
| h3ykb9 | 343 | 49 | 14.3 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h1x0s6 | 412 | 59 | 14.3 | SubName: Full=Membrane protein, toxin regulator-like protein... |
| h1wnn6 | 412 | 59 | 14.3 | SubName: Full=Membrane protein, toxin regulator-like protein... |
| h1wp49 | 412 | 59 | 14.3 | SubName: Full=Membrane protein, toxin regulator-like protein... |
| f5wfc8 | 343 | 49 | 14.3 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| b9rcq4 | 343 | 49 | 14.3 | SubName: Full=Nadhp hc toxin reductase, putative; EC=1.1.1.2... |
| a8fgc2 | 342 | 49 | 14.3 | SubName: Full=Possible toxin regulator;                         |
| q93tt2 | 338 | 48 | 14.2 | SubName: Full=Toxin-coregulated pilus biosynthesis protein F... |
| p0c6q5 | 338 | 48 | 14.2 | RecName: Full=Toxin coregulated pilus biosynthesis protein F... |
| k5ugv1 | 338 | 48 | 14.2 | SubName: Full=Toxin coregulated pilus biosynthesis protein F... |
| k5u3m8 | 338 | 48 | 14.2 | SubName: Full=Toxin coregulated pilus biosynthesis protein F... |
| k5rnx7 | 338 | 48 | 14.2 | SubName: Full=Toxin coregulated pilus biosynthesis protein F... |
| k5qra5 | 338 | 48 | 14.2 | SubName: Full=Toxin coregulated pilus biosynthesis protein F... |
| k5nim9 | 338 | 48 | 14.2 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| k5l3u1 | 338 | 48 | 14.2 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| k5k6j3 | 338 | 48 | 14.2 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| k2xrj7 | 338 | 48 | 14.2 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| k2wup8 | 338 | 48 | 14.2 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| k2wn46 | 338 | 48 | 14.2 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| k2w8k1 | 338 | 48 | 14.2 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| k2u4s7 | 338 | 48 | 14.2 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| j1zrl5 | 338 | 48 | 14.2 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| j1z6q4 | 338 | 48 | 14.2 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| j1xr30 | 338 | 48 | 14.2 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| j1wgs6 | 338 | 48 | 14.2 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| j1lpd1 | 338 | 48 | 14.2 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| j1kf44 | 338 | 48 | 14.2 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| j1gfc8 | 338 | 48 | 14.2 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| j1gba9 | 338 | 48 | 14.2 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| j1fjz7 | 338 | 48 | 14.2 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| j1ffe8 | 338 | 48 | 14.2 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| j1cw53 | 338 | 48 | 14.2 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| j1cbt3 | 338 | 48 | 14.2 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| i7jd91 | 379 | 54 | 14.2 | SubName: Full=Predicted membrane protein, putative toxin reg... |
| i5pwy0 | 331 | 47 | 14.2 | SubName: Full=Toxin B domain protein;                           |
| h8jv64 | 338 | 48 | 14.2 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| h4m865 | 331 | 47 | 14.2 | SubName: Full=Toxin B domain protein;                           |
| g8qse2 | 338 | 48 | 14.2 | SubName: Full=Putative membrane protein, putative toxin regu... |
| g7xzf8 | 429 | 61 | 14.2 | SubName: Full=Toxin biosynthesis protein;                       |
| g7tn03 | 338 | 48 | 14.2 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g7bua6 | 338 | 48 | 14.2 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |

|        |     |    |      |   |
|--------|-----|----|------|---|
| g7av76 | 338 | 48 | 14.2 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| g7alp5 | 338 | 48 | 14.2 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| g7aaj7 | 338 | 48 | 14.2 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| g7a1c1 | 338 | 48 | 14.2 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| g6zqt9 | 338 | 48 | 14.2 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| g6zd90 | 338 | 48 | 14.2 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| g0slw3 | 338 | 48 | 14.2 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| f9c565 | 338 | 48 | 14.2 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| f9b8s7 | 338 | 48 | 14.2 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| f9a328 | 338 | 48 | 14.2 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| f8ztz4 | 338 | 48 | 14.2 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| f8zj47 | 338 | 48 | 14.2 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| f8z7r0 | 338 | 48 | 14.2 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| f8ywt0 | 338 | 48 | 14.2 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| f8bf54 | 338 | 48 | 14.2 | SubName: Full=Predicted membrane protein; putative toxin reg... |
| f5lzs4 | 437 | 62 | 14.2 | SubName: Full=Hemolysin-type calcium-binding region; RTX tox... |
| f0n891 | 367 | 52 | 14.2 | SubName: Full=Zonula occludens toxin family protein;            |
| f0ljr2 | 358 | 51 | 14.2 | SubName: Full=Diphtheria toxin resistance protein;              |
| d5k9g5 | 402 | 57 | 14.2 | SubName: Full=Zeta_2 toxin;                                     |
| d2yk23 | 338 | 48 | 14.2 | SubName: Full=Toxin coregulated pilus biosynthesis protein F... |
| d1eby3 | 402 | 57 | 14.2 | SubName: Full=Zeta toxin family protein;                        |
| d0hrq6 | 338 | 48 | 14.2 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| d0h643 | 338 | 48 | 14.2 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| c6yew4 | 338 | 48 | 14.2 | SubName: Full=Toxin-coregulated pilus biosynthesis protein F... |
| c6rw18 | 338 | 48 | 14.2 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| c5r7z0 | 360 | 51 | 14.2 | SubName: Full=Membrane protein, toxin regulator;                |
| c3nt61 | 338 | 48 | 14.2 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| c2ign4 | 338 | 48 | 14.2 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| b0fyx0 | 360 | 51 | 14.2 | SubName: Full=NADPH HC toxin reductase-like protein;            |
| a5f383 | 338 | 48 | 14.2 | RecName: Full=Toxin coregulated pilus biosynthesis protein F... |
| a3gys4 | 338 | 48 | 14.2 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| a1wsu5 | 365 | 52 | 14.2 | SubName: Full=Zeta toxin family protein;                        |
| q7a4k7 | 234 | 46 | 14.1 | SubName: Full=Toxic shock syndrome toxin-1;                     |
| q7a2n8 | 234 | 46 | 14.1 | SubName: Full=Toxic shock syndrome toxin-1;                     |
| q4wqz1 | 263 | 46 | 14.1 | SubName: Full=Toxin biosynthesis protein, putative;             |
| q1w694 | 305 | 46 | 14.1 | RecName: Full=Sphingomyelin phosphodiesterase D LiSicTox-bet... |
| p09807 | 249 | 46 | 14.1 | RecName: Full=Killer toxin subunit gamma; AltName: Full=RF3 ... |
| o87120 | 222 | 46 | 14.1 | RecName: Full=Cytolethal distending toxin subunit A; Short=C... |
| o54462 | 234 | 46 | 14.1 | SubName: Full=Toxic shock syndrome toxin-1;                     |
| k4zbi8 | 268 | 46 | 14.1 | SubName: Full=Zeta toxin;                                       |
| i3dti5 | 219 | 46 | 14.1 | SubName: Full=Toxin secretion/phage lysis holin;                |
| i1xuc5 | 222 | 46 | 14.1 | SubName: Full=Cytolethal distending toxin protein A;            |
| i0bjc0 | 461 | 65 | 14.1 | SubName: Full=RTX toxins and-related Ca2+-binding protein;      |
| h6nhx5 | 461 | 65 | 14.1 | SubName: Full=RTX toxins and-related Ca2+-binding protein;      |
| h4qh29 | 355 | 50 | 14.1 | SubName: Full=Toxin B domain protein;                           |
| h4hfd0 | 241 | 46 | 14.1 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4en49 | 241 | 46 | 14.1 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4ds02 | 241 | 46 | 14.1 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4d9h1 | 241 | 46 | 14.1 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4bpq7 | 241 | 46 | 14.1 | SubName: Full=Toxin beta-grasp domain protein;                  |
| h4b859 | 241 | 46 | 14.1 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4b858 | 241 | 46 | 14.1 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4b100 | 241 | 46 | 14.1 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4atj3 | 241 | 46 | 14.1 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4akf0 | 241 | 46 | 14.1 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4ac76 | 241 | 46 | 14.1 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h3u5m0 | 325 | 46 | 14.1 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h1t5c8 | 325 | 46 | 14.1 | SubName: Full=Toxin, beta-grasp domain protein;                 |

|        |     |    |      |   |
|--------|-----|----|------|---|
| h1ste4 | 234 | 46 | 14.1 | SubName: Full=Toxin, OB domain protein;                         |
| h0d1m3 | 234 | 46 | 14.1 | SubName: Full=Toxin, OB domain protein;                         |
| h0apn8 | 234 | 46 | 14.1 | SubName: Full=Toxin, OB-fold domain protein;                    |
| g7fbw9 | 326 | 46 | 14.1 | SubName: Full=Exfoliative toxin A/B;                            |
| g7enm0 | 325 | 46 | 14.1 | SubName: Full=Exfoliative toxin A/B;                            |
| g5bj91 | 266 | 46 | 14.1 | SubName: Full=Ras-related C3 botulinum toxin substrate 1;       |
| g4b6l8 | 222 | 46 | 14.1 | SubName: Full=Cytolethal distending toxin protein A;            |
| g4b3v8 | 222 | 46 | 14.1 | SubName: Full=Cytolethal distending toxin protein A;            |
| g4aug1 | 222 | 46 | 14.1 | SubName: Full=Cytolethal distending toxin protein A;            |
| g4apj0 | 222 | 46 | 14.1 | SubName: Full=Cytolethal distending toxin protein A;            |
| g4ajd0 | 222 | 46 | 14.1 | SubName: Full=Cytolethal distending toxin protein A;            |
| g4a1r5 | 222 | 46 | 14.1 | SubName: Full=Cytolethal distending toxin protein A;            |
| g3zhs8 | 222 | 46 | 14.1 | SubName: Full=Cytolethal distending toxin protein A;            |
| g3zas6 | 222 | 46 | 14.1 | SubName: Full=Cytolethal distending toxin protein A;            |
| g0d2p5 | 262 | 46 | 14.1 | SubName: Full=Secreted auto transporter toxin;                  |
| f9zv55 | 404 | 57 | 14.1 | SubName: Full=Zonular occludens toxin;                          |
| f9zkg5 | 324 | 46 | 14.1 | SubName: Full=Zonular occludens toxin;                          |
| f9kur6 | 308 | 46 | 14.1 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f9kkq8 | 231 | 46 | 14.1 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f9kii6 | 308 | 46 | 14.1 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f9kh95 | 234 | 46 | 14.1 | SubName: Full=Toxin, OB-fold domain protein;                    |
| f9kf44 | 234 | 46 | 14.1 | SubName: Full=Toxin, OB-fold domain protein;                    |
| f9jmi2 | 325 | 46 | 14.1 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f4fp22 | 227 | 46 | 14.1 | SubName: Full=Staphylococcal enterotoxin-like toxin;            |
| e9pa30 | 289 | 46 | 14.1 | SubName: Full=K-2 killer toxin; Flags: Precursor;               |
| e9fm34 | 303 | 46 | 14.1 | SubName: Full=Putative exfoliative toxin;                       |
| e7az29 | 315 | 46 | 14.1 | SubName: Full=Putative toxin subunit;                           |
| e5rm95 | 268 | 46 | 14.1 | SubName: Full=Cytolethal distending toxin B;                    |
| e5rm52 | 268 | 46 | 14.1 | SubName: Full=Cytolethal distending toxin B;                    |
| e5ray4 | 241 | 46 | 14.1 | SubName: Full=Staphylococcal/Streptococcal toxin, beta-grasp... |
| e5r7g0 | 227 | 46 | 14.1 | SubName: Full=Staphylococcal/Streptococcal toxin, beta-grasp... |
| e1m3h2 | 299 | 46 | 14.1 | SubName: Full=Exfoliative toxin A;                              |
| d9xqk8 | 275 | 46 | 14.1 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d7j5y0 | 288 | 46 | 14.1 | SubName: Full=Zeta toxin superfamily;                           |
| d6t5n8 | 311 | 46 | 14.1 | SubName: Full=Leukocidin/hemolysin toxin family protein;        |
| d6dia3 | 341 | 48 | 14.1 | SubName: Full=Predicted membrane protein, putative toxin reg... |
| d4ue98 | 311 | 46 | 14.1 | SubName: Full=Leukocidin/hemolysin toxin family protein;        |
| d4u919 | 311 | 46 | 14.1 | SubName: Full=Leukocidin/hemolysin toxin family protein;        |
| d2zin0 | 212 | 46 | 14.1 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d2feq4 | 234 | 46 | 14.1 | SubName: Full=Toxic shock syndrome toxin-1;                     |
| d1yl98 | 261 | 46 | 14.1 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| d1qjx4 | 311 | 46 | 14.1 | SubName: Full=Leukocidin/hemolysin toxin family protein;        |
| d0gnj3 | 362 | 51 | 14.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| c9r3b7 | 222 | 46 | 14.1 | SubName: Full=Cytolethal distending toxin protein A;            |
| c9qi52 | 229 | 46 | 14.1 | SubName: Full=Cholera toxin transcriptional activator; SubNa... |
| c9l269 | 181 | 46 | 14.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| c8mih6 | 241 | 46 | 14.1 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8lkp9 | 241 | 46 | 14.1 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8l4c4 | 241 | 46 | 14.1 | SubName: Full=Toxin;  |
| c6lm64 | 277 | 46 | 14.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| c6lgw5 | 354 | 50 | 14.1 | SubName: Full=Putative toxin regulator PfoR;                    |
| c3wyh0 | 300 | 46 | 14.1 | SubName: Full=Zeta-toxin;                                       |
| b4dyv3 | 244 | 46 | 14.1 | SubName: Full=Multidrug and toxin extrusion protein 1; SubNa... |
| b3c673 | 288 | 46 | 14.1 | SubName: Full=Zeta toxin;                                       |
| b1mxh1 | 412 | 58 | 14.1 | SubName: Full=Predicted membrane protein, putative toxin reg... |
| b0y588 | 263 | 46 | 14.1 | SubName: Full=Toxin biosynthesis protein, putative;             |
| a7x4h0 | 234 | 46 | 14.1 | SubName: Full=Toxic shock syndrome toxin-1;                     |
| a6u0y7 | 241 | 46 | 14.1 | SubName: Full=Toxin beta-grasp domain protein; Flags: Precur... |

|        |     |    |      |   |
|--------|-----|----|------|---|
| a6tyq6 | 227 | 46 | 14.1 | SubName: Full=Toxin beta-grasp domain protein; Flags: Precur... |
| a6qe87 | 227 | 46 | 14.1 | SubName: Full=Staphylococcal enterotoxin-like toxin;            |
| a5is53 | 241 | 46 | 14.1 | SubName: Full=Toxin, beta-grasp domain protein; Flags: Precu... |
| a4f2d9 | 273 | 46 | 14.1 | SubName: Full=Cytolethal distending toxin A;                    |
| a2qlz8 | 282 | 46 | 14.1 | SubName: Full=Similarity to hypothetical host-specific AK-to... |
| a1c8i9 | 326 | 46 | 14.1 | SubName: Full=Toxin biosynthesis proten (Fum3), putative;       |
| a0ys26 | 253 | 46 | 14.1 | SubName: Full=Hemolysin-type calcium-binding toxin;             |
| q9f5r3 | 349 | 49 | 14.0 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| q8r2g4 | 371 | 52 | 14.0 | RecName: Full=Ecto-ADP-ribosyltransferase 3; EC=2.4.2.31; Al... |
| q5e000 | 394 | 55 | 14.0 | SubName: Full=Zona occludens toxin;                             |
| q4fq6b | 364 | 51 | 14.0 | SubName: Full=Probable toxin regulator pfoR;                    |
| q45471 | 336 | 47 | 14.0 | SubName: Full=35.8-kilodalton mosquitocidal toxin;              |
| q3iyt6 | 437 | 61 | 14.0 | SubName: Full=Hemolysin-type calcium-binding region; RTX tox... |
| h4n3v8 | 387 | 54 | 14.0 | SubName: Full=Toxin B domain protein;                           |
| d3v902 | 372 | 52 | 14.0 | SubName: Full=Tpx40, 40kDa insecticidal toxin (Previously na... |
| d0eva2 | 399 | 56 | 14.0 | SubName: Full=Zonula occludens toxin type 1;                    |
| a5whz5 | 364 | 51 | 14.0 | SubName: Full=Membrane protein putative toxin regulator-like... |
| a3vhu3 | 463 | 65 | 14.0 | SubName: Full=Hemolysin-type calcium-binding toxin;             |
| q7x7u5 | 338 | 47 | 13.9 | SubName: Full=Os07g0601000 protein; SubName: Full=Putative N... |
| k5msn9 | 331 | 46 | 13.9 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| k2un46 | 331 | 46 | 13.9 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| j1kp39 | 331 | 46 | 13.9 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| j1e0l2 | 331 | 46 | 13.9 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| j0waf2 | 381 | 53 | 13.9 | SubName: Full=Membrane protein, toxin regulator;                |
| h3xjs9 | 360 | 50 | 13.9 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3twq7 | 330 | 46 | 13.9 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h0ek52 | 380 | 53 | 13.9 | SubName: Full=Putative HC-toxin efflux carrier TOXA;            |
| g7bgl1 | 331 | 46 | 13.9 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| g6itz5 | 380 | 53 | 13.9 | SubName: Full=Membrane protein, toxin regulator-like protein... |
| e0nky3 | 337 | 47 | 13.9 | SubName: Full=Toxin regulator;                                  |
| d5k9e4 | 402 | 56 | 13.9 | SubName: Full=Zeta_2 toxin;                                     |
| d2qan2 | 382 | 53 | 13.9 | SubName: Full=Anititoxin/toxin system zeta toxin;               |
| c7tjc4 | 380 | 53 | 13.9 | SubName: Full=Membrane protein, toxin regulator-like protein... |
| c7tck4 | 380 | 53 | 13.9 | SubName: Full=Membrane protein, toxin regulator-like protein... |
| c2jx72 | 380 | 53 | 13.9 | SubName: Full=Possible membrane protein, probable toxin regu... |
| b5qqv4 | 380 | 53 | 13.9 | SubName: Full=Predicted membrane protein, putative toxin reg... |
| b1hq61 | 337 | 47 | 13.9 | SubName: Full=Hypothetical Mtx2/3 toxin-like protein;           |
| q9rf12 | 398 | 55 | 13.8 | RecName: Full=Phospholipase C; Short=PLC; EC=3.1.4.3; AltNam... |
| q93nb5 | 354 | 49 | 13.8 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| q81dd1 | 245 | 45 | 13.8 | RecName: Full=Stage II sporulation protein SA; AltName: Full... |
| q5f1k5 | 265 | 45 | 13.8 | SubName: Full=Cytolethal distending toxin B;                    |
| q58ed1 | 363 | 50 | 13.8 | SubName: Full=Multidrug and toxin extrusion protein 1; SubNa... |
| q03v93 | 376 | 52 | 13.8 | SubName: Full=Predicted membrane protein, putative toxin reg... |
| o35975 | 289 | 45 | 13.8 | RecName: Full=T-cell ecto-ADP-ribosyltransferase 2; EC=2.4.2... |
| k6lyp9 | 251 | 45 | 13.8 | SubName: Full=Zeta toxin;                                       |
| k3ayk4 | 284 | 45 | 13.8 | SubName: Full=Pre-toxin domain with VENN motif family protei... |
| k2zqql | 284 | 45 | 13.8 | SubName: Full=Pre-toxin domain with VENN motif family protei... |
| k2vus7 | 273 | 45 | 13.8 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k2pm82 | 310 | 45 | 13.8 | SubName: Full=Exfoliative toxin A;                              |
| k2me39 | 264 | 45 | 13.8 | SubName: Full=Putative Hemolysin-type calcium-binding RTX to... |
| j7td49 | 213 | 45 | 13.8 | SubName: Full=Toxin-antitoxin system, toxin component, MazF ... |
| j2lk80 | 355 | 49 | 13.8 | SubName: Full=Zonula occludens toxin; Flags: Precursor;         |
| i6gcx7 | 310 | 45 | 13.8 | SubName: Full=Zeta toxin family protein;                        |
| i1b782 | 310 | 45 | 13.8 | SubName: Full=Putative zeta toxin poison-antidote element;      |
| i0xda1 | 308 | 45 | 13.8 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| i0bni4 | 456 | 63 | 13.8 | SubName: Full=RTX toxins and-related Ca2+-binding protein;      |
| h9cjpg | 225 | 45 | 13.8 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| h6uj62 | 277 | 45 | 13.8 | SubName: Full=Cytolethal distending toxin B;                    |



|        |     |    |      |   |
|--------|-----|----|------|---|
| h5mna1 | 310 | 45 | 13.8 | SubName: Full=Zeta toxin family protein;                        |
| h5es84 | 310 | 45 | 13.8 | SubName: Full=Zeta toxin family protein;                        |
| h4gg18 | 308 | 45 | 13.8 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h4fxe0 | 308 | 45 | 13.8 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3zvp8 | 308 | 45 | 13.8 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3ypa7 | 308 | 45 | 13.8 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3xt86 | 308 | 45 | 13.8 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3xem7 | 308 | 45 | 13.8 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h1tfu2 | 308 | 45 | 13.8 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h0kfb7 | 222 | 45 | 13.8 | SubName: Full=Cytolethal distending toxin protein A;            |
| h0d013 | 308 | 45 | 13.8 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| g7vk82 | 376 | 52 | 13.8 | SubName: Full=Membrane protein, putative toxin regulator;       |
| g7c4v8 | 327 | 45 | 13.8 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| g7b5r9 | 327 | 45 | 13.8 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| g6z4q7 | 327 | 45 | 13.8 | SubName: Full=Vibrio cholerae toxin co-regulated pilus biosy... |
| g5sqz7 | 301 | 45 | 13.8 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| g0uee9 | 355 | 49 | 13.8 | SubName: Full=Membrane protein, toxin regulator;                |
| f9zkh6 | 321 | 45 | 13.8 | SubName: Full=Zonular occludens toxin;                          |
| f9xw43 | 266 | 45 | 13.8 | SubName: Full=Cytolethal distending toxin B;                    |
| f7z6i4 | 392 | 54 | 13.8 | SubName: Full=Membrane protein putative toxin regulator-like... |
| f5rhd4 | 384 | 53 | 13.8 | SubName: Full=Zonular occludens toxin;                          |
| f4vm09 | 310 | 45 | 13.8 | SubName: Full=Putative zeta-toxin;                              |
| f4fp16 | 308 | 45 | 13.8 | SubName: Full=Staphylococcal enterotoxin-like toxin;            |
| f3xz81 | 301 | 45 | 13.8 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| f3t7r3 | 308 | 45 | 13.8 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f3pyj4 | 271 | 45 | 13.8 | SubName: Full=Toxin-antitoxin system, toxin component, Fic d... |
| f0z3d6 | 199 | 45 | 13.8 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| e6iq41 | 239 | 45 | 13.8 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| e5av21 | 390 | 54 | 13.8 | SubName: Full=Pfam: Zeta toxin::PF06414;                        |
| e2sz17 | 270 | 45 | 13.8 | SubName: Full=Toxin-antitoxin system;                           |
| e1es17 | 239 | 45 | 13.8 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| e0hc60 | 239 | 45 | 13.8 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| d9xwd4 | 281 | 45 | 13.8 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9xjb3 | 273 | 45 | 13.8 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9wdc5 | 276 | 45 | 13.8 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9wcy4 | 280 | 45 | 13.8 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9w941 | 279 | 45 | 13.8 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9rux5 | 311 | 45 | 13.8 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d7w2u6 | 292 | 45 | 13.8 | SubName: Full=Fic family toxin-antitoxin system;                |
| d7jyc0 | 305 | 45 | 13.8 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| d7j695 | 305 | 45 | 13.8 | SubName: Full=Toxin-antitoxin system toxin component;           |
| d6rlr8 | 369 | 51 | 13.8 | SubName: Full=Toxin biosynthesis protein;                       |
| d6l8q3 | 229 | 45 | 13.8 | SubName: Full=Fic family toxin-antitoxin system, toxin compo... |
| d5ry79 | 349 | 48 | 13.8 | SubName: Full=Toxin regulator;                                  |
| d5q344 | 349 | 48 | 13.8 | SubName: Full=Toxin regulator;                                  |
| d4bse6 | 256 | 45 | 13.8 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d4bnz7 | 249 | 45 | 13.8 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| d3l3y4 | 233 | 45 | 13.8 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| d3anr6 | 279 | 45 | 13.8 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| d2u4e3 | 271 | 45 | 13.8 | SubName: Full=Insecticidal toxin complex protein;               |
| d1vzv1 | 340 | 47 | 13.8 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| c9kjd9 | 205 | 45 | 13.8 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| c9dtx3 | 384 | 53 | 13.8 | SubName: Full=Zonula occludens toxin type 1;                    |
| c8pc38 | 210 | 45 | 13.8 | SubName: Full=Xre family toxin-antitoxin system;                |
| c7big4 | 327 | 45 | 13.8 | SubName: Full=Insecticidal toxin complex protein tccc3;         |
| c4tiy2 | 273 | 45 | 13.8 | SubName: Full=Cytolethal distending toxin B;                    |
| c2khn0 | 376 | 52 | 13.8 | SubName: Full=Membrane protein, toxin regulator;                |
| b7m7t2 | 310 | 45 | 13.8 | SubName: Full=Putative zeta toxin; poison-antidote element;     |

|        |     |    |      |   |
|--------|-----|----|------|---|
| b7law4 | 310 | 45 | 13.8 | SubName: Full=Putative zeta toxin poison-antidote element;      |
| b6qdj2 | 249 | 45 | 13.8 | SubName: Full=Toxin biosynthesis ketoreductase, putative;       |
| b5gia4 | 271 | 45 | 13.8 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| b2i4v8 | 384 | 53 | 13.8 | SubName: Full=Zonular occludens toxin;                          |
| a8y0l5 | 377 | 52 | 13.8 | RecName: Full=GDP-mannose 4,6 dehydratase 1; EC=4.2.1.47; Al... |
| a6qe81 | 308 | 45 | 13.8 | SubName: Full=Staphylococcal enterotoxin-like toxin;            |
| a6apn4 | 378 | 52 | 13.8 | SubName: Full=Insecticidal toxin, SepC/Tcc class;               |
| a4xfn7 | 315 | 45 | 13.8 | SubName: Full=Zeta toxin family protein;                        |
| a4f2e0 | 266 | 45 | 13.8 | SubName: Full=Cytolethal distending toxin B;                    |
| a4f2c8 | 266 | 45 | 13.8 | SubName: Full=Cytolethal distending toxin B;                    |
| a0rm03 | 266 | 45 | 13.8 | SubName: Full=Cytolethal distending toxin;                      |
| h0auj5 | 343 | 47 | 13.7 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f9sav3 | 343 | 47 | 13.7 | SubName: Full=Zonular occludens toxin;                          |
| f2tgw9 | 357 | 49 | 13.7 | SubName: Full=Toxin biosynthesis protein;                       |
| c5grr0 | 357 | 49 | 13.7 | SubName: Full=Toxin biosynthesis protein;                       |
| c2d340 | 328 | 45 | 13.7 | SubName: Full=VIP2 family actin-ADP-ribosylating toxin;         |
| c0ay17 | 358 | 49 | 13.7 | SubName: Full=Putative hemolysin toxin protein A;               |
| b8mxk8 | 415 | 57 | 13.7 | SubName: Full=Toxin biosynthesis protein (Tri7), putative;      |
| q7vsx8 | 463 | 63 | 13.6 | RecName: Full=Type IV secretion system protein PtlD; AltName... |
| q5nv02 | 411 | 56 | 13.6 | SubName: Full=Hypothetical Toxin coregulated pilus biosynth...  |
| q03vd0 | 412 | 56 | 13.6 | SubName: Full=Predicted membrane protein, putative toxin reg... |
| k1x5u3 | 419 | 57 | 13.6 | SubName: Full=Toxin biosynthesis protein;                       |
| j4w6u7 | 390 | 53 | 13.6 | SubName: Full=Cercosporin toxin biosynthesis protein;           |
| j0lwc6 | 337 | 46 | 13.6 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| h8hdq3 | 352 | 48 | 13.6 | SubName: Full=Putative toxin regulator;                         |
| h8ha28 | 352 | 48 | 13.6 | SubName: Full=Putative toxin regulator;                         |
| g7xwm9 | 435 | 59 | 13.6 | SubName: Full=Toxin biosynthesis protein;                       |
| g7x8p2 | 447 | 61 | 13.6 | SubName: Full=Toxin biosynthesis protein;                       |
| g7vk45 | 412 | 56 | 13.6 | SubName: Full=Membrane protein, putative toxin regulator;       |
| g7htu9 | 449 | 61 | 13.6 | SubName: Full=RTX toxins and related Ca2+-binding proteins;     |
| g0wkn6 | 345 | 47 | 13.6 | SubName: Full=Hypothetical membrane protein; SubName: Full=M... |
| e7s0f3 | 420 | 57 | 13.6 | SubName: Full=HipA family toxin-antitoxin system;               |
| e1kph0 | 412 | 56 | 13.6 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d8n900 | 440 | 60 | 13.6 | SubName: Full=Putative zonula occludens toxin;                  |
| d7ixn3 | 427 | 58 | 13.6 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d5p0n3 | 339 | 46 | 13.6 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| d2n8v0 | 338 | 46 | 13.6 | SubName: Full=Synergohymenotropic toxin;                        |
| d1w768 | 381 | 52 | 13.6 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d1pb70 | 345 | 47 | 13.6 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| c5uy10 | 487 | 66 | 13.6 | SubName: Full=Toxin complex component ORF-X3;                   |
| c4ihl5 | 487 | 66 | 13.6 | SubName: Full=Toxin complex component ORF-X3;                   |
| b2v3v2 | 487 | 66 | 13.6 | SubName: Full=Toxin complex component ORF-X3;                   |
| q9ux58 | 212 | 44 | 13.5 | SubName: Full=Diphtheria toxin repressor;                       |
| q9f0l4 | 234 | 44 | 13.5 | SubName: Full=Toxic shock syndrome toxin-1;                     |
| q8lqd6 | 248 | 44 | 13.5 | RecName: Full=Stage II sporulation protein SA; AltName: Full... |
| q6wrx0 | 408 | 55 | 13.5 | SubName: Full=Alveicin A bacteriocin toxin;                     |
| q47089 | 273 | 44 | 13.5 | SubName: Full=CdtB; SubName: Full=Cytolethal distending toxi... |
| q2yvp2 | 234 | 44 | 13.5 | SubName: Full=Toxic shock syndrome toxin-1;                     |
| q07338 | 289 | 44 | 13.5 | RecName: Full=Toxin tox21A; AltName: Full=Insect-selective n... |
| p84613 | 281 | 44 | 13.5 | RecName: Full=Insecticidal crystal toxin protein;               |
| k6tky6 | 313 | 44 | 13.5 | SubName: Full=Insecticide toxin TcdB middle/N-terminal domai... |
| k2rj98 | 341 | 46 | 13.5 | SubName: Full=Toxin biosynthesis protein;                       |
| k1uld5 | 270 | 44 | 13.5 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| j8xwd5 | 295 | 44 | 13.5 | SubName: Full=RTX toxin protein;                                |
| j5vna7 | 312 | 44 | 13.5 | SubName: Full=Zeta toxin;                                       |
| j2ce59 | 280 | 44 | 13.5 | SubName: Full=RelE family toxin-antitoxin system;               |
| j2c890 | 280 | 44 | 13.5 | SubName: Full=RelE family toxin-antitoxin system;               |
| j2bth4 | 280 | 44 | 13.5 | SubName: Full=RelE family toxin-antitoxin system;               |

|        |     |    |      |   |
|--------|-----|----|------|---|
| j0fy90 | 213 | 44 | 13.5 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| i8u5u1 | 415 | 56 | 13.5 | SubName: Full=Toxin biosynthesis protein (Tri7), putative;      |
| i7kfw0 | 379 | 51 | 13.5 | SubName: Full=Predicted membrane protein, putative toxin reg... |
| i7h4m4 | 275 | 44 | 13.5 | SubName: Full=Cytolethal distending toxin subunit A;            |
| i2fc56 | 275 | 44 | 13.5 | SubName: Full=Cytolethal distending toxin subunit A;            |
| i0swi5 | 253 | 44 | 13.5 | SubName: Full=Zeta toxin;                                       |
| h8d1b8 | 265 | 44 | 13.5 | SubName: Full=Cytolethal distending toxin subunit CdtB;         |
| h7yaj4 | 265 | 44 | 13.5 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h6uj65 | 277 | 44 | 13.5 | SubName: Full=Cytolethal distending toxin B;                    |
| h6p9v0 | 312 | 44 | 13.5 | SubName: Full=Exfoliative toxin A;                              |
| h5qmd8 | 304 | 44 | 13.5 | SubName: Full=Zeta toxin family protein;                        |
| h5le17 | 304 | 44 | 13.5 | SubName: Full=Zeta toxin family protein;                        |
| h5ewt5 | 246 | 44 | 13.5 | SubName: Full=Toxin B domain protein;                           |
| h4ird6 | 291 | 44 | 13.5 | SubName: Full=Zonular occludens toxin family protein;           |
| h4hw33 | 241 | 44 | 13.5 | SubName: Full=Zonular occludens toxin family protein;           |
| h4h4u1 | 232 | 44 | 13.5 | SubName: Full=Enterotoxin-like toxin;                           |
| h4eua0 | 232 | 44 | 13.5 | SubName: Full=Enterotoxin-like toxin;                           |
| h1x9n7 | 311 | 44 | 13.5 | SubName: Full=VIP2 family actin-ADP-ribosylating toxin;         |
| h1snu5 | 282 | 44 | 13.5 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h1qxd8 | 293 | 44 | 13.5 | SubName: Full=Toxin transcriptional activator ToxR;             |
| h1c982 | 160 | 44 | 13.5 | SubName: Full=Toxin secretion/phage lysis holin;                |
| h0cc66 | 282 | 44 | 13.5 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| g9yhg8 | 301 | 44 | 13.5 | SubName: Full=Toxin-antitoxin system, toxin component, Fic d... |
| g5gz65 | 296 | 44 | 13.5 | SubName: Full=Zeta-toxin;                                       |
| g1zrs0 | 304 | 44 | 13.5 | SubName: Full=Zeta toxin family protein;                        |
| g1zct1 | 304 | 44 | 13.5 | SubName: Full=Zeta toxin family protein;                        |
| g0qn14 | 196 | 44 | 13.5 | SubName: Full=Ras-related c3 botulinum toxin substrate 1, pu... |
| g0agw5 | 371 | 50 | 13.5 | SubName: Full=Zonula occludens toxin-like protein;              |
| f9xux8 | 183 | 44 | 13.5 | SubName: Full=Cytolethal distending toxin A/C family;           |
| f9jwd6 | 282 | 44 | 13.5 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f8nfd8 | 356 | 48 | 13.5 | SubName: Full=Protoplast regeneration and killer toxin resis... |
| f5sqx6 | 364 | 49 | 13.5 | SubName: Full=Toxin regulator;                                  |
| f4uw17 | 304 | 44 | 13.5 | SubName: Full=Putative zeta-toxin;                              |
| f4n120 | 394 | 53 | 13.5 | SubName: Full=Toxin RTX-I translocation ATP-binding protein;... |
| f0p0u9 | 263 | 44 | 13.5 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| e9x8d5 | 304 | 44 | 13.5 | SubName: Full=Zeta toxin protein;                               |
| e9w155 | 304 | 44 | 13.5 | SubName: Full=Zeta toxin protein;                               |
| e9fkW7 | 256 | 44 | 13.5 | SubName: Full=Zeta toxin superfamily;                           |
| e7sxl2 | 273 | 44 | 13.5 | SubName: Full=Cytolethal distending toxin subunit B;            |
| e7n4w6 | 279 | 44 | 13.5 | SubName: Full=Zeta toxin;                                       |
| e7jbk8 | 304 | 44 | 13.5 | SubName: Full=Zeta toxin family protein;                        |
| e7itx5 | 304 | 44 | 13.5 | SubName: Full=Zeta toxin family protein;                        |
| e7hv18 | 304 | 44 | 13.5 | SubName: Full=Zeta toxin family protein;                        |
| e5rm66 | 268 | 44 | 13.5 | SubName: Full=Cytolethal distending toxin B;                    |
| e5rm61 | 268 | 44 | 13.5 | SubName: Full=Cytolethal distending toxin B;                    |
| e4vl65 | 275 | 44 | 13.5 | SubName: Full=Cytolethal distending toxin;                      |
| e4lr30 | 314 | 44 | 13.5 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| e4lk93 | 279 | 44 | 13.5 | SubName: Full=Zeta toxin;                                       |
| e3wia1 | 283 | 44 | 13.5 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| e1pnv6 | 265 | 44 | 13.5 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| e1ciu9 | 267 | 44 | 13.5 | SubName: Full=Cytolethal distending toxin B;                    |
| e0h0g1 | 239 | 44 | 13.5 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| d9wtr8 | 283 | 44 | 13.5 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9wni8 | 290 | 44 | 13.5 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9wcw2 | 291 | 44 | 13.5 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| d9rxa5 | 315 | 44 | 13.5 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d8f5z8 | 256 | 44 | 13.5 | SubName: Full=Toxin-antitoxin system, toxin component family... |
| d6m2v3 | 294 | 44 | 13.5 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |

|        |     |    |      |   |
|--------|-----|----|------|---|
| d6kch6 | 168 | 44 | 13.5 | SubName: Full=GNAT family toxin-antitoxin system, toxin comp... |
| d6kbp2 | 286 | 44 | 13.5 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d5d4z7 | 273 | 44 | 13.5 | SubName: Full=Cytolethal distending toxin, subunit B;           |
| d4wud1 | 305 | 44 | 13.5 | SubName: Full=Toxin-antitoxin system, toxin component family... |
| d4wbe1 | 305 | 44 | 13.5 | SubName: Full=Toxin-antitoxin system, toxin component family... |
| d4vlj7 | 305 | 44 | 13.5 | SubName: Full=Toxin-antitoxin system, toxin component family... |
| d4fbk0 | 284 | 44 | 13.5 | SubName: Full=Toxin secretion/phage lysis holin;                |
| d4ctm5 | 379 | 51 | 13.5 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d3pg22 | 254 | 44 | 13.5 | SubName: Full=Kunitz/BPTI-like toxin;                           |
| d2rcy8 | 239 | 44 | 13.5 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| c9mz30 | 356 | 48 | 13.5 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| c9dtx2 | 384 | 52 | 13.5 | SubName: Full=Zonula occludens toxin type 1;                    |
| c8vq62 | 265 | 44 | 13.5 | SubName: Full=Toxin biosynthesis protein, putative (AFU_orth... |
| c7gi03 | 238 | 44 | 13.5 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| c6bku5 | 276 | 44 | 13.5 | SubName: Full=Zonular occludens toxin;                          |
| c5jx93 | 301 | 44 | 13.5 | SubName: Full=Toxin biosynthesis protein;                       |
| c4k4z6 | 242 | 44 | 13.5 | SubName: Full=ADP-ribosyltransferase toxin-1;                   |
| c2ck47 | 341 | 46 | 13.5 | SubName: Full=Toxin regulator;                                  |
| b8neg2 | 422 | 57 | 13.5 | SubName: Full=Toxin biosynthesis protein, putative;             |
| b8k890 | 287 | 44 | 13.5 | SubName: Full=Leukocidin/Hemolysin toxin family;                |
| b7tgx8 | 224 | 44 | 13.5 | SubName: Full=Toxin co-regulated pilin;                         |
| b3x2s6 | 273 | 44 | 13.5 | SubName: Full=Cytolethal distending toxin B subunit;            |
| b0nfz7 | 248 | 44 | 13.5 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| a9kh13 | 250 | 44 | 13.5 | SubName: Full=Toxin secretion/phage lysis holin;                |
| a8fjn4 | 265 | 44 | 13.5 | SubName: Full=Cytolethal distending toxin, type I deoxyribon... |
| a7jzc6 | 323 | 44 | 13.5 | SubName: Full=Leukocidin/Hemolysin toxin family;                |
| a5lh53 | 273 | 44 | 13.5 | SubName: Full=Cytolethal distending toxin B subunit;            |
| a5jj19 | 234 | 44 | 13.5 | SubName: Full=Toxic shock syndrome toxin-1;                     |
| a5jj18 | 234 | 44 | 13.5 | SubName: Full=Toxic shock syndrome toxin-1;                     |
| a4f277 | 265 | 44 | 13.5 | SubName: Full=Cytolethal distending toxin B;                    |
| a0rpj0 | 183 | 44 | 13.5 | SubName: Full=Cytolethal distending toxin A/C family;           |
| q8ech2 | 455 | 61 | 13.4 | SubName: Full=Toxin-antitoxin system toxin HipA family;         |
| q13508 | 389 | 52 | 13.4 | RecName: Full=Ecto-ADP-ribosyltransferase 3; EC=2.4.2.31; A1... |
| q04bx5 | 351 | 47 | 13.4 | SubName: Full=Predicted membrane protein, putative toxin reg... |
| q03v59 | 352 | 47 | 13.4 | SubName: Full=Predicted membrane protein, putative toxin reg... |
| i9wqy7 | 455 | 61 | 13.4 | SubName: Full=Rtx toxin hemolysin-type calcium-binding prote... |
| i3cu89 | 478 | 64 | 13.4 | SubName: Full=Cholera toxin secretion EpsM protein;             |
| h6nfn9 | 350 | 47 | 13.4 | SubName: Full=RTX toxins and-related Ca2+-binding protein;      |
| g7vkj6 | 352 | 47 | 13.4 | SubName: Full=Membrane protein, putative toxin regulator;       |
| f8ktk4 | 449 | 60 | 13.4 | SubName: Full=Toxin-like outer membrane protein;                |
| e8srw0 | 402 | 54 | 13.4 | SubName: Full=Zeta_2 toxin;                                     |
| e4sws2 | 351 | 47 | 13.4 | SubName: Full=Predicted membrane protein, putative toxin reg... |
| d4d6q2 | 410 | 55 | 13.4 | SubName: Full=Toxin biosynthesis protein (Tri7), putative;      |
| d3akv1 | 365 | 49 | 13.4 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| d2up08 | 351 | 47 | 13.4 | SubName: Full=Leukocidin/hemolysin toxin subunit S;             |
| c2v1x5 | 382 | 51 | 13.4 | SubName: Full=41.9 kDa insecticidal toxin;                      |
| c2v4w1 | 382 | 51 | 13.4 | SubName: Full=41.9 kDa insecticidal toxin;                      |
| c2u6f0 | 382 | 51 | 13.4 | SubName: Full=41.9 kDa insecticidal toxin;                      |
| c2lhp9 | 403 | 54 | 13.4 | SubName: Full=Toxin;  |
| c2ki78 | 352 | 47 | 13.4 | SubName: Full=Membrane protein, toxin regulator;                |
| b7wx60 | 388 | 52 | 13.4 | SubName: Full=Zonular occludens toxin;                          |
| b6qk83 | 381 | 51 | 13.4 | SubName: Full=Toxin biosynthesis protein, putative;             |
| b4ez44 | 403 | 54 | 13.4 | SubName: Full=Putative toxin;                                   |
| q8gcy3 | 398 | 53 | 13.3 | SubName: Full=Alpha-toxin; Flags: Precursor;                    |
| q8ekm9 | 435 | 58 | 13.3 | SubName: Full=Toxin-antitoxin system toxin HipA family;         |
| q5b2e7 | 420 | 56 | 13.3 | SubName: Full=TRI7-like toxin biosynthesis protein, putative... |
| q18801 | 399 | 53 | 13.3 | RecName: Full=GDP-mannose 4,6 dehydratase 1; EC=4.2.1.47; A1... |
| q036g8 | 347 | 46 | 13.3 | SubName: Full=Predicted membrane protein, putative toxin reg... |

|        |     |    |      |   |
|--------|-----|----|------|---|
| p93188 | 362 | 48 | 13.3 | SubName: Full=NADPH-dependent HC-toxin reductase;               |
| j1gy49 | 332 | 44 | 13.3 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| i8uhe5 | 332 | 44 | 13.3 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| i8iqr1 | 422 | 56 | 13.3 | SubName: Full=Toxin biosynthesis protein;                       |
| g9zck3 | 375 | 50 | 13.3 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| g6auf4 | 331 | 44 | 13.3 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| f9f0g5 | 391 | 52 | 13.3 | SubName: Full=Zonula occludens toxin family protein;            |
| e9eu03 | 332 | 44 | 13.3 | SubName: Full=Zeta toxin family protein;                        |
| e3fk18 | 555 | 74 | 13.3 | SubName: Full=RTX toxin transporter;                            |
| e3bd20 | 384 | 51 | 13.3 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d8gal6 | 347 | 46 | 13.3 | SubName: Full=Predicted membrane protein, putative toxin reg... |
| d0iwp5 | 436 | 58 | 13.3 | SubName: Full=Zonular occludens toxin;                          |
| c3hbb5 | 353 | 47 | 13.3 | SubName: Full=35.8-kilodalton mosquitocidal toxin;              |
| c2h0d0 | 345 | 46 | 13.3 | SubName: Full=Membrane protein, toxin regulator;                |
| c2fc10 | 347 | 46 | 13.3 | SubName: Full=Membrane protein, toxin regulator;                |
| c2dhy6 | 345 | 46 | 13.3 | SubName: Full=Membrane protein, toxin regulator;                |
| c0x6n5 | 345 | 46 | 13.3 | SubName: Full=Membrane protein, toxin regulator;                |
| b0y590 | 437 | 58 | 13.3 | SubName: Full=Toxin biosynthesis regulatory protein AflJ, pu... |
| a7xs54 | 368 | 49 | 13.3 | SubName: Full=42 kDa insecticidal toxin;                        |
| a1cif4 | 445 | 59 | 13.3 | SubName: Full=Toxin biosynthesis protein, putative;             |
| q9fdd4 | 306 | 43 | 13.2 | SubName: Full=Exfoliative toxin A;                              |
| q99075 | 208 | 43 | 13.2 | RecName: Full=Proheparin-binding EGF-like growth factor; Con... |
| q8iae2 | 226 | 43 | 13.2 | RecName: Full=Toxin PsTX-20A; Short=Pstx20; Short=ptx20a; Al... |
| q8gnj5 | 278 | 43 | 13.2 | SubName: Full=Exfoliative toxin ExhC;                           |
| q8gnj4 | 272 | 43 | 13.2 | SubName: Full=Exfoliative toxin ExhD;                           |
| q8gax8 | 281 | 43 | 13.2 | SubName: Full=Exfoliative toxin D;                              |
| q5r231 | 226 | 43 | 13.2 | RecName: Full=Hemolytic toxin Avt-1; AltName: Full=Avt-I; Fl... |
| q5iqz7 | 269 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin B;                    |
| q5iqz2 | 269 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin B;                    |
| q5hx87 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin, subunit B;           |
| q56uc0 | 273 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin B; SubName: Full=C... |
| q4hg80 | 267 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin A;                    |
| q46101 | 265 | 43 | 13.2 | SubName: Full=CdtB; SubName: Full=Cytolethal distending toxi... |
| q41867 | 357 | 47 | 13.2 | SubName: Full=NADPH HC-toxin reductase;                         |
| q2yxe9 | 315 | 43 | 13.2 | SubName: Full=Probable exfoliative toxin;                       |
| q0pc57 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin B; Flags: Precurso... |
| q081x8 | 284 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin B;                    |
| k9gj79 | 247 | 43 | 13.2 | SubName: Full=MFS toxin efflux pump (AflT), putative;           |
| k9fp20 | 247 | 43 | 13.2 | SubName: Full=MFS toxin efflux pump (AflT), putative;           |
| k6yn68 | 239 | 43 | 13.2 | SubName: Full=Zeta toxin;                                       |
| k6a0a7 | 288 | 43 | 13.2 | SubName: Full=Zeta-toxin;                                       |
| k4zna5 | 186 | 43 | 13.2 | SubName: Full=Toxin secretion/phage lysis holin;                |
| k4hjn4 | 355 | 47 | 13.2 | SubName: Full=Toxin secretion protein;                          |
| k3udh9 | 319 | 43 | 13.2 | SubName: Full=Shiga toxin 2, subunit A; EC=3.2.2.22;            |
| k2nfm0 | 342 | 45 | 13.2 | SubName: Full=Toxin regulator;                                  |
| k1ydm3 | 318 | 43 | 13.2 | SubName: Full=Zonular occludens toxin;                          |
| k1c5d1 | 393 | 52 | 13.2 | SubName: Full=Zonular occludens toxin;                          |
| k0hgs3 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit CdtB;         |
| j9hjr3 | 393 | 52 | 13.2 | SubName: Full=Zonular occludens toxin;                          |
| j7s0h8 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin B;                    |
| j7bj35 | 251 | 43 | 13.2 | SubName: Full=Toxin-antitoxin system, toxin component, Bro d... |
| j6yt77 | 251 | 43 | 13.2 | SubName: Full=Toxin-antitoxin system, toxin component, Bro d... |
| j5hs75 | 325 | 43 | 13.2 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| j0yca2 | 239 | 43 | 13.2 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j0efg7 | 239 | 43 | 13.2 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| i9qgr8 | 288 | 43 | 13.2 | SubName: Full=Zeta-toxin;                                       |
| i1dfs4 | 230 | 43 | 13.2 | SubName: Full=Toxin transcriptional activator ToxR;             |
| i0sx35 | 256 | 43 | 13.2 | SubName: Full=Zeta toxin;                                       |

|        |     |    |      |   |
|--------|-----|----|------|---|
| i0scs6 | 262 | 43 | 13.2 | SubName: Full=Zeta toxin;                                       |
| h8l7m2 | 258 | 43 | 13.2 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| h8cun4 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h8clw1 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h8ch31 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h8ced0 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h8c801 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h8c236 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h8byi3 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h8bq00 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h8bpj7 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h8bgr7 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h8bdn4 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h8b731 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h8b0u9 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h8axd8 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h8anx1 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h8amf3 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit CdtB;         |
| h8agv4 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h8abu7 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h8a4r8 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h8a2p0 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7zxx9 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7zs76 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7zn44 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7zfx4 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7z907 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7z7e9 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7z2m4 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit CdtB;         |
| h7yi88 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7y023 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7xxc5 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7xn80 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit CdtB;         |
| h7xgi5 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7x6v1 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7wzb9 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7wj54 | 267 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit CdtB;         |
| h7wfg0 | 267 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit CdtB;         |
| h7vyr8 | 267 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit CdtB;         |
| h7vp51 | 267 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7vjd6 | 267 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7vcp7 | 267 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7vb44 | 267 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7uza8 | 267 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7ums5 | 267 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit CdtB;         |
| h7uhw7 | 267 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7tme2 | 267 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7t4t7 | 267 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7st09 | 267 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7slb6 | 267 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7sej0 | 267 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7sbx7 | 267 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7s5c4 | 267 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7rv45 | 267 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7rgf1 | 267 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit CdtB;         |
| h7rat0 | 267 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h4irj7 | 291 | 43 | 13.2 | SubName: Full=Zonular occludens toxin family protein;           |
| h4evy4 | 241 | 43 | 13.2 | SubName: Full=Beta-grasp domain toxin protein;                  |

|        |     |    |      |   |
|--------|-----|----|------|---|
| h3u5q6 | 241 | 43 | 13.2 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3twq8 | 356 | 47 | 13.2 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h2b2r7 | 239 | 43 | 13.2 | SubName: Full=Putative toxin;                                   |
| h1wfv5 | 438 | 58 | 13.2 | SubName: Full=Putative Hemolysin-type calcium-binding toxin,... |
| h1tpe4 | 281 | 43 | 13.2 | SubName: Full=Exfoliative toxin B; EC=3.4.21.-;                 |
| h1m048 | 252 | 43 | 13.2 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| h0cnv7 | 264 | 43 | 13.2 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h0cir8 | 317 | 43 | 13.2 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| g9xhk9 | 251 | 43 | 13.2 | SubName: Full=Toxin-antitoxin system, toxin component, Bro d... |
| g8v567 | 281 | 43 | 13.2 | SubName: Full=Exfoliative toxin B; EC=3.4.21.-;                 |
| g8fee8 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit CdtB;         |
| g7y1c6 | 274 | 43 | 13.2 | SubName: Full=HC-toxin synthetase;                              |
| g5kg26 | 254 | 43 | 13.2 | SubName: Full=Zeta toxin;                                       |
| g3j0d4 | 372 | 49 | 13.2 | SubName: Full=Zonular occludens toxin;                          |
| g2x395 | 252 | 43 | 13.2 | SubName: Full=Multidrug and toxin extrusion protein;            |
| f9s7k3 | 315 | 43 | 13.2 | SubName: Full=Zeta toxin family protein;                        |
| f6m8n2 | 278 | 43 | 13.2 | SubName: Full=Exfoliative toxin ExhC;                           |
| f5x6y6 | 260 | 43 | 13.2 | SubName: Full=PezT Zeta toxin;                                  |
| f5w4w9 | 281 | 43 | 13.2 | SubName: Full=Exfoliative toxin B; EC=3.4.21.-;                 |
| f5w403 | 356 | 47 | 13.2 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f3uea9 | 195 | 43 | 13.2 | SubName: Full=HicB family toxin-antitoxin system;               |
| f3thk9 | 356 | 47 | 13.2 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f0def4 | 315 | 43 | 13.2 | SubName: Full=Exfoliative toxin;                                |
| f0did4 | 315 | 43 | 13.2 | SubName: Full=Exfoliative toxin;                                |
| e8srw2 | 401 | 53 | 13.2 | SubName: Full=Zeta_1 toxin;                                     |
| e7nvs5 | 257 | 43 | 13.2 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| e7mwn4 | 259 | 43 | 13.2 | SubName: Full=Staphylococcal toxin, beta-grasp domain protei... |
| e6rzc6 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin;                      |
| e6rt81 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin subunit B;            |
| e6hyy1 | 239 | 43 | 13.2 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| e5rm55 | 268 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin B;                    |
| e5azk7 | 259 | 43 | 13.2 | SubName: Full=Staphylococcal/Streptococcal toxin, beta-grasp... |
| e4iu95 | 261 | 43 | 13.2 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| e3yzx0 | 259 | 43 | 13.2 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| e3yuk4 | 257 | 43 | 13.2 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| e3r6w9 | 271 | 43 | 13.2 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e3iex3 | 235 | 43 | 13.2 | SubName: Full=Anthrax toxin A moiety lethal factor; Flags: P... |
| e3cfi1 | 255 | 43 | 13.2 | SubName: Full=Zeta toxin;                                       |
| e2xjz9 | 258 | 43 | 13.2 | SubName: Full=Type I toxin efflux ATP-binding protein; EC=3.... |
| e2sut2 | 320 | 43 | 13.2 | SubName: Full=Toxin-antitoxin system;                           |
| e2rzj7 | 280 | 43 | 13.2 | SubName: Full=Exfoliative toxin; SubName: Full=Exfoliative t... |
| e2csk7 | 305 | 43 | 13.2 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| e1xgc1 | 253 | 43 | 13.2 | SubName: Full=Putative zeta-toxin;                              |
| e0qey5 | 267 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin B;                    |
| e0ibv1 | 168 | 43 | 13.2 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e0fdw5 | 211 | 43 | 13.2 | SubName: Full=RTX toxin protein;                                |
| e0f1f6 | 211 | 43 | 13.2 | SubName: Full=RTX toxin protein;                                |
| d9xt06 | 292 | 43 | 13.2 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9wsz1 | 314 | 43 | 13.2 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9wia0 | 308 | 43 | 13.2 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d8f3v1 | 272 | 43 | 13.2 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d6lil3 | 227 | 43 | 13.2 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| d6lfk4 | 269 | 43 | 13.2 | SubName: Full=Zeta-toxin;                                       |
| d5k9g7 | 401 | 53 | 13.2 | SubName: Full=Zeta_1 toxin;                                     |
| d5k9f1 | 403 | 53 | 13.2 | SubName: Full=Zeta_3 toxin;                                     |
| d5k9e9 | 401 | 53 | 13.2 | SubName: Full=Zeta_1 toxin;                                     |
| d5k9e2 | 401 | 53 | 13.2 | SubName: Full=Zeta_1 toxin;                                     |
| d4rwf6 | 307 | 43 | 13.2 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |

|        |     |    |      |   |
|--------|-----|----|------|---|
| d4c3d2 | 197 | 43 | 13.2 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| d4axw1 | 410 | 54 | 13.2 | SubName: Full=Toxin biosynthesis protein (Tri7), putative;      |
| d3f155 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin B;                    |
| d2yzq3 | 226 | 43 | 13.2 | RecName: Full=Hemolytic toxin Avt-2; AltName: Full=Avt-II; F... |
| d1w1g9 | 424 | 56 | 13.2 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d1pgp4 | 288 | 43 | 13.2 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| c9m9d2 | 247 | 43 | 13.2 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| c9m6w2 | 264 | 43 | 13.2 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| c9lu51 | 265 | 43 | 13.2 | SubName: Full=PemK family protein; SubName: Full=Toxin-antit... |
| c7tqf0 | 319 | 43 | 13.2 | SubName: Full=Shiga toxin 2d subunit A;                         |
| c7ggz0 | 273 | 43 | 13.2 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| c61lv9 | 342 | 45 | 13.2 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| c5tns4 | 324 | 43 | 13.2 | SubName: Full=Putative RTX toxin exported protein;              |
| c3xie2 | 267 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin b;                    |
| c2csx9 | 262 | 43 | 13.2 | SubName: Full=Zeta toxin family protein;                        |
| b9k4d8 | 243 | 43 | 13.2 | SubName: Full=Rhizobiocin/RTX toxin;                            |
| b8f3v8 | 277 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin protein B;            |
| b8f3q6 | 277 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin protein B;            |
| b5gbb6 | 277 | 43 | 13.2 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| b1sx84 | 303 | 43 | 13.2 | SubName: Full=Zonular occludens toxin;                          |
| b1er32 | 269 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin B;                    |
| b0nig9 | 187 | 43 | 13.2 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| a6zvn9 | 296 | 43 | 13.2 | SubName: Full=Killer toxin;                                     |
| a5khz7 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin;                      |
| a4f2b0 | 267 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin B;                    |
| a4f2a1 | 267 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin B;                    |
| a4f283 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin B;                    |
| a3zks3 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin, subunit B;           |
| a3yq19 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin, subunit B;           |
| a3ykt6 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin, subunit B;           |
| a3ke18 | 268 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin B;                    |
| a3ke15 | 268 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin B;                    |
| a3elq5 | 247 | 43 | 13.2 | SubName: Full=Toxin secretion transporter, putative;            |
| a1vxg3 | 265 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin, subunit B;           |
| a1ab03 | 273 | 43 | 13.2 | SubName: Full=Cytolethal distending toxin type IV subunit B;... |
| a0yr49 | 260 | 43 | 13.2 | SubName: Full=Hemolysin-type calcium-binding toxin;             |
| q7vsx4 | 374 | 49 | 13.1 | RecName: Full=Type IV secretion system protein PtlG; AltName... |
| q57398 | 328 | 43 | 13.1 | SubName: Full=Epsilaon-toxin; SubName: Full=Epsilon toxin; S... |
| q31zq8 | 329 | 43 | 13.1 | SubName: Full=Cytolethal distending toxin subunit B;            |
| q039a3 | 382 | 50 | 13.1 | SubName: Full=Predicted membrane protein, putative toxin reg... |
| q03515 | 327 | 43 | 13.1 | RecName: Full=GPI-linked NAD(P)(+)--arginine ADP-ribosyltran... |
| q02307 | 328 | 43 | 13.1 | RecName: Full=Epsilon-toxin type B; Flags: Precursor;           |
| f4ux72 | 457 | 60 | 13.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| f2py33 | 443 | 58 | 13.1 | SubName: Full=Cercosporin toxin biosynthesis protein;           |
| f0urw0 | 413 | 54 | 13.1 | SubName: Full=Toxin biosynthesis protein;                       |
| e5r8v6 | 351 | 46 | 13.1 | SubName: Full=Leukocidin/Hemolysin toxin family protein;        |
| e0sl26 | 389 | 51 | 13.1 | SubName: Full=RTX toxins-like Ca2+-binding protein;             |
| d9rni7 | 351 | 46 | 13.1 | SubName: Full=Leukocidin/lemolysin toxin family protein;        |
| d8ggq7 | 382 | 50 | 13.1 | SubName: Full=Predicted membrane protein, putative toxin reg... |
| d7j6t4 | 429 | 56 | 13.1 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d6k088 | 406 | 53 | 13.1 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d5rdg5 | 381 | 50 | 13.1 | SubName: Full=HipA family toxin-antitoxin system;               |
| d4mx99 | 351 | 46 | 13.1 | SubName: Full=Predicted membrane protein, putative toxin reg... |
| d0wgu6 | 420 | 55 | 13.1 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| c8ld32 | 351 | 46 | 13.1 | SubName: Full=Leukocidin/hemolysin toxin subunit S;             |
| c6hh60 | 413 | 54 | 13.1 | SubName: Full=Toxin biosynthesis protein;                       |
| c4k6t7 | 329 | 43 | 13.1 | SubName: Full=APSE-2 prophage cytolethal distending toxin su... |
| c3ib67 | 374 | 49 | 13.1 | SubName: Full=41.9 kDa insecticidal toxin;                      |



|        |     |    |      |   |
|--------|-----|----|------|---|
| c2ffk1 | 382 | 50 | 13.1 | SubName: Full=Membrane protein, toxin regulator;                |
| b1v315 | 328 | 43 | 13.1 | SubName: Full=Epsilon-toxin;                                    |
| b1r956 | 328 | 43 | 13.1 | SubName: Full=Epsilon-toxin;                                    |
| a6qil8 | 351 | 46 | 13.1 | SubName: Full=Leukocidin/hemolysin toxin family S subunit;      |
| q8e8p4 | 455 | 59 | 13.0 | SubName: Full=DNA damage-inducible multidrug and toxin efflu... |
| q87020 | 362 | 47 | 13.0 | SubName: Full=K2 killer toxin; Flags: Precursor;                |
| q3qzb9 | 384 | 50 | 13.0 | SubName: Full=Zonular occludens toxin;                          |
| q09b57 | 569 | 74 | 13.0 | SubName: Full=RTX toxin transporter, putative;                  |
| p59026 | 399 | 52 | 13.0 | RecName: Full=Phospholipase C; Short=PLC; EC=3.1.4.3; AltNam... |
| p34182 | 478 | 62 | 13.0 | RecName: Full=Zinc metalloproteinase/disintegrin; Contains: ... |
| k1qxg8 | 400 | 52 | 13.0 | SubName: Full=Multidrug and toxin extrusion protein 1;          |
| j7ta11 | 392 | 51 | 13.0 | SubName: Full=Putative toxin-antitoxin system toxin componen... |
| j7lfa8 | 378 | 49 | 13.0 | SubName: Full=Zeta toxin family protein;                        |
| j4vm74 | 332 | 43 | 13.0 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| j2xbd7 | 468 | 61 | 13.0 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| i3djwt | 332 | 43 | 13.0 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| h3sam9 | 338 | 44 | 13.0 | SubName: Full=Mtx2/3 toxin-like protein;                        |
| h3rr67 | 376 | 49 | 13.0 | SubName: Full=Putative toxin regulator;                         |
| g3iyt3 | 362 | 47 | 13.0 | SubName: Full=Zonular occludens toxin;                          |
| f9rba8 | 346 | 45 | 13.0 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| f9p4y7 | 331 | 43 | 13.0 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| e7ecw1 | 362 | 47 | 13.0 | SubName: Full=40kDa insecticidal toxin;                         |
| e6mti8 | 424 | 55 | 13.0 | SubName: Full=HipA family toxin-antitoxin system;               |
| e4zte0 | 548 | 71 | 13.0 | SubName: Full=Similar to MFS toxin efflux pump (AflT);          |
| e1yre4 | 376 | 49 | 13.0 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d7ivv8 | 376 | 49 | 13.0 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d4vbk8 | 422 | 55 | 13.0 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d4v8s7 | 332 | 43 | 13.0 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d2up07 | 338 | 44 | 13.0 | SubName: Full=Leukocidin/hemolysin toxin family protein;        |
| d2fns1 | 338 | 44 | 13.0 | SubName: Full=Leukocidin/hemolysin toxin family protein;        |
| c5fqt0 | 414 | 54 | 13.0 | SubName: Full=Cercosporin toxin biosynthesis protein;           |
| c3htd7 | 353 | 46 | 13.0 | SubName: Full=35.8-kilodalton mosquitocidal toxin;              |
| c2jzf2 | 347 | 45 | 13.0 | SubName: Full=Possible membrane protein, probable toxin regu... |
| b5qks7 | 347 | 45 | 13.0 | SubName: Full=Predicted membrane protein, putative toxin reg... |
| a3rxj6 | 424 | 55 | 13.0 | SubName: Full=Possible Zonular occludens toxin (Zot);           |
| q97qz1 | 253 | 42 | 12.9 | RecName: Full=Toxin PezT; AltName: Full=UDP-N-acetylglucosam... |
| q8ku16 | 319 | 42 | 12.9 | SubName: Full=Shiga toxin 2A subunit;                           |
| q8ggk9 | 319 | 42 | 12.9 | SubName: Full=Shiga toxin 2d activatable subunit A; SubName:... |
| q8ggk8 | 319 | 42 | 12.9 | SubName: Full=Variant Shiga toxin type 2 A subunit;             |
| q878k3 | 292 | 42 | 12.9 | SubName: Full=Putative exfoliative toxin;                       |
| q7bgc5 | 489 | 63 | 12.9 | SubName: Full=Toxin-coregulated pilus biosynthesis outer mem... |
| q76dt2 | 498 | 64 | 12.9 | RecName: Full=Toxin AvTX-60A; Flags: Precursor;                 |
| q60935 | 325 | 42 | 12.9 | RecName: Full=GPI-linked NAD(P)(+)--arginine ADP-ribosyltran... |
| q5dz51 | 208 | 42 | 12.9 | SubName: Full=Toxin coregulated pilin subunit TcpA;             |
| q5auk5 | 418 | 54 | 12.9 | SubName: Full=Toxin biosynthesis protein, putative (AFU_orth... |
| q4w8a6 | 267 | 42 | 12.9 | SubName: Full=Cytolethal distending toxin B; SubName: Full=C... |
| q48jb2 | 288 | 42 | 12.9 | SubName: Full=Insecticidal toxin complex protein, putative;     |
| q2ace8 | 319 | 42 | 12.9 | SubName: Full=Shiga toxin 2 A subunit;                          |
| q1rh39 | 139 | 42 | 12.9 | SubName: Full=Toxin of toxin-antitoxin (TA) system;             |
| q09118 | 208 | 42 | 12.9 | RecName: Full=Proheparin-binding EGF-like growth factor; Con... |
| q04470 | 259 | 42 | 12.9 | RecName: Full=Type-2Aa cytolytic delta-endotoxin; AltName: F... |
| p29481 | 489 | 63 | 12.9 | RecName: Full=Toxin coregulated pilus biosynthesis outer mem... |
| p09332 | 277 | 42 | 12.9 | RecName: Full=Exfoliative toxin B; EC=3.4.21.-; AltName: Ful... |
| p06886 | 234 | 42 | 12.9 | RecName: Full=Toxic shock syndrome toxin-1; Short=TSST-1; Fl... |
| o49166 | 356 | 46 | 12.9 | SubName: Full=NADPH HC toxin reductase;                         |
| o06522 | 223 | 42 | 12.9 | RecName: Full=Cytolethal distending toxin subunit A; Short=C... |
| k8ffm1 | 218 | 42 | 12.9 | SubName: Full=Zeta toxin;                                       |
| k6syc3 | 233 | 42 | 12.9 | SubName: Full=Insecticide toxin TcdB middle/N-terminal domai... |

|        |     |    |      |   |
|--------|-----|----|------|---|
| k6biz2 | 271 | 42 | 12.9 | SubName: Full=Zeta toxin;                                       |
| k4n4u4 | 250 | 42 | 12.9 | SubName: Full=Clostridial binary toxin A family protein; EC=... |
| k3g287 | 319 | 42 | 12.9 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| k2xey3 | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| k2wrt4 | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| k2wj76 | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| k2vxa8 | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| k2ttp9 | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| k1b9w6 | 268 | 42 | 12.9 | SubName: Full=Toxin subunit S1;                                 |
| k0jjm0 | 280 | 42 | 12.9 | SubName: Full=Toxin A;  |
| j6q4w5 | 220 | 42 | 12.9 | SubName: Full=Zeta toxin;                                       |
| j5jqj8 | 410 | 53 | 12.9 | SubName: Full=Host-specific AK-toxin Akt2;                      |
| j4pje3 | 237 | 42 | 12.9 | SubName: Full=Zeta toxin;                                       |
| j2a4b8 | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| j2a0g6 | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| j1wzv9 | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| j1wpf5 | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| j1w0m7 | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| j1vs20 | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| j1uua7 | 253 | 42 | 12.9 | SubName: Full=Toxin PezT;                                       |
| j1u113 | 253 | 42 | 12.9 | SubName: Full=Toxin PezT;                                       |
| j1t8d7 | 253 | 42 | 12.9 | SubName: Full=Toxin PezT;                                       |
| j1rum2 | 253 | 42 | 12.9 | SubName: Full=Toxin PezT;                                       |
| j1qvg2 | 253 | 42 | 12.9 | SubName: Full=Zeta toxin family protein;                        |
| j1qtt6 | 253 | 42 | 12.9 | SubName: Full=Zeta toxin family protein;                        |
| j1pfi6 | 253 | 42 | 12.9 | SubName: Full=Zeta toxin family protein;                        |
| j1nq07 | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| j1nqx2 | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| j1m890 | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| j1khw5 | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| j1gdr8 | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| j1fg05 | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| j1ebz0 | 456 | 59 | 12.9 | SubName: Full=Zonular occludens toxin family protein;           |
| j1dxf9 | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| j1dgy0 | 275 | 42 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1cnw6 | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| j1bfj1 | 248 | 42 | 12.9 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| j0yhu4 | 253 | 42 | 12.9 | SubName: Full=Toxin PezT;                                       |
| j0y7n0 | 253 | 42 | 12.9 | SubName: Full=Toxin PezT;                                       |
| j0y625 | 253 | 42 | 12.9 | SubName: Full=Toxin PezT;                                       |
| j0xh61 | 253 | 42 | 12.9 | SubName: Full=Zeta toxin family protein;                        |
| j0u9f4 | 253 | 42 | 12.9 | SubName: Full=Zeta toxin family protein;                        |
| j0sqq4 | 246 | 42 | 12.9 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j0q8p9 | 246 | 42 | 12.9 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j0ifs2 | 246 | 42 | 12.9 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| i718e4 | 229 | 42 | 12.9 | SubName: Full=Diphtheria toxin repressor; SubName: Full=Unch... |
| i4ipd4 | 241 | 42 | 12.9 | SubName: Full=Putative Cytotoxic distending toxin subunit B...  |
| i3rtf5 | 273 | 42 | 12.9 | SubName: Full=Exfoliative toxin ExhA;                           |
| i3hdm2 | 315 | 42 | 12.9 | SubName: Full=C4-dicarboxylate transporter/malic acid transp... |
| i3h9h0 | 315 | 42 | 12.9 | SubName: Full=C4-dicarboxylate transporter/malic acid transp... |
| i3h5u4 | 315 | 42 | 12.9 | SubName: Full=C4-dicarboxylate transporter/malic acid transp... |
| i3gn46 | 315 | 42 | 12.9 | SubName: Full=C4-dicarboxylate transporter/malic acid transp... |
| i3ggx0 | 315 | 42 | 12.9 | SubName: Full=C4-dicarboxylate transporter/malic acid transp... |
| i3g3i1 | 315 | 42 | 12.9 | SubName: Full=C4-dicarboxylate transporter/malic acid transp... |
| i3fvq3 | 315 | 42 | 12.9 | SubName: Full=C4-dicarboxylate transporter/malic acid transp... |
| i2fge6 | 241 | 42 | 12.9 | SubName: Full=Toxic shock syndrome toxin-1;                     |
| i0s5s4 | 256 | 42 | 12.9 | SubName: Full=Zeta toxin;                                       |
| i0nvp7 | 253 | 42 | 12.9 | SubName: Full=Zeta toxin family protein;                        |

|         |     |    |      |   |
|---------|-----|----|------|---|
| i0ntr0  | 253 | 42 | 12.9 | SubName: Full=Zeta toxin family protein;                        |
| i0n8e2  | 253 | 42 | 12.9 | SubName: Full=Zeta toxin family protein;                        |
| h9cjpg4 | 323 | 42 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| h9cjpg3 | 510 | 66 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| h8nya8  | 232 | 42 | 12.9 | SubName: Full=Toxin-coregulated pilus subunit TcpA;             |
| h8jv58  | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| h7y8x5  | 265 | 42 | 12.9 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7xsi1  | 265 | 42 | 12.9 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7wp33  | 267 | 42 | 12.9 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7ud26  | 267 | 42 | 12.9 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7u7d5  | 267 | 42 | 12.9 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7twh5  | 267 | 42 | 12.9 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7trs2  | 267 | 42 | 12.9 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7t912  | 267 | 42 | 12.9 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7qws3  | 267 | 42 | 12.9 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7pz88  | 253 | 42 | 12.9 | SubName: Full=Zeta toxin family protein;                        |
| h7psb1  | 253 | 42 | 12.9 | SubName: Full=Zeta toxin family protein;                        |
| h7c8i0  | 269 | 42 | 12.9 | SubName: Full=Cytolethal distending toxin B;                    |
| h5xmm8  | 235 | 42 | 12.9 | SubName: Full=Zeta toxin;                                       |
| h4bxu4  | 228 | 42 | 12.9 | SubName: Full=Toxic shock syndrome toxin-1;                     |
| h3u7x3  | 242 | 42 | 12.9 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3tsb6  | 242 | 42 | 12.9 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h1tiu4  | 242 | 42 | 12.9 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h1snq7  | 242 | 42 | 12.9 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h1ski9  | 250 | 42 | 12.9 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h0eh70  | 225 | 42 | 12.9 | SubName: Full=Putative HC-toxin synthetase;                     |
| h0cbb8  | 250 | 42 | 12.9 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h0avl6  | 250 | 42 | 12.9 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| g8pyp3  | 433 | 56 | 12.9 | SubName: Full=RTX toxins-related Ca2+-binding protein;          |
| g8gwq0  | 319 | 42 | 12.9 | SubName: Full=Shiga toxin 2 subunit A;                          |
| g8fah9  | 265 | 42 | 12.9 | SubName: Full=Cytolethal distending toxin subunit CdtB;         |
| g8atw6  | 273 | 42 | 12.9 | SubName: Full=Putative hemolysin-type calcium-binding RTX to... |
| g7tmz7  | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| g7c4v2  | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| g7bu99  | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| g7bgk5  | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| g7av70  | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| g7aln9  | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| g7aaj1  | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| g7a1b5  | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| g6zqt3  | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| g6zd84  | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| g6z4q1  | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| g6avu4  | 313 | 42 | 12.9 | SubName: Full=Toxin-antitoxin system, toxin component, Fic d... |
| g0slw9  | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| g0slw4  | 303 | 42 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| f9xux9  | 264 | 42 | 12.9 | SubName: Full=Cytolethal distending toxin;                      |
| f9rse3  | 442 | 57 | 12.9 | SubName: Full=Zonular occludens toxin;                          |
| f9p308  | 255 | 42 | 12.9 | SubName: Full=Zeta toxin;                                       |
| f9lvw0  | 256 | 42 | 12.9 | SubName: Full=Zeta toxin;                                       |
| f9li1j9 | 207 | 42 | 12.9 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f9jxt1  | 242 | 42 | 12.9 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f9jnz6  | 242 | 42 | 12.9 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f9c559  | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| f9b8s1  | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| f9a322  | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| f8zty8  | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| f8zj41  | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |

|        |     |    |      |   |
|--------|-----|----|------|---|
| f8z7q3 | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| f8yws3 | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| f8d2d7 | 235 | 42 | 12.9 | SubName: Full=Anthrax toxin A moiety lethal factor; Flags: P... |
| f5rn46 | 301 | 42 | 12.9 | SubName: Full=Fic family toxin-antitoxin system;                |
| f4vfb0 | 283 | 42 | 12.9 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| f4ac07 | 279 | 42 | 12.9 | SubName: Full=Putative epsilon-toxin type B;                    |
| f3pyd8 | 277 | 42 | 12.9 | SubName: Full=Toxin-antitoxin system, toxin component, Fic d... |
| f2f0u1 | 342 | 44 | 12.9 | SubName: Full=Predicted membrane protein, putative toxin reg... |
| f0xft7 | 388 | 50 | 12.9 | SubName: Full=Killer toxin sensitivity protein;                 |
| f0pfx2 | 218 | 42 | 12.9 | SubName: Full=Zeta toxin family protein;                        |
| f0p6u2 | 310 | 42 | 12.9 | SubName: Full=Synergohymenotropic toxin;                        |
| f0h0j1 | 183 | 42 | 12.9 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e9yzw8 | 241 | 42 | 12.9 | SubName: Full=Pertussis toxin protein;                          |
| e9tkd4 | 308 | 42 | 12.9 | SubName: Full=Zeta toxin;                                       |
| e9sms4 | 158 | 42 | 12.9 | SubName: Full=Xre family Toxin-antitoxin system;                |
| e9fgw3 | 303 | 42 | 12.9 | SubName: Full=Putative exfoliative toxin;                       |
| e9eqv3 | 419 | 54 | 12.9 | SubName: Full=Toxin biosynthesis protein, putative;             |
| e8xvt8 | 232 | 42 | 12.9 | SubName: Full=Toxin-coregulated pilus subunit TcpA;             |
| e8k8k2 | 261 | 42 | 12.9 | SubName: Full=Zeta toxin;                                       |
| e7mwn5 | 268 | 42 | 12.9 | SubName: Full=Staphylococcal toxin, beta-grasp domain protei... |
| e7gl84 | 158 | 42 | 12.9 | SubName: Full=Xre family Toxin-antitoxin system;                |
| e6k9q7 | 425 | 55 | 12.9 | SubName: Full=HipA family toxin-antitoxin system;               |
| e6f8b3 | 387 | 50 | 12.9 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e5x3x3 | 288 | 42 | 12.9 | SubName: Full=Zeta toxin;                                       |
| e5r7g3 | 227 | 42 | 12.9 | SubName: Full=Staphylococcal/Streptococcal toxin, beta-grasp... |
| e5azk6 | 268 | 42 | 12.9 | SubName: Full=Staphylococcal/Streptococcal toxin, beta-grasp... |
| e4w0m8 | 288 | 42 | 12.9 | SubName: Full=Zeta toxin family protein;                        |
| e4jl45 | 381 | 49 | 12.9 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e4jf34 | 381 | 49 | 12.9 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e4jcv4 | 381 | 49 | 12.9 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e4jcg9 | 381 | 49 | 12.9 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e4iyq6 | 381 | 49 | 12.9 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e4iwm0 | 381 | 49 | 12.9 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e4ilz2 | 381 | 49 | 12.9 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e4il28 | 381 | 49 | 12.9 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e4iaa5 | 381 | 49 | 12.9 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e4i6r2 | 381 | 49 | 12.9 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e2sra7 | 281 | 42 | 12.9 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| e2sl20 | 248 | 42 | 12.9 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| e2sks5 | 246 | 42 | 12.9 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e2nw43 | 221 | 42 | 12.9 | SubName: Full=Toxin-antitoxin system, toxin component domain... |
| e1yys3 | 427 | 55 | 12.9 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| e1xjs7 | 253 | 42 | 12.9 | SubName: Full=Putative zeta-toxin;                              |
| e1etu5 | 218 | 42 | 12.9 | SubName: Full=Zeta toxin;                                       |
| e0h0v5 | 387 | 50 | 12.9 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e0e219 | 240 | 42 | 12.9 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| d9y0y6 | 286 | 42 | 12.9 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9xxz2 | 284 | 42 | 12.9 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9wwl0 | 253 | 42 | 12.9 | SubName: Full=ArsR family toxin-antitoxin system, antitoxin ... |
| d9wtz2 | 286 | 42 | 12.9 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9wqq9 | 192 | 42 | 12.9 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| d9w952 | 168 | 42 | 12.9 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| d8hi53 | 315 | 42 | 12.9 | SubName: Full=Probable exfoliative toxin;                       |
| d8hfp3 | 234 | 42 | 12.9 | SubName: Full=Toxic shock syndrome toxin-1;                     |
| d7w0k0 | 292 | 42 | 12.9 | SubName: Full=Fic family toxin-antitoxin system;                |
| d7hlb1 | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| d6t8f2 | 315 | 42 | 12.9 | SubName: Full=Exfoliative toxin A/B;                            |
| d6sew7 | 241 | 42 | 12.9 | SubName: Full=Toxic shock syndrome toxin-1;                     |

|        |     |    |      |  |
|--------|-----|----|------|--|
| d6k581 | 283 | 42 | 12.9 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c...  |
| d4uh24 | 315 | 42 | 12.9 | SubName: Full=Exfoliative toxin A/B;                             |
| d4bus8 | 198 | 42 | 12.9 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f...  |
| d3har1 | 299 | 42 | 12.9 | SubName: Full=Exfoliative toxin A;                               |
| d3a650 | 394 | 51 | 12.9 | SubName: Full=Zonula occludens toxin family protein;             |
| d2yk18 | 489 | 63 | 12.9 | SubName: Full=Toxin coregulated pilus biosynthesis outer mem...  |
| d2una1 | 326 | 42 | 12.9 | SubName: Full=Leukocidin/hemolysin toxin family protein;         |
| d2gsw7 | 254 | 42 | 12.9 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f...  |
| d2g0h5 | 315 | 42 | 12.9 | SubName: Full=Exfoliative toxin;                                 |
| d1qwj6 | 315 | 42 | 12.9 | SubName: Full=Exfoliative toxin A/B;                             |
| d1qlj8 | 315 | 42 | 12.9 | SubName: Full=Exfoliative toxin A/B;                             |
| d1pfc2 | 273 | 42 | 12.9 | SubName: Full=Putative toxin-antitoxin system, toxin compone...  |
| d0k489 | 315 | 42 | 12.9 | SubName: Full=Exfoliative toxin, putative;                       |
| d0hrr2 | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ...  |
| c9mva7 | 243 | 42 | 12.9 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f...  |
| c9d7r2 | 256 | 42 | 12.9 | SubName: Full=Astacin-like metalloprotease toxin 2; Flags: P...  |
| c8tbn4 | 410 | 53 | 12.9 | SubName: Full=Xre family toxin-antitoxin system;                 |
| c8mn48 | 227 | 42 | 12.9 | SubName: Full=Toxin beta-grasp domain-containing protein;        |
| c8mig7 | 315 | 42 | 12.9 | SubName: Full=Exfoliative toxin A;                               |
| c8mcl2 | 242 | 42 | 12.9 | SubName: Full=Toxin beta-grasp domain-containing protein;        |
| c8m8y5 | 315 | 42 | 12.9 | SubName: Full=Exfoliative toxin A;                               |
| c8lgv1 | 227 | 42 | 12.9 | SubName: Full=Toxin beta-grasp domain-containing protein;        |
| c8l7t4 | 227 | 42 | 12.9 | SubName: Full=Toxin beta-grasp domain-containing protein;        |
| c8l4b9 | 315 | 42 | 12.9 | SubName: Full=Exfoliative toxin A;                               |
| c7u172 | 298 | 42 | 12.9 | SubName: Full=Putative entericidin like toxin protien;           |
| c7hry3 | 301 | 42 | 12.9 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c...  |
| c7gzg2 | 248 | 42 | 12.9 | SubName: Full=Toxin-antitoxin system, antitoxin component, P...  |
| c7fpv8 | 319 | 42 | 12.9 | SubName: Full=Shiga toxin 2 A subunit;                           |
| c6yev8 | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me...  |
| c6rw12 | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ...  |
| c5kpg1 | 264 | 42 | 12.9 | SubName: Full=Diphtheria toxin resistance protein 2, dph2, pu... |
| c5j4y3 | 319 | 42 | 12.9 | SubName: Full=Shiga toxin 2A;                                    |
| c3pkw4 | 258 | 42 | 12.9 | SubName: Full=Putative zeta-toxin;                               |
| c3nt67 | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ...  |
| c3lt82 | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me...  |
| c3icx2 | 248 | 42 | 12.9 | SubName: Full=Zeta toxin;  |
| c2ja19 | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ...  |
| c2igm8 | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ...  |
| c2d4w6 | 325 | 42 | 12.9 | SubName: Full=VIP2 family actin-ADP-ribosylating toxin;          |
| c0xm23 | 325 | 42 | 12.9 | SubName: Full=VIP2 family actin-ADP-ribosylating toxin;          |
| c0wtv2 | 325 | 42 | 12.9 | SubName: Full=VIP2 family actin-ADP-ribosylating toxin;          |
| b9lab8 | 389 | 50 | 12.9 | SubName: Full=Zonular occludens toxin (Zot) family;              |
| b8zpj8 | 253 | 42 | 12.9 | SubName: Full=Putative zeta-toxin;                               |
| b8m887 | 326 | 42 | 12.9 | SubName: Full=Toxin biosynthesis protein Tri7-like , putativ...  |
| b6cju5 | 258 | 42 | 12.9 | SubName: Full=Kallikrein toxin Var13;                            |
| b5qhw4 | 285 | 42 | 12.9 | SubName: Full=Cytolethal distending toxin;                       |
| b5gie7 | 199 | 42 | 12.9 | SubName: Full=PIN family toxin-antitoxin system, toxin compo...  |
| b5gie6 | 371 | 48 | 12.9 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c...  |
| b5ghw6 | 289 | 42 | 12.9 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c...  |
| b5g8z8 | 379 | 49 | 12.9 | SubName: Full=Fic family toxin-antitoxin system, toxin compo...  |
| b1t3r7 | 302 | 42 | 12.9 | SubName: Full=Zonular occludens toxin; Flags: Precursor;         |
| b1be44 | 286 | 42 | 12.9 | SubName: Full=Non-toxin haemagglutinin HA-33;                    |
| b0phc0 | 197 | 42 | 12.9 | SubName: Full=Putative toxin-antitoxin system, toxin compone...  |
| a8pmg6 | 308 | 42 | 12.9 | SubName: Full=Shiga toxin A-chain (RRNA N-glycosidase); EC=3...  |
| a8gua1 | 139 | 42 | 12.9 | SubName: Full=Toxin of toxin-antitoxin (TA) system;              |
| a7umy0 | 319 | 42 | 12.9 | SubName: Full=Shiga toxin 2A; SubName: Full=Shiga toxin 2c s...  |
| a6xv06 | 456 | 59 | 12.9 | SubName: Full=Zonula occludens toxin;                            |
| a6tyq9 | 227 | 42 | 12.9 | SubName: Full=Toxin beta-grasp domain protein; Flags: Precur...  |

|        |     |    |      |   |
|--------|-----|----|------|---|
| a4f2c5 | 284 | 42 | 12.9 | SubName: Full=Cytolethal distending toxin B;                    |
| a3gyr8 | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| a3eic9 | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| a2ppc2 | 456 | 59 | 12.9 | SubName: Full=Zonular occludens toxin (Zot) family;             |
| a1f0y6 | 489 | 63 | 12.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| a0rpj1 | 264 | 42 | 12.9 | SubName: Full=Cytolethal distending toxin;                      |
| q9ric3 | 532 | 68 | 12.8 | SubName: Full=Toxin;  |
| q9gum2 | 383 | 49 | 12.8 | RecName: Full=Beta-1,4-N-acetylgalactosaminyltransferase bre... |
| q7x6n6 | 335 | 43 | 12.8 | SubName: Full=Os07g0601100 protein; SubName: Full=Putative N... |
| q7lzu3 | 345 | 44 | 12.8 | SubName: Full=Killer toxin K28;                                 |
| q6qmt2 | 359 | 46 | 12.8 | RecName: Full=Beta-1,3-galactosyltransferase bre-2; EC=2.4.1... |
| q4wlc8 | 429 | 55 | 12.8 | SubName: Full=Toxin biosynthesis protein Tri7-like , putativ... |
| q46308 | 336 | 43 | 12.8 | SubName: Full=Beta-toxin; Flags: Precursor;                     |
| q46181 | 336 | 43 | 12.8 | SubName: Full=Beta-toxin;                                       |
| q1c1l7 | 407 | 52 | 12.8 | SubName: Full=Putative insecticidal toxin;                      |
| p70871 | 366 | 47 | 12.8 | SubName: Full=Diarrheal toxin;                                  |
| p58911 | 501 | 64 | 12.8 | RecName: Full=Toxin PsTX-60A; Flags: Precursor;                 |
| p0c216 | 398 | 51 | 12.8 | RecName: Full=Phospholipase C; Short=PLC; EC=3.1.4.3; AltNam... |
| k4ib10 | 327 | 42 | 12.8 | SubName: Full=Serine kinase toxin of HipAB toxin-antitoxin m... |
| i0uvs5 | 366 | 47 | 12.8 | SubName: Full=Zeta toxin;                                       |
| i0kns9 | 430 | 55 | 12.8 | SubName: Full=Zona occludens toxin;                             |
| f8fb41 | 461 | 59 | 12.8 | SubName: Full=RTX toxins and related Ca2+-binding protein;      |
| f4u2g4 | 422 | 54 | 12.8 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| f3xwr9 | 344 | 44 | 12.8 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| f2j697 | 444 | 57 | 12.8 | SubName: Full=Putative toxin/protease secretion system;         |
| e9uj84 | 422 | 54 | 12.8 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| e6lir5 | 486 | 62 | 12.8 | SubName: Full=Zeta-toxin;                                       |
| e6amt1 | 422 | 54 | 12.8 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| e5zr09 | 422 | 54 | 12.8 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| e5cuj7 | 335 | 43 | 12.8 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| d9rbi8 | 351 | 45 | 12.8 | SubName: Full=Leukocidin/lemolysin toxin family protein;        |
| d3i7q2 | 431 | 55 | 12.8 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d1w920 | 375 | 48 | 12.8 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d1p7e4 | 445 | 57 | 12.8 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d0yu51 | 436 | 56 | 12.8 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| c9lr41 | 375 | 48 | 12.8 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| c7bmr0 | 530 | 68 | 12.8 | SubName: Full=Insecticidal toxin complex; Flags: Precursor;     |
| c5t353 | 392 | 50 | 12.8 | SubName: Full=Zonular occludens toxin;                          |
| b3q3r0 | 436 | 56 | 12.8 | SubName: Full=Putative toxin secretion protein;                 |
| b2i4x5 | 397 | 51 | 12.8 | SubName: Full=Zonular occludens toxin;                          |
| b1v2y2 | 398 | 51 | 12.8 | SubName: Full=Phospholipase C (PLC) (Phosphatidylcholinechol... |
| b1r9v5 | 336 | 43 | 12.8 | SubName: Full=Beta-toxin;                                       |
| b1blg4 | 336 | 43 | 12.8 | SubName: Full=Beta-toxin;                                       |
| b0xm34 | 429 | 55 | 12.8 | SubName: Full=Toxin biosynthesis protein Tri7-like , putativ... |
| a8y1p7 | 384 | 49 | 12.8 | RecName: Full=Beta-1,4-N-acetylgalactosaminyltransferase bre... |
| a6m446 | 532 | 68 | 12.8 | SubName: Full=Toxin;  |
| a1tpt9 | 453 | 58 | 12.8 | SubName: Full=Zonular occludens toxin;                          |
| q9gmn8 | 463 | 59 | 12.7 | RecName: Full=Toxin CaTX-A; Short=Toxin A; AltName: Full=CAT... |
| q9agw9 | 489 | 62 | 12.7 | SubName: Full=Toxin-coregulated pilus biosynthesis outer mem... |
| q8fhf4 | 472 | 60 | 12.7 | RecName: Full=Serine/threonine-protein kinase HipA; Short=Se... |
| q7vsx3 | 339 | 43 | 12.7 | RecName: Full=Type IV secretion system protein PtlH; AltName... |
| q3c005 | 395 | 50 | 12.7 | SubName: Full=Putative Zeta toxin of the postsegregational k... |
| p23874 | 440 | 56 | 12.7 | RecName: Full=Serine/threonine-protein kinase HipA; Short=Se... |
| k2v6t4 | 489 | 62 | 12.7 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| j6rpa5 | 463 | 59 | 12.7 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j6q7m8 | 463 | 59 | 12.7 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j6pgm9 | 463 | 59 | 12.7 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j6p9g9 | 463 | 59 | 12.7 | SubName: Full=Toxin secretion/phage lysis holin;                |

|        |     |    |      |   |
|--------|-----|----|------|---|
| j6mha3 | 463 | 59 | 12.7 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j6hbm9 | 463 | 59 | 12.7 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j6eqh5 | 463 | 59 | 12.7 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j6eje8 | 463 | 59 | 12.7 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j6d062 | 463 | 59 | 12.7 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j6cxc1 | 463 | 59 | 12.7 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j6crj2 | 463 | 59 | 12.7 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j6bzi4 | 463 | 59 | 12.7 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j5jpk7 | 463 | 59 | 12.7 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j5i134 | 463 | 59 | 12.7 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j5gfv6 | 463 | 59 | 12.7 | SubName: Full=Toxin secretion/phage lysis holin;                |
| i2jcr8 | 347 | 44 | 12.7 | SubName: Full=Zonula occludens toxin;                           |
| i0zrp1 | 433 | 55 | 12.7 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| g7ugf6 | 369 | 47 | 12.7 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| f0xfy2 | 424 | 54 | 12.7 | SubName: Full=Toxin biosynthesis protein;                       |
| e9tb78 | 440 | 56 | 12.7 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| e9pa29 | 362 | 46 | 12.7 | SubName: Full=K2 killer toxin;                                  |
| e9d1x5 | 363 | 46 | 12.7 | SubName: Full=Toxin biosynthesis protein;                       |
| e6im65 | 377 | 48 | 12.7 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e5uz31 | 425 | 54 | 12.7 | SubName: Full=HipA family Toxin-antitoxin system;               |
| e1hbw3 | 440 | 56 | 12.7 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| e0gga0 | 387 | 49 | 12.7 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| d9rb40 | 353 | 45 | 12.7 | SubName: Full=Toxin regulatory protein;                         |
| d8n3i8 | 395 | 50 | 12.7 | SubName: Full=Putative zeta toxin of the postsegregational k... |
| d8buc8 | 440 | 56 | 12.7 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d8b9r9 | 440 | 56 | 12.7 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d8au28 | 440 | 56 | 12.7 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d7zrj6 | 440 | 56 | 12.7 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d7y252 | 440 | 56 | 12.7 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d4ltx2 | 378 | 48 | 12.7 | SubName: Full=Predicted membrane protein, putative toxin reg... |
| d4lij1 | 363 | 46 | 12.7 | SubName: Full=Predicted membrane protein, putative toxin reg... |
| d0h649 | 489 | 62 | 12.7 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| d0gpm9 | 332 | 42 | 12.7 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| c9lwd8 | 482 | 61 | 12.7 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| c5rb87 | 362 | 46 | 12.7 | SubName: Full=Possible toxin regulator;                         |
| a7wk53 | 464 | 59 | 12.7 | SubName: Full=Cry49Aa protein; SubName: Full=Crystal toxin;     |
| a7gbf7 | 490 | 62 | 12.7 | SubName: Full=Toxin complex component ORF-X3;                   |
| a6a644 | 456 | 58 | 12.7 | SubName: Full=Zonular occludens toxin (Zot) family;             |
| a5f395 | 489 | 62 | 12.7 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| a3gme0 | 489 | 62 | 12.7 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| a2pc75 | 456 | 58 | 12.7 | SubName: Full=Zonular occludens toxin (Zot) family;             |
| q9kwh0 | 268 | 41 | 12.6 | SubName: Full=Exfoliative toxin B;                              |
| q9fd43 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin type 2 subunit A;                |
| q99qj1 | 273 | 41 | 12.6 | SubName: Full=Toxin-coregulated pilus biosynthesis protein D... |
| q93gv6 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin type 2 variant A subunit;             |
| q93ey5 | 319 | 41 | 12.6 | SubName: Full=Stx2-NV206 toxin A subunit;                       |
| q90392 | 414 | 52 | 12.6 | RecName: Full=Snake venom metalloproteinase atrolysin-C; Sho... |
| q8xbv2 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 A subunit; SubName: Full=Shiga t... |
| q8vv72 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 A-subunit;                          |
| q8nju1 | 238 | 41 | 12.6 | SubName: Full=Killer toxin zygocin;                             |
| q8ktv6 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 A subunit; SubName: Full=Shiga t... |
| q8ktu8 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 A subunit; SubName: Full=Shiga t... |
| q8ha14 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2, subunit A;                         |
| q8gnj6 | 301 | 41 | 12.6 | SubName: Full=Exfoliative toxin ExhB;                           |
| q8gj12 | 181 | 41 | 12.6 | SubName: Full=Cytolethal distending toxin C;                    |
| q8g8k7 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 A subunit; SubName: Full=Shiga t... |
| q838c5 | 322 | 41 | 12.6 | SubName: Full=Exfoliative toxin A, putative;                    |
| q7w9a2 | 241 | 41 | 12.6 | SubName: Full=Putative toxin;                                   |

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|--------|-----|----|------|---|
| q7vyq9 | 241 | 41 | 12.6 | SubName: Full=Putative toxin;                                   |
| q7di68 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 A-subunit; SubName: Full=Shiga t... |
| q7b5l0 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| q77ch9 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| q77ch6 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 A subunit;                          |
| q776q3 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| q776g1 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin2 subunit A;                           |
| q776e1 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin2 subunit A;                           |
| q6yii8 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| q6upc7 | 181 | 41 | 12.6 | SubName: Full=Cytolethal distending toxin C;                    |
| q6upc2 | 269 | 41 | 12.6 | SubName: Full=Cytolethal distending toxin B;                    |
| q6upc1 | 181 | 41 | 12.6 | SubName: Full=Cytolethal distending toxin C;                    |
| q6dwp7 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| q6dwp5 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| q6dwp3 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| q6dwp1 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| q6dwn9 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| q6dwn7 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| q6dwn5 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| q6dwn3 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| q6dwn1 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| q6dwm9 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| q6dwm7 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| q6dwm5 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| q6dwm3 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| q6dwm1 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| q6dwl9 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| q6dwl7 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| q6dwl5 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| q6dwl3 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| q6dwl1 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| q67uq3 | 269 | 41 | 12.6 | SubName: Full=NADPH HC toxin reductase-like;                    |
| q67uq2 | 358 | 45 | 12.6 | SubName: Full=Os06g0651100 protein; SubName: Full=Putative N... |
| q5wpw9 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 A subunit; SubName: Full=Verocyt... |
| q5tjl6 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2A-subunit; SubName: Full=Shiga-li... |
| q5pxe6 | 398 | 50 | 12.6 | SubName: Full=Alpha toxin;                                      |
| q5hgr0 | 315 | 41 | 12.6 | SubName: Full=Exfoliative toxin, putative;                      |
| q5ar34 | 298 | 41 | 12.6 | SubName: Full=Toxin biosynthesis proten (Fum3), putative (AF... |
| q546i1 | 227 | 41 | 12.6 | SubName: Full=Pertussis toxin subunit 3;                        |
| q4wqz4 | 437 | 55 | 12.6 | SubName: Full=Toxin biosynthesis regulatory protein AflJ, pu... |
| q47647 | 315 | 41 | 12.6 | SubName: Full=Shiga-like toxin type-I alpha subunit; Flags: ... |
| q47643 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin II A subunit;                    |
| q47642 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin type IIvhc; Flags: Precursor;... |
| q47636 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 A subunit; SubName: Full=Shiga t... |
| q3hr45 | 398 | 50 | 12.6 | SubName: Full=Alpha toxin;                                      |
| q3dp31 | 230 | 41 | 12.6 | SubName: Full=Exfoliative toxin A;                              |
| q2l9b4 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin II subunit A;                         |
| q2g1x0 | 319 | 41 | 12.6 | RecName: Full=Alpha-hemolysin; Short=Alpha-HL; AltName: Full... |
| q2fhr5 | 315 | 41 | 12.6 | SubName: Full=Exfoliative toxin A;                              |
| q2acg6 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 A subunit;                          |
| q2acg0 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 A subunit;                          |
| q2acf4 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 A subunit;                          |
| q2acf1 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 A subunit; SubName: Full=Shiga t... |
| q1elx7 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin II subunit A; Flags: Precursor;       |
| q19vg7 | 478 | 60 | 12.6 | SubName: Full=Capillary morphogenesis protein 2A; SubName: F... |
| q189k7 | 232 | 41 | 12.6 | SubName: Full=Negative regulator of toxin gene expression;      |
| q08ja4 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| q04bp6 | 342 | 43 | 12.6 | SubName: Full=Predicted membrane protein, putative toxin reg... |



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| p71293 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin IIe variant A subunit;           |
| p29491 | 278 | 41 | 12.6 | RecName: Full=Toxin coregulated pilus biosynthesis protein D... |
| p19972 | 222 | 41 | 12.6 | RecName: Full=Salt-mediated killer protoxin 1; Contains: Rec... |
| p15167 | 414 | 52 | 12.6 | RecName: Full=Snake venom metalloproteinase atrolysin-D; Sho... |
| p09385 | 319 | 41 | 12.6 | RecName: Full=Shiga-like toxin 2 subunit A; Short=SLT-2 A su... |
| p04979 | 227 | 41 | 12.6 | RecName: Full=Pertussis toxin subunit 3; Short=PTX S3; AltNa... |
| k9gnu9 | 215 | 41 | 12.6 | SubName: Full=Putative toxin to DivIC;                          |
| k8f8h1 | 350 | 44 | 12.6 | SubName: Full=Membrane protein, toxin regulator, putative;      |
| k5ugn9 | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k5ug21 | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k5s134 | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k5t82  | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k5iqw3 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| k5id39 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| k5i9x4 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2, subunit A; EC=3.2.2.22;            |
| k5hxr5 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| k5hsj8 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| k5h154 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| k5fk95 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| k5di14 | 414 | 52 | 12.6 | SubName: Full=Zonula occludens toxin;                           |
| k4z1f4 | 322 | 41 | 12.6 | SubName: Full=Exfoliative toxin A;                              |
| k4x5i3 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| k4ig64 | 364 | 46 | 12.6 | SubName: Full=Antitoxin transcriptional regulator of toxin/a... |
| k4fw70 | 235 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| k3ulc5 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| k3t131 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| k3s9m2 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| k3lqq6 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| k3le80 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| k3km98 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| k3k026 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2, subunit A; EC=3.2.2.22;            |
| k3hvg5 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| k3glp7 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2, subunit A; EC=3.2.2.22;            |
| k3gfi7 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| k3fkf6 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2, subunit A; EC=3.2.2.22;            |
| k3f6c9 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| k3ejv5 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| k3e0h9 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| k3cq70 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2, subunit A; EC=3.2.2.22;            |
| k3bjr9 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2, subunit A; EC=3.2.2.22;            |
| k3az48 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2, subunit A; EC=3.2.2.22;            |
| k3agb4 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| k2zj63 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| k2yhy1 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2, subunit A; EC=3.2.2.22;            |
| k2y8n8 | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k2xv13 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| k2xbv1 | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k2wya8 | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k2wqr7 | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k2v4z2 | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k2ul65 | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k2t132 | 349 | 44 | 12.6 | SubName: Full=Putative insecticidal toxin complex;              |
| k2q3r6 | 304 | 41 | 12.6 | SubName: Full=Rhizobiocin/RTX toxin;                            |
| k1wl71 | 250 | 41 | 12.6 | SubName: Full=Hemolysin-type calcium-binding toxin;             |
| k1fgp2 | 414 | 52 | 12.6 | SubName: Full=Zonula occludens toxin;                           |
| k0jd26 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| k0bgu8 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| k0aqr0 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |

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| j9zmp2  | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| j9yx72  | 288 | 41 | 12.6 | SubName: Full=Zeta toxin;                                       |
| j9uvvg6 | 280 | 41 | 12.6 | SubName: Full=Toxin A;  |
| j9usr5  | 315 | 41 | 12.6 | SubName: Full=Exfoliative toxin A/B;                            |
| j9i5b0  | 229 | 41 | 12.6 | SubName: Full=Ras-related C3 botulinum toxin substrate 1;       |
| j7s8x4  | 253 | 41 | 12.6 | SubName: Full=Zeta toxin;                                       |
| j7qv05  | 227 | 41 | 12.6 | SubName: Full=Pertussis toxin subunit 3;                        |
| j7qty7  | 308 | 41 | 12.6 | SubName: Full=Putative zeta toxin poison-antidote element;      |
| j7qn60  | 241 | 41 | 12.6 | SubName: Full=Putative toxin;                                   |
| j7qay7  | 308 | 41 | 12.6 | SubName: Full=Putative zeta toxin;                              |
| j7i8z7  | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2A subunit;                           |
| j4tjg0  | 173 | 41 | 12.6 | SubName: Full=Zeta toxin;                                       |
| j4kar2  | 252 | 41 | 12.6 | SubName: Full=Zeta toxin;                                       |
| j2dsz6  | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| j2a4n0  | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j2a0t2  | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1yzm4  | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1yvi2  | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1xie9  | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1wp06  | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1q9v9  | 256 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| j1nx23  | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1l5s2  | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1ki58  | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1glv9  | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1fur9  | 256 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| j1eti6  | 315 | 41 | 12.6 | SubName: Full=Exfoliative toxin;                                |
| j1dx28  | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1ch63  | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1c8j2  | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j0na04  | 248 | 41 | 12.6 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| i6fr60  | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| i5ynu5  | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| i5y4p3  | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2, subunit A; EC=3.2.2.22;            |
| i5xkq2  | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| i5vv10  | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| i5v8v9  | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| i5ugi8  | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| i5u5g9  | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2, subunit A; EC=3.2.2.22;            |
| i5u318  | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| i5szy9  | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2, subunit A; EC=3.2.2.22;            |
| i5r5j3  | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2, subunit A; EC=3.2.2.22;            |
| i5r1j1  | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| i5pu99  | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2, subunit A; EC=3.2.2.22;            |
| i5ptv9  | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| i5n6w7  | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| i5n6n8  | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2, subunit A; EC=3.2.2.22;            |
| i5me70  | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2, subunit A; EC=3.2.2.22;            |
| i5li41  | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| i5l7a1  | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| i5l6f3  | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| i5j183  | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2, subunit A; EC=3.2.2.22;            |
| i5i6b2  | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| i5grx2  | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| i5gjg0  | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| i5fe17  | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2, subunit A; EC=3.2.2.22;            |
| i5fbh5  | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2, subunit A; EC=3.2.2.22;            |
| i5f790  | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |

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| i5dwa8 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| i5dv52 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2, subunit A; EC=3.2.2.22;            |
| i5dub5 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2, subunit A; EC=3.2.2.22;            |
| i4qul4 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| i4qnf7 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| i4j1f9 | 373 | 47 | 12.6 | SubName: Full=Toxin YeeV;                                       |
| i3a880 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin;                                       |
| i2xz17 | 247 | 41 | 12.6 | SubName: Full=Putative shiga-like toxin 2 subunit A;            |
| i2xqa4 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin;                                       |
| i2xpk1 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| i2wmh1 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| i2wgi8 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin;                                       |
| i2vte8 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| i2vn45 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| i2vkz4 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin;                                       |
| i2uz63 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin;                                       |
| i2uu46 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| i2ubj3 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin;                                       |
| i2txi5 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin;                                       |
| i2tp80 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin;                                       |
| i2t9m9 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| i2t582 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin;                                       |
| i2sr90 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin;                                       |
| i2sjc0 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| i2sid3 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin;                                       |
| i2rx93 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| i1zt41 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| i0vxx6 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| i0tzj4 | 242 | 41 | 12.6 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h8xbn0 | 235 | 41 | 12.6 | SubName: Full=Diphtheria toxin repressor;                       |
| h8jv60 | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| h7c8g7 | 269 | 41 | 12.6 | SubName: Full=Cytolethal distending toxin B;                    |
| h6ln29 | 315 | 41 | 12.6 | SubName: Full=Exfoliative toxin A;                              |
| h5ri09 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h5r2n0 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h5q8x8 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h5psz2 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h5pch3 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h5nxp2 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h5nhh7 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h5n1w9 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h5m8w5 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h5lv24 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h5l1s7 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h5km21 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h5k6t7 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h5jbx4 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h5j9m6 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h5is23 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h5ibm3 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h5hxj4 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h5hfk4 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h5h003 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h5gkd8 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h5g555 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h5fmp7 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h5f7d7 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h5ea86 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |

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| h5dsi9 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h5d0y4 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h5cuw4 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h5c4i5 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h5bz12 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h5bi90 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h5b2l7 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h5alt9 | 290 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h5a539 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h4zm47 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h4z4c0 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h4yp29 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h4y9h7 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h4xtr1 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h4wzc1 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| h4h615 | 241 | 41 | 12.6 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4h4u0 | 231 | 41 | 12.6 | SubName: Full=Enterotoxin-like toxin;                           |
| h4h0n4 | 241 | 41 | 12.6 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4gq11 | 241 | 41 | 12.6 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4fsg7 | 181 | 41 | 12.6 | SubName: Full=Type III cytolethal distending toxin protein C... |
| h4eu99 | 231 | 41 | 12.6 | SubName: Full=Enterotoxin-like toxin;                           |
| h4edm0 | 241 | 41 | 12.6 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4e6m5 | 241 | 41 | 12.6 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4di89 | 241 | 41 | 12.6 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4d385 | 241 | 41 | 12.6 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4cuq6 | 241 | 41 | 12.6 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4cl69 | 241 | 41 | 12.6 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4ccq8 | 241 | 41 | 12.6 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4c656 | 241 | 41 | 12.6 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4by58 | 241 | 41 | 12.6 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4bg89 | 241 | 41 | 12.6 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4a240 | 231 | 41 | 12.6 | SubName: Full=Enterotoxin-like toxin;                           |
| h3ywj6 | 292 | 41 | 12.6 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3yw84 | 242 | 41 | 12.6 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3y8j0 | 242 | 41 | 12.6 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3y7g5 | 292 | 41 | 12.6 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3y061 | 298 | 41 | 12.6 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3x5i0 | 292 | 41 | 12.6 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3x4r0 | 242 | 41 | 12.6 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3s694 | 241 | 41 | 12.6 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h3rx38 | 241 | 41 | 12.6 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h1ta04 | 292 | 41 | 12.6 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h1t7i6 | 242 | 41 | 12.6 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h1t7i3 | 251 | 41 | 12.6 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h1lf10 | 247 | 41 | 12.6 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| h0siy8 | 563 | 71 | 12.6 | SubName: Full=Putative secretion protein (HlyD family); toxi... |
| h0ew22 | 313 | 41 | 12.6 | SubName: Full=Putative Killer toxin subunits alpha/beta;        |
| h0cpz5 | 242 | 41 | 12.6 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h0aqi5 | 240 | 41 | 12.6 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| g9l6i9 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| g8gwp8 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| g8gwp6 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| g8gwp4 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| g7tmz9 | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g7c4v4 | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g7b5r5 | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g7av72 | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g7alp1 | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |

|        |     |    |      |   |
|--------|-----|----|------|---|
| g7aaj3 | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g7a1b7 | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g6zqt5 | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g6zd86 | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g6z4q3 | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g5yek4 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A;                     |
| g5xup9 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A;                     |
| g5xpi9 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A;                     |
| g5x5s1 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A;                     |
| g5wqh6 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A;                     |
| g5whw1 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A;                     |
| g5w193 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A;                     |
| g5vlk2 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A;                     |
| g5up99 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A;                     |
| g5uk40 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A;                     |
| g5ttv4 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A;                     |
| g5tgu1 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A;                     |
| g4kam2 | 317 | 41 | 12.6 | SubName: Full=Cytolethal distending toxin subunit CdtB;         |
| g3zyi7 | 212 | 41 | 12.6 | SubName: Full=Cytolethal distending toxin protein A;            |
| g2d715 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| g2bx87 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| g2ans0 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| g2a7e9 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| g2a7d1 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| g1yy82 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| g1yh72 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| g1yal2 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| g0slw7 | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g0dq05 | 430 | 54 | 12.6 | SubName: Full=Aerolysin/hemolysin/leukocidin toxin; Flags: P... |
| g0ath5 | 430 | 54 | 12.6 | SubName: Full=Aerolysin/hemolysin/leukocidin toxin; Flags: P... |
| f9rba7 | 501 | 63 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| f9nwe3 | 232 | 41 | 12.6 | SubName: Full=Diphtheria toxin repressor;                       |
| f9k549 | 292 | 41 | 12.6 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f9k3x8 | 242 | 41 | 12.6 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f9k0b6 | 240 | 41 | 12.6 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f9hw98 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; SubName: Full=St... |
| f9ct70 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| f9c561 | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| f9b8s3 | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| f9a324 | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| f8ztz0 | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| f8zj43 | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| f8yrc5 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| f8xi36 | 194 | 41 | 12.6 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| f8x810 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| f8vfw2 | 248 | 41 | 12.6 | SubName: Full=Putative pertussis toxin s1 subunit;              |
| f6dm37 | 131 | 41 | 12.6 | SubName: Full=Toxin secretion/phage lysis holin;                |
| f6av87 | 454 | 57 | 12.6 | SubName: Full=Zonular occludens toxin;                          |
| f5wpt5 | 292 | 41 | 12.6 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f5wm09 | 242 | 41 | 12.6 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f5w8g0 | 242 | 41 | 12.6 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f5ipm7 | 144 | 41 | 12.6 | SubName: Full=Toxin-antitoxin system, antitoxin component, H... |
| f5imu2 | 134 | 41 | 12.6 | SubName: Full=Toxin-antitoxin system, antitoxin component, H... |
| f4xh68 | 320 | 41 | 12.6 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| f4t804 | 422 | 53 | 12.6 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| f4lh04 | 241 | 41 | 12.6 | SubName: Full=Putative toxin;                                   |
| f4lg59 | 227 | 41 | 12.6 | SubName: Full=Toxin subunit 3;                                  |
| f4fqz0 | 311 | 41 | 12.6 | SubName: Full=Exfoliative toxin A/B;                            |

|        |     |    |      |   |
|--------|-----|----|------|---|
| f3the7 | 242 | 41 | 12.6 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f3tcj1 | 292 | 41 | 12.6 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f2pxv8 | 443 | 56 | 12.6 | SubName: Full=Toxin biosynthesis protein;                       |
| f2pw03 | 420 | 53 | 12.6 | SubName: Full=Cercosporin toxin biosynthesis protein;           |
| f1y8u7 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin II subunit A; EC=3.2.2.22;       |
| f1xiq2 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin II subunit A; EC=3.2.2.22;       |
| f0z3g5 | 248 | 41 | 12.6 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| f0hkv4 | 256 | 41 | 12.6 | SubName: Full=Zeta toxin;                                       |
| e9ux89 | 414 | 52 | 12.6 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| e8lkd6 | 196 | 41 | 12.6 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e8jt30 | 256 | 41 | 12.6 | SubName: Full=Zeta toxin; SubName: Full=Zeta-toxin;             |
| e7s5b6 | 255 | 41 | 12.6 | SubName: Full=Zeta-toxin;                                       |
| e7iv56 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| e7hdh6 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| e7dyu8 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 A subunit;                          |
| e7b9x0 | 317 | 41 | 12.6 | SubName: Full=Cytolethal distending toxin subunit B;            |
| e6bm05 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin;                                       |
| e5x9x0 | 256 | 41 | 12.6 | SubName: Full=Zeta toxin;                                       |
| e5thn3 | 311 | 41 | 12.6 | SubName: Full=Exfoliative toxin A;                              |
| e5rm34 | 268 | 41 | 12.6 | SubName: Full=Cytolethal distending toxin A;                    |
| e5r7q7 | 242 | 41 | 12.6 | SubName: Full=Staphylococcal/Streptococcal toxin, beta-grasp... |
| e5r7f5 | 292 | 41 | 12.6 | SubName: Full=Staphylococcal/Streptococcal toxin, beta-grasp... |
| e4rfu1 | 326 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| e3clq3 | 256 | 41 | 12.6 | SubName: Full=Zeta toxin;                                       |
| e2zd37 | 256 | 41 | 12.6 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| e2xk00 | 459 | 58 | 12.6 | SubName: Full=Type I toxin efflux ATP-binding protein; EC=3.... |
| e2jx82 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| e2csd4 | 202 | 41 | 12.6 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e2csb7 | 422 | 53 | 12.6 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| e1m0f2 | 256 | 41 | 12.6 | SubName: Full=Zeta toxin;                                       |
| e1lpb9 | 253 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| e1l933 | 249 | 41 | 12.6 | SubName: Full=Toxin-antitoxin system, toxin component, Fic d... |
| e1j319 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin;                                       |
| e1isa9 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin;                                       |
| e1ekw2 | 323 | 41 | 12.6 | SubName: Full=Leukocidin/Hemolysin toxin family;                |
| e1ds35 | 323 | 41 | 12.6 | SubName: Full=Leukocidin/Hemolysin toxin family;                |
| e1d4g0 | 323 | 41 | 12.6 | SubName: Full=Leukocidin/Hemolysin toxin family;                |
| e1czr3 | 323 | 41 | 12.6 | SubName: Full=Leukocidin/Hemolysin toxin family;                |
| e0wtr5 | 342 | 43 | 12.6 | SubName: Full=Putative ABC associated RTX toxin transporter;... |
| e0wtg4 | 284 | 41 | 12.6 | SubName: Full=Toxin A;  |
| e0j0h3 | 308 | 41 | 12.6 | SubName: Full=Putative zeta toxin; SubName: Full=Uncharacter... |
| d9y6k6 | 290 | 41 | 12.6 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| d9xjp5 | 304 | 41 | 12.6 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9wbu2 | 277 | 41 | 12.6 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9w856 | 291 | 41 | 12.6 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d8epb6 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin;                                       |
| d8ejy2 | 194 | 41 | 12.6 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d8ea82 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin;                                       |
| d7yiq3 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin;                                       |
| d7y0f3 | 193 | 41 | 12.6 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d7xt93 | 308 | 41 | 12.6 | SubName: Full=Zeta toxin;                                       |
| d7ikg9 | 285 | 41 | 12.6 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| d7hla9 | 278 | 41 | 12.6 | SubName: Full=Toxin coregulated pilus biosynthesis protein D... |
| d6m205 | 296 | 41 | 12.6 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d6lzm2 | 311 | 41 | 12.6 | SubName: Full=Exfoliative toxin A/B;                            |
| d6lwz0 | 315 | 41 | 12.6 | SubName: Full=Exfoliative toxin A/B;                            |
| d6lix5 | 256 | 41 | 12.6 | SubName: Full=Fic family toxin-antitoxin system toxin compon... |
| d6kle4 | 256 | 41 | 12.6 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |

|        |     |    |      |   |
|--------|-----|----|------|---|
| d6kdy7 | 204 | 41 | 12.6 | SubName: Full=GNAT family toxin-antitoxin system, toxin comp... |
| d6k5m5 | 280 | 41 | 12.6 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d6izg6 | 315 | 41 | 12.6 | SubName: Full=Exfoliative toxin;                                |
| d6hg16 | 315 | 41 | 12.6 | SubName: Full=Exfoliative toxin A/B;                            |
| d6gze1 | 315 | 41 | 12.6 | SubName: Full=Putative exfoliative toxin;                       |
| d5nwd3 | 286 | 41 | 12.6 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| d4xeh8 | 446 | 56 | 12.6 | SubName: Full=HipA family toxin-antitoxin system;               |
| d4u339 | 315 | 41 | 12.6 | SubName: Full=Exfoliative toxin A/B;                            |
| d4mbj6 | 350 | 44 | 12.6 | SubName: Full=Predicted membrane protein, putative toxin reg... |
| d4eyz9 | 322 | 41 | 12.6 | SubName: Full=Putative exfoliative toxin A;                     |
| d4ep15 | 322 | 41 | 12.6 | SubName: Full=Putative exfoliative toxin A;                     |
| d4cxa4 | 143 | 41 | 12.6 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| d3y4l3 | 322 | 41 | 12.6 | SubName: Full=Necrotic enteritis toxin B;                       |
| d3v105 | 404 | 51 | 12.6 | SubName: Full=Toxin XaxA;                                       |
| d3v104 | 350 | 44 | 12.6 | SubName: Full=Toxin XaxB;                                       |
| d3lqb7 | 261 | 41 | 12.6 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| d3kzy5 | 297 | 41 | 12.6 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| d3afu9 | 185 | 41 | 12.6 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| d2yk19 | 273 | 41 | 12.6 | SubName: Full=Toxin coregulated pilus biosynthesis protein D... |
| d2utv8 | 311 | 41 | 12.6 | SubName: Full=Putative exfoliative toxin;                       |
| d2urc1 | 315 | 41 | 12.6 | SubName: Full=Putative exfoliative toxin;                       |
| d2up11 | 311 | 41 | 12.6 | SubName: Full=Exfoliative toxin A/B;                            |
| d2uld3 | 315 | 41 | 12.6 | SubName: Full=Exfoliative toxin A/B;                            |
| d2n6e4 | 315 | 41 | 12.6 | SubName: Full=Exfoliative toxin A;                              |
| d2gtc9 | 311 | 41 | 12.6 | SubName: Full=Putative exfoliative toxin;                       |
| d2gqp3 | 315 | 41 | 12.6 | SubName: Full=Putative exfoliative toxin;                       |
| d2ghu5 | 311 | 41 | 12.6 | SubName: Full=Exfoliative toxin A;                              |
| d2gfd4 | 315 | 41 | 12.6 | SubName: Full=Exfoliative toxin;                                |
| d2g8x2 | 315 | 41 | 12.6 | SubName: Full=Exfoliative toxin;                                |
| d2fuj9 | 315 | 41 | 12.6 | SubName: Full=Putative exfoliative toxin;                       |
| d2fns5 | 311 | 41 | 12.6 | SubName: Full=Exfoliative toxin A/B;                            |
| d2feq2 | 311 | 41 | 12.6 | SubName: Full=Exfoliative toxin A/B;                            |
| d2fcb4 | 315 | 41 | 12.6 | SubName: Full=Exfoliative toxin A/B;                            |
| d2f667 | 315 | 41 | 12.6 | SubName: Full=Exfoliative toxin A/B;                            |
| d1q682 | 315 | 41 | 12.6 | SubName: Full=Exfoliative toxin A/B;                            |
| d0w4t6 | 239 | 41 | 12.6 | SubName: Full=Putative zeta-toxin;                              |
| d0hrr0 | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| d0h647 | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| c9nxt9 | 229 | 41 | 12.6 | SubName: Full=Cholera toxin transcriptional activator;          |
| c9mx57 | 222 | 41 | 12.6 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| c9m7h5 | 187 | 41 | 12.6 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| c9lws4 | 198 | 41 | 12.6 | SubName: Full=Zeta toxin family protein;                        |
| c9kj89 | 249 | 41 | 12.6 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| c8uc22 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| c8u7k7 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| c8rrj6 | 265 | 41 | 12.6 | SubName: Full=Toxin-antitoxin system, toxin component;          |
| c8mn39 | 292 | 41 | 12.6 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8m7q7 | 242 | 41 | 12.6 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8m0m0 | 242 | 41 | 12.6 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8lv20 | 242 | 41 | 12.6 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8lh30 | 242 | 41 | 12.6 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8lgu2 | 292 | 41 | 12.6 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8lbp3 | 315 | 41 | 12.6 | SubName: Full=Exfoliative toxin A;                              |
| c8l7s5 | 292 | 41 | 12.6 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8l2z7 | 242 | 41 | 12.6 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8ar56 | 315 | 41 | 12.6 | SubName: Full=Exfoliative toxin;                                |
| c8ak50 | 315 | 41 | 12.6 | SubName: Full=Exfoliative toxin;                                |
| c8ab38 | 315 | 41 | 12.6 | SubName: Full=Exfoliative toxin;                                |

|        |     |    |      |   |
|--------|-----|----|------|---|
| c8a357 | 315 | 41 | 12.6 | SubName: Full=Exfoliative toxin;                                |
| c7zwb9 | 315 | 41 | 12.6 | SubName: Full=Exfoliative toxin;                                |
| c7vr65 | 322 | 41 | 12.6 | SubName: Full=Exfoliative toxin A;                              |
| c7tqg2 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2e subunit A;                         |
| c7g7a6 | 254 | 41 | 12.6 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| c7fpw8 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 A subunit; SubName: Full=Shiga t... |
| c7fpu4 | 315 | 41 | 12.6 | SubName: Full=Shiga toxin 1 A subunit;                          |
| c6yew0 | 278 | 41 | 12.6 | SubName: Full=Toxin coregulated pilus biosynthesis protein D... |
| c6uzn1 | 319 | 41 | 12.6 | SubName: Full=Shiga-like toxin II subunit A;                    |
| c6up09 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin II subunit A;                         |
| c6rw14 | 273 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| c6evg0 | 242 | 41 | 12.6 | SubName: Full=CRISP toxin;                                      |
| c5a9q8 | 372 | 47 | 12.6 | SubName: Full=Zonular occludens toxin;                          |
| c3q8h1 | 288 | 41 | 12.6 | SubName: Full=Anititoxin/toxin system zeta toxin;               |
| c3nt65 | 278 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| c3lt84 | 278 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| c3jr21 | 289 | 41 | 12.6 | SubName: Full=Putative zeta toxin protein;                      |
| c2xl48 | 248 | 41 | 12.6 | SubName: Full=Zeta toxin;                                       |
| c2jkg2 | 350 | 44 | 12.6 | SubName: Full=Membrane protein, toxin regulator;                |
| c2ja17 | 278 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| c2ign0 | 278 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| c2h4p6 | 350 | 44 | 12.6 | SubName: Full=Membrane protein, toxin regulator;                |
| c2dcj0 | 350 | 44 | 12.6 | SubName: Full=Membrane protein, toxin regulator;                |
| c0x5p0 | 350 | 44 | 12.6 | SubName: Full=Membrane protein, toxin regulator;                |
| b8n9y6 | 247 | 41 | 12.6 | SubName: Full=Toxin biosynthesis ketoreductase, putative;       |
| b5yyr1 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin subunit A;                            |
| b5yti3 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin subunit A;                            |
| b5gj56 | 279 | 41 | 12.6 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| b3wj85 | 308 | 41 | 12.6 | SubName: Full=Putative zeta toxin;                              |
| b3igl4 | 308 | 41 | 12.6 | SubName: Full=Putative zeta toxin;                              |
| b3i356 | 308 | 41 | 12.6 | SubName: Full=Putative zeta toxin;                              |
| b3hep8 | 308 | 41 | 12.6 | SubName: Full=Putative zeta toxin;                              |
| b3bug4 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin A-chain; EC=3.2.2.22;                 |
| b3ali1 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| b3a622 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin A-chain; EC=3.2.2.22;                 |
| b2p389 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| b2nm92 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| b2n4h5 | 181 | 41 | 12.6 | SubName: Full=Cytolethal distending toxin subunit C;            |
| b0fee0 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 subunit A;                          |
| a9zmr8 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 A subunit;                          |
| a8a7c2 | 308 | 41 | 12.6 | SubName: Full=Putative zeta toxin;                              |
| a7zup1 | 308 | 41 | 12.6 | SubName: Full=Putative zeta toxin;                              |
| a6zsf9 | 313 | 41 | 12.6 | SubName: Full=Killer toxin resistant protein;                   |
| a6u2t1 | 242 | 41 | 12.6 | SubName: Full=Toxin beta-grasp domain protein;                  |
| a6tyq1 | 292 | 41 | 12.6 | SubName: Full=Toxin beta-grasp domain protein; Flags: Precur... |
| a6qg72 | 315 | 41 | 12.6 | SubName: Full=Exfoliative toxin A;                              |
| a6qe85 | 237 | 41 | 12.6 | SubName: Full=Staphylococcal enterotoxin-like toxin;            |
| a6qe82 | 234 | 41 | 12.6 | SubName: Full=Staphylococcal enterotoxin-like toxin;            |
| a6mts3 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 A subunit;                          |
| a6mts1 | 319 | 41 | 12.6 | SubName: Full=Shiga toxin 2 A subunit;                          |
| a6b0c4 | 323 | 41 | 12.6 | SubName: Full=Leukocidin/Hemolysin toxin family;                |
| a6am34 | 183 | 41 | 12.6 | SubName: Full=Putative toxin co-regulated pilus biosynthesis... |
| a5itz3 | 242 | 41 | 12.6 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| a5f397 | 278 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| a4f273 | 259 | 41 | 12.6 | SubName: Full=Cytolethal distending toxin A;                    |
| a3gys0 | 278 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| a3gmd8 | 278 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| a3d2w6 | 430 | 54 | 12.6 | SubName: Full=Aerolysin/hemolysin/leukocidin toxin; Flags: P... |



|        |     |    |      |   |
|--------|-----|----|------|---|
| a2q922 | 310 | 41 | 12.6 | SubName: Full=Function: A. alternata Akt3-1 is involved in A... |
| a1f0y8 | 278 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| a1eic0 | 278 | 41 | 12.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| a0y7q9 | 452 | 57 | 12.6 | SubName: Full=Putative toxin secretion transmembrane protein... |
| a0fkn6 | 264 | 41 | 12.6 | RecName: Full=Astacin-like metalloprotease toxin; EC=3.4.24...  |
| k9ikq7 | 488 | 61 | 12.5 | SubName: Full=Putative anthrax toxin receptor 2;                |
| k4rgr5 | 608 | 76 | 12.5 | SubName: Full=Zeta-toxin;                                       |
| k2vhu7 | 456 | 57 | 12.5 | SubName: Full=Zonular occludens toxin family protein;           |
| k0lm55 | 353 | 44 | 12.5 | SubName: Full=MW1800 protein; SubName: Full=Toxin regulatory... |
| j2kqp9 | 409 | 51 | 12.5 | SubName: Full=Zonula occludens toxin;                           |
| i3cfh0 | 375 | 47 | 12.5 | SubName: Full=Zonula occludens toxin; Flags: Precursor;         |
| i1bb96 | 433 | 54 | 12.5 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| i0xd84 | 352 | 44 | 12.5 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| i0vmm6 | 440 | 55 | 12.5 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| h5j0f5 | 352 | 44 | 12.5 | SubName: Full=Zonular occludens toxin family protein;           |
| h4kxg8 | 352 | 44 | 12.5 | SubName: Full=Zonular occludens toxin family protein;           |
| h4jln9 | 352 | 44 | 12.5 | SubName: Full=Zonular occludens toxin family protein;           |
| h4gg16 | 352 | 44 | 12.5 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h4fxe2 | 352 | 44 | 12.5 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3zvq0 | 352 | 44 | 12.5 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3ypa9 | 352 | 44 | 12.5 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3y063 | 352 | 44 | 12.5 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3xt88 | 352 | 44 | 12.5 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3xem9 | 352 | 44 | 12.5 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h1tfu4 | 352 | 44 | 12.5 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h0d011 | 352 | 44 | 12.5 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| g7w7u8 | 345 | 43 | 12.5 | SubName: Full=Putative membrane protein, putative toxin regu... |
| g4iut6 | 457 | 57 | 12.5 | SubName: Full=Cholera toxin secretion EpsM protein;             |
| f9j0v1 | 360 | 45 | 12.5 | SubName: Full=Zeta toxin family protein;                        |
| f8xhl9 | 440 | 55 | 12.5 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| f4uml6 | 440 | 55 | 12.5 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| f4fp14 | 352 | 44 | 12.5 | SubName: Full=Staphylococcal enterotoxin-like toxin;            |
| f2t6g2 | 415 | 52 | 12.5 | SubName: Full=Toxin-insensitive protein;                        |
| f0hzd9 | 360 | 45 | 12.5 | SubName: Full=Toxin secretion/phage lysis holin subfamily;      |
| e9ueg8 | 440 | 55 | 12.5 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| e9trs2 | 440 | 55 | 12.5 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| e9f8n5 | 545 | 68 | 12.5 | SubName: Full=Insecticidal toxin complex protein;               |
| e9exn2 | 407 | 51 | 12.5 | SubName: Full=Putative toxin subunit;                           |
| e8zxr2 | 400 | 50 | 12.5 | SubName: Full=General secretion pathway protein F Cholera to... |
| e8vue2 | 455 | 57 | 12.5 | SubName: Full=Zona occludens toxin;                             |
| e6l5i8 | 352 | 44 | 12.5 | SubName: Full=Toxin secretion ATP-binding protein;              |
| e6bp89 | 440 | 55 | 12.5 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| e6asa0 | 440 | 55 | 12.5 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| e5zx56 | 440 | 55 | 12.5 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| e2yzp0 | 393 | 49 | 12.5 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e1jnr2 | 328 | 41 | 12.5 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| e1j966 | 440 | 55 | 12.5 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| e1hyb0 | 440 | 55 | 12.5 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| e0mth4 | 407 | 51 | 12.5 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| e0gq32 | 393 | 49 | 12.5 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| d9rm13 | 353 | 44 | 12.5 | SubName: Full=Toxin regulatory protein;                         |
| d8ett5 | 440 | 55 | 12.5 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d8cih8 | 440 | 55 | 12.5 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d8be79 | 440 | 55 | 12.5 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d7z993 | 440 | 55 | 12.5 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d7yrt0 | 440 | 55 | 12.5 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d7xlq2 | 440 | 55 | 12.5 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d4s305 | 361 | 45 | 12.5 | SubName: Full=Putative toxin regulator PfoR;                    |

|        |     |    |      |   |
|--------|-----|----|------|---|
| d4bg54 | 431 | 54 | 12.5 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d0hix9 | 336 | 42 | 12.5 | SubName: Full=General secretion pathway protein K (Cholera t... |
| d0gx15 | 336 | 42 | 12.5 | SubName: Full=General secretion pathway protein K (Cholera t... |
| c6h2h4 | 455 | 57 | 12.5 | SubName: Full=Toxin biosynthesis protein;                       |
| c4u9t0 | 424 | 53 | 12.5 | SubName: Full=RTX toxin and Ca2+-binding protein;               |
| c2l143 | 361 | 45 | 12.5 | SubName: Full=Toxin regulator;                                  |
| c2c6g7 | 464 | 58 | 12.5 | SubName: Full=Zona occludens toxin;                             |
| b2i4x2 | 384 | 48 | 12.5 | SubName: Full=Zonular occludens toxin;                          |
| b0tsz7 | 415 | 52 | 12.5 | SubName: Full=Toxin secretion, membrane fusion protein;         |
| a9kwe4 | 399 | 50 | 12.5 | SubName: Full=Aerolysin/hemolysin/leukocidin toxin;             |
| a6qe80 | 352 | 44 | 12.5 | SubName: Full=Staphylococcal enterotoxin-like toxin;            |
| q8eix5 | 452 | 56 | 12.4 | SubName: Full=Multidrug and toxin efflux protein MATE family... |
| q56977 | 531 | 66 | 12.4 | SubName: Full=Toxin;  |
| q4wqc3 | 445 | 55 | 12.4 | SubName: Full=Toxin biosynthesis protein, putative;             |
| q4wks5 | 421 | 52 | 12.4 | SubName: Full=Toxin biosynthesis protein, putative;             |
| q03w61 | 380 | 47 | 12.4 | SubName: Full=Predicted membrane protein, putative toxin reg... |
| o85i54 | 532 | 66 | 12.4 | SubName: Full=Insecticidal toxin complex protein TcaZ; SubNa... |
| o49i65 | 356 | 44 | 12.4 | SubName: Full=NADPH HC toxin reductase;                         |
| o49i64 | 356 | 44 | 12.4 | SubName: Full=NADPH HC toxin reductase;                         |
| k9ggp7 | 347 | 43 | 12.4 | SubName: Full=Killer toxin sensitivity protein (Iki1), putat... |
| k9fuj9 | 347 | 43 | 12.4 | SubName: Full=Killer toxin sensitivity protein (Iki1), putat... |
| k9bpf3 | 491 | 61 | 12.4 | SubName: Full=Zonula occludens toxin;                           |
| k8w2i0 | 402 | 50 | 12.4 | SubName: Full=Toxin XaxA;                                       |
| k5exv9 | 491 | 61 | 12.4 | SubName: Full=Zonula occludens toxin;                           |
| k4zpc0 | 364 | 45 | 12.4 | SubName: Full=Putative mosquitocidal toxin;                     |
| j9jek1 | 338 | 42 | 12.4 | SubName: Full=Putative zeta toxin protein;                      |
| i3xwf0 | 420 | 52 | 12.4 | SubName: Full=Zonular occludens toxin (Zot);                    |
| h3z9z4 | 380 | 47 | 12.4 | SubName: Full=Zonular occludens toxin;                          |
| g7viw2 | 380 | 47 | 12.4 | SubName: Full=Membrane protein, putative toxin regulator;       |
| g7cue8 | 459 | 57 | 12.4 | SubName: Full=RTX toxin-like protein;                           |
| g5gyq5 | 379 | 47 | 12.4 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| f4u2u9 | 442 | 55 | 12.4 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| f2g3i4 | 606 | 75 | 12.4 | SubName: Full=RTX toxin, putative;                              |
| f0hfh5 | 396 | 49 | 12.4 | SubName: Full=Putative toxin-antitoxin system toxin componen... |
| e6i7i6 | 387 | 48 | 12.4 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e6i4s9 | 372 | 46 | 12.4 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e6hv88 | 387 | 48 | 12.4 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e3bfy5 | 412 | 51 | 12.4 | SubName: Full=Toxin secretion, membrane fusion protein;         |
| e1vm56 | 402 | 50 | 12.4 | SubName: Full=Putative Zeta toxin of the postsegregational k... |
| e0hhw5 | 387 | 48 | 12.4 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| d9wes2 | 364 | 45 | 12.4 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d6l823 | 380 | 47 | 12.4 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d5hes4 | 363 | 45 | 12.4 | SubName: Full=Predicted membrane protein, putative toxin reg... |
| d4w3k8 | 396 | 49 | 12.4 | SubName: Full=Toxin-antitoxin system toxin component, PIN fa... |
| d4v7p2 | 502 | 62 | 12.4 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d3v9i5 | 429 | 53 | 12.4 | SubName: Full=JHE-like toxin, ''Photorhabdus insecticidal re... |
| d0yqq5 | 428 | 53 | 12.4 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| c3bc84 | 419 | 52 | 12.4 | SubName: Full=Mosquitocidal toxin protein;                      |
| c3avr9 | 419 | 52 | 12.4 | SubName: Full=Mosquitocidal toxin protein;                      |
| b1qqf2 | 490 | 61 | 12.4 | SubName: Full=Toxin complex component ORF-X3;                   |
| b0y4j2 | 445 | 55 | 12.4 | SubName: Full=Toxin biosynthesis protein, putative;             |
| a4sli3 | 461 | 57 | 12.4 | SubName: Full=RTX toxin-like protein;                           |
| q9rec3 | 319 | 40 | 12.3 | SubName: Full=Shiga toxin 2 variant A-subunit; SubName: Full... |
| q9mbz8 | 319 | 40 | 12.3 | SubName: Full=Shiga toxin 2e A-subunit; SubName: Full=StxA2e... |
| q9fbi2 | 315 | 40 | 12.3 | RecName: Full=Shiga toxin subunit A; EC=3.2.2.22; Flags: Pre... |
| q9c1b9 | 447 | 55 | 12.3 | SubName: Full=T-2 toxin biosynthesis protein; SubName: Full=... |
| q93k9i | 319 | 40 | 12.3 | SubName: Full=Shiga toxin 2e A; SubName: Full=Shiga toxin 2e... |
| q93cm1 | 286 | 40 | 12.3 | RecName: Full=Toxin zeta; AltName: Full=UDP-N-acetylglucosam... |

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|--------|-----|----|------|---|
| q8x696 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin 1 A subunit; SubName: Full=Shiga t... |
| q8fpg6 | 230 | 40 | 12.3 | RecName: Full=Diphtheria toxin repressor; AltName: Full=Iron... |
| q838u8 | 487 | 60 | 12.3 | RecName: Full=NAD(+)--arginine ADP-ribosyltransferase EFV; E... |
| q7wzi8 | 313 | 40 | 12.3 | SubName: Full=Shiga toxin 1 variant A subunit;                  |
| q7w2u6 | 227 | 40 | 12.3 | SubName: Full=Pertussis toxin subunit 3;                        |
| q7vg76 | 273 | 40 | 12.3 | SubName: Full=Cytolethal distending toxin CdtB;                 |
| q7ayi8 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin 1 Stx1, A-subunit;                    |
| q7ak38 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin 1 subunit A;                          |
| q77yb9 | 315 | 40 | 12.3 | SubName: Full=Shiga-like toxin A subunit;                       |
| q779k4 | 315 | 40 | 12.3 | RecName: Full=Shiga toxin subunit A; EC=3.2.2.22; Flags: Pre... |
| q777w4 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin 1, subunit A;                         |
| q776e8 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin1 subunit A;                           |
| q6ldt4 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin-like subunit A; Flags: Precursor;     |
| q6h9w4 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin 1 subunit A;                          |
| q6dwk9 | 319 | 40 | 12.3 | SubName: Full=Shiga toxin 2 subunit A;                          |
| q6dwk7 | 319 | 40 | 12.3 | SubName: Full=Shiga toxin 2 subunit A;                          |
| q63ue0 | 471 | 58 | 12.3 | SubName: Full=Putative toxin-related secretion protein;         |
| q5xci2 | 316 | 40 | 12.3 | SubName: Full=Putative exfoliative toxin;                       |
| q5dz56 | 259 | 40 | 12.3 | SubName: Full=Toxin coregulated pilus biosynthesis protein T... |
| q57478 | 319 | 40 | 12.3 | SubName: Full=Shiga toxin 2e subunit A; SubName: Full=SlT-II... |
| q4afh7 | 208 | 40 | 12.3 | SubName: Full=AM-toxin synthetase;                              |
| q47645 | 319 | 40 | 12.3 | SubName: Full=Shiga-like toxin II; Flags: Precursor;            |
| q32gm1 | 315 | 40 | 12.3 | RecName: Full=Shiga toxin subunit A; EC=3.2.2.22; Flags: Pre... |
| q2hwu1 | 319 | 40 | 12.3 | SubName: Full=Shiga toxin 2 variant f A-subunit;                |
| q25bx4 | 319 | 40 | 12.3 | SubName: Full=Shiga toxin 2 variant e A-subunit; SubName: Fu... |
| q1pl25 | 251 | 40 | 12.3 | SubName: Full=RTX toxin;  |
| q1ely1 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin I subunit A; Flags: Precursor;        |
| q0hji0 | 238 | 40 | 12.3 | SubName: Full=Zeta toxin family protein;                        |
| q08lx7 | 182 | 40 | 12.3 | SubName: Full=Cytolethal distending toxin C;                    |
| q04868 | 273 | 40 | 12.3 | RecName: Full=Elongator complex protein 6; AltName: Full=Gam... |
| p45784 | 252 | 40 | 12.3 | RecName: Full=Type II secretion system protein N; Short=T2SS... |
| p17981 | 287 | 40 | 12.3 | RecName: Full=T-cell ecto-ADP-ribosyltransferase 1; EC=2.4.2... |
| p17260 | 313 | 40 | 12.3 | RecName: Full=Protein KRE1; AltName: Full=Killer toxin-resis... |
| p10149 | 315 | 40 | 12.3 | RecName: Full=Shiga-like toxin 1 subunit A; Short=SLT-1 A su... |
| p09331 | 280 | 40 | 12.3 | RecName: Full=Exfoliative toxin A; EC=3.4.21.-; AltName: Ful... |
| p08026 | 315 | 40 | 12.3 | RecName: Full=Shiga-like toxin 1 subunit A; Short=SLT-1 A su... |
| o94088 | 447 | 55 | 12.3 | SubName: Full=T-2 toxin biosynthesis protein;                   |
| o49163 | 357 | 44 | 12.3 | SubName: Full=NADPH HC toxin reductase;                         |
| k7rac6 | 239 | 40 | 12.3 | SubName: Full=Zeta toxin;                                       |
| k6mas4 | 414 | 51 | 12.3 | SubName: Full=Zonula occludens toxin;                           |
| k5nl26 | 414 | 51 | 12.3 | SubName: Full=Zonula occludens toxin;                           |
| k5h4b1 | 315 | 40 | 12.3 | SubName: Full=Shiga-like toxin 1 subunit A; EC=3.2.2.22;        |
| k5fxm0 | 315 | 40 | 12.3 | SubName: Full=Shiga-like toxin 1 subunit A; EC=3.2.2.22;        |
| k4xjd7 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin 1 subunit A;                          |
| k4x433 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin 1 subunit A;                          |
| k4x157 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin 1 subunit A;                          |
| k4w0t0 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin 1 subunit A;                          |
| k4vxl2 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin 1 subunit A;                          |
| k4uyv4 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin 1 subunit A;                          |
| k4uxp9 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin I subunit A;                          |
| k4uqw0 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin 1 subunit A;                          |
| k4t863 | 226 | 40 | 12.3 | SubName: Full=Pertussis toxin subunit 2;                        |
| k4t754 | 241 | 40 | 12.3 | SubName: Full=Putative toxin;                                   |
| k3umm3 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| k3ttz6 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| k3t4g9 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| k3qrw9 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| k3h152 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |

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|--------|-----|----|------|---|
| k3giq1 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| k3ffk1 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| k3f5h7 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| k3dqq7 | 315 | 40 | 12.3 | SubName: Full=Shiga-like toxin 1 subunit A; EC=3.2.2.22;        |
| k3d7t9 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| k3b7a9 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| k3axb4 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| k3a764 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| k2z6d9 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| k2ypg6 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| k2yei3 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| k2bv13 | 258 | 40 | 12.3 | SubName: Full=Zeta toxin family protein;                        |
| k0mwd9 | 241 | 40 | 12.3 | SubName: Full=Putative toxin;                                   |
| k0mpi4 | 227 | 40 | 12.3 | SubName: Full=Pertussis toxin subunit 3;                        |
| j9fuv7 | 245 | 40 | 12.3 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| j8vad4 | 276 | 40 | 12.3 | SubName: Full=Putative zeta toxin;                              |
| j7t349 | 258 | 40 | 12.3 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j7m7h6 | 301 | 40 | 12.3 | SubName: Full=Exfoliative toxin;                                |
| j7i4w4 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin 1A subunit;                           |
| j6rl54 | 134 | 40 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j6mfq0 | 463 | 57 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j5i2y1 | 134 | 40 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j4utv1 | 255 | 40 | 12.3 | SubName: Full=Mosquitocidal toxin protein;                      |
| j1v289 | 253 | 40 | 12.3 | SubName: Full=Toxin PezT;                                       |
| j1n4m1 | 253 | 40 | 12.3 | SubName: Full=Zeta toxin family protein;                        |
| j1hdd4 | 253 | 40 | 12.3 | SubName: Full=Toxin PezT;                                       |
| j1eci1 | 253 | 40 | 12.3 | SubName: Full=Zeta toxin family protein;                        |
| j0y0e8 | 129 | 40 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j0ec38 | 129 | 40 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| i9paq9 | 270 | 40 | 12.3 | SubName: Full=Zeta toxin;                                       |
| i6aja1 | 288 | 40 | 12.3 | SubName: Full=Zonula occludens toxin;                           |
| i5v6p5 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| i5ueb1 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| i5sy39 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| i5qiy5 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| i5p687 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| i5l9p6 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| i5j337 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| i5i2n7 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| i5h0k1 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| i5fac7 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| i5dtp1 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| i5drt6 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| i5dpt9 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| i4rzv5 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin 1 subunit A;                          |
| i4rw57 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin 1 subunit A;                          |
| i4qxi9 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin 1 subunit A;                          |
| i4qt46 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin 1 subunit A;                          |
| i4qfa3 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin 1 subunit A;                          |
| i4ps51 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin 1 subunit A;                          |
| i4np13 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin 1 subunit A;                          |
| i4njp7 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin 1 subunit A;                          |
| i3add7 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| i2xz62 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| i2xh57 | 319 | 40 | 12.3 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| i2v9e0 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| i2uri7 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| i2u8r2 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |

|        |     |    |      |   |
|--------|-----|----|------|---|
| i2trs0 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| i2s7a2 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| i2rqq0 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| i2rl67 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| i1zxm5 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin I subunit A;                          |
| i0xd30 | 242 | 40 | 12.3 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| i0b576 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin 1 subunit A;                          |
| i0b573 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin 1 subunit A;                          |
| h9cnk5 | 177 | 40 | 12.3 | SubName: Full=Lipocalin-like toxin;                             |
| h9cjf9 | 486 | 60 | 12.3 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| h7qnp0 | 253 | 40 | 12.3 | SubName: Full=Zeta toxin family protein;                        |
| h6nu24 | 284 | 40 | 12.3 | SubName: Full=Pertussis toxin, subunit 1 subfamily;             |
| h5hi69 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| h5dy30 | 227 | 40 | 12.3 | SubName: Full=Antitoxin of the YeeV-YeeU toxin-antitoxin sys... |
| h5du59 | 269 | 40 | 12.3 | SubName: Full=Toxin B domain protein;                           |
| h4yrs6 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| h4mnz6 | 228 | 40 | 12.3 | SubName: Full=Toxin B domain protein;                           |
| h4iay7 | 248 | 40 | 12.3 | SubName: Full=Zonular occludens toxin family protein;           |
| h4hfc9 | 241 | 40 | 12.3 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4en48 | 241 | 40 | 12.3 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4dz25 | 241 | 40 | 12.3 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4ds01 | 241 | 40 | 12.3 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4d9h0 | 241 | 40 | 12.3 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4bpq6 | 241 | 40 | 12.3 | SubName: Full=Toxin beta-grasp domain protein;                  |
| h4b531 | 232 | 40 | 12.3 | SubName: Full=Enterotoxin-like toxin;                           |
| h4b0z9 | 241 | 40 | 12.3 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4atj2 | 241 | 40 | 12.3 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4ake9 | 241 | 40 | 12.3 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4ac75 | 241 | 40 | 12.3 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h3yqt4 | 242 | 40 | 12.3 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3yfy6 | 242 | 40 | 12.3 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3y022 | 242 | 40 | 12.3 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3xuu7 | 242 | 40 | 12.3 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3tx75 | 280 | 40 | 12.3 | SubName: Full=Exfoliative toxin A; EC=3.4.21.-;                 |
| h1ste7 | 240 | 40 | 12.3 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h0edz9 | 236 | 40 | 12.3 | SubName: Full=Putative HC-toxin efflux carrier TOXA;            |
| h0dj76 | 182 | 40 | 12.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| h0cnd9 | 280 | 40 | 12.3 | SubName: Full=Exfoliative toxin A; EC=3.4.21.-;                 |
| g8zd70 | 312 | 40 | 12.3 | SubName: Full=Putative MosT toxin component;                    |
| g8zcz1 | 312 | 40 | 12.3 | SubName: Full=Putative MosT toxin component;                    |
| g8zcx9 | 312 | 40 | 12.3 | SubName: Full=Putative MosT toxin component;                    |
| g8vra5 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| g8vev2 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| g8vab2 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| g7y1c5 | 291 | 40 | 12.3 | SubName: Full=HC-toxin synthetase;                              |
| g7v3i0 | 211 | 40 | 12.3 | SubName: Full=Zeta toxin family protein;                        |
| g7u8q0 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| g7j427 | 399 | 49 | 12.3 | SubName: Full=Multidrug and toxin extrusion protein;            |
| g7f019 | 320 | 40 | 12.3 | SubName: Full=Exfoliative toxin A/B;                            |
| g6c780 | 341 | 42 | 12.3 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| g4c137 | 238 | 40 | 12.3 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| g2x6g5 | 326 | 40 | 12.3 | SubName: Full=Zeta toxin family protein;                        |
| g2cjh6 | 319 | 40 | 12.3 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| g2b407 | 246 | 40 | 12.3 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| g2a0g5 | 315 | 40 | 12.3 | SubName: Full=Shiga-like toxin 1 subunit A; EC=3.2.2.22;        |
| g1yy42 | 315 | 40 | 12.3 | SubName: Full=Shiga-like toxin 1 subunit A; EC=3.2.2.22;        |
| g1yrf0 | 319 | 40 | 12.3 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| g0ics9 | 299 | 40 | 12.3 | SubName: Full=Exfoliative toxin;                                |

|        |     |    |      |   |
|--------|-----|----|------|---|
| g0fda0 | 319 | 40 | 12.3 | SubName: Full=Shiga-like toxin 2 subunit A;                     |
| g0dw74 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| f9xw44 | 273 | 40 | 12.3 | SubName: Full=Cytolethal distending toxin A;                    |
| f9rba9 | 236 | 40 | 12.3 | SubName: Full=Toxin coregulated pilus biosynthesis protein T... |
| f9mnw1 | 183 | 40 | 12.3 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| f9l310 | 279 | 40 | 12.3 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f9kh92 | 240 | 40 | 12.3 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f9jnz8 | 254 | 40 | 12.3 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f9h053 | 342 | 42 | 12.3 | SubName: Full=Putative zeta toxin, P-loop nucleoside triphos... |
| f5wgd2 | 242 | 40 | 12.3 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f5w6u8 | 240 | 40 | 12.3 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f5txf6 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| f5tl32 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| f5i5x7 | 414 | 51 | 12.3 | SubName: Full=Zonula occludens toxin;                           |
| f5i008 | 414 | 51 | 12.3 | SubName: Full=Zonula occludens toxin;                           |
| f4xgm1 | 185 | 40 | 12.3 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| f4u8i7 | 440 | 54 | 12.3 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| f4tt83 | 260 | 40 | 12.3 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| f3ux10 | 256 | 40 | 12.3 | SubName: Full=Zeta-toxin;                                       |
| f3ly88 | 281 | 40 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| f3d0f8 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| f3cvq7 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| f3cm25 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| f2gb24 | 239 | 40 | 12.3 | SubName: Full=Zeta toxin;                                       |
| f1vgh3 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| f1v923 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| f1v296 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| f1uwn4 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| f1unb9 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| f1ufc9 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| f0u573 | 455 | 56 | 12.3 | SubName: Full=Toxin biosynthesis protein;                       |
| f0gt21 | 281 | 40 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| f0gn05 | 281 | 40 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| f0fcq4 | 251 | 40 | 12.3 | SubName: Full=Zeta-toxin;                                       |
| f0epw6 | 287 | 40 | 12.3 | SubName: Full=Zeta-toxin;                                       |
| e9ux98 | 291 | 40 | 12.3 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| e9us95 | 183 | 40 | 12.3 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| e9uqy4 | 208 | 40 | 12.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| e9fnx7 | 189 | 40 | 12.3 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e9e8q4 | 414 | 51 | 12.3 | SubName: Full=Toxin biosynthesis protein, putative;             |
| e8zn10 | 315 | 40 | 12.3 | SubName: Full=Exfoliative toxin A;                              |
| e8le92 | 239 | 40 | 12.3 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| e7n9j6 | 414 | 51 | 12.3 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| e7mwz3 | 251 | 40 | 12.3 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| e7mtu0 | 242 | 40 | 12.3 | SubName: Full=Staphylococcal toxin, beta-grasp domain protei... |
| e7mgz1 | 242 | 40 | 12.3 | SubName: Full=Staphylococcal toxin, beta-grasp domain protei... |
| e7ij10 | 315 | 40 | 12.3 | SubName: Full=Shiga-like toxin 1 subunit A; EC=3.2.2.22;        |
| e7h8m7 | 315 | 40 | 12.3 | SubName: Full=Shiga-like toxin 1 subunit A; EC=3.2.2.22;        |
| e6l7p0 | 265 | 40 | 12.3 | SubName: Full=Cytolethal distending toxin B;                    |
| e6ed02 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e6dz43 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e6dui6 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e6di58 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e6db54 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e6d896 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e6cwe7 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e6cuy6 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e6cg15 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |

|        |     |    |      |   |
|--------|-----|----|------|---|
| e6ccz3 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e6c1r7 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e6bva8 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e5xhb3 | 209 | 40 | 12.3 | SubName: Full=Xre family Toxin-antitoxin system;                |
| e5ray3 | 241 | 40 | 12.3 | SubName: Full=Staphylococcal/Streptococcal toxin, beta-grasp... |
| e5ray0 | 319 | 40 | 12.3 | SubName: Full=Alpha-hemolysin (Alpha-toxin) (Alpha-HL);         |
| e4w7w5 | 319 | 40 | 12.3 | SubName: Full=Shiga toxin 2 A-subunit;                          |
| e4hx43 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4hwu1 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4hch5 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4h5n3 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4gys2 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4gr21 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4gm32 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4gck4 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4g194 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4fvg3 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4fni4 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4fgh6 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4f8b5 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4eyr0 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4esp8 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4en44 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4ebf6 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4e9n0 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4dq50 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4dh93 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4dbk6 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4d5g9 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4cx03 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4cua8 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4cj36 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4cbk7 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4c2f3 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4bwp5 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4bp81 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4bdd9 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4b197 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4ata8 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4am04 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4a7y4 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e3zmu7 | 381 | 47 | 12.3 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e3r4t7 | 159 | 40 | 12.3 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e3ge42 | 307 | 40 | 12.3 | SubName: Full=Toxin-antitoxin system;                           |
| e3c1q5 | 281 | 40 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e3c0r1 | 281 | 40 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e3bvwo | 281 | 40 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e3bsq9 | 281 | 40 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e2z4w7 | 134 | 40 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e2ymd1 | 239 | 40 | 12.3 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| e2yc23 | 239 | 40 | 12.3 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| e2xh95 | 315 | 40 | 12.3 | SubName: Full=Shiga-like toxin 1 subunit A; EC=3.2.2.22;        |
| e2pik7 | 238 | 40 | 12.3 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| e2cst8 | 416 | 51 | 12.3 | SubName: Full=RTX-III toxin determinant A from serotype 2;      |
| e1nxd1 | 281 | 40 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e1nr52 | 281 | 40 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e1nmd1 | 281 | 40 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e1nke6 | 281 | 40 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |

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|--------|-----|----|------|---|
| e1nfk1 | 281 | 40 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e1mcx0 | 237 | 40 | 12.3 | SubName: Full=Putative diphtheria toxin repressor;              |
| e1lbn6 | 256 | 40 | 12.3 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| e1hls1 | 193 | 40 | 12.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| e1gxx0 | 514 | 63 | 12.3 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| e0sng2 | 439 | 54 | 12.3 | SubName: Full=Toxin;  |
| e0dfe6 | 227 | 40 | 12.3 | SubName: Full=Diphtheria toxin repressor;                       |
| d9xzt7 | 218 | 40 | 12.3 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9xzi5 | 194 | 40 | 12.3 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9xk82 | 306 | 40 | 12.3 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9wuc3 | 283 | 40 | 12.3 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9wqw2 | 277 | 40 | 12.3 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9wpy5 | 283 | 40 | 12.3 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9wmw3 | 287 | 40 | 12.3 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9wii8 | 283 | 40 | 12.3 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9wbq1 | 264 | 40 | 12.3 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d8c4r8 | 193 | 40 | 12.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d8b7p3 | 193 | 40 | 12.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d8alk1 | 193 | 40 | 12.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d7x0x5 | 440 | 54 | 12.3 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d7ixq0 | 192 | 40 | 12.3 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d7ied8 | 293 | 40 | 12.3 | SubName: Full=Insecticidal toxin complex protein TccC6;         |
| d7iag2 | 305 | 40 | 12.3 | SubName: Full=Toxin-antitoxin system, toxin component;          |
| d7ark2 | 202 | 40 | 12.3 | SubName: Full=Transcriptional modulator of MazE/toxin, MazF;... |
| d6m0s8 | 321 | 40 | 12.3 | SubName: Full=Leukocidin/hemolysin toxin family protein;        |
| d61er7 | 250 | 40 | 12.3 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| d618i7 | 223 | 40 | 12.3 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d6kaj1 | 286 | 40 | 12.3 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d6k781 | 218 | 40 | 12.3 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d6k4k2 | 289 | 40 | 12.3 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d6k021 | 275 | 40 | 12.3 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d6jza3 | 282 | 40 | 12.3 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d6hcb3 | 321 | 40 | 12.3 | SubName: Full=Leukocidin/hemolysin toxin family protein;        |
| d5u624 | 294 | 40 | 12.3 | SubName: Full=Toxin A; Flags: Precursor;                        |
| d4xia6 | 180 | 40 | 12.3 | SubName: Full=GNAT family toxin-antitoxin system; EC=2.3.1.-... |
| d4wta1 | 257 | 40 | 12.3 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| d4wae9 | 257 | 40 | 12.3 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| d4vme6 | 257 | 40 | 12.3 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| d4mgr0 | 287 | 40 | 12.3 | SubName: Full=Zeta toxin;                                       |
| d4hbb4 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| d4ers3 | 239 | 40 | 12.3 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| d4eq28 | 239 | 40 | 12.3 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| d4cwb0 | 271 | 40 | 12.3 | SubName: Full=Zeta-toxin;                                       |
| d3pi97 | 272 | 40 | 12.3 | SubName: Full=Kunitz/BPTI-like toxin;                           |
| d3pgm3 | 256 | 40 | 12.3 | SubName: Full=Kunitz/BPTI-like toxin;                           |
| d3mn22 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| d3mev2 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| d3app9 | 333 | 41 | 12.3 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| d3af12 | 266 | 40 | 12.3 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| d2utu2 | 262 | 40 | 12.3 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| d2n6d5 | 319 | 40 | 12.3 | SubName: Full=Alpha-hemolysin (Alpha-toxin) (Alpha-HL);         |
| d2fgc4 | 321 | 40 | 12.3 | SubName: Full=Leukocidin/hemolysin toxin family protein;        |
| d2f9y4 | 321 | 40 | 12.3 | SubName: Full=Leukocidin/hemolysin toxin family protein;        |
| d1yie7 | 262 | 40 | 12.3 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| d1yeh4 | 569 | 70 | 12.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| d1qjp5 | 321 | 40 | 12.3 | SubName: Full=Leukocidin/hemolysin toxin family protein;        |
| d1q723 | 321 | 40 | 12.3 | SubName: Full=Leukocidin/hemolysin toxin family protein;        |
| d0yp07 | 237 | 40 | 12.3 | SubName: Full=Diphtheria toxin repressor;                       |



|        |     |    |      |   |
|--------|-----|----|------|---|
| d0ki10 | 235 | 40 | 12.3 | SubName: Full=Zeta toxin family protein;                        |
| d0h7l2 | 399 | 49 | 12.3 | SubName: Full=Zona occludens toxin;                             |
| d0cux1 | 480 | 59 | 12.3 | SubName: Full=Putative RTX toxins and related Ca2+-binding p... |
| c9qi56 | 232 | 40 | 12.3 | SubName: Full=Cholera toxin transcriptional activator;          |
| c9m739 | 317 | 40 | 12.3 | SubName: Full=Putative Zeta toxin of the postsegregational k... |
| c8xtg4 | 322 | 40 | 12.3 | SubName: Full=Necrotic enteritis toxin B; SubName: Full=NetB... |
| c8uej9 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin 1 subunit A;                          |
| c8u110 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin 1 subunit A;                          |
| c8tpy4 | 318 | 40 | 12.3 | SubName: Full=Shiga toxin 1 subunit A;                          |
| c8tcb1 | 192 | 40 | 12.3 | SubName: Full=Fic family toxin-antitoxin system;                |
| c8t9u4 | 440 | 54 | 12.3 | SubName: Full=HipA family toxin-antitoxin system;               |
| c8mig4 | 241 | 40 | 12.3 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8m8z1 | 241 | 40 | 12.3 | SubName: Full=Toxin beta-gncated TagFrasp domain-containing ... |
| c8m2g3 | 241 | 40 | 12.3 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8lkq0 | 241 | 40 | 12.3 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8l4c5 | 241 | 40 | 12.3 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c7tqm6 | 319 | 40 | 12.3 | SubName: Full=Shiga toxin 2e subunit A;                         |
| c7tqf8 | 319 | 40 | 12.3 | SubName: Full=Shiga toxin 2e subunit A;                         |
| c7tqe6 | 319 | 40 | 12.3 | SubName: Full=Shiga toxin 2e subunit A;                         |
| c5jls1 | 277 | 40 | 12.3 | SubName: Full=Toxin biosynthesis ketoreductase;                 |
| c4tiq6 | 258 | 40 | 12.3 | SubName: Full=Cytolethal distending toxin A;                    |
| c3wqw5 | 296 | 40 | 12.3 | SubName: Full=Zeta-toxin;                                       |
| c2p4i4 | 249 | 40 | 12.3 | SubName: Full=Zeta toxin;                                       |
| c2na44 | 249 | 40 | 12.3 | SubName: Full=Zeta toxin;                                       |
| c2i0g6 | 464 | 57 | 12.3 | SubName: Full=Zona occludens toxin;                             |
| c0qxe9 | 267 | 40 | 12.3 | SubName: Full=Toxin A;  |
| b9kdq2 | 259 | 40 | 12.3 | SubName: Full=Cytolethal distending toxin, subunit CdtB;        |
| b7wu13 | 399 | 49 | 12.3 | SubName: Full=Zonular occludens toxin;                          |
| b6zz03 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| b6dz86 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin 1 subunit A;                          |
| b5gk50 | 237 | 40 | 12.3 | SubName: Full=Toxin-antitoxin system, antitoxin component;      |
| b5fbz3 | 293 | 40 | 12.3 | SubName: Full=Toxin transcriptional activator ToxR;             |
| b3gk88 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin 1 subunit A;                          |
| b3bqk2 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| b3b832 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| b2i3u7 | 202 | 40 | 12.3 | SubName: Full=Zeta toxin family protein;                        |
| b1c637 | 203 | 40 | 12.3 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| a8ulg6 | 322 | 40 | 12.3 | SubName: Full=Necrotic enteritis toxin B; SubName: Full=NetB... |
| a8s861 | 256 | 40 | 12.3 | SubName: Full=Toxin-antitoxin system, toxin component, MazF ... |
| a8b1h9 | 315 | 40 | 12.3 | SubName: Full=Shiga toxin 1 subunit A; SubName: Full=Shiga t... |
| a8ax66 | 298 | 40 | 12.3 | SubName: Full=Exfoliative toxin A;                              |
| a6u0y6 | 241 | 40 | 12.3 | SubName: Full=Toxin beta-grasp domain protein; Flags: Precur... |
| a5w815 | 241 | 40 | 12.3 | SubName: Full=Zeta toxin family protein;                        |
| a5l784 | 172 | 40 | 12.3 | SubName: Full=Toxin resistance protein;                         |
| a5is52 | 241 | 40 | 12.3 | SubName: Full=Toxin, beta-grasp domain protein; Flags: Precu... |
| a5f097 | 399 | 49 | 12.3 | SubName: Full=Zona occludens toxin;                             |
| a4f2c4 | 273 | 40 | 12.3 | SubName: Full=Cytolethal distending toxin A;                    |
| a3eid1 | 278 | 40 | 12.3 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| a2bjn5 | 185 | 40 | 12.3 | RecName: Full=Putative ribonuclease VapC; Short=Putative RNA... |
| a1kxb9 | 280 | 40 | 12.3 | SubName: Full=Exfoliative toxin A;                              |
| a1kx51 | 280 | 40 | 12.3 | SubName: Full=Exfoliative toxin A;                              |
| a1et22 | 399 | 49 | 12.3 | SubName: Full=Zona occludens toxin;                             |
| a0rm02 | 182 | 40 | 12.3 | SubName: Full=Cytolethal distending toxin A/C family;           |
| q8efq1 | 501 | 61 | 12.2 | SubName: Full=Multidrug and toxin efflux protein MATE family... |
| q7wuh3 | 427 | 52 | 12.2 | SubName: Full=Binary ADP-ribosyltransferase CDT toxin;          |
| q4lau4 | 442 | 54 | 12.2 | SubName: Full=Putative zonula occludens toxin;                  |
| q1igt2 | 458 | 56 | 12.2 | SubName: Full=Putative type I toxin efflux membrane fusion p... |
| k8w4t1 | 336 | 41 | 12.2 | SubName: Full=Toxin;  |

|        |     |    |      |   |
|--------|-----|----|------|---|
| k5k2c1 | 433 | 53 | 12.2 | SubName: Full=TcdB toxin N-terminal helical domain protein;     |
| k5izl7 | 433 | 53 | 12.2 | SubName: Full=TcdB toxin N-terminal helical domain protein;     |
| k5hvg2 | 433 | 53 | 12.2 | SubName: Full=TcdB toxin N-terminal helical domain protein;     |
| k5gh15 | 433 | 53 | 12.2 | SubName: Full=TcdB toxin N-terminal helical domain protein;     |
| k5g408 | 433 | 53 | 12.2 | SubName: Full=TcdB toxin N-terminal helical domain protein;     |
| k5f1z4 | 433 | 53 | 12.2 | SubName: Full=TcdB toxin N-terminal helical domain protein;     |
| j8xmd2 | 361 | 44 | 12.2 | SubName: Full=Zonula occludens toxin family protein;            |
| i0dpu2 | 400 | 49 | 12.2 | SubName: Full=Toxin XaxA;                                       |
| h4y0r7 | 345 | 42 | 12.2 | SubName: Full=Zonular occludens toxin family protein;           |
| h1s1l9 | 360 | 44 | 12.2 | SubName: Full=Zonular occludens toxin;                          |
| g9asi0 | 369 | 45 | 12.2 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| f9n0y9 | 360 | 44 | 12.2 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| f4siu8 | 459 | 56 | 12.2 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| f1z7n2 | 336 | 41 | 12.2 | SubName: Full=Rhizobiocin/RTX toxin and hemolysin-type calci... |
| e9ea21 | 361 | 44 | 12.2 | SubName: Full=Killer toxin sensitivity protein (Iki1), putat... |
| e9e0w8 | 419 | 51 | 12.2 | SubName: Full=Toxin biosynthesis protein, putative;             |
| e8pja3 | 360 | 44 | 12.2 | SubName: Full=Zeta toxin family protein;                        |
| e6itw7 | 393 | 48 | 12.2 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e6evc6 | 393 | 48 | 12.2 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e6emj7 | 393 | 48 | 12.2 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e4jl17 | 329 | 40 | 12.2 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e4jgb3 | 393 | 48 | 12.2 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e4jbq1 | 329 | 40 | 12.2 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e4j8y8 | 393 | 48 | 12.2 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e4ixi1 | 393 | 48 | 12.2 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e4imv7 | 393 | 48 | 12.2 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e4ih95 | 393 | 48 | 12.2 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e4ig18 | 329 | 40 | 12.2 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e4i9w5 | 329 | 40 | 12.2 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e4i7b3 | 393 | 48 | 12.2 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e0hba4 | 393 | 48 | 12.2 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| d2fn02 | 327 | 40 | 12.2 | SubName: Full=Leukocidin/hemolysin toxin family protein;        |
| d1vv31 | 360 | 44 | 12.2 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d0ys52 | 451 | 55 | 12.2 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d0fwh3 | 426 | 52 | 12.2 | SubName: Full=Botulinum toxin-like protein;                     |
| c5jv20 | 418 | 51 | 12.2 | SubName: Full=Toxin-insensitive protein;                        |
| c4l4z6 | 352 | 43 | 12.2 | SubName: Full=Membrane protein putative toxin regulator-like... |
| c1fuh3 | 490 | 60 | 12.2 | SubName: Full=Toxin complex component ORF-X3;                   |
| b0luq8 | 370 | 45 | 12.2 | SubName: Full=Binary toxin A;                                   |
| a3y550 | 441 | 54 | 12.2 | SubName: Full=Putative toxin secretion transmembrane protein... |
| a3sud4 | 418 | 51 | 12.2 | SubName: Full=Putative toxin secretion transmembrane protein... |
| q90391 | 414 | 50 | 12.1 | RecName: Full=Snake venom metalloproteinase atrolysin-B; Sho... |
| q83xj1 | 464 | 56 | 12.1 | SubName: Full=Insecticidal toxin complex protein TcbA;          |
| q7xig2 | 340 | 41 | 12.1 | SubName: Full=Os07g0602000 protein; SubName: Full=Putative N... |
| q7wzg4 | 330 | 40 | 12.1 | SubName: Full=Exfoliative toxin;                                |
| q48i06 | 438 | 53 | 12.1 | SubName: Full=Zona occludens toxin, putative;                   |
| q46220 | 454 | 55 | 12.1 | SubName: Full=Iota toxin component Ia; Flags: Precursor;        |
| q1igt4 | 445 | 54 | 12.1 | SubName: Full=Putative type I toxin efflux outer membrane pr... |
| q0tv31 | 398 | 48 | 12.1 | RecName: Full=Phospholipase C; Short=PLC; EC=3.1.4.3; AltNam... |
| o82881 | 346 | 42 | 12.1 | RecName: Full=mRNA endoribonuclease LsoA; EC=3.1.-.-; AltNam... |
| j4qeb4 | 339 | 41 | 12.1 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| j0upb3 | 420 | 51 | 12.1 | SubName: Full=JHE-like toxin PirB;                              |
| h7gb48 | 569 | 69 | 12.1 | SubName: Full=Toxin secretion/phage lysis holin;                |
| h1lvt7 | 454 | 55 | 12.1 | SubName: Full=Toxin-antitoxin system, toxin component domain... |
| g5svl0 | 348 | 42 | 12.1 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| g2j4u6 | 389 | 47 | 12.1 | SubName: Full=Zonula occludens toxin family protein;            |
| g0slw5 | 503 | 61 | 12.1 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| f9ry20 | 379 | 46 | 12.1 | SubName: Full=Zonular occludens toxin;                          |

|        |     |    |      |   |
|--------|-----|----|------|---|
| f5l1p8 | 339 | 41 | 12.1 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| f3xp80 | 348 | 42 | 12.1 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| f3ebi8 | 438 | 53 | 12.1 | SubName: Full=Zona occludens toxin;                             |
| f0p3j0 | 330 | 40 | 12.1 | SubName: Full=Exfoliative toxin;                                |
| f0bkg7 | 388 | 47 | 12.1 | SubName: Full=Zonular occludens toxin (Zot);                    |
| e9tnx7 | 364 | 44 | 12.1 | SubName: Full=Zonula occludens toxin;                           |
| e7hia7 | 480 | 58 | 12.1 | SubName: Full=Toxin B domain protein;                           |
| e1ywp8 | 347 | 42 | 12.1 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| e1tq15 | 364 | 44 | 12.1 | SubName: Full=Possible toxin regulator;                         |
| d8bb65 | 364 | 44 | 12.1 | SubName: Full=Zonula occludens toxin;                           |
| d7vd09 | 364 | 44 | 12.1 | SubName: Full=Possible toxin regulator;                         |
| d3hzb6 | 380 | 46 | 12.1 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d0whw8 | 371 | 45 | 12.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, A... |
| d0m8b3 | 461 | 56 | 12.1 | SubName: Full=Zona occludens toxin;                             |
| d0fpk2 | 488 | 59 | 12.1 | SubName: Full=General secretion pathway protein E (Type II t... |
| c9psk6 | 428 | 52 | 12.1 | SubName: Full=Xre family toxin-antitoxin system;                |
| b5blw1 | 330 | 40 | 12.1 | SubName: Full=Exfoliative toxin;                                |
| b3hxx8 | 364 | 44 | 12.1 | SubName: Full=Putative uncharacterized protein; SubName: Ful... |
| b1bsy1 | 454 | 55 | 12.1 | SubName: Full=Tota toxin component Ia;                          |
| a8sjw5 | 372 | 45 | 12.1 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| a3elq4 | 462 | 56 | 12.1 | SubName: Full=Toxin secretion transporter, putative;            |
| q9s676 | 283 | 39 | 12.0 | SubName: Full=CdtB; SubName: Full=Cytolethal distending toxi... |
| q9gv72 | 450 | 54 | 12.0 | RecName: Full=Toxin CrTX-A; AltName: Full=CRT-1; AltName: Fu... |
| q9a061 | 302 | 39 | 12.0 | SubName: Full=Putative exfoliative toxin;                       |
| q93md0 | 265 | 39 | 12.0 | SubName: Full=Beta2-toxin;                                      |
| q8vv65 | 319 | 39 | 12.0 | SubName: Full=Shiga toxin 2 A-subunit;                          |
| q8p1b0 | 302 | 39 | 12.0 | SubName: Full=Putative exfoliative toxin;                       |
| q8n5y8 | 322 | 39 | 12.0 | RecName: Full=Mono [ADP-ribose] polymerase PARP16; EC=2.4.2.... |
| q8l170 | 315 | 39 | 12.0 | SubName: Full=Shiga toxin 1 A subunit;                          |
| q8k7u0 | 302 | 39 | 12.0 | SubName: Full=Putative exfoliative toxin;                       |
| q8k0h1 | 567 | 68 | 12.0 | RecName: Full=Multidrug and toxin extrusion protein 1; Short... |
| q8gnj7 | 273 | 39 | 12.0 | SubName: Full=Exfoliative toxin ExhA;                           |
| q8eix3 | 433 | 52 | 12.0 | SubName: Full=Toxin-antitoxin system toxin HipA family;         |
| q7wzi7 | 315 | 39 | 12.0 | SubName: Full=Shiga toxin 1 variant A subunit;                  |
| q7wuf4 | 319 | 39 | 12.0 | SubName: Full=Shiga-like toxin IIe variant subunit A;           |
| q7wdu4 | 227 | 39 | 12.0 | SubName: Full=Pertussis toxin subunit 3;                        |
| q7n731 | 451 | 54 | 12.0 | SubName: Full=RTX toxin ABC transporter protein (MFP) RtxD;     |
| q6zje8 | 341 | 41 | 12.0 | SubName: Full=Os07g0598000 protein; SubName: Full=Putative N... |
| q6niz7 | 204 | 39 | 12.0 | SubName: Full=Putative diphtheria toxin repressor 2;            |
| q5wpv7 | 319 | 39 | 12.0 | SubName: Full=Shiga toxin 2g subunit A; SubName: Full=Verocy... |
| q5mq75 | 265 | 39 | 12.0 | SubName: Full=Beta2 toxin;                                      |
| q5jhe5 | 160 | 39 | 12.0 | RecName: Full=Putative ribonuclease VapC; Short=Putative RNA... |
| q4wa37 | 341 | 41 | 12.0 | SubName: Full=Toxin biosynthesis peroxidase, putative; EC=1.... |
| q4hru0 | 265 | 39 | 12.0 | SubName: Full=Cytolethal distending toxin B;                    |
| q46668 | 258 | 39 | 12.0 | RecName: Full=Cytolethal distending toxin subunit A; Short=C... |
| q3hr44 | 258 | 39 | 12.0 | SubName: Full=Truncated alpha toxin;                            |
| q3dqk9 | 305 | 39 | 12.0 | SubName: Full=Exfoliative toxin A;                              |
| q1elx9 | 315 | 39 | 12.0 | SubName: Full=Shiga toxin I subunit A; Flags: Precursor;        |
| q0vc22 | 316 | 39 | 12.0 | RecName: Full=Ecto-ADP-ribosyltransferase 5; EC=2.4.2.31; A1... |
| q05938 | 292 | 39 | 12.0 | RecName: Full=Cholera toxin homolog transcriptional activato... |
| q04gu1 | 321 | 39 | 12.0 | SubName: Full=Predicted membrane protein, putative toxin reg... |
| q03qw3 | 321 | 39 | 12.0 | SubName: Full=VIP2 A family of actin-ADP-ribosylating toxin;... |
| p52129 | 357 | 43 | 12.0 | RecName: Full=mRNA endoribonuclease LS; EC=3.1.-.-; AltName:... |
| p34253 | 313 | 39 | 12.0 | RecName: Full=Protein KTI12; AltName: Full=Gamma-toxin targe... |
| o32587 | 181 | 39 | 12.0 | SubName: Full=Cytolethal distending toxin C; SubName: Full=C... |
| o32586 | 269 | 39 | 12.0 | SubName: Full=Cytolethal distending toxin B; SubName: Full=C... |
| k8zcv0 | 341 | 41 | 12.0 | SubName: Full=Zonular occludens toxin family protein;           |
| k6htw8 | 247 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |

|        |     |    |      |   |
|--------|-----|----|------|---|
| k4z9z7 | 301 | 39 | 12.0 | SubName: Full=Insecticidal toxin complex protein;               |
| k4u747 | 227 | 39 | 12.0 | SubName: Full=Pertussis toxin subunit 3;                        |
| k3hq53 | 269 | 39 | 12.0 | SubName: Full=Cytolethal distending toxin subunit B; EC=3.1.... |
| k1wrt5 | 501 | 60 | 12.0 | SubName: Full=Toxin biosynthesis cytochrome P450 monooxygena... |
| k1ss91 | 290 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| k0g684 | 308 | 39 | 12.0 | SubName: Full=35.8-kilodalton mosquitocidal toxin;              |
| j9y368 | 474 | 57 | 12.0 | SubName: Full=RTX toxin;  |
| j9bpx2 | 177 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| j6yyl2 | 297 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| j6xnt9 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| j6r922 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| j6r6s7 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| j6qi15 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| j6qhn7 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| j6q2y3 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| j6pq00 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| j6naq3 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| j6n7z0 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| j6g1m8 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| j6egi7 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| j6dex6 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| j6czt4 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| j6cp86 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| j5yzh8 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| j5dn65 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| j5bjz7 | 259 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| j5ais1 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| j4x295 | 280 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| j4ugu1 | 160 | 39 | 12.0 | SubName: Full=Toxin ToxN, type III toxin-antitoxin system;      |
| j3jkh9 | 171 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| j3fv33 | 302 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| j3fks5 | 243 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| j3a8h9 | 195 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| j2tfn8 | 302 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| j1qr06 | 232 | 39 | 12.0 | SubName: Full=Diphtheria toxin repressor;                       |
| j1gv35 | 270 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| j0w8b6 | 253 | 39 | 12.0 | SubName: Full=Zeta toxin family protein;                        |
| j0npz9 | 172 | 39 | 12.0 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j0lsk6 | 341 | 41 | 12.0 | SubName: Full=Zonular occludens toxin family protein;           |
| i7iw01 | 245 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| i7c513 | 326 | 39 | 12.0 | SubName: Full=Zeta toxin family protein;                        |
| i5pdi9 | 269 | 39 | 12.0 | SubName: Full=Cytolethal distending toxin subunit B; EC=3.1.... |
| i4k1f8 | 172 | 39 | 12.0 | SubName: Full=RTX toxin acyltransferase family protein; EC=2... |
| i3tk64 | 524 | 63 | 12.0 | SubName: Full=Rhizobiocin/RTX toxin and hemolysin-type calci... |
| i3i257 | 302 | 39 | 12.0 | SubName: Full=Exfoliative toxin;                                |
| i3hzu3 | 151 | 39 | 12.0 | SubName: Full=Toxin secretion/phage lysis holin family prote... |
| i2t6v2 | 269 | 39 | 12.0 | SubName: Full=Cytolethal distending toxin subunit B; EC=3.1.... |
| i2rhk1 | 232 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| i2r9w7 | 319 | 39 | 12.0 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| i2nlz1 | 334 | 40 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| i0vks8 | 269 | 39 | 12.0 | SubName: Full=Type III cytolethal distending toxin protein C... |
| i0gvi9 | 408 | 49 | 12.0 | SubName: Full=Putative HipA-like toxin protein;                 |
| h8nyb5 | 509 | 61 | 12.0 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| h8f766 | 302 | 39 | 12.0 | SubName: Full=Exfoliative toxin A;                              |
| h7ynn3 | 265 | 39 | 12.0 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7wtz6 | 190 | 39 | 12.0 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7vjd7 | 190 | 39 | 12.0 | SubName: Full=Cytolethal distending toxin, subunit CdtC;        |
| h7vcp6 | 190 | 39 | 12.0 | SubName: Full=Cytolethal distending toxin, subunit CdtC;        |

|        |     |    |      |   |
|--------|-----|----|------|---|
| h7vb43 | 190 | 39 | 12.0 | SubName: Full=Cytolethal distending toxin, subunit CdtC;        |
| h7r3i8 | 190 | 39 | 12.0 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7ees5 | 182 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| h4rsk5 | 435 | 52 | 12.0 | SubName: Full=Toxin B domain protein;                           |
| h4p1p3 | 269 | 39 | 12.0 | SubName: Full=Cytolethal distending toxin subunit B; EC=3.1.... |
| h4hc85 | 232 | 39 | 12.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4h4u2 | 232 | 39 | 12.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4gxd0 | 232 | 39 | 12.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4gm60 | 232 | 39 | 12.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4fsg6 | 269 | 39 | 12.0 | SubName: Full=Cytolethal distending toxin subunit CdtB;         |
| h4eua1 | 232 | 39 | 12.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4ep55 | 232 | 39 | 12.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4dx50 | 232 | 39 | 12.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4dp66 | 232 | 39 | 12.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4dez4 | 232 | 39 | 12.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4d7x3 | 232 | 39 | 12.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4csp1 | 232 | 39 | 12.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4c3z7 | 232 | 39 | 12.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4bvg0 | 232 | 39 | 12.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4bm64 | 232 | 39 | 12.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4bdy6 | 232 | 39 | 12.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4ayx1 | 232 | 39 | 12.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4ari7 | 232 | 39 | 12.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4ahw5 | 232 | 39 | 12.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4aa79 | 232 | 39 | 12.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4a409 | 241 | 39 | 12.0 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h3yca3 | 164 | 39 | 12.0 | SubName: Full=Toxin, OB domain protein;                         |
| h3tsb4 | 251 | 39 | 12.0 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3sng7 | 493 | 59 | 12.0 | SubName: Full=Toxin complex component ORF-X3;                   |
| h3s3q0 | 232 | 39 | 12.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h3knb6 | 319 | 39 | 12.0 | SubName: Full=Zonular occludens toxin family protein;           |
| h1t1u2 | 251 | 39 | 12.0 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h0udd3 | 317 | 39 | 12.0 | SubName: Full=Clostridium epsilon toxin ETX/Bacillus mosquit... |
| h0kfb6 | 283 | 39 | 12.0 | SubName: Full=Cytolethal distending toxin subunit CdtB;         |
| h0ezn4 | 358 | 43 | 12.0 | SubName: Full=Putative HC-toxin efflux carrier TOXA;            |
| h0eck9 | 368 | 44 | 12.0 | SubName: Full=Putative HC-toxin efflux carrier TOXA;            |
| g9zrq2 | 241 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| g9yla2 | 159 | 39 | 12.0 | SubName: Full=Toxin secretion/phage lysis holin;                |
| g9y741 | 180 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| g9xvy7 | 383 | 46 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| g8v0n0 | 232 | 39 | 12.0 | SubName: Full=Enterotoxin-like toxin;                           |
| g8p5r8 | 324 | 39 | 12.0 | SubName: Full=Exfoliative toxin A;                              |
| g8mre2 | 245 | 39 | 12.0 | SubName: Full=Antitoxin/toxin system zeta toxin, signal reco... |
| g8mrb4 | 283 | 39 | 12.0 | SubName: Full=Cytolethal distending toxin protein B;            |
| g6xuv3 | 443 | 53 | 12.0 | SubName: Full=Putative toxin secretion transmembrane protein... |
| g6b1w2 | 333 | 40 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| g6axk4 | 313 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, Fic d... |
| g5rwe4 | 240 | 39 | 12.0 | SubName: Full=Cytolethal distending toxin subunit B;            |
| g5ns16 | 301 | 39 | 12.0 | SubName: Full=Cytolethal distending toxin subunit B;            |
| g5nag6 | 269 | 39 | 12.0 | SubName: Full=Cytolethal distending toxin subunit B;            |
| g5m4l5 | 240 | 39 | 12.0 | SubName: Full=Cytolethal distending toxin subunit B;            |
| g5k6l0 | 249 | 39 | 12.0 | SubName: Full=Clostridial binary toxin A;                       |
| g5jzb3 | 151 | 39 | 12.0 | SubName: Full=Toxin secretion/phage lysis holin;                |
| g4tbn7 | 433 | 52 | 12.0 | SubName: Full=Related to MAK11 protein (Maintenance of kille... |
| g4r5t3 | 151 | 39 | 12.0 | SubName: Full=Toxin secretion/phage lysis holin family prote... |
| g4r4x5 | 151 | 39 | 12.0 | SubName: Full=Toxin secretion/phage lysis holin family prote... |
| g4n7k6 | 343 | 41 | 12.0 | SubName: Full=Zeta toxin family protein;                        |
| g4b6l9 | 283 | 39 | 12.0 | SubName: Full=Cytolethal distending toxin protein B;            |

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|--------|-----|----|------|---|
| g3zhs9 | 283 | 39 | 12.0 | SubName: Full=Cytolethal distending toxin B;                    |
| g2ycb0 | 256 | 39 | 12.0 | SubName: Full=Similar to cercosporin toxin biosynthesis prot... |
| g2sy25 | 210 | 39 | 12.0 | SubName: Full=Putative entericidin like toxin protein;          |
| g2pym4 | 275 | 39 | 12.0 | SubName: Full=Zeta toxin family protein;                        |
| g2c3l1 | 240 | 39 | 12.0 | SubName: Full=Pertussis toxin, subunit 1 family protein;        |
| g0ep51 | 294 | 39 | 12.0 | SubName: Full=Toxin A;  |
| f9mgz5 | 256 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| f9kyj2 | 154 | 39 | 12.0 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| f9diz3 | 170 | 39 | 12.0 | SubName: Full=HicA family toxin-antitoxin system;               |
| f7nbg0 | 265 | 39 | 12.0 | SubName: Full=RTX toxin Ca2+-binding protein;                   |
| f6a157 | 269 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| f5lud5 | 269 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| f4xfr5 | 308 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| f4xa11 | 275 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| f4una7 | 269 | 39 | 12.0 | SubName: Full=Cytolethal distending toxin subunit B (CDT B);... |
| f4una6 | 181 | 39 | 12.0 | SubName: Full=Cytolethal distending toxin A/C family protein... |
| f4tg28 | 459 | 55 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| f4sz77 | 459 | 55 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| f4fp12 | 226 | 39 | 12.0 | SubName: Full=Staphylococcal enterotoxin-like toxin;            |
| f3zdw3 | 275 | 39 | 12.0 | SubName: Full=Putative xre family toxin-antitoxin system, an... |
| f3uwz1 | 256 | 39 | 12.0 | SubName: Full=Zeta-toxin;                                       |
| f3f571 | 296 | 39 | 12.0 | SubName: Full=Insecticidal toxin complex protein;               |
| f2zal6 | 315 | 39 | 12.0 | SubName: Full=PL-toxin II;                                      |
| f1zhh7 | 232 | 39 | 12.0 | SubName: Full=Zeta toxin family protein;                        |
| f1zha4 | 319 | 39 | 12.0 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| f0svc4 | 218 | 39 | 12.0 | SubName: Full=Addiction module toxin, RelE/StbE family;         |
| f0ph19 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin family protein;                        |
| f0p944 | 304 | 39 | 12.0 | SubName: Full=Exfoliative toxin A;                              |
| f0n116 | 332 | 40 | 12.0 | SubName: Full=RTX prokaryotic toxin family protein;             |
| e9yna4 | 232 | 39 | 12.0 | SubName: Full=Zeta toxin protein;                               |
| e9uxg6 | 283 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| e9s8d0 | 191 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e9qg70 | 226 | 39 | 12.0 | SubName: Full=Multidrug and toxin extrusion protein 1;          |
| e9fmm8 | 258 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| e9fjv5 | 249 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| e7mtt9 | 244 | 39 | 12.0 | SubName: Full=Staphylococcal toxin, beta-grasp domain protei... |
| e7mf72 | 250 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| e6mzi2 | 332 | 40 | 12.0 | SubName: Full=RTX family exoprotein; SubName: Full=RTX proka... |
| e6ixd6 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| e6icf3 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| e6hyx9 | 190 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| e6hax5 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| e6h4z7 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| e6gya3 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| e6f1d0 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| e6eqv3 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| e6an77 | 460 | 55 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| e5rm54 | 266 | 39 | 12.0 | SubName: Full=Cytolethal distending toxin A;                    |
| e5rm36 | 192 | 39 | 12.0 | SubName: Full=Cytolethal distending toxin C;                    |
| e5r7f9 | 232 | 39 | 12.0 | SubName: Full=Staphylococcal/Streptococcal toxin, beta-grasp... |
| e4lqr6 | 323 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| e4lje4 | 301 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, Fic d... |
| e4l353 | 249 | 39 | 12.0 | SubName: Full=Clostridial binary toxin A;                       |
| e4jlb3 | 443 | 53 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e4jbe0 | 443 | 53 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e4j0f2 | 443 | 53 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e4iic0 | 443 | 53 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e4i7f5 | 443 | 53 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |

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|--------|-----|----|------|---|
| e3r6x2 | 265 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| e2ysy4 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| e2yqe3 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| e2ydg5 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| e2swg1 | 182 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| e2cls6 | 270 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| e2ckk8 | 201 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, gnat ... |
| e1mgg9 | 226 | 39 | 12.0 | SubName: Full=Putative toxin-antitoxin system, antitoxin com... |
| e1ciu5 | 268 | 39 | 12.0 | SubName: Full=Cytolethal distending toxin A;                    |
| e0nwu1 | 273 | 39 | 12.0 | SubName: Full=Zeta-toxin;                                       |
| e0nwe5 | 178 | 39 | 12.0 | SubName: Full=HicB family toxin-antitoxin system;               |
| e0hhg0 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| e0h0f9 | 190 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| e0gvu0 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| e0gkp3 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| e0gdb3 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| d9y8z1 | 171 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d9xsn4 | 284 | 39 | 12.0 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9xpi7 | 291 | 39 | 12.0 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9xl90 | 289 | 39 | 12.0 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9rtp8 | 424 | 51 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d8eet3 | 232 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| d8ea14 | 268 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d7jck2 | 219 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| d7j838 | 367 | 44 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d6m9d6 | 169 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| d6m3m0 | 186 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component;          |
| d6kgw4 | 306 | 39 | 12.0 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d5zu85 | 256 | 39 | 12.0 | SubName: Full=Hemolysin-type calcium-binding toxin;             |
| d4u5d8 | 309 | 39 | 12.0 | SubName: Full=Leukocidin/hemolysin toxin family protein;        |
| d4tx51 | 254 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| d4s1m0 | 316 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d4ra59 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin superfamily;                           |
| d4exm2 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin family protein;                        |
| d4epf9 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin family protein;                        |
| d4bvk5 | 234 | 39 | 12.0 | SubName: Full=RTX toxin transporter;                            |
| d4bta2 | 244 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| d2zqn0 | 239 | 39 | 12.0 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| d2psw5 | 311 | 39 | 12.0 | SubName: Full=Zeta toxin family protein;                        |
| d2ert4 | 299 | 39 | 12.0 | SubName: Full=Putative exfoliative toxin;                       |
| d1xz90 | 417 | 50 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d1nzv4 | 181 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d0yrw8 | 226 | 39 | 12.0 | SubName: Full=Putative toxin-antitoxin system, antitoxin com... |
| d0rtm9 | 307 | 39 | 12.0 | SubName: Full=Exfoliative toxin A;                              |
| c9r3b8 | 283 | 39 | 12.0 | SubName: Full=Cytolethal distending toxin protein B;            |
| c9nxu3 | 203 | 39 | 12.0 | SubName: Full=Cholera toxin transcriptional activator;          |
| c9mv70 | 257 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| c9kyx7 | 253 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| c8mn43 | 232 | 39 | 12.0 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8m6y4 | 232 | 39 | 12.0 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8m250 | 232 | 39 | 12.0 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8l7s9 | 232 | 39 | 12.0 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c7x111 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin family protein;                        |
| c7vmj1 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin family protein;                        |
| c7uic7 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin family protein;                        |
| c7m646 | 270 | 39 | 12.0 | SubName: Full=Zeta toxin family protein;                        |
| c7hsf5 | 183 | 39 | 12.0 | SubName: Full=Toxin-antitoxin system, toxin component;          |
| c7d2r3 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin family protein;                        |

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|--------|-----|----|------|---|
| c5zzp9 | 269 | 39 | 12.0 | SubName: Full=Type III cytolethal distending toxin protein C... |
| c5zzp8 | 181 | 39 | 12.0 | SubName: Full=Type III cytolethal distending toxin protein C... |
| c5f0g5 | 182 | 39 | 12.0 | SubName: Full=Cytolethal distending toxin CdtC;                 |
| c4k8c4 | 168 | 39 | 12.0 | SubName: Full=ADP-ribosyltransferase toxin-2;                   |
| c3ks19 | 490 | 59 | 12.0 | SubName: Full=Toxin complex component ORF-X3;                   |
| c2jlk9 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin protein;                               |
| c2jin8 | 399 | 48 | 12.0 | SubName: Full=Zona occludens toxin;                             |
| c2dby1 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| c0x6t1 | 146 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| c0b4u5 | 245 | 39 | 12.0 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| b9juu4 | 301 | 39 | 12.0 | SubName: Full=Rhizobiocin/RTX toxin;                            |
| b7r0y1 | 129 | 39 | 12.0 | RecName: Full=Putative ribonuclease VapC; Short=Putative RNA... |
| b6vmw2 | 451 | 54 | 12.0 | SubName: Full=RTX toxin ABC transporter protein;                |
| b6cju6 | 259 | 39 | 12.0 | SubName: Full=Kallikrein toxin Var14;                           |
| b5x131 | 302 | 39 | 12.0 | SubName: Full=Putative exfoliative toxin;                       |
| b5gjz3 | 276 | 39 | 12.0 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| b5gja6 | 284 | 39 | 12.0 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| b5gez4 | 283 | 39 | 12.0 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| b3g4c5 | 333 | 40 | 12.0 | SubName: Full=RTX toxin-like protein;                           |
| b3ckc8 | 287 | 39 | 12.0 | SubName: Full=Zeta toxin;                                       |
| b3bq93 | 366 | 44 | 12.0 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| b2n4h4 | 269 | 39 | 12.0 | SubName: Full=Cytolethal distending toxin B;                    |
| b1l2f9 | 490 | 59 | 12.0 | SubName: Full=Toxin complex component ORF-X3;                   |
| a6zzk6 | 313 | 39 | 12.0 | SubName: Full=Toxin-insensitive protein;                        |
| a6tyq5 | 232 | 39 | 12.0 | SubName: Full=Toxin beta-grasp domain protein; Flags: Precur... |
| a6qe78 | 226 | 39 | 12.0 | SubName: Full=Staphylococcal enterotoxin-like toxin;            |
| a6mtu5 | 317 | 39 | 12.0 | SubName: Full=Shiga toxin 2d A subunit;                         |
| a5vxx3 | 326 | 39 | 12.0 | SubName: Full=Zeta toxin family protein;                        |
| a4f2e5 | 273 | 39 | 12.0 | SubName: Full=Cytolethal distending toxin A;                    |
| a4f274 | 265 | 39 | 12.0 | SubName: Full=Cytolethal distending toxin B;                    |
| a2qjq5 | 264 | 39 | 12.0 | SubName: Full=Similarity to larvicidal toxin 42K protein - B... |
| a0rm04 | 273 | 39 | 12.0 | SubName: Full=Cytolethal distending toxin A;                    |
| q93tt3 | 503 | 60 | 11.9 | SubName: Full=Toxin-coregulated pilus biosynthesis protein T... |
| q7bgc2 | 503 | 60 | 11.9 | SubName: Full=Toxin-coregulated pilus biosynthesis protein T... |
| q58ci5 | 371 | 44 | 11.9 | SubName: Full=Zona occludens toxin homologue;                   |
| p29480 | 503 | 60 | 11.9 | RecName: Full=Toxin coregulated pilus biosynthesis protein T... |
| k7rqk8 | 606 | 72 | 11.9 | SubName: Full=RTX toxin;  |
| k6ptp1 | 344 | 41 | 11.9 | SubName: Full=Membrane protein, putative toxin regulator;       |
| k6nrh9 | 344 | 41 | 11.9 | SubName: Full=Membrane protein, putative toxin regulator;       |
| k1yxm2 | 480 | 57 | 11.9 | SubName: Full=RTX toxin membrane fusion protein;                |
| k1i4b1 | 486 | 58 | 11.9 | SubName: Full=ADP-ribosyltransferase toxin AexT;                |
| k0g047 | 478 | 57 | 11.9 | SubName: Full=RTX-I toxin secretion component;                  |
| j8xbd3 | 361 | 43 | 11.9 | SubName: Full=Zonula occludens toxin family protein;            |
| j8v338 | 361 | 43 | 11.9 | SubName: Full=Zonula occludens toxin family protein;            |
| j4wze7 | 344 | 41 | 11.9 | SubName: Full=Membrane protein, putative toxin regulator;       |
| j4wdc3 | 344 | 41 | 11.9 | SubName: Full=Membrane protein, putative toxin regulator;       |
| j4w8j9 | 344 | 41 | 11.9 | SubName: Full=Membrane protein, putative toxin regulator;       |
| j4w696 | 344 | 41 | 11.9 | SubName: Full=Membrane protein, putative toxin regulator;       |
| j4w0v1 | 344 | 41 | 11.9 | SubName: Full=Membrane protein, putative toxin regulator;       |
| j4vvs7 | 344 | 41 | 11.9 | SubName: Full=Membrane protein, putative toxin regulator;       |
| j4vrp2 | 344 | 41 | 11.9 | SubName: Full=Membrane protein, putative toxin regulator;       |
| j4ppn4 | 344 | 41 | 11.9 | SubName: Full=Membrane protein, putative toxin regulator;       |
| j3k735 | 335 | 40 | 11.9 | SubName: Full=Toxin biosynthesis protein;                       |
| j2zyj0 | 344 | 41 | 11.9 | SubName: Full=Membrane protein, putative toxin regulator;       |
| j2id70 | 436 | 52 | 11.9 | SubName: Full=Toxin;  |
| i6a753 | 479 | 57 | 11.9 | SubName: Full=Zeta toxin family protein;                        |
| i4cqt7 | 394 | 47 | 11.9 | SubName: Full=Zonular occludens toxin;                          |
| h8jv62 | 503 | 60 | 11.9 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |



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|--------|-----|----|------|---|
| h1swa9 | 369 | 44 | 11.9 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| g7xxq8 | 403 | 48 | 11.9 | SubName: Full=Cercosporin toxin biosynthesis protein;           |
| g7xq95 | 438 | 52 | 11.9 | SubName: Full=Similar to toxin biosynthesis protein;            |
| g7tn01 | 503 | 60 | 11.9 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g4pdn9 | 335 | 40 | 11.9 | SubName: Full=Exfoliative toxin; EC=3.4.21.-;                   |
| f9rba3 | 478 | 57 | 11.9 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| f7j0a4 | 454 | 54 | 11.9 | SubName: Full=Iota toxin component Ia;                          |
| f4vuy8 | 438 | 52 | 11.9 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| f0n9r7 | 361 | 43 | 11.9 | SubName: Full=Zonula occludens toxin family protein;            |
| f0n4p1 | 361 | 43 | 11.9 | SubName: Full=Zonula occludens toxin family protein;            |
| f0mph7 | 361 | 43 | 11.9 | SubName: Full=Zonula occludens toxin family protein;            |
| f0b333 | 361 | 43 | 11.9 | SubName: Full=Zonula occludens toxin family protein;            |
| f0aut8 | 361 | 43 | 11.9 | SubName: Full=Zonula occludens toxin family protein;            |
| f0aim6 | 361 | 43 | 11.9 | SubName: Full=Zonula occludens toxin family protein;            |
| f0ad33 | 361 | 43 | 11.9 | SubName: Full=Zonula occludens toxin family protein;            |
| f0a1q5 | 361 | 43 | 11.9 | SubName: Full=Zonula occludens toxin family protein;            |
| e9fjv2 | 329 | 39 | 11.9 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| e6mvz6 | 361 | 43 | 11.9 | SubName: Full=Zonula occludens toxin family protein; SubName... |
| e3ddk6 | 488 | 58 | 11.9 | SubName: Full=General secretion pathway protein E (Type II t... |
| e1kqp8 | 496 | 59 | 11.9 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d7hla7 | 503 | 60 | 11.9 | SubName: Full=Toxin-coregulated pilus biosynthesis protein T... |
| d2tvp1 | 528 | 63 | 11.9 | SubName: Full=RTX family toxin transporter;                     |
| d1p0x0 | 421 | 50 | 11.9 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d0hrq8 | 503 | 60 | 11.9 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| d0h645 | 503 | 60 | 11.9 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| c8n925 | 420 | 50 | 11.9 | SubName: Full=Toxin secretion ABC superfamily ATP binding ca... |
| c7x301 | 531 | 63 | 11.9 | SubName: Full=Toxin secretion ATP-binding protein;              |
| c7fej8 | 360 | 43 | 11.9 | SubName: Full=Zeta toxin family protein;                        |
| c6yew2 | 503 | 60 | 11.9 | SubName: Full=Toxin-coregulated pilus biosynthesis protein T... |
| c6rw16 | 503 | 60 | 11.9 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| c3nt63 | 503 | 60 | 11.9 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| c3lt86 | 503 | 60 | 11.9 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| c2ja15 | 503 | 60 | 11.9 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| c2ign2 | 503 | 60 | 11.9 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| b6scz9 | 360 | 43 | 11.9 | SubName: Full=Putative Shiga-like toxin alpha subunit;          |
| b3ph78 | 438 | 52 | 11.9 | SubName: Full=Putative toxin secretion, membrane fusion prot... |
| a7dv67 | 387 | 46 | 11.9 | SubName: Full=RTX toxins and related Ca2+-binding protein; S... |
| a6fg05 | 437 | 52 | 11.9 | SubName: Full=Toxin secretion transporter, putative;            |
| a5f381 | 503 | 60 | 11.9 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| a3upb9 | 413 | 49 | 11.9 | SubName: Full=Toxin secretion, membrane fusion protein;         |
| a3s9h7 | 438 | 52 | 11.9 | SubName: Full=Putative toxin secretion transmembrane protein... |
| a3gys2 | 503 | 60 | 11.9 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| a3gmd6 | 503 | 60 | 11.9 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| a1f0z0 | 503 | 60 | 11.9 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| a1eib8 | 503 | 60 | 11.9 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| q7n656 | 340 | 40 | 11.8 | SubName: Full=Similarities with C-terminal region of insecti... |
| q6yix9 | 560 | 66 | 11.8 | SubName: Full=Diphtheria toxin;                                 |
| q6g140 | 355 | 42 | 11.8 | SubName: Full=Hypothetical toxin secretion protein;             |
| q5hei1 | 330 | 39 | 11.8 | RecName: Full=Phospholipase C; EC=3.1.4.3; AltName: Full=Bet... |
| q4wyy7 | 363 | 43 | 11.8 | SubName: Full=Toxin biosynthesis proten (Fum3), putative;       |
| q4r7b7 | 557 | 66 | 11.8 | RecName: Full=Anthrax toxin receptor-like; Flags: Precursor;... |
| q3es64 | 501 | 59 | 11.8 | SubName: Full=MOSQUITOCIDAL TOXIN PROTEIN;                      |
| q2j943 | 450 | 53 | 11.8 | SubName: Full=Zeta toxin;                                       |
| q2fwp1 | 330 | 39 | 11.8 | RecName: Full=Phospholipase C; EC=3.1.4.3; AltName: Full=Bet... |
| p09978 | 330 | 39 | 11.8 | RecName: Full=Phospholipase C; EC=3.1.4.3; AltName: Full=Bet... |
| k8x8f2 | 442 | 52 | 11.8 | SubName: Full=RTX toxin transporter;                            |
| k7a6q3 | 407 | 48 | 11.8 | SubName: Full=RTX toxin, putative;                              |
| k5ey41 | 391 | 46 | 11.8 | SubName: Full=Zonula occludens toxin;                           |

|        |     |    |      |   |
|--------|-----|----|------|---|
| j2jm71 | 587 | 69 | 11.8 | SubName: Full=Ca2+-binding protein, RTX toxin;                  |
| h0cx22 | 356 | 42 | 11.8 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| g9b0x6 | 440 | 52 | 11.8 | SubName: Full=Alpha-toxin;                                      |
| g7xgj3 | 424 | 50 | 11.8 | SubName: Full=Toxin biosynthesis protein;                       |
| g6avb9 | 338 | 40 | 11.8 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| f9k9i3 | 347 | 41 | 11.8 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f3t7r5 | 356 | 42 | 11.8 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f3lgl1 | 406 | 48 | 11.8 | SubName: Full=Zona occludens toxin;                             |
| e9exn1 | 416 | 49 | 11.8 | SubName: Full=Putative toxin subunit;                           |
| e4lc29 | 355 | 42 | 11.8 | SubName: Full=Zeta toxin;                                       |
| e3r4w6 | 382 | 45 | 11.8 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| d9rt09 | 331 | 39 | 11.8 | SubName: Full=Toxin-antitoxin system, toxin component, Fic d... |
| d3vak4 | 475 | 56 | 11.8 | SubName: Full=RTX toxin ABC transporter protein RtxD;           |
| d3uxc2 | 451 | 53 | 11.8 | SubName: Full=RTX toxin ABC transporter protein (MFP) RtxD;     |
| d2kba6 | 448 | 53 | 11.8 | SubName: Full=Zonular occludens toxin;                          |
| c9lmw5 | 347 | 41 | 11.8 | SubName: Full=Zeta toxin family protein;                        |
| c2khj0 | 425 | 50 | 11.8 | SubName: Full=Membrane protein, toxin regulator;                |
| c0qp15 | 476 | 56 | 11.8 | SubName: Full=General secretion pathway protein E (Type II t... |
| b6qrt0 | 423 | 50 | 11.8 | SubName: Full=Toxin biosynthesis protein (Tri7), putative;      |
| b6eq45 | 456 | 54 | 11.8 | SubName: Full=Putative type I toxin secretion system, outer ... |
| b5sab6 | 449 | 53 | 11.8 | SubName: Full=Probable hemolysin-type calcium-binding protei... |
| b0y919 | 416 | 49 | 11.8 | SubName: Full=Toxin biosynthesis protein, putative;             |
| b0xzv5 | 363 | 43 | 11.8 | SubName: Full=Toxin biosynthesis protein (Fum3), putative;      |
| a9d923 | 415 | 49 | 11.8 | SubName: Full=Toxin secretion, membrane fusion protein;         |
| a3rpd0 | 449 | 53 | 11.8 | SubName: Full=Hemolysin-type Calcium-binding protein-RTX tox... |
| a0zhv9 | 526 | 62 | 11.8 | SubName: Full=RTX toxin transporter;                            |
| q9zab7 | 283 | 38 | 11.7 | SubName: Full=Cytolethal distending toxin protein B;            |
| q9s5j2 | 319 | 38 | 11.7 | SubName: Full=Shiga toxin 2 A-subunit; SubName: Full=Stx1 A ... |
| q9kgq7 | 461 | 54 | 11.7 | SubName: Full=Zonula occludens toxin like protein;              |
| q9f655 | 319 | 38 | 11.7 | SubName: Full=Shiga toxin II A subunit;                         |
| q9cra0 | 300 | 38 | 11.7 | RecName: Full=Ecto-ADP-ribosyltransferase 4; EC=2.4.2.31; Al... |
| q93k92 | 319 | 38 | 11.7 | SubName: Full=Shiga-like toxin 2A-subunit;                      |
| q8ypf4 | 523 | 61 | 11.7 | SubName: Full=RTX toxin transporter;                            |
| q8vv71 | 319 | 38 | 11.7 | SubName: Full=Shiga toxin 2 A-subunit;                          |
| q8vv70 | 319 | 38 | 11.7 | SubName: Full=Shiga toxin 2 A-subunit;                          |
| q8vv64 | 315 | 38 | 11.7 | SubName: Full=Shiga toxin 1 A-subunit;                          |
| q8v1k6 | 319 | 38 | 11.7 | SubName: Full=Shiga toxin 2 A-subunit;                          |
| q8vld2 | 319 | 38 | 11.7 | SubName: Full=Shiga toxin 2 A-subunit; SubName: Full=Shiga t... |
| q8np95 | 228 | 38 | 11.7 | RecName: Full=Diphtheria toxin repressor; AltName: Full=Iron... |
| q8gn91 | 199 | 38 | 11.7 | SubName: Full=Toxin-coregulated pilus subunit;                  |
| q8egz7 | 252 | 38 | 11.7 | SubName: Full=Bifunctional toxin-antitoxin system HepN famil... |
| q8dz95 | 305 | 38 | 11.7 | SubName: Full=Exfoliative toxin A, putative;                    |
| q7dk12 | 283 | 38 | 11.7 | SubName: Full=Cytolethal distending toxin; SubName: Full=Cyt... |
| q7cq44 | 240 | 38 | 11.7 | RecName: Full=Guanine nucleotide exchange factor sopE2; AltN... |
| q7b4a3 | 199 | 38 | 11.7 | SubName: Full=Toxin-coregulated pilus subunit;                  |
| q79eb3 | 319 | 38 | 11.7 | SubName: Full=Variant shiga-like toxin type II A subunit; Fl... |
| q6wrw3 | 358 | 42 | 11.7 | SubName: Full=Alveicin B bacteriocin toxin;                     |
| q56uc1 | 237 | 38 | 11.7 | SubName: Full=Cytolethal distending toxin type IV subunit A;... |
| q508i6 | 410 | 48 | 11.7 | SubName: Full=Anthrax toxin receptor/neuroblastoma fusion pr... |
| q4zft7 | 265 | 38 | 11.7 | SubName: Full=Beta2 toxin;                                      |
| q4zft6 | 265 | 38 | 11.7 | SubName: Full=Beta2 toxin;                                      |
| q4zft4 | 265 | 38 | 11.7 | SubName: Full=Beta2 toxin;                                      |
| q0fsh1 | 175 | 38 | 11.7 | SubName: Full=RTX toxins and related Ca2+-binding protein;      |
| q03037 | 319 | 38 | 11.7 | SubName: Full=Shiga toxin 2d subunit A; SubName: Full=Shiga-... |
| p69929 | 233 | 38 | 11.7 | RecName: Full=Peptide toxins Am-1; AltName: Full=Peptide tox... |
| p23024 | 224 | 38 | 11.7 | RecName: Full=Toxin coregulated pilin; AltName: Full=Pilus c... |
| p0djl7 | 226 | 38 | 11.7 | RecName: Full=Diphtheria toxin repressor; AltName: Full=Iron... |
| p09985 | 174 | 38 | 11.7 | RecName: Full=Hemolysin-activating lysine-acyltransferase Hl... |

|        |     |    |      |   |
|--------|-----|----|------|---|
| p01546 | 316 | 38 | 11.7 | RecName: Full=M1-1 protoxin; AltName: Full=Killer toxin K1; ... |
| o87121 | 283 | 38 | 11.7 | SubName: Full=Cytolethal distending toxin B;                    |
| o32322 | 263 | 38 | 11.7 | RecName: Full=Type-2Bb cytolytic delta-endotoxin; AltName: F... |
| k9eeq7 | 152 | 38 | 11.7 | SubName: Full=Toxin secretion/phage lysis holin;                |
| k8zcx0 | 175 | 38 | 11.7 | SubName: Full=Toxin-antitoxin toxin gnat family;                |
| k8x392 | 401 | 47 | 11.7 | SubName: Full=Toxin XaxA;                                       |
| k2jbw1 | 279 | 38 | 11.7 | SubName: Full=Putative Hemolysin-type calcium-binding RTX to... |
| k2h2f8 | 276 | 38 | 11.7 | SubName: Full=Toxin resistance protein, putative;               |
| k2gtp1 | 276 | 38 | 11.7 | SubName: Full=Zeta toxin family protein;                        |
| k0jky3 | 332 | 39 | 11.7 | SubName: Full=Toxin A;  |
| k0htl6 | 261 | 38 | 11.7 | SubName: Full=Structural toxin;                                 |
| j8y994 | 412 | 48 | 11.7 | SubName: Full=Pre-toxin domain with VENN motif family protei... |
| j8a620 | 173 | 38 | 11.7 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j6uhx9 | 220 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, PIN d... |
| j5skz9 | 304 | 38 | 11.7 | SubName: Full=Zeta toxin family protein;                        |
| j5br25 | 265 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| j4nqa3 | 334 | 39 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| j3h5q0 | 302 | 38 | 11.7 | SubName: Full=Zeta toxin;                                       |
| j2m8v2 | 319 | 38 | 11.7 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| j1byz5 | 213 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| j0zvr9 | 213 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| j0vk38 | 175 | 38 | 11.7 | SubName: Full=Toxin-antitoxin toxin gnat family;                |
| j0rsu4 | 250 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| i8i766 | 286 | 38 | 11.7 | SubName: Full=Toxin biosynthesis protein;                       |
| i7jgv9 | 324 | 38 | 11.7 | SubName: Full=Exfoliative toxin A;                              |
| i6iq89 | 180 | 38 | 11.7 | SubName: Full=Toxin complex domain protein;                     |
| i4d801 | 219 | 38 | 11.7 | SubName: Full=Cytotoxic translational repressor of toxin-ant... |
| i4auc1 | 226 | 38 | 11.7 | SubName: Full=Diphtheria toxin repressor;                       |
| i3rtf3 | 273 | 38 | 11.7 | SubName: Full=Exfoliative toxin ExhA;                           |
| i3qy03 | 226 | 38 | 11.7 | SubName: Full=Diphtheria toxin repressor;                       |
| i2wbf6 | 360 | 42 | 11.7 | SubName: Full=Hemolysin toxin protein A domain protein;         |
| i2w9m8 | 319 | 38 | 11.7 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| i2smd8 | 319 | 38 | 11.7 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| i1xuc6 | 283 | 38 | 11.7 | SubName: Full=Cytolethal distending toxin protein B;            |
| i0xcz1 | 242 | 38 | 11.7 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| i0snk6 | 334 | 39 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| i0at63 | 226 | 38 | 11.7 | SubName: Full=Diphtheria toxin repressor;                       |
| h8lte6 | 226 | 38 | 11.7 | SubName: Full=Diphtheria toxin repressor;                       |
| h6myv6 | 240 | 38 | 11.7 | SubName: Full=Putative metal dependent repressor, diptheria ... |
| h6m2x9 | 226 | 38 | 11.7 | SubName: Full=Diphtheria toxin repressor;                       |
| h5lfl0 | 341 | 40 | 11.7 | SubName: Full=Zonular occludens toxin family protein;           |
| h5ktu1 | 341 | 40 | 11.7 | SubName: Full=Zonular occludens toxin family protein;           |
| h5j0m1 | 212 | 38 | 11.7 | SubName: Full=Toxin B domain protein;                           |
| h5idd7 | 199 | 38 | 11.7 | SubName: Full=Toxin B domain protein;                           |
| h4u2z6 | 341 | 40 | 11.7 | SubName: Full=Zonular occludens toxin family protein;           |
| h4hl79 | 232 | 38 | 11.7 | SubName: Full=Enterotoxin-like toxin;                           |
| h4h616 | 241 | 38 | 11.7 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4h614 | 238 | 38 | 11.7 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4g4u2 | 242 | 38 | 11.7 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h4evy3 | 238 | 38 | 11.7 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4eda4 | 232 | 38 | 11.7 | SubName: Full=Enterotoxin-like toxin;                           |
| h4eda2 | 231 | 38 | 11.7 | SubName: Full=Enterotoxin-like toxin;                           |
| h4e8z6 | 232 | 38 | 11.7 | SubName: Full=Enterotoxin-like toxin;                           |
| h4e8z4 | 231 | 38 | 11.7 | SubName: Full=Enterotoxin-like toxin;                           |
| h4d104 | 232 | 38 | 11.7 | SubName: Full=Enterotoxin-like toxin;                           |
| h4d102 | 231 | 38 | 11.7 | SubName: Full=Enterotoxin-like toxin;                           |
| h4cll9 | 231 | 38 | 11.7 | SubName: Full=Enterotoxin-like toxin;                           |
| h4cll7 | 232 | 38 | 11.7 | SubName: Full=Enterotoxin-like toxin;                           |

|        |     |    |      |   |
|--------|-----|----|------|---|
| h4cbt7 | 232 | 38 | 11.7 | SubName: Full=Enterotoxin-like toxin;                           |
| h4cbt5 | 231 | 38 | 11.7 | SubName: Full=Enterotoxin-like toxin;                           |
| h3yqt5 | 242 | 38 | 11.7 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3xuu8 | 242 | 38 | 11.7 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3u297 | 250 | 38 | 11.7 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3rvw7 | 232 | 38 | 11.7 | SubName: Full=Enterotoxin-like toxin;                           |
| h3rvw5 | 231 | 38 | 11.7 | SubName: Full=Enterotoxin-like toxin;                           |
| h2g4i9 | 226 | 38 | 11.7 | SubName: Full=Diphtheria toxin repressor;                       |
| h2fmh4 | 226 | 38 | 11.7 | SubName: Full=Diphtheria toxin repressor;                       |
| hitfe8 | 242 | 38 | 11.7 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h0d1p1 | 256 | 38 | 11.7 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h0b0j0 | 242 | 38 | 11.7 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h0auz9 | 242 | 38 | 11.7 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| g9zy63 | 168 | 38 | 11.7 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| g9yv70 | 152 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| g9ys65 | 166 | 38 | 11.7 | SubName: Full=Toxin secretion/phage lysis holin;                |
| g9yne3 | 164 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| g8w1j9 | 224 | 38 | 11.7 | SubName: Full=RelE family toxin-antitoxin system;               |
| g8u621 | 178 | 38 | 11.7 | SubName: Full=Putative toxin component;                         |
| g7xfw7 | 410 | 48 | 11.7 | SubName: Full=Toxin biosynthesis protein;                       |
| g7tzj1 | 226 | 38 | 11.7 | SubName: Full=Diphtheria toxin repressor;                       |
| g6e6f5 | 310 | 38 | 11.7 | SubName: Full=Zonular occludens toxin;                          |
| g6c706 | 253 | 38 | 11.7 | SubName: Full=Zeta toxin;                                       |
| g5sm95 | 311 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| g4qzr8 | 226 | 38 | 11.7 | SubName: Full=Diphtheria toxin repressor;                       |
| g4qqq0 | 226 | 38 | 11.7 | SubName: Full=Diphtheria toxin repressor;                       |
| g4aug0 | 283 | 38 | 11.7 | SubName: Full=Cytolethal distending toxin protein B;            |
| g4api9 | 283 | 38 | 11.7 | SubName: Full=Cytolethal distending toxin B;                    |
| g4ajc9 | 283 | 38 | 11.7 | SubName: Full=Cytolethal distending toxin protein B;            |
| g4alr4 | 283 | 38 | 11.7 | SubName: Full=Cytolethal distending toxin protein B;            |
| g3zyi6 | 283 | 38 | 11.7 | SubName: Full=Cytolethal distending toxin protein B;            |
| g3zas7 | 283 | 38 | 11.7 | SubName: Full=Cytolethal distending toxin B;                    |
| g2z7b4 | 226 | 38 | 11.7 | SubName: Full=Probable toxin; EC=2.4.2.36;                      |
| g2bq30 | 281 | 38 | 11.7 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| g0i491 | 226 | 38 | 11.7 | SubName: Full=Diphtheria toxin repressor;                       |
| f9p0y1 | 253 | 38 | 11.7 | SubName: Full=Zeta toxin;                                       |
| f9ks20 | 238 | 38 | 11.7 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f9hgn2 | 261 | 38 | 11.7 | SubName: Full=Zeta toxin;                                       |
| f8kh43 | 300 | 38 | 11.7 | SubName: Full=Putative toxin biosynthesis associated enzyme;... |
| f5t7s2 | 250 | 38 | 11.7 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| f5s5r2 | 171 | 38 | 11.7 | SubName: Full=GNAT family toxin-antitoxin system;               |
| f4ugw8 | 244 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| f4t8f6 | 244 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| f4fp21 | 232 | 38 | 11.7 | SubName: Full=Staphylococcal enterotoxin-like toxin;            |
| f4fp19 | 231 | 38 | 11.7 | SubName: Full=Staphylococcal enterotoxin-like toxin;            |
| f4fp18 | 231 | 38 | 11.7 | SubName: Full=Staphylococcal enterotoxin-like toxin;            |
| f3zg81 | 286 | 38 | 11.7 | SubName: Full=Putative xre family toxin-antitoxin system, an... |
| f3y040 | 311 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| f3rqs4 | 461 | 54 | 11.7 | SubName: Full=Zona occludens toxin;                             |
| f2zal5 | 317 | 38 | 11.7 | SubName: Full=PL-toxin I;                                       |
| f2tij9 | 277 | 38 | 11.7 | SubName: Full=Toxin biosynthesis ketoreductase;                 |
| f0x720 | 223 | 38 | 11.7 | SubName: Full=Killer toxin, kp4;                                |
| f0mxy3 | 332 | 39 | 11.7 | SubName: Full=RTX prokaryotic toxin family protein;             |
| e9tur8 | 203 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| e9sr12 | 268 | 38 | 11.7 | SubName: Full=Xre family Toxin-antitoxin system;                |
| e9flp2 | 256 | 38 | 11.7 | SubName: Full=Zeta-toxin;                                       |
| e9a164 | 240 | 38 | 11.7 | SubName: Full=Guanine nucleotide exchange factor sopE2 Effec... |
| e8da25 | 216 | 38 | 11.7 | SubName: Full=Cytolethal distending toxin subunit B;            |

|         |     |    |      |   |
|---------|-----|----|------|---|
| e7hia6  | 238 | 38 | 11.7 | SubName: Full=Toxin B domain protein;                           |
| e7h9n7  | 257 | 38 | 11.7 | SubName: Full=Toxin B domain protein;                           |
| e7b7m5  | 157 | 38 | 11.7 | SubName: Full=Putative ABC associated RTX toxin transporter,... |
| e6y3z8  | 252 | 38 | 11.7 | SubName: Full=Toxin PezT; SubName: Full=Zeta toxin;             |
| e6if23  | 234 | 38 | 11.7 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e6hmu3  | 269 | 38 | 11.7 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e6hdc1  | 384 | 45 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e6ey37  | 124 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| e6eu72  | 234 | 38 | 11.7 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e6a7k9  | 203 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| e5rm65  | 264 | 38 | 11.7 | SubName: Full=Cytolethal distending toxin A;                    |
| e5rm60  | 264 | 38 | 11.7 | SubName: Full=Cytolethal distending toxin A;                    |
| e5rm35  | 268 | 38 | 11.7 | SubName: Full=Cytolethal distending toxin B;                    |
| e4lep0  | 166 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| e3fbw3  | 226 | 38 | 11.7 | SubName: Full=Diphtheria toxin repressor;                       |
| e2z121  | 384 | 45 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e2yrv0  | 410 | 48 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e2y1b9  | 384 | 45 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e2yfq1  | 384 | 45 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e2ss64  | 211 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| e2spf2  | 183 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| e1eb25  | 461 | 54 | 11.7 | SubName: Full=Zonula occludens toxin (Zot) family;              |
| e1dnq4  | 461 | 54 | 11.7 | SubName: Full=Zonula occludens toxin (Zot) family;              |
| e1crn1  | 461 | 54 | 11.7 | SubName: Full=Zonula occludens toxin (Zot) family;              |
| e0mrs3  | 296 | 38 | 11.7 | SubName: Full=RTX toxins and related Ca2+-binding protein;      |
| e0h195  | 384 | 45 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e0eli0  | 477 | 56 | 11.7 | SubName: Full=RTX-III toxin determinant D;                      |
| e0efd5  | 477 | 56 | 11.7 | SubName: Full=RTX-III toxin determinant D;                      |
| d9xzx16 | 277 | 38 | 11.7 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9xui4  | 285 | 38 | 11.7 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9xq58  | 286 | 38 | 11.7 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9wm99  | 294 | 38 | 11.7 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9wdz4  | 288 | 38 | 11.7 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9wbk0  | 313 | 38 | 11.7 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9wa37  | 193 | 38 | 11.7 | SubName: Full=GNAT family toxin-antitoxin system, toxin comp... |
| d9w8b9  | 257 | 38 | 11.7 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9qaw1  | 226 | 38 | 11.7 | SubName: Full=Diphtheria toxin repressor;                       |
| d9q8v1  | 226 | 38 | 11.7 | SubName: Full=Diphtheria toxin repressor;                       |
| d9pc78  | 478 | 56 | 11.7 | SubName: Full=RTX-I toxin secretion component;                  |
| d9pbq5  | 477 | 56 | 11.7 | SubName: Full=RTX-III toxin determinant D;                      |
| d9p6i4  | 477 | 56 | 11.7 | SubName: Full=RTX-III toxin determinant D;                      |
| d9p4p6  | 478 | 56 | 11.7 | SubName: Full=RTX-I toxin secretion component;                  |
| d8isf1  | 478 | 56 | 11.7 | SubName: Full=Cholera toxin secretion EpsM protein;             |
| d8ce74  | 203 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d8bs75  | 341 | 40 | 11.7 | SubName: Full=Zonula occludens toxin;                           |
| d8bkf9  | 203 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d8aad1  | 164 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d7z2b0  | 203 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d7xak9  | 164 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d7vt65  | 292 | 38 | 11.7 | SubName: Full=Fic family toxin-antitoxin system;                |
| d7n6q6  | 243 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| d6m3x4  | 291 | 38 | 11.7 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d6m2p2  | 286 | 38 | 11.7 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d6k6b7  | 287 | 38 | 11.7 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d6jzt7  | 294 | 38 | 11.7 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d5nvyy  | 185 | 38 | 11.7 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| d4x5p2  | 196 | 38 | 11.7 | SubName: Full=Fic family toxin-antitoxin system;                |
| d4s157  | 301 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |

|        |     |    |      |   |
|--------|-----|----|------|---|
| d4ryw4 | 129 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X...         |
| d4rxu3 | 231 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X...         |
| d4ew07 | 384 | 45 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f...         |
| d4en34 | 384 | 45 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f...         |
| d4d7n5 | 258 | 38 | 11.7 | SubName: Full=Toxin biosynthesis ketoreductase, putative;               |
| d4c3g4 | 198 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f...         |
| d4bv38 | 145 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, H...         |
| d4ak74 | 258 | 38 | 11.7 | SubName: Full=Toxin biosynthesis ketoreductase, putative;               |
| d31lg2 | 285 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ...         |
| d3ank0 | 248 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f...         |
| d2utt9 | 250 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f...         |
| d2fl45 | 315 | 38 | 11.7 | SubName: Full=Exfoliative toxin A/B;                                    |
| d1w3i5 | 343 | 40 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f...         |
| d0w5c4 | 235 | 38 | 11.7 | SubName: Full=Zonula occludens toxin family protein;                    |
| d0gnz3 | 209 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f...         |
| c9sp65 | 294 | 38 | 11.7 | SubName: Full=Zeta toxin family protein;                                |
| c9mtt0 | 193 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X...         |
| c9mmm8 | 315 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ...         |
| c9m6s2 | 240 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X...         |
| c9m1m3 | 219 | 38 | 11.7 | SubName: Full=Xre family toxin-antitoxin system;                        |
| c9l9c8 | 376 | 44 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ...         |
| c9l7h2 | 268 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X...         |
| c9klu7 | 189 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X...         |
| c9klu6 | 145 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, H...         |
| c8p7k5 | 307 | 38 | 11.7 | SubName: Full=Xre family toxin-antitoxin system;                        |
| c8mei4 | 315 | 38 | 11.7 | SubName: Full=Exfoliative toxin;  |
| c7tqf6 | 319 | 38 | 11.7 | SubName: Full=Shiga toxin 2g subunit A; SubName: Full=Stx2gA...         |
| c7h2n8 | 170 | 38 | 11.7 | SubName: Full=Putative toxin-antitoxin system, toxin compone...         |
| c7gd11 | 170 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ...         |
| c7bnh6 | 280 | 38 | 11.7 | SubName: Full=Insecticidal toxin complex protein tccc3;                 |
| c7b1e8 | 258 | 38 | 11.7 | SubName: Full=Cholera toxin A subunit;                                  |
| c6lg84 | 225 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f...         |
| c6l1n0 | 319 | 38 | 11.7 | SubName: Full=Shiga toxin 2 variant f A-subunit;                        |
| c6h6c7 | 263 | 38 | 11.7 | SubName: Full=Killer toxin sensitivity protein;                         |
| c5uq70 | 137 | 38 | 11.7 | SubName: Full=Toxin secretion/phage lysis holin;                        |
| c5gte8 | 277 | 38 | 11.7 | SubName: Full=Toxin biosynthesis ketoreductase;                         |
| c4tir5 | 237 | 38 | 11.7 | SubName: Full=Cytolethal distending toxin A;                            |
| c4ltp3 | 276 | 38 | 11.7 | SubName: Full=Toxin resistance protein, putative;                       |
| c3xmt6 | 274 | 38 | 11.7 | SubName: Full=Cytolethal distending toxin subunit B;                    |
| c2y3j4 | 248 | 38 | 11.7 | SubName: Full=Zeta toxin;   |
| b9kdq3 | 270 | 38 | 11.7 | SubName: Full=Cytolethal distending toxin, subunit CdtA;                |
| b8r8l4 | 191 | 38 | 11.7 | SubName: Full=Putative RTX toxin;                                       |
| b7tgx2 | 136 | 38 | 11.7 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ...         |
| b7j5f4 | 445 | 52 | 11.7 | SubName: Full=Toxin secretion protein, HlyD family;                     |
| b6zcd1 | 252 | 38 | 11.7 | SubName: Full=Zeta toxin;   |
| b5ty44 | 226 | 38 | 11.7 | SubName: Full=Diphtheria toxin repressor;                               |
| b5nit5 | 242 | 38 | 11.7 | SubName: Full=Pertussis toxin, subunit 1 subfamily;                     |
| b3gyh6 | 478 | 56 | 11.7 | SubName: Full=RTX-I toxin secretion component;                          |
| b2vd51 | 259 | 38 | 11.7 | SubName: Full=Probable toxin transcriptional activator ToxR;...         |
| b2ubw3 | 351 | 41 | 11.7 | SubName: Full=Zonular occludens toxin;                                  |
| b0p0w5 | 135 | 38 | 11.7 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f...         |
| b0bqr5 | 477 | 56 | 11.7 | SubName: Full=RTX-III toxin determinant D;                              |
| a6qe86 | 232 | 38 | 11.7 | SubName: Full=Staphylococcal enterotoxin-like toxin;                    |
| a6qe84 | 231 | 38 | 11.7 | SubName: Full=Staphylococcal enterotoxin-like toxin;                    |
| a6qe83 | 231 | 38 | 11.7 | SubName: Full=Staphylococcal enterotoxin-like toxin;                    |
| a6gag4 | 320 | 38 | 11.7 | SubName: Full=RTX toxins and related Ca <sup>2+</sup> -binding protein; |
| a5kpb6 | 156 | 38 | 11.7 | SubName: Full=Toxin secretion/phage lysis holin;                        |
| a4qp34 | 478 | 56 | 11.7 | SubName: Full=Anthrax toxin receptor 2a; SubName: Full=Uncha...         |

|        |     |    |      |   |
|--------|-----|----|------|---|
| a3n290 | 478 | 56 | 11.7 | SubName: Full=RTX-I toxin secretion component;                  |
| a1dlq3 | 252 | 38 | 11.7 | SubName: Full=Killer toxin sensitivity protein (Iki1), putat... |
| a1cgf7 | 487 | 57 | 11.7 | SubName: Full=Toxin biosynthesis cytochrome P450 monooxygena... |
| a1ab02 | 237 | 38 | 11.7 | SubName: Full=Cytolethal distending toxin type IV subunit A;... |
| a0kw86 | 238 | 38 | 11.7 | SubName: Full=Zeta toxin family protein;                        |
| q9agx1 | 430 | 50 | 11.6 | SubName: Full=Toxin-coregulated pilus biosynthesis protein B... |
| q7bgc7 | 430 | 50 | 11.6 | SubName: Full=Toxin-coregulated pilus biosynthesis protein B... |
| q74yf9 | 587 | 68 | 11.6 | SubName: Full=Toxin; SubName: Full=Toxin protein;               |
| q508i8 | 387 | 45 | 11.6 | SubName: Full=Anthrax toxin receptor/neuroblastoma fusion pr... |
| q1cc79 | 587 | 68 | 11.6 | SubName: Full=Toxin;  |
| q1c004 | 587 | 68 | 11.6 | SubName: Full=Toxin;  |
| q11mr3 | 586 | 68 | 11.6 | SubName: Full=Zeta toxin;                                       |
| q0mqm7 | 370 | 43 | 11.6 | SubName: Full=Binary toxin A;                                   |
| p52961 | 327 | 38 | 11.6 | RecName: Full=GPI-linked NAD(P)(+)--arginine ADP-ribosyltran... |
| p23476 | 430 | 50 | 11.6 | RecName: Full=Toxin coregulated pilus biosynthesis protein B... |
| k9a101 | 344 | 40 | 11.6 | SubName: Full=Toxin-antitoxin antitoxin xre family;             |
| k6byv1 | 396 | 46 | 11.6 | SubName: Full=Putative insecticidal toxin complex;              |
| k5ufs1 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k5tt93 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k5rue5 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k5rl60 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k5rfm3 | 397 | 46 | 11.6 | SubName: Full=Zonula occludens toxin;                           |
| k4ivs1 | 344 | 40 | 11.6 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| k2xfv2 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k2ws12 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k2vv33 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k2v996 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k2v6r1 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k2tnx5 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k2t483 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k0xvf9 | 424 | 49 | 11.6 | SubName: Full=Zona occludens toxin;                             |
| k0c977 | 423 | 49 | 11.6 | SubName: Full=Type I protease secretion protein, hemolytica ... |
| j7sw03 | 352 | 41 | 11.6 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j1zrq8 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1x0a7 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1w143 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1vsq1 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1puj4 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1pqs7 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1ld75 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1fsj4 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1f8c0 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1f470 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1e839 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1dql3 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1cyg9 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1c1p7 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j0mnf8 | 336 | 39 | 11.6 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| j0jnr4 | 404 | 47 | 11.6 | SubName: Full=Vacuolating toxin;                                |
| i6y0k5 | 337 | 39 | 11.6 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| h8jv56 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| h3t7d2 | 424 | 49 | 11.6 | SubName: Full=Zona occludens toxin;                             |
| h3t148 | 424 | 49 | 11.6 | SubName: Full=Zona occludens toxin;                             |
| g9xsb1 | 346 | 40 | 11.6 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| g7xud1 | 464 | 54 | 11.6 | SubName: Full=Toxin biosynthesis protein;                       |
| g7tmz5 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g7c4v0 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g7bu97 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |

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|--------|-----|----|------|---|
| g7bgk3 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g7b5r1 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g7av68 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g7aln7 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g7aai9 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g7a1b3 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g6zqt1 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g6zd82 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g6z4p9 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g4y0w0 | 458 | 53 | 11.6 | SubName: Full=Putative ABC associated RTX toxin transporter;... |
| g0jkk2 | 587 | 68 | 11.6 | SubName: Full=Toxin;  |
| f9c557 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| f9b8r9 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| f9a320 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| f8zty6 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| f8zj39 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| f8z7q1 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| f8yws1 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| e9e0x0 | 577 | 67 | 11.6 | SubName: Full=MFS toxin efflux pump (AflT);                     |
| e8p8e8 | 587 | 68 | 11.6 | SubName: Full=Toxin;  |
| e6ibx1 | 396 | 46 | 11.6 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e5g5f8 | 465 | 54 | 11.6 | SubName: Full=RTX toxin and related Ca2+-binding protein-lik... |
| e5cli5 | 378 | 44 | 11.6 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e4jl09 | 388 | 45 | 11.6 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e4j7e4 | 388 | 45 | 11.6 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e4j2x9 | 388 | 45 | 11.6 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e4iij7 | 388 | 45 | 11.6 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e4id66 | 388 | 45 | 11.6 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e2y6k9 | 387 | 45 | 11.6 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e2mpz6 | 345 | 40 | 11.6 | SubName: Full=Zeta toxin family protein;                        |
| e2cs80 | 441 | 51 | 11.6 | SubName: Full=Putative toxin secretion transmembrane protein... |
| e0fp20 | 473 | 55 | 11.6 | SubName: Full=RTX-III toxin determinant D;                      |
| e0fi02 | 473 | 55 | 11.6 | SubName: Full=RTX-III toxin determinant D;                      |
| e0fc13 | 473 | 55 | 11.6 | SubName: Full=RTX-III toxin determinant D;                      |
| e0f5n7 | 473 | 55 | 11.6 | SubName: Full=RTX-III toxin determinant D;                      |
| e0ezm0 | 473 | 55 | 11.6 | SubName: Full=RTX-III toxin determinant D;                      |
| e0etc9 | 473 | 55 | 11.6 | SubName: Full=RTX-III toxin determinant D;                      |
| e0elv1 | 473 | 55 | 11.6 | SubName: Full=RTX-III toxin determinant D;                      |
| e0efk0 | 473 | 55 | 11.6 | SubName: Full=RTX-III toxin determinant D;                      |
| e0e9q2 | 473 | 55 | 11.6 | SubName: Full=RTX-III toxin determinant D;                      |
| d7h1b3 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| d6kq44 | 371 | 43 | 11.6 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d5b900 | 587 | 68 | 11.6 | SubName: Full=Toxin;  |
| d4xjp9 | 422 | 49 | 11.6 | SubName: Full=HipA family toxin-antitoxin system;               |
| d4v0z6 | 396 | 46 | 11.6 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| d4j1s0 | 361 | 42 | 11.6 | SubName: Full=Predicted membrane protein, putative toxin reg... |
| d4c5q8 | 439 | 51 | 11.6 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d2u4e5 | 627 | 73 | 11.6 | SubName: Full=Insecticidal toxin complex protein;               |
| d2tvp2 | 449 | 52 | 11.6 | SubName: Full=RTX toxin ABC transporter protein;                |
| d0wd88 | 370 | 43 | 11.6 | SubName: Full=Zonula occludens toxin family protein;            |
| d0jyc2 | 587 | 68 | 11.6 | SubName: Full=Toxin;  |
| d0jnj7 | 587 | 68 | 11.6 | SubName: Full=Toxin;  |
| d0hrr4 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| d0h651 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| c6yev6 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| c6rw10 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| c4i172 | 587 | 68 | 11.6 | SubName: Full=Toxin;  |
| c4hpz3 | 587 | 68 | 11.6 | SubName: Full=Toxin;  |



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|--------|-----|----|------|---|
| c4hbn0 | 587 | 68 | 11.6 | SubName: Full=Toxin;  |
| c3nt69 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| c3lt80 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| c2igm6 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| c2cyx2 | 362 | 42 | 11.6 | SubName: Full=Possible toxin regulator;                         |
| c0xhd1 | 328 | 38 | 11.6 | SubName: Full=VIP2 family actin-ADP-ribosylating toxin;         |
| c0wmw1 | 362 | 42 | 11.6 | SubName: Full=Possible toxin regulator;                         |
| b7tgz9 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| b7tgz4 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| b7tgx9 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| b7tgx4 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| b7tgw9 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| b7tgw4 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| b7qzb0 | 568 | 66 | 11.6 | SubName: Full=Toxin secretion ABC transporter, ATP binding p... |
| b6qqk0 | 440 | 51 | 11.6 | SubName: Full=Toxin biosynthesis protein, putative;             |
| b1bsw2 | 553 | 64 | 11.6 | SubName: Full=Lambda toxin;                                     |
| b0i0z4 | 587 | 68 | 11.6 | SubName: Full=Toxin;  |
| b0hnm7 | 587 | 68 | 11.6 | SubName: Full=Toxin;  |
| b0hb47 | 587 | 68 | 11.6 | SubName: Full=Toxin;  |
| b0gzx5 | 587 | 68 | 11.6 | SubName: Full=Toxin;  |
| b0glm6 | 587 | 68 | 11.6 | SubName: Full=Toxin;  |
| b0a5m9 | 587 | 68 | 11.6 | SubName: Full=Toxin;  |
| a9zd22 | 587 | 68 | 11.6 | SubName: Full=Toxin;  |
| a9qye2 | 587 | 68 | 11.6 | SubName: Full=Toxin;  |
| a6w1l7 | 430 | 50 | 11.6 | SubName: Full=Aerolysin/hemolysin/leukocidin toxin; Flags: P... |
| a5f393 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| a4tsw6 | 587 | 68 | 11.6 | SubName: Full=Toxin;  |
| a3gyr6 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| a3gme2 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| a1f0y4 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| a1eic4 | 430 | 50 | 11.6 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| q92032 | 407 | 47 | 11.5 | RecName: Full=Snake venom metalloproteinase ACLH; Short=SVMP... |
| q5b719 | 444 | 51 | 11.5 | SubName: Full=Toxin biosynthesis protein, putative (AFU_orth... |
| q508i7 | 419 | 48 | 11.5 | SubName: Full=Anthrax toxin receptor/neuroblastoma fusion pr... |
| q08633 | 477 | 55 | 11.5 | RecName: Full=RTX-III toxin determinant D; AltName: Full=APX... |
| p58912 | 488 | 56 | 11.5 | RecName: Full=Toxin PsTX-60B; Flags: Precursor;                 |
| p45782 | 407 | 47 | 11.5 | RecName: Full=Type II secretion system protein L; Short=T2SS... |
| p37093 | 503 | 58 | 11.5 | RecName: Full=Type II secretion system protein E; Short=T2SS... |
| k9gur4 | 443 | 51 | 11.5 | SubName: Full=Toxin biosynthesis protein, putative;             |
| k9f5n2 | 443 | 51 | 11.5 | SubName: Full=Toxin biosynthesis protein, putative;             |
| k7b588 | 489 | 56 | 11.5 | SubName: Full=Anthrax toxin receptor 2;                         |
| k5u1t5 | 470 | 54 | 11.5 | SubName: Full=Zonular occludens toxin family protein;           |
| j4uz83 | 348 | 40 | 11.5 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| i8t555 | 583 | 67 | 11.5 | SubName: Full=Antitoxin, type II toxin-antitoxin system fami... |
| i3ck66 | 347 | 40 | 11.5 | SubName: Full=Zonula occludens toxin;                           |
| h6llq3 | 338 | 39 | 11.5 | SubName: Full=Leukocidin/hemolysin toxin family protein;        |
| h3ywj7 | 356 | 41 | 11.5 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3y7g6 | 356 | 41 | 11.5 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3x5i1 | 356 | 41 | 11.5 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h2qps0 | 488 | 56 | 11.5 | SubName: Full=Anthrax toxin receptor 2; SubName: Full=Unchar... |
| h1ta03 | 356 | 41 | 11.5 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h0rpv7 | 644 | 74 | 11.5 | SubName: Full=Putative secretion protein (HlyD family); toxi... |
| h0eby9 | 572 | 66 | 11.5 | SubName: Full=Hemolysin-type calcium-binding toxin;             |
| h0da35 | 356 | 41 | 11.5 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| g7kg46 | 511 | 59 | 11.5 | SubName: Full=Multidrug and toxin extrusion protein;            |
| g6xuv4 | 539 | 62 | 11.5 | SubName: Full=Putative toxin secretion ATP-binding ABC trans... |
| g2sm68 | 349 | 40 | 11.5 | SubName: Full=Toxin/antitoxin system, Antitoxin component;      |
| g0ugk2 | 382 | 44 | 11.5 | SubName: Full=Membrane protein, toxin regulator;                |

|        |     |    |      |   |
|--------|-----|----|------|---|
| g0a211 | 460 | 53 | 11.5 | SubName: Full=Zonular occludens toxin;                          |
| f9kur7 | 356 | 41 | 11.5 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f7qwk8 | 349 | 40 | 11.5 | SubName: Full=Membrane protein, toxin regulator;                |
| f5wpt6 | 356 | 41 | 11.5 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f4v217 | 459 | 53 | 11.5 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| f3tcj2 | 356 | 41 | 11.5 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f1yr32 | 487 | 56 | 11.5 | SubName: Full=RTX-III toxin determinant D;                      |
| f1w3e5 | 426 | 49 | 11.5 | SubName: Full=RTX toxins and Ca2+-binding proteins-like prot... |
| e8li77 | 365 | 42 | 11.5 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e5r7f4 | 356 | 41 | 11.5 | SubName: Full=Staphylococcal/Streptococcal toxin, beta-grasp... |
| e0gk38 | 384 | 44 | 11.5 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| d9y4i1 | 416 | 48 | 11.5 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d9rni6 | 338 | 39 | 11.5 | SubName: Full=Leukocidin/hemolysin toxin family protein;        |
| d4db75 | 418 | 48 | 11.5 | SubName: Full=Toxin biosynthesis protein, putative;             |
| d3ahh7 | 338 | 39 | 11.5 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d2yk22 | 340 | 39 | 11.5 | SubName: Full=Toxin coregulated pilus biosynthesis protein E... |
| d2yjt8 | 503 | 58 | 11.5 | SubName: Full=Toxin coregulated pilus biosynthesis protein I... |
| d1ph77 | 497 | 57 | 11.5 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d1avh7 | 349 | 40 | 11.5 | SubName: Full=Membrane protein putative toxin regulator-like... |
| c8n7a9 | 477 | 55 | 11.5 | SubName: Full=RTX toxin transporter;                            |
| c8mn38 | 356 | 41 | 11.5 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8lgu1 | 356 | 41 | 11.5 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8ld31 | 338 | 39 | 11.5 | SubName: Full=Leukocidin/hemolysin toxin family protein;        |
| c8l7s4 | 356 | 41 | 11.5 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c7h633 | 347 | 40 | 11.5 | SubName: Full=Toxin-antitoxin system, toxin component, MazF ... |
| b8m6b8 | 358 | 41 | 11.5 | SubName: Full=Killer toxin sensitivity protein (Iki1), putat... |
| b8lwh3 | 443 | 51 | 11.5 | SubName: Full=Toxin biosynthesis protein, putative;             |
| b2ubw7 | 382 | 44 | 11.5 | SubName: Full=Zonular occludens toxin;                          |
| a8sk81 | 382 | 44 | 11.5 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| a6tyq0 | 356 | 41 | 11.5 | SubName: Full=Toxin beta-grasp domain protein; Flags: Precur... |
| a6qi17 | 338 | 39 | 11.5 | SubName: Full=Leukocidin/hemolysin toxin family F subunit;      |
| q9f5r5 | 333 | 38 | 11.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| q66ag0 | 456 | 52 | 11.4 | SubName: Full=Putative ABC associated RTX toxin transporter,... |
| q508i5 | 411 | 47 | 11.4 | SubName: Full=Anthrax toxin receptor/neuroblastoma fusion pr... |
| q4wsi8 | 551 | 63 | 11.4 | SubName: Full=MFS toxin efflux pump (AflT), putative;           |
| q4jev5 | 492 | 56 | 11.4 | SubName: Full=Pore-forming toxin-like protein Hfr-2;            |
| q48el8 | 449 | 51 | 11.4 | SubName: Full=Insecticidal toxin protein, putative;             |
| q1emi4 | 367 | 42 | 11.4 | SubName: Full=Putative associated RTX toxin transporter;        |
| p12963 | 370 | 42 | 11.4 | RecName: Full=41.9 kDa insecticidal toxin; AltName: Full=Str... |
| p06575 | 370 | 42 | 11.4 | RecName: Full=41.9 kDa insecticidal toxin; AltName: Full=Str... |
| k7yxd6 | 405 | 46 | 11.4 | SubName: Full=Toxin module HipA, protein kinase of phosphati... |
| k5uq57 | 458 | 52 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| k5kqt9 | 458 | 52 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| k0fzn9 | 369 | 42 | 11.4 | SubName: Full=41.9 kDa insecticidal toxin;                      |
| j2w4e9 | 440 | 50 | 11.4 | SubName: Full=HipA family toxin-antitoxin system;               |
| j2v1i9 | 440 | 50 | 11.4 | SubName: Full=HipA family toxin-antitoxin system;               |
| j2k4a0 | 440 | 50 | 11.4 | SubName: Full=HipA family toxin-antitoxin system;               |
| j0u9l1 | 457 | 52 | 11.4 | SubName: Full=Zonula occludens toxin;                           |
| i8s1x8 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i8s0t6 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i8q1b4 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i8p2a3 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i8nym7 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i8lyg5 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i8ksj3 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i8jxx6 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i8jef0 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i8j2y3 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |

|        |     |    |      |   |
|--------|-----|----|------|---|
| i8h4l5 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i8g9m0 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i8g833 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i8fw85 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i8fcnl | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i8f8h7 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i8clt1 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i8b7y5 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i8ay95 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i8a962 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i8a5j1 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i7z5m0 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i7yjb2 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i7y5q8 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i7xyb9 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i7xx27 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i7x193 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i7wlg6 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i7w355 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i7vuv2 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i7vk00 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i7vey1 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i7v6e1 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i7uzr2 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i7uvt9 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i7unc0 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i7ua88 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i7u9u3 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i7t8p6 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i7src5 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i7sm92 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i7rw13 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i7qib0 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i7pte4 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i7pp02 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i7p2x5 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i7mvn6 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i7mv77 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i6kn25 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i6km18 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i6jw54 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i6jsl1 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i6j356 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i6iyi4 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i6igr0 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i6i423 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i6hpx6 | 341 | 39 | 11.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i4mkb6 | 351 | 40 | 11.4 | SubName: Full=Zonula occludens toxin;                           |
| i0vzn0 | 333 | 38 | 11.4 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| i0sx66 | 333 | 38 | 11.4 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| i0svj2 | 333 | 38 | 11.4 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| h0ta23 | 643 | 73 | 11.4 | SubName: Full=Putative secretion protein (HlyD family); toxi... |
| g8w2m6 | 440 | 50 | 11.4 | SubName: Full=HipA family toxin-antitoxin system;               |
| g8tnj7 | 473 | 54 | 11.4 | SubName: Full=Binary exotoxin B/Anthrax toxin B moiety prote... |
| g4y0w6 | 458 | 52 | 11.4 | SubName: Full=Putative ABC associated RTX toxin transporter;... |
| g4ca95 | 431 | 49 | 11.4 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| g0slx1 | 430 | 49 | 11.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| f3xqr7 | 341 | 39 | 11.4 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |

|         |     |    |      |   |
|---------|-----|----|------|---|
| e9fnu5  | 333 | 38 | 11.4 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| e7pkf4  | 448 | 51 | 11.4 | SubName: Full=Insecticidal toxin protein, putative;             |
| e6e895  | 569 | 65 | 11.4 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4zlz4  | 448 | 51 | 11.4 | SubName: Full=Similar to toxin biosynthesis protein;            |
| d7ip50  | 334 | 38 | 11.4 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d6l9w6  | 334 | 38 | 11.4 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d2yk16  | 430 | 49 | 11.4 | SubName: Full=Toxin coregulated pilus biosynthesis protein B... |
| d0gvw5  | 457 | 52 | 11.4 | SubName: Full=Zona occludens toxin;                             |
| c6xeu5  | 386 | 44 | 11.4 | SubName: Full=Zonular occludens toxin;                          |
| c6mah0  | 395 | 45 | 11.4 | SubName: Full=Zonula occludens toxin family protein;            |
| c4hg10  | 341 | 39 | 11.4 | SubName: Full=Zona occludens toxin;                             |
| c4h6e7  | 341 | 39 | 11.4 | SubName: Full=Zona occludens toxin;                             |
| c2q549  | 368 | 42 | 11.4 | SubName: Full=41.9 kDa insecticidal toxin;                      |
| b7tgy9  | 430 | 49 | 11.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| b7tgy4  | 430 | 49 | 11.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| b6scy5  | 361 | 41 | 11.4 | SubName: Full=Putative Shiga-like toxin alpha subunit;          |
| b3ip45  | 490 | 56 | 11.4 | SubName: Full=RTX toxin RtxA;                                   |
| b1hq58  | 370 | 42 | 11.4 | SubName: Full=41.9 kDa insecticidal toxin;                      |
| b0xr34  | 551 | 63 | 11.4 | SubName: Full=MFS toxin efflux pump (AflT), putative;           |
| b0ske4  | 367 | 42 | 11.4 | SubName: Full=Putative associated RTX toxin transporter;        |
| a3eic8  | 430 | 49 | 11.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| a1dl43  | 588 | 67 | 11.4 | SubName: Full=MFS toxin efflux pump, putative;                  |
| a0z973  | 405 | 46 | 11.4 | SubName: Full=Addiction module toxin, Txe/YoeB;                 |
| q9l8e4  | 199 | 37 | 11.3 | SubName: Full=Toxin coregulated pili subunit;                   |
| q95ne0  | 314 | 37 | 11.3 | RecName: Full=Ecto-ADP-ribosyltransferase 4; EC=2.4.2.31; Al... |
| q94m00  | 315 | 37 | 11.3 | SubName: Full=Shiga toxin 1A variant OX3;                       |
| q93070  | 314 | 37 | 11.3 | RecName: Full=Ecto-ADP-ribosyltransferase 4; EC=2.4.2.31; Al... |
| q8vv67  | 315 | 37 | 11.3 | SubName: Full=Shiga toxin 1 A subunit; SubName: Full=Shiga t... |
| q8vv62  | 319 | 37 | 11.3 | SubName: Full=Shiga toxin 2 A-subunit;                          |
| q8l356  | 258 | 37 | 11.3 | SubName: Full=Cholera toxin A subunit;                          |
| q8l168  | 315 | 37 | 11.3 | SubName: Full=Shiga toxin 1 A subunit;                          |
| q8dr23  | 303 | 37 | 11.3 | SubName: Full=Exfoliative toxin A;                              |
| q82yff7 | 612 | 69 | 11.3 | SubName: Full=Putative Zeta toxin;                              |
| q7whg5  | 241 | 37 | 11.3 | SubName: Full=Putative toxin;                                   |
| q7n937  | 530 | 60 | 11.3 | SubName: Full=Insecticidal toxin complex protein TcaZ;          |
| q7n8b1  | 408 | 46 | 11.3 | RecName: Full=Photox toxin; EC=2.4.2.31; AltName: Full=Mono(... |
| q6dfx2  | 487 | 55 | 11.3 | RecName: Full=Anthrax toxin receptor 2; Flags: Precursor;       |
| q5pmi6  | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;            |
| q5hx86  | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin, subunit A;           |
| q5f1k6  | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin A;                    |
| q5dz57  | 149 | 37 | 11.3 | SubName: Full=Toxin coregulated pilus biosynthesis protein T... |
| q5dkx4  | 277 | 37 | 11.3 | SubName: Full=Exfoliative toxin ExhB;                           |
| q58869  | 197 | 37 | 11.3 | RecName: Full=Putative ribonuclease VapC5; Short=Putative RN... |
| q4ww19  | 247 | 37 | 11.3 | SubName: Full=Toxin biosynthesis ketoreductase, putative; EC... |
| q47640  | 315 | 37 | 11.3 | SubName: Full=SLT-I A subunit coding region; SubName: Full=S... |
| q47088  | 237 | 37 | 11.3 | SubName: Full=CdtA; SubName: Full=Cytolethal distending toxi... |
| q46150  | 398 | 45 | 11.3 | RecName: Full=Phospholipase C; Short=PLC; EC=3.1.4.3; AltNam... |
| q46050  | 320 | 37 | 11.3 | SubName: Full=Shiga-like toxin;                                 |
| q45192  | 224 | 37 | 11.3 | SubName: Full=Toxin co-regulated pilin; SubName: Full=Type I... |
| q45871  | 293 | 37 | 11.3 | SubName: Full=HA-33; SubName: Full=HA-33 protein; SubName: F... |
| q0pc56  | 268 | 37 | 11.3 | RecName: Full=Cytolethal distending toxin subunit A; Short=C... |
| q04m64  | 299 | 37 | 11.3 | SubName: Full=Exfoliative toxin, putative;                      |
| p70352  | 309 | 37 | 11.3 | RecName: Full=Ecto-ADP-ribosyltransferase 5; EC=2.4.2.31; Al... |
| p15795  | 294 | 37 | 11.3 | RecName: Full=Cholera toxin transcriptional activator;          |
| p0ag16  | 158 | 37 | 11.3 | RecName: Full=Ribosome association toxin RatA;                  |
| p0ag15  | 158 | 37 | 11.3 | RecName: Full=Ribosome association toxin RatA; AltName: Full... |
| o58440  | 161 | 37 | 11.3 | RecName: Full=Putative ribonuclease VapC6; Short=Putative RN... |
| o34853  | 248 | 37 | 11.3 | RecName: Full=Stage II sporulation protein SA; AltName: Full... |

|        |     |    |      |   |
|--------|-----|----|------|---|
| o06523 | 283 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin protein B;            |
| k9j4t3 | 488 | 55 | 11.3 | SubName: Full=Anthrax toxin receptor 2 isoform 2;               |
| k7s0d8 | 278 | 37 | 11.3 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| k6rma2 | 323 | 37 | 11.3 | SubName: Full=Exfoliative toxin A;                              |
| k6qjg9 | 323 | 37 | 11.3 | SubName: Full=Exfoliative toxin A;                              |
| k6nne7 | 354 | 40 | 11.3 | SubName: Full=Zonula occludens toxin;                           |
| k6l1q9 | 178 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| k6kv55 | 354 | 40 | 11.3 | SubName: Full=Zonula occludens toxin;                           |
| k5veb9 | 208 | 37 | 11.3 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k5umz9 | 187 | 37 | 11.3 | SubName: Full=Putative toxin co-regulated pilus biosynthesis... |
| k5c2s8 | 254 | 37 | 11.3 | SubName: Full=Zeta toxin;                                       |
| k4u1b8 | 241 | 37 | 11.3 | SubName: Full=Putative toxin;                                   |
| k4tg32 | 269 | 37 | 11.3 | SubName: Full=Pertussis toxin subunit 1; EC=2.4.2.-;            |
| k4qp58 | 227 | 37 | 11.3 | SubName: Full=Pertussis toxin subunit 3;                        |
| k4qe40 | 241 | 37 | 11.3 | SubName: Full=Putative toxin;                                   |
| k4ib84 | 399 | 45 | 11.3 | SubName: Full=Addiction module toxin protein HipA;              |
| k4iat8 | 153 | 37 | 11.3 | SubName: Full=Antitoxin transcriptional regulator (Mobile my... |
| k3kkv1 | 215 | 37 | 11.3 | SubName: Full=Xre family toxin-antitoxin system domain prote... |
| k2gge2 | 235 | 37 | 11.3 | SubName: Full=Zeta toxin;                                       |
| k2aqz6 | 205 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| k1v4a0 | 266 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| k1erj8 | 354 | 40 | 11.3 | SubName: Full=Zonula occludens toxin;                           |
| k0hsd7 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin, subunit A;           |
| k0fzv0 | 515 | 58 | 11.3 | SubName: Full=Mosquitocidal toxin protein;                      |
| j9fys8 | 253 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| j8dy60 | 141 | 37 | 11.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j7rpt0 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin A;                    |
| j7qh70 | 226 | 37 | 11.3 | SubName: Full=Pertussis toxin subunit 2;                        |
| j7fsj2 | 269 | 37 | 11.3 | SubName: Full=Pertussis toxin subunit 1;                        |
| j5wzm8 | 201 | 37 | 11.3 | SubName: Full=Zeta toxin;                                       |
| j4k896 | 252 | 37 | 11.3 | SubName: Full=Zeta toxin;                                       |
| j3kss8 | 316 | 37 | 11.3 | SubName: Full=Multidrug and toxin extrusion protein 1;          |
| j3jaa3 | 260 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| j2z5v8 | 362 | 41 | 11.3 | SubName: Full=Putative toxin regulator;                         |
| j1uh06 | 299 | 37 | 11.3 | SubName: Full=Exfoliative toxin A; EC=3.1.26.4;                 |
| j1hhv1 | 299 | 37 | 11.3 | SubName: Full=Exfoliative toxin A; EC=3.1.26.4;                 |
| j1cni6 | 164 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| j0jq74 | 164 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| j0hv65 | 164 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| j0gtm6 | 164 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| i5rsz1 | 201 | 37 | 11.3 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| i5ay19 | 315 | 37 | 11.3 | SubName: Full=Zonula occludens toxin; Flags: Precursor;         |
| i4m4a8 | 110 | 37 | 11.3 | SubName: Full=Addiction module toxin, RelE/StbE family prote... |
| i4jum8 | 226 | 37 | 11.3 | SubName: Full=Diphtheria toxin repressor;                       |
| i3ha33 | 251 | 37 | 11.3 | SubName: Full=Toxin OB-fold domain-containing protein staphy... |
| i3h4n3 | 251 | 37 | 11.3 | SubName: Full=Toxin OB-fold domain-containing protein staphy... |
| i3h4d4 | 251 | 37 | 11.3 | SubName: Full=Toxin OB-fold domain-containing protein staphy... |
| i3gd28 | 251 | 37 | 11.3 | SubName: Full=Toxin OB-fold domain-containing protein staphy... |
| i3g074 | 251 | 37 | 11.3 | SubName: Full=Toxin OB-fold domain-containing protein staphy... |
| i3frr6 | 251 | 37 | 11.3 | SubName: Full=Toxin OB-fold domain-containing protein staphy... |
| i2z7x6 | 169 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| i2wg41 | 197 | 37 | 11.3 | SubName: Full=Hemolysin toxin protein A domain protein;         |
| i2wdm6 | 315 | 37 | 11.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| i2ssv1 | 315 | 37 | 11.3 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| i2r000 | 158 | 37 | 11.3 | SubName: Full=Putative toxin YfjG;                              |
| i2fc55 | 278 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit B;            |
| i0xl60 | 239 | 37 | 11.3 | SubName: Full=Insecticide toxin TcdB middle/N-terminal domai... |
| i0tzn9 | 254 | 37 | 11.3 | SubName: Full=Toxin, beta-grasp domain protein;                 |

|        |     |    |      |   |
|--------|-----|----|------|---|
| i0tpe6 | 164 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| i0ti13 | 164 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| i0s742 | 252 | 37 | 11.3 | SubName: Full=Zeta toxin;                                       |
| i0qhh7 | 257 | 37 | 11.3 | SubName: Full=Zeta-toxin;                                       |
| i0nwh0 | 252 | 37 | 11.3 | SubName: Full=Zeta toxin family protein;                        |
| i0nqq9 | 252 | 37 | 11.3 | SubName: Full=Zeta toxin family protein;                        |
| i0n969 | 252 | 37 | 11.3 | SubName: Full=Zeta toxin family protein;                        |
| i0ac48 | 151 | 37 | 11.3 | SubName: Full=Oligoketide cyclase/lipid transport protein; S... |
| h8xbm9 | 226 | 37 | 11.3 | SubName: Full=Diphtheria toxin repressor;                       |
| h8xbm8 | 226 | 37 | 11.3 | SubName: Full=Diphtheria toxin repressor;                       |
| h8e091 | 162 | 37 | 11.3 | SubName: Full=RTX-I toxin-activating lysine-acyltransferase ... |
| h8d1b9 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h8cun5 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h8clw2 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h8ch32 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h8c802 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h8c235 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h8byi4 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h8bq01 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h8bpj6 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h8bgr8 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h8bdn3 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h8b730 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h8b0v0 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h8axd9 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h8anx2 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h8amf4 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h8agv5 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h8abu8 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h8a4r7 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h8a2p1 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7zxx8 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7zs77 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7zfx5 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7z906 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7z7f0 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7z2m5 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7ynn2 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7yi87 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7yaj3 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7y024 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7xxc6 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7xsi2 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7xgi6 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7x6v0 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7wzb8 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h5a674 | 236 | 37 | 11.3 | SubName: Full=Toxin B domain protein;                           |
| h4vw07 | 353 | 40 | 11.3 | SubName: Full=Zonula occludens toxin;                           |
| h4rd58 | 373 | 42 | 11.3 | SubName: Full=Toxin B domain protein;                           |
| h4q814 | 373 | 42 | 11.3 | SubName: Full=Toxin B domain protein;                           |
| h4nu51 | 373 | 42 | 11.3 | SubName: Full=Toxin B domain protein;                           |
| h4g932 | 242 | 37 | 11.3 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h4g4u3 | 242 | 37 | 11.3 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h4eda3 | 232 | 37 | 11.3 | SubName: Full=Enterotoxin-like toxin;                           |
| h4e8z5 | 232 | 37 | 11.3 | SubName: Full=Enterotoxin-like toxin;                           |
| h4d384 | 238 | 37 | 11.3 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4d103 | 232 | 37 | 11.3 | SubName: Full=Enterotoxin-like toxin;                           |
| h4cl18 | 232 | 37 | 11.3 | SubName: Full=Enterotoxin-like toxin;                           |

|        |     |    |      |   |
|--------|-----|----|------|---|
| h4cbt6 | 232 | 37 | 11.3 | SubName: Full=Enterotoxin-like toxin;                           |
| h4a410 | 250 | 37 | 11.3 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4a242 | 232 | 37 | 11.3 | SubName: Full=Enterotoxin-like toxin;                           |
| h3zfp4 | 441 | 50 | 11.3 | SubName: Full=Toxin;  |
| h3yw82 | 254 | 37 | 11.3 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3yvw7 | 242 | 37 | 11.3 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3yg91 | 254 | 37 | 11.3 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3y8j2 | 254 | 37 | 11.3 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3x4q8 | 254 | 37 | 11.3 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3w2n1 | 164 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| h3uxc3 | 164 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| h3um79 | 164 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| h3ubv2 | 164 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| h3rvw6 | 232 | 37 | 11.3 | SubName: Full=Enterotoxin-like toxin;                           |
| h3n1d1 | 145 | 37 | 11.3 | SubName: Full=Putative toxin YfjG;                              |
| h3lbn1 | 145 | 37 | 11.3 | SubName: Full=Putative toxin YfjG;                              |
| h3bua0 | 257 | 37 | 11.3 | SubName: Full=Anthrax toxin receptor-like;                      |
| h2i5g8 | 226 | 37 | 11.3 | SubName: Full=Diphtheria toxin repressor;                       |
| h2i233 | 226 | 37 | 11.3 | RecName: Full=Diphtheria toxin repressor; AltName: Full=Iron... |
| h2hu09 | 226 | 37 | 11.3 | SubName: Full=Diphtheria toxin repressor;                       |
| h2hlx9 | 226 | 37 | 11.3 | SubName: Full=Diphtheria toxin repressor;                       |
| h2hex0 | 226 | 37 | 11.3 | SubName: Full=Diphtheria toxin repressor;                       |
| h2h7z7 | 226 | 37 | 11.3 | SubName: Full=Diphtheria toxin repressor;                       |
| h2h108 | 226 | 37 | 11.3 | SubName: Full=Diphtheria toxin repressor;                       |
| h2gud3 | 226 | 37 | 11.3 | SubName: Full=Diphtheria toxin repressor;                       |
| h2gs97 | 226 | 37 | 11.3 | SubName: Full=Diphtheria toxin repressor;                       |
| h2ghu3 | 226 | 37 | 11.3 | SubName: Full=Diphtheria toxin repressor;                       |
| h2gbz2 | 226 | 37 | 11.3 | SubName: Full=Diphtheria toxin repressor;                       |
| h1xmv3 | 531 | 60 | 11.3 | SubName: Full=Toxin RTX-I translocation ATP-binding protein;... |
| h1w5z2 | 260 | 37 | 11.3 | SubName: Full=Putative Hemolysin-type calcium-binding toxin;... |
| h1tfe9 | 242 | 37 | 11.3 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h1t7i8 | 254 | 37 | 11.3 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h1snq9 | 254 | 37 | 11.3 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h1rh48 | 242 | 37 | 11.3 | SubName: Full=Pertussis toxin-like subunit ArtA;                |
| h1lil3 | 336 | 38 | 11.3 | SubName: Full=Clostridial binary toxin A;                       |
| h1bud2 | 158 | 37 | 11.3 | SubName: Full=Putative toxin YfjG;                              |
| h0n8n2 | 242 | 37 | 11.3 | SubName: Full=Pertussis toxin-like subunit ArtA;                |
| h0mr56 | 242 | 37 | 11.3 | SubName: Full=Pertussis toxin-like subunit ArtA;                |
| h0mfj5 | 242 | 37 | 11.3 | SubName: Full=Pertussis toxin-like subunit ArtA;                |
| h0m606 | 242 | 37 | 11.3 | SubName: Full=Pertussis toxin-like subunit ArtA;                |
| h0lv12 | 242 | 37 | 11.3 | SubName: Full=Pertussis toxin-like subunit ArtA;                |
| h0lhf5 | 242 | 37 | 11.3 | SubName: Full=Pertussis toxin-like subunit ArtA;                |
| h0la32 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;            |
| h0eup5 | 191 | 37 | 11.3 | SubName: Full=Putative HC-toxin synthetase;                     |
| h0eph4 | 223 | 37 | 11.3 | SubName: Full=Putative HC-toxin efflux carrier TOXA;            |
| h0dip2 | 242 | 37 | 11.3 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h0cpz7 | 254 | 37 | 11.3 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h0cpz3 | 251 | 37 | 11.3 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h0c774 | 251 | 37 | 11.3 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h0b0j1 | 242 | 37 | 11.3 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h0av00 | 242 | 37 | 11.3 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h0a914 | 203 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| g9y6a5 | 208 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, Bro d... |
| g9vv39 | 242 | 37 | 11.3 | SubName: Full=Pertussis toxin-like subunit ArtA;                |
| g9vi22 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;            |
| g9uye4 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;            |
| g9usl2 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;            |
| g9ubc4 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;            |

|        |     |    |      |  |
|--------|-----|----|------|--|
| g9u076 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;             |
| g9ts96 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;             |
| g9taq8 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;             |
| g8u619 | 226 | 37 | 11.3 | SubName: Full=Putative toxin component;                          |
| g8qn71 | 296 | 37 | 11.3 | SubName: Full=Zonula occludens toxin; Flags: Precursor;          |
| g8q4t2 | 144 | 37 | 11.3 | SubName: Full=Toxin-antitoxin antitoxin component;               |
| g8fee7 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;             |
| g8fah8 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;             |
| g7tnm2 | 294 | 37 | 11.3 | SubName: Full=Cholera toxin transcriptional activator;           |
| g7km41 | 198 | 37 | 11.3 | SubName: Full=Multidrug and toxin extrusion protein;             |
| g6bqz7 | 166 | 37 | 11.3 | SubName: Full=Toxin secretion/phage lysis holin;                 |
| g5rwe7 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;             |
| g5mjj9 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;             |
| g5gtr6 | 281 | 37 | 11.3 | SubName: Full=Zeta-toxin;  |
| g5c5k6 | 192 | 37 | 11.3 | SubName: Full=Ras-related C3 botulinum toxin substrate 1;        |
| g3jmh9 | 326 | 37 | 11.3 | SubName: Full=Zeta toxin family protein;                         |
| g3i1l1 | 487 | 55 | 11.3 | SubName: Full=Anthrax toxin receptor 2;                          |
| g2agj6 | 315 | 37 | 11.3 | SubName: Full=Shiga-like toxin 1 subunit A; EC=3.2.2.22;         |
| g2aeu0 | 319 | 37 | 11.3 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;         |
| g1xvm9 | 192 | 37 | 11.3 | SubName: Full=RTX toxins and related Ca2+-binding protein;       |
| g1ub80 | 283 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin protein B;             |
| g0vxc1 | 317 | 37 | 11.3 | SubName: Full=Elongator complex protein 3 Gamma-toxin target...  |
| g0t3d2 | 290 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin;                       |
| g0st31 | 258 | 37 | 11.3 | SubName: Full=Toxin, cholera;                                    |
| f9xux7 | 205 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin A;                     |
| f9xux6 | 264 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin;                       |
| f9rny8 | 442 | 50 | 11.3 | SubName: Full=Zonular occludens toxin;                           |
| f9rba2 | 177 | 37 | 11.3 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ...  |
| f9rba0 | 219 | 37 | 11.3 | SubName: Full=Toxin coregulated pilin subunit TcpA;              |
| f9kwt9 | 219 | 37 | 11.3 | SubName: Full=Toxin, beta-grasp domain protein;                  |
| f9kkh2 | 254 | 37 | 11.3 | SubName: Full=Toxin, beta-grasp domain protein;                  |
| f9kcq8 | 242 | 37 | 11.3 | SubName: Full=Toxin, beta-grasp domain protein;                  |
| f9kcq7 | 242 | 37 | 11.3 | SubName: Full=Toxin, beta-grasp domain protein;                  |
| f9k3x6 | 254 | 37 | 11.3 | SubName: Full=Toxin, beta-grasp domain protein;                  |
| f9jxt3 | 254 | 37 | 11.3 | SubName: Full=Toxin, beta-grasp domain protein;                  |
| f7swz7 | 450 | 51 | 11.3 | SubName: Full=Toxin complex component ORF-X3;                    |
| f5wm11 | 254 | 37 | 11.3 | SubName: Full=Toxin, beta-grasp domain protein;                  |
| f5wgd4 | 254 | 37 | 11.3 | SubName: Full=Toxin, beta-grasp domain protein;                  |
| f5w8g2 | 254 | 37 | 11.3 | SubName: Full=Toxin, beta-grasp domain protein;                  |
| f5w8f8 | 251 | 37 | 11.3 | SubName: Full=Toxin, beta-grasp domain protein;                  |
| f5w6u6 | 238 | 37 | 11.3 | SubName: Full=Toxin, beta-grasp domain protein;                  |
| f5u9b0 | 155 | 37 | 11.3 | SubName: Full=Toxin secretion/phage lysis holin;                 |
| f4w301 | 243 | 37 | 11.3 | SubName: Full=Pertussis toxin, subunit 1 subfamily;              |
| f4vfa9 | 185 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ...  |
| f4lt97 | 185 | 37 | 11.3 | SubName: Full=Transcriptional modulator of MazE/toxin, MazF;...  |
| f4fp20 | 232 | 37 | 11.3 | SubName: Full=Staphylococcal enterotoxin-like toxin;             |
| f4b5s3 | 127 | 37 | 11.3 | SubName: Full=VapC-type toxin;                                   |
| f4b4z1 | 132 | 37 | 11.3 | SubName: Full=VapC-type toxin;                                   |
| f3zep3 | 279 | 37 | 11.3 | SubName: Full=Putative xre family toxin-antitoxin system, an...  |
| f3xtk2 | 399 | 45 | 11.3 | SubName: Full=Toxin-antitoxin system toxin component, PIN fa...  |
| f3v6c4 | 237 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin A/C family protein...  |
| f3thk7 | 276 | 37 | 11.3 | SubName: Full=Toxin, beta-grasp domain protein;                  |
| f3the9 | 254 | 37 | 11.3 | SubName: Full=Toxin, beta-grasp domain protein;                  |
| f3spb6 | 179 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ...  |
| f3q5n4 | 172 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ...  |
| f0vs80 | 126 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, antitoxin component, Hi... |
| f0cwz3 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;             |
| f0cvg6 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;             |



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|--------|-----|----|------|---|
| f0cj52 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;            |
| f0cgy6 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;            |
| f0ceu3 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;            |
| f0c5c1 | 380 | 43 | 11.3 | SubName: Full=Zonular occludens toxin (Zot);                    |
| e9v3r2 | 388 | 44 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| e9up65 | 159 | 37 | 11.3 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e9u5p6 | 193 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| e9tqu5 | 193 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| e9tp86 | 194 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| e9t907 | 193 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| e9ehw3 | 496 | 56 | 11.3 | SubName: Full=Putative mosquitocidal toxin;                     |
| e9dn63 | 257 | 37 | 11.3 | SubName: Full=Zeta-toxin;                                       |
| e8vuv8 | 453 | 51 | 11.3 | SubName: Full=RTX toxin transporter;                            |
| e8grg3 | 242 | 37 | 11.3 | SubName: Full=Pertussis toxin-like subunit ArtA;                |
| e8gfi3 | 242 | 37 | 11.3 | SubName: Full=Pertussis toxin-like subunit ArtA;                |
| e8gci3 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;            |
| e8fwd5 | 242 | 37 | 11.3 | SubName: Full=Pertussis toxin-like subunit ArtA;                |
| e8fbf9 | 197 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit CdtB;         |
| e8fbf6 | 242 | 37 | 11.3 | SubName: Full=Pertussis toxin-like subunit ArtA;                |
| e8f4s7 | 242 | 37 | 11.3 | SubName: Full=Pertussis toxin-like subunit ArtA;                |
| e8etv7 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;            |
| e8ebi0 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;            |
| e8dit8 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;            |
| e8da22 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;            |
| e8cmq4 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;            |
| e8c873 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;            |
| e8bn42 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;            |
| e8ba17 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;            |
| e8b4e3 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;            |
| e8ajg7 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;            |
| e8af80 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;            |
| e8a0b8 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;            |
| e7zlj2 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;            |
| e7zd26 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;            |
| e7yx05 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;            |
| e7yl41 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;            |
| e7y928 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;            |
| e7zzf6 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;            |
| e7xn53 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;            |
| e7x9t2 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;            |
| e7wlp7 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;            |
| e7wb85 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;            |
| e7v1x7 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;            |
| e7sxl1 | 237 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| e7r6v3 | 261 | 37 | 11.3 | SubName: Full=Killer toxin Resistant;                           |
| e7n3u9 | 197 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e7g270 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin A/C family protein... |
| e7c4p4 | 264 | 37 | 11.3 | SubName: Full=RTX toxins and related Ca2+-binding proteins;     |
| e6rzc7 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin;                      |
| e6rt82 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| e6l7p1 | 244 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin A;                    |
| e6bqi8 | 193 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| e6ap82 | 193 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| e6afp8 | 193 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| e5zm96 | 193 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| e5zh47 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin A/C family protein... |
| e5rql1 | 277 | 37 | 11.3 | SubName: Full=Exfoliative toxin;                                |
| e5r7q9 | 254 | 37 | 11.3 | SubName: Full=Staphylococcal/Streptococcal toxin, beta-grasp... |

|        |     |    |      |   |
|--------|-----|----|------|---|
| e5aua1 | 408 | 46 | 11.3 | SubName: Full=Insecticidal toxin complex protein TccB;          |
| e411a1 | 227 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| e3g6f3 | 240 | 37 | 11.3 | SubName: Full=Toxin-coregulated pilus subunit TcpA;             |
| e2z4d8 | 152 | 37 | 11.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e2sln9 | 186 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| e2g058 | 226 | 37 | 11.3 | SubName: Full=Diphtheria toxin repressor; SubName: Full=Dipt... |
| e2crr0 | 255 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| e2cnk3 | 258 | 37 | 11.3 | SubName: Full=Putative toxin-antitoxin system, antitoxin com... |
| e1yrn7 | 276 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| e1pnv7 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| e1kw12 | 256 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| e1jcy6 | 193 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| e1img5 | 193 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| e1hy73 | 193 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| e1ciu8 | 258 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin A;                    |
| e0ts71 | 299 | 37 | 11.3 | SubName: Full=Exfoliative toxin A;                              |
| e0e4e2 | 379 | 43 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d9xx30 | 286 | 37 | 11.3 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9xl13 | 218 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, antitoxin component;      |
| d9wcu8 | 291 | 37 | 11.3 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9wcm9 | 289 | 37 | 11.3 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9wc06 | 270 | 37 | 11.3 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d8fqq9 | 307 | 37 | 11.3 | SubName: Full=Putative toxin-antitoxin system, antitoxin com... |
| d8f817 | 199 | 37 | 11.3 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| d8ey77 | 114 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, antitoxin component, H... |
| d8e9a1 | 193 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d8c974 | 193 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d8bce1 | 193 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d8af22 | 237 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin A/C family protein... |
| d7zrd3 | 193 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d7z885 | 193 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d7yv18 | 193 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d7yc36 | 193 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d7y2g9 | 288 | 37 | 11.3 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| d7xgg4 | 193 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d7n3r4 | 532 | 60 | 11.3 | SubName: Full=RTX toxin;  |
| d7k6c6 | 312 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d7ixp9 | 284 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d7ixf2 | 408 | 46 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d7igc6 | 371 | 42 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d7hjn9 | 258 | 37 | 11.3 | SubName: Full=Cholera toxin A protein;                          |
| d7h7i8 | 294 | 37 | 11.3 | SubName: Full=Cholera toxin transcriptional activator;          |
| d613i1 | 188 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| d6k110 | 283 | 37 | 11.3 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d6hpp6 | 201 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| d6e8z1 | 265 | 37 | 11.3 | SubName: Full=Zeta toxin;                                       |
| d5gsj8 | 183 | 37 | 11.3 | RecName: Full=Toxin CpTx1; Flags: Precursor;                    |
| d5d4z8 | 237 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin, subunit A;           |
| d4x497 | 163 | 37 | 11.3 | SubName: Full=GNAT family toxin-antitoxin system;               |
| d4v7p4 | 276 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d4rzg2 | 234 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| d4cbs9 | 170 | 37 | 11.3 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| d4bx64 | 199 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d4bvk6 | 442 | 50 | 11.3 | SubName: Full=RTX toxin transporter;                            |
| d3pfm6 | 244 | 37 | 11.3 | SubName: Full=Kunitz/BPTI-like toxin;                           |
| d31l65 | 212 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| d3fl56 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin A;                    |
| d3aan4 | 242 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |

|        |     |    |      |   |
|--------|-----|----|------|---|
| d2yk21 | 201 | 37 | 11.3 | SubName: Full=Toxin coregulated pilus biosynthesis protein T... |
| d1yh16 | 261 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| d0ys91 | 344 | 39 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d0wdm1 | 234 | 37 | 11.3 | SubName: Full=Zonula occludens toxin family protein;            |
| d0hjj5 | 215 | 37 | 11.3 | SubName: Full=RTX toxin transporter;                            |
| c9nua0 | 223 | 37 | 11.3 | SubName: Full=Cholera toxin transcriptional activator;          |
| c9msp2 | 245 | 37 | 11.3 | SubName: Full=Putative toxin-antitoxin system protein;          |
| c9lwm5 | 202 | 37 | 11.3 | SubName: Full=Helix-turn-helix domain protein; SubName: Full... |
| c91ou6 | 276 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| c9kur5 | 316 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| c9d7r3 | 243 | 37 | 11.3 | SubName: Full=Astacin-like metalloprotease toxin 3; Flags: P... |
| c8tah9 | 172 | 37 | 11.3 | SubName: Full=GNAT family toxin-antitoxin system; EC=2.3.1.-... |
| c7g829 | 184 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system protein;                   |
| c7fpv4 | 315 | 37 | 11.3 | SubName: Full=Shiga toxin 1 A subunit;                          |
| c6yc25 | 258 | 37 | 11.3 | SubName: Full=Cholera toxin A protein;                          |
| c6ybh1 | 294 | 37 | 11.3 | SubName: Full=Cholera toxin transcriptional activator;          |
| c61kh4 | 188 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| c6ejx4 | 158 | 37 | 11.3 | SubName: Full=Cyclase/dehydrase; SubName: Full=Putative unch... |
| c6acb0 | 154 | 37 | 11.3 | SubName: Full=RTX toxin-activating protein;                     |
| c5whb6 | 313 | 37 | 11.3 | SubName: Full=Putative exfoliative toxin;                       |
| c5f0g4 | 251 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin B;                    |
| c4tiw6 | 237 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin A;                    |
| c41ok8 | 322 | 37 | 11.3 | SubName: Full=Translocated cysteine protease/Rho GTPase toxi... |
| c4hb61 | 322 | 37 | 11.3 | SubName: Full=Translocated cysteine protease/Rho GTPase toxi... |
| c3wmw2 | 160 | 37 | 11.3 | SubName: Full=Toxin secretion/phage lysis holin;                |
| c3ltn2 | 294 | 37 | 11.3 | SubName: Full=Cholera toxin transcriptional activator;          |
| c1cir1 | 299 | 37 | 11.3 | SubName: Full=Exfoliative toxin A;                              |
| c0wrv9 | 328 | 37 | 11.3 | SubName: Full=VIP2 family actin-ADP-ribosylating toxin;         |
| b9mky1 | 147 | 37 | 11.3 | SubName: Full=Transcriptional modulator of MazE/toxin, MazF;... |
| b8zk83 | 252 | 37 | 11.3 | SubName: Full=Zeta toxin;                                       |
| b8n7n4 | 542 | 61 | 11.3 | SubName: Full=MFS toxin efflux pump (AflT), putative;           |
| b8maj2 | 248 | 37 | 11.3 | SubName: Full=Toxin biosynthesis ketoreductase, putative;       |
| b7xlz2 | 325 | 37 | 11.3 | SubName: Full=Dermonecrotic toxin;                              |
| b7glc4 | 172 | 37 | 11.3 | SubName: Full=Toxin-antitoxin addiction module toxin compone... |
| b5ty45 | 226 | 37 | 11.3 | SubName: Full=Diphtheria toxin repressor;                       |
| b5qhw5 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin;                      |
| b5gct6 | 278 | 37 | 11.3 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| b5cj27 | 242 | 37 | 11.3 | SubName: Full=Pertussis toxin, subunit 1 subfamily protein;     |
| b5bad3 | 242 | 37 | 11.3 | SubName: Full=Putative pertussis-like toxin subunit;            |
| b4ttl5 | 242 | 37 | 11.3 | SubName: Full=Pertussis toxin, subunit 1 subfamily;             |
| b4apr7 | 345 | 39 | 11.3 | SubName: Full=Zeta toxin family protein;                        |
| b3x2s7 | 237 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin A subunit;            |
| b2za50 | 224 | 37 | 11.3 | SubName: Full=Toxin-coregulated pilin;                          |
| b2e1h8 | 299 | 37 | 11.3 | SubName: Full=Exfoliative toxin A;                              |
| b2drr3 | 299 | 37 | 11.3 | SubName: Full=Exfoliative toxin A;                              |
| a8sgk8 | 238 | 37 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, MazF ... |
| a8fjn5 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin;                      |
| a6u2t3 | 254 | 37 | 11.3 | SubName: Full=Toxin OB-fold domain protein; Flags: Precursor... |
| a6u2t0 | 251 | 37 | 11.3 | SubName: Full=Toxin OB-fold domain protein; Flags: Precursor... |
| a6m3u9 | 322 | 37 | 11.3 | SubName: Full=Translocated cysteine protease/Rho GTPase toxi... |
| a6frh9 | 556 | 63 | 11.3 | SubName: Full=RTX toxins and related Ca2+-binding protein;      |
| a5mj08 | 299 | 37 | 11.3 | SubName: Full=Exfoliative toxin, putative;                      |
| a5lh52 | 237 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin A subunit;            |
| a5kv82 | 310 | 37 | 11.3 | SubName: Full=RTX (Repeat in toxin) cytotoxin;                  |
| a5khz8 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin;                      |
| a5itz5 | 254 | 37 | 11.3 | SubName: Full=Toxin, OB-fold domain protein; Flags: Precurso... |
| a5itz2 | 251 | 37 | 11.3 | SubName: Full=Toxin, OB-fold domain protein; Flags: Precurso... |
| a5f2t8 | 294 | 37 | 11.3 | SubName: Full=Cholera toxin transcriptional activator;          |

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|--------|-----|----|------|---|
| a4f276 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin A;                    |
| a4f270 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin A;                    |
| a3zks4 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin, subunit A;           |
| a3zfk6 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin subunit A;            |
| a3yq18 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin, subunit A;           |
| a3ykt7 | 268 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin, subunit A;           |
| a3unn4 | 249 | 37 | 11.3 | RecName: Full=Putative NAD(+)--arginine ADP-ribosyltransfera... |
| a3ke14 | 270 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin A;                    |
| a3i0q0 | 434 | 49 | 11.3 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| a3h0m9 | 294 | 37 | 11.3 | SubName: Full=Cholera toxin transcriptional activator; SubNa... |
| a3gnz6 | 294 | 37 | 11.3 | SubName: Full=Cholera toxin transcriptional activator;          |
| a3elj8 | 294 | 37 | 11.3 | SubName: Full=Cholera toxin transcriptional activator;          |
| a3cq47 | 305 | 37 | 11.3 | SubName: Full=Exfoliative toxin, putative;                      |
| a1vxg4 | 268 | 37 | 11.3 | RecName: Full=Cytolethal distending toxin subunit A; Short=C... |
| a1f5i1 | 294 | 37 | 11.3 | SubName: Full=Cholera toxin transcriptional activator;          |
| a1enq2 | 294 | 37 | 11.3 | SubName: Full=Cholera toxin transcriptional activator;          |
| a1d2g1 | 551 | 62 | 11.3 | SubName: Full=MFS toxin efflux pump (AflT), putative;           |
| a0rpi9 | 205 | 37 | 11.3 | SubName: Full=Cytolethal distending toxin A;                    |
| a0pxh4 | 398 | 45 | 11.3 | SubName: Full=Phospholipase C (PLC) (Phosphatidylcholinechol... |
| q9p5j4 | 412 | 46 | 11.2 | SubName: Full=Related to host-specific AK-toxin Akt2;           |
| q9nr21 | 331 | 37 | 11.2 | RecName: Full=Poly [ADP-ribose] polymerase 11; Short=PARP-11... |
| q5py51 | 536 | 60 | 11.2 | SubName: Full=Diphtheria toxin;                                 |
| q3izg0 | 578 | 65 | 11.2 | SubName: Full=ABC protein toxin exporter, fused ATPase and i... |
| q03562 | 455 | 51 | 11.2 | RecName: Full=Beta-1,4-mannosyltransferase bre-3; EC=2.4.1.-... |
| p58335 | 489 | 55 | 11.2 | RecName: Full=Anthrax toxin receptor 2; AltName: Full=Capill... |
| p55220 | 591 | 66 | 11.2 | RecName: Full=Mono(ADP-ribosyl)transferase SpvB; Short=mADPR... |
| p17450 | 591 | 66 | 11.2 | RecName: Full=Mono(ADP-ribosyl)transferase SpvB; Short=mADPR... |
| k8ze19 | 520 | 58 | 11.2 | SubName: Full=Toxin-antitoxin toxin pin family;                 |
| k6bz31 | 455 | 51 | 11.2 | SubName: Full=Putative insecticidal toxin complex;              |
| k2akz1 | 331 | 37 | 11.2 | SubName: Full=Rhizobiocin/RTX toxin;                            |
| k0g649 | 508 | 57 | 11.2 | SubName: Full=Toxin;  |
| j7li28 | 366 | 41 | 11.2 | SubName: Full=Zeta toxin family protein;                        |
| j3kpy9 | 411 | 46 | 11.2 | SubName: Full=Anthrax toxin receptor 2;                         |
| i2yub1 | 384 | 43 | 11.2 | SubName: Full=Cytolethal distending toxin A/C family;           |
| h9ac79 | 591 | 66 | 11.2 | SubName: Full=Actin-ADP-ribosyltransferase2C toxin SpvB;        |
| h9abz5 | 591 | 66 | 11.2 | SubName: Full=Actin-ADP-ribosyltransferase2C toxin SpvB;        |
| h4g770 | 356 | 40 | 11.2 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h0cnv5 | 356 | 40 | 11.2 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f7kxg6 | 392 | 44 | 11.2 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| e7jhy0 | 384 | 43 | 11.2 | SubName: Full=Cytolethal distending toxin A/C family protein... |
| d4m327 | 347 | 39 | 11.2 | SubName: Full=Predicted membrane protein, putative toxin reg... |
| d3vj06 | 330 | 37 | 11.2 | SubName: Full=Positive transcriptional regulator for motilit... |
| d0zhs9 | 591 | 66 | 11.2 | RecName: Full=Mono(ADP-ribosyl)transferase SpvB; Short=mADPR... |
| b0ggq1 | 349 | 39 | 11.2 | SubName: Full=Toxin subunit;                                    |
| a8xac4 | 455 | 51 | 11.2 | RecName: Full=Beta-1,4-mannosyltransferase bre-3; EC=2.4.1.-... |
| a8tvc3 | 565 | 63 | 11.2 | SubName: Full=RTX toxins and related Ca2+-binding protein;      |
| a2qqt5 | 552 | 62 | 11.2 | SubName: Full=Function: TOXA of C. carbonum exports the cycl... |
| a1cmu4 | 587 | 66 | 11.2 | SubName: Full=MFS toxin efflux pump, putative;                  |
| a1cmc9 | 347 | 39 | 11.2 | SubName: Full=Killer toxin sensitivity protein (Iki1), putat... |
| q5rdu4 | 610 | 68 | 11.1 | RecName: Full=Poly [ADP-ribose] polymerase 6; Short=PARP-6; ... |
| p24419 | 593 | 66 | 11.1 | RecName: Full=Mono(ADP-ribosyl)transferase SpvB; Short=mADPR... |
| o54327 | 434 | 48 | 11.1 | SubName: Full=Toxin degrading protease;                         |
| k7b8r2 | 333 | 37 | 11.1 | SubName: Full=Anthrax toxin receptor 1;                         |
| k6gzw3 | 360 | 40 | 11.1 | SubName: Full=Zeta toxin family protein;                        |
| k5p9a6 | 458 | 51 | 11.1 | SubName: Full=Zonular occludens toxin family protein;           |
| k5ndf8 | 458 | 51 | 11.1 | SubName: Full=Zonular occludens toxin family protein;           |
| k2vv37 | 414 | 46 | 11.1 | SubName: Full=RTX toxin RtxA domain protein;                    |
| j2jse1 | 413 | 46 | 11.1 | SubName: Full=Zonula occludens toxin; Flags: Precursor;         |

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|---------|-----|----|------|---|
| i2e2g2  | 370 | 41 | 11.1 | SubName: Full=Binary toxin A;                                   |
| i2cuv0  | 488 | 54 | 11.1 | SubName: Full=Anthrax toxin receptor 2 isoform 1;               |
| i0dy10  | 646 | 72 | 11.1 | SubName: Full=ABC transporter RTX toxin;                        |
| h4rsk0  | 389 | 43 | 11.1 | SubName: Full=Toxin B domain protein;                           |
| h4mnz8  | 389 | 43 | 11.1 | SubName: Full=Toxin B domain protein;                           |
| h1xn55  | 387 | 43 | 11.1 | SubName: Full=Zonular occludens toxin family protein;           |
| g4y0v7  | 458 | 51 | 11.1 | SubName: Full=Putative ABC associated RTX toxin transporter;... |
| f8kh44  | 441 | 49 | 11.1 | SubName: Full=Putative toxin biosynthesis associated enzyme;... |
| f5jud8  | 360 | 40 | 11.1 | SubName: Full=Zeta toxin family protein;                        |
| f3p1w6  | 569 | 63 | 11.1 | SubName: Full=Toxin secretion/phage lysis holin;                |
| f3bjg3  | 414 | 46 | 11.1 | SubName: Full=Toxin secretion, membrane fusion protein;         |
| f2uwj8  | 404 | 45 | 11.1 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| f0qps4  | 360 | 40 | 11.1 | SubName: Full=Zeta toxin family protein;                        |
| f0h6f2  | 334 | 37 | 11.1 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| e7bf65  | 352 | 39 | 11.1 | SubName: Full=Putative zonular occludens toxin-like protein;... |
| e6fnn7  | 387 | 43 | 11.1 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e6fa39  | 397 | 44 | 11.1 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e4hjc7  | 569 | 63 | 11.1 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e3dhhb6 | 424 | 47 | 11.1 | SubName: Full=Botulinum toxin-like protein;                     |
| e2y819  | 397 | 44 | 11.1 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e1me95  | 415 | 46 | 11.1 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d7jbg8  | 334 | 37 | 11.1 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d7iqh0  | 333 | 37 | 11.1 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d4wvb8  | 334 | 37 | 11.1 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d4wkj0  | 334 | 37 | 11.1 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d4vqy0  | 334 | 37 | 11.1 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d0ysg1  | 415 | 46 | 11.1 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d0caj5  | 371 | 41 | 11.1 | SubName: Full=Zonular occludens toxin;                          |
| c6rsp2  | 461 | 51 | 11.1 | SubName: Full=Zonula occludens toxin family protein;            |
| c4t7b7  | 561 | 62 | 11.1 | SubName: Full=RTX toxin and Ca2+-binding protein;               |
| c4ryb6  | 650 | 72 | 11.1 | SubName: Full=RTX toxin and Ca2+-binding protein;               |
| c4k399  | 458 | 51 | 11.1 | SubName: Full=Putative ABC associated RTX toxin transporter;... |
| c2eja5  | 352 | 39 | 11.1 | SubName: Full=Membrane protein, toxin regulator;                |
| b9mei6  | 396 | 44 | 11.1 | SubName: Full=Zonular occludens toxin;                          |
| b6k114  | 477 | 53 | 11.1 | SubName: Full=Protoplast regeneration and killer toxin resis... |
| b2vi07  | 488 | 54 | 11.1 | SubName: Full=General secretion pathway protein E (Type II t... |
| b1mu48  | 593 | 66 | 11.1 | SubName: Full=Actin-ADP-ribosyltransferase toxin SpvB; SubNa... |
| a8zrf3  | 333 | 37 | 11.1 | SubName: Full=ATPase, Zeta toxin;                               |
| a6dzv0  | 576 | 64 | 11.1 | SubName: Full=Rhizobiocin/RTX toxin;                            |
| a3xf19  | 442 | 49 | 11.1 | SubName: Full=Putative toxin secretion transmembrane protein... |
| a3whs3  | 569 | 63 | 11.1 | SubName: Full=Toxin secretion ABC transporter ATP-binding pr... |
| a1cpj9  | 548 | 61 | 11.1 | SubName: Full=MFS toxin efflux pump (AflT), putative;           |
| q9f5q9  | 277 | 36 | 11.0 | SubName: Full=Toxin co-regulated pilus virulence regulatory ... |
| q9f5q7  | 276 | 36 | 11.0 | SubName: Full=Toxin co-regulated pilus virulence regulatory ... |
| q97sg1  | 299 | 36 | 11.0 | SubName: Full=Putative exfoliative toxin;                       |
| q8ein5  | 453 | 50 | 11.0 | SubName: Full=Multidrug and toxin efflux protein MATE family... |
| q7wdu7  | 226 | 36 | 11.0 | SubName: Full=Pertussis toxin subunit 2;                        |
| q6sv31  | 319 | 36 | 11.0 | SubName: Full=Putative alpha toxin; Flags: Precursor;           |
| q5xhy4  | 308 | 36 | 11.0 | RecName: Full=Ecto-ADP-ribosyltransferase 5; EC=2.4.2.31; A1... |
| q5i0e9  | 566 | 62 | 11.0 | RecName: Full=Multidrug and toxin extrusion protein 1; Short... |
| q4kip6  | 161 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system antitoxin component, TI... |
| q4jv96  | 240 | 36 | 11.0 | RecName: Full=Diphtheria toxin repressor; AltName: Full=Iron... |
| q4hhh8  | 204 | 36 | 11.0 | SubName: Full=Toxin-like outer membrane protein, putative;      |
| q46670  | 181 | 36 | 11.0 | RecName: Full=Cytolethal distending toxin subunit C; Short=C... |
| q46237  | 553 | 61 | 11.0 | SubName: Full=Lambda toxin;                                     |
| q3rgq1  | 444 | 49 | 11.0 | SubName: Full=Zonular occludens toxin;                          |
| q3r0p5  | 444 | 49 | 11.0 | SubName: Full=Zonular occludens toxin;                          |
| q3qyy6  | 444 | 49 | 11.0 | SubName: Full=Zonular occludens toxin;                          |

|         |     |    |      |   |
|---------|-----|----|------|---|
| q3db06  | 219 | 36 | 11.0 | SubName: Full=Exfoliative toxin A;                              |
| q3d3d5  | 305 | 36 | 11.0 | SubName: Full=Exfoliative toxin A;                              |
| q0k3d6  | 462 | 51 | 11.0 | SubName: Full=RTX toxin membrane fusion protein;                |
| q081x9  | 234 | 36 | 11.0 | SubName: Full=Cytolethal distending toxinA;                     |
| q02908  | 557 | 61 | 11.0 | RecName: Full=Elongator complex protein 3; EC=2.3.1.48; AltN... |
| p45777  | 305 | 36 | 11.0 | RecName: Full=Type II secretion system protein C; Short=T2SS... |
| p40026  | 464 | 51 | 11.0 | RecName: Full=DNA repair protein KRE29; AltName: Full=Killer... |
| p0a4m2  | 287 | 36 | 11.0 | RecName: Full=Toxin zeta; AltName: Full=UDP-N-acetylglucosam... |
| p0a4m1  | 287 | 36 | 11.0 | RecName: Full=Toxin zeta; AltName: Full=UDP-N-acetylglucosam... |
| p09616  | 319 | 36 | 11.0 | RecName: Full=Alpha-hemolysin; Short=Alpha-HL; AltName: Full... |
| p04978  | 226 | 36 | 11.0 | RecName: Full=Pertussis toxin subunit 2; Short=PTX S2; AltNa... |
| p04977  | 269 | 36 | 11.0 | RecName: Full=Pertussis toxin subunit 1; Short=PTX S1; AltNa... |
| o88931  | 192 | 36 | 11.0 | RecName: Full=Ras-related C3 botulinum toxin substrate 2; Al... |
| o66399  | 144 | 36 | 11.0 | RecName: Full=Probable ribonuclease VapC1; Short=Probable RN... |
| k9g819  | 206 | 36 | 11.0 | SubName: Full=MFS toxin efflux pump (AflT), putative;           |
| k9fug2  | 206 | 36 | 11.0 | SubName: Full=MFS toxin efflux pump (AflT), putative;           |
| k8z165  | 204 | 36 | 11.0 | SubName: Full=Chpb toxin of the-toxin-antitoxin system;         |
| k8ga89  | 562 | 62 | 11.0 | SubName: Full=Toxin secretion ABC transporter ATP-binding pr... |
| k8g3n9  | 562 | 62 | 11.0 | SubName: Full=Toxin secretion ABC transporter ATP-binding pr... |
| k7cwu4  | 192 | 36 | 11.0 | SubName: Full=Ras-related C3 botulinum toxin substrate 1 (Rh... |
| k6bxx4  | 150 | 36 | 11.0 | SubName: Full=Toxin-antitoxin antitoxin component;              |
| k5n3u7  | 317 | 36 | 11.0 | SubName: Full=Zonular occludens toxin family protein;           |
| k4yr80  | 173 | 36 | 11.0 | SubName: Full=GNAT family toxin-antitoxin system;               |
| k4u8u4  | 226 | 36 | 11.0 | SubName: Full=Pertussis toxin subunit 2;                        |
| k4tks1  | 241 | 36 | 11.0 | SubName: Full=Putative toxin;                                   |
| k4tih4  | 227 | 36 | 11.0 | SubName: Full=Pertussis toxin subunit 3;                        |
| k4q9u3  | 305 | 36 | 11.0 | SubName: Full=K11041 exfoliative toxin A/B;                     |
| k41jd0  | 165 | 36 | 11.0 | SubName: Full=Antitoxin component of toxin-antitoxin system,... |
| k4if68  | 198 | 36 | 11.0 | SubName: Full=Toxin (Filamentation induced by cAMP protein, ... |
| k3kvik5 | 214 | 36 | 11.0 | SubName: Full=Antitoxin of the YeeV-YeeU toxin-antitoxin sys... |
| k3jvg4  | 312 | 36 | 11.0 | SubName: Full=Cytolethal distending toxin A/C family protein... |
| k1rgq0  | 305 | 36 | 11.0 | SubName: Full=Ras-related C3 botulinum toxin substrate 1;       |
| k1mc05  | 142 | 36 | 11.0 | SubName: Full=Toxin secretion/phage lysis holin;                |
| k0e210  | 291 | 36 | 11.0 | SubName: Full=Cytolethal distending toxin B-like protein;       |
| j9w150  | 362 | 40 | 11.0 | SubName: Full=Putative toxin regulator;                         |
| j9j599  | 304 | 36 | 11.0 | SubName: Full=Multidrug and toxin extrusion protein 1;          |
| j7fna7  | 269 | 36 | 11.0 | SubName: Full=Pertussis toxin subunit 1;                        |
| j6ivd7  | 237 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, Fic d... |
| j6bt54  | 287 | 36 | 11.0 | SubName: Full=Zeta toxin;                                       |
| j5kkd8  | 205 | 36 | 11.0 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j5kgw5  | 206 | 36 | 11.0 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j5his5  | 174 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, Fic d... |
| j3jaa5  | 261 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| j1gxy6  | 197 | 36 | 11.0 | SubName: Full=Zeta toxin;                                       |
| j1b611  | 164 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| j0nev6  | 336 | 37 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| j0k095  | 153 | 36 | 11.0 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| i9lqs2  | 178 | 36 | 11.0 | SubName: Full=Holin toxin secretion/phage lysis;                |
| i9lhc4  | 178 | 36 | 11.0 | SubName: Full=Holin toxin secretion/phage lysis;                |
| i8uia8  | 194 | 36 | 11.0 | SubName: Full=Zeta toxin;                                       |
| i8t6b5  | 178 | 36 | 11.0 | SubName: Full=Holin toxin secretion/phage lysis;                |
| i7h361  | 226 | 36 | 11.0 | SubName: Full=Diphtheria toxin repressor;                       |
| i7gyv8  | 278 | 36 | 11.0 | SubName: Full=Cytolethal distending toxin subunit B;            |
| i6y684  | 356 | 39 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| i3zre5  | 151 | 36 | 11.0 | RecName: Full=Putative ribonuclease VapC; Short=Putative RN...  |
| i3ds40  | 174 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, Fic d... |
| i3dp65  | 235 | 36 | 11.0 | SubName: Full=Zeta toxin;                                       |
| i2yvw0  | 169 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |

|         |     |    |      |   |
|---------|-----|----|------|---|
| i2nw19  | 144 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| i2nr26  | 325 | 36 | 11.0 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| i0uu56  | 209 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| i0tzip3 | 239 | 36 | 11.0 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| i0t129  | 223 | 36 | 11.0 | SubName: Full=Zonula occludens toxin domain protein;            |
| h9cjpg1 | 277 | 36 | 11.0 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| h9cjf6  | 243 | 36 | 11.0 | SubName: Full=Toxin co-regulated pilin A;                       |
| h8lib3  | 299 | 36 | 11.0 | SubName: Full=Exfoliative toxin A;                              |
| h8kac5  | 140 | 36 | 11.0 | SubName: Full=Toxin of toxin-antitoxin (TA) system, containi... |
| h8ced1  | 268 | 36 | 11.0 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7y8x6  | 256 | 36 | 11.0 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7xn81  | 268 | 36 | 11.0 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7w750  | 267 | 36 | 11.0 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7vvy0  | 267 | 36 | 11.0 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7vp50  | 258 | 36 | 11.0 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7tiu7  | 267 | 36 | 11.0 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7tcc5  | 267 | 36 | 11.0 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7rsc8  | 194 | 36 | 11.0 | SubName: Full=Cytolethal distending toxin, subunit CdtC;        |
| h7qyq6  | 267 | 36 | 11.0 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7d048  | 226 | 36 | 11.0 | SubName: Full=Beta2-toxin;                                      |
| h6uj64  | 226 | 36 | 11.0 | SubName: Full=Cytolethal distending toxin A;                    |
| h5huh3  | 185 | 36 | 11.0 | SubName: Full=Toxin B domain protein;                           |
| h4x1b3  | 214 | 36 | 11.0 | SubName: Full=Antitoxin of the YeeV-YeeU toxin-antitoxin sys... |
| h4uvq5  | 214 | 36 | 11.0 | SubName: Full=Antitoxin of the YeeV-YeeU toxin-antitoxin sys... |
| h4hc84  | 232 | 36 | 11.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4hc83  | 231 | 36 | 11.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4h0n3  | 241 | 36 | 11.0 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4gq10  | 241 | 36 | 11.0 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4g7s4  | 221 | 36 | 11.0 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h4ep57  | 231 | 36 | 11.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4ep56  | 232 | 36 | 11.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4dz24  | 241 | 36 | 11.0 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4dp65  | 232 | 36 | 11.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4dp64  | 231 | 36 | 11.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4di88  | 241 | 36 | 11.0 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4d7x2  | 232 | 36 | 11.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4d7x1  | 231 | 36 | 11.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4cuq5  | 241 | 36 | 11.0 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4c655  | 241 | 36 | 11.0 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4bm63  | 232 | 36 | 11.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4bm62  | 231 | 36 | 11.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4bg88  | 241 | 36 | 11.0 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4ayx0  | 232 | 36 | 11.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4ayw9  | 231 | 36 | 11.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4ari6  | 232 | 36 | 11.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4ari5  | 231 | 36 | 11.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4ahw4  | 232 | 36 | 11.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4ahw3  | 231 | 36 | 11.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4aa78  | 232 | 36 | 11.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h4aa77  | 231 | 36 | 11.0 | SubName: Full=Enterotoxin-like toxin;                           |
| h3y8j1  | 239 | 36 | 11.0 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3x4q9  | 239 | 36 | 11.0 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3s693  | 241 | 36 | 11.0 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h3m8x9  | 145 | 36 | 11.0 | SubName: Full=Putative toxin YfjG;                              |
| h3ls60  | 145 | 36 | 11.0 | SubName: Full=Putative toxin YfjG;                              |
| h2dgm3  | 226 | 36 | 11.0 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h2dgm0  | 226 | 36 | 11.0 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h2dgl1  | 226 | 36 | 11.0 | SubName: Full=Cytolethal distending toxin subunit A;            |

|        |     |    |      |   |
|--------|-----|----|------|---|
| h1ttm6 | 250 | 36 | 11.0 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h1tr69 | 356 | 39 | 11.0 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h1tn64 | 221 | 36 | 11.0 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h1t7i7 | 239 | 36 | 11.0 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h1snq8 | 239 | 36 | 11.0 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h0tf60 | 583 | 64 | 11.0 | SubName: Full=Putative secretion ATP-binding protein (ABC-ty... |
| h0db18 | 158 | 36 | 11.0 | SubName: Full=Toxin, OB-fold domain protein;                    |
| h0cpz6 | 239 | 36 | 11.0 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h0ckc8 | 221 | 36 | 11.0 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h0c7f3 | 239 | 36 | 11.0 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h0a3a1 | 190 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| g9xhl2 | 156 | 36 | 11.0 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| g7tn02 | 285 | 36 | 11.0 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g7q909 | 110 | 36 | 11.0 | SubName: Full=Addiction module toxin, RelE/StbE family;         |
| g7l7e9 | 447 | 49 | 11.0 | SubName: Full=Multidrug and toxin extrusion protein;            |
| g7gq50 | 291 | 36 | 11.0 | SubName: Full=Zeta toxin family protein;                        |
| g6ibs1 | 132 | 36 | 11.0 | SubName: Full=Toxin secretion/phage lysis holin;                |
| g6h122 | 191 | 36 | 11.0 | SubName: Full=Zeta toxin family protein;                        |
| g6bg23 | 166 | 36 | 11.0 | SubName: Full=Toxin secretion/phage lysis holin;                |
| g6b4s2 | 166 | 36 | 11.0 | SubName: Full=Toxin secretion/phage lysis holin;                |
| g6avr5 | 142 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| g5mjj6 | 289 | 36 | 11.0 | SubName: Full=Cytolethal distending toxin subunit B;            |
| g5am48 | 198 | 36 | 11.0 | SubName: Full=Anthrax toxin receptor-like protein;              |
| g4t4y4 | 511 | 56 | 11.0 | SubName: Full=Related to DPH2-diphtheria toxin resistance pr... |
| g4cn33 | 296 | 36 | 11.0 | SubName: Full=Zeta-toxin;                                       |
| g0hm22 | 153 | 36 | 11.0 | RecName: Full=Putative ribonuclease VapC; Short=Putative RNA... |
| f9rba5 | 257 | 36 | 11.0 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| f9rba1 | 436 | 48 | 11.0 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| f9kkh1 | 239 | 36 | 11.0 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f9k3x7 | 239 | 36 | 11.0 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f9jxt2 | 239 | 36 | 11.0 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f9jly9 | 234 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, MazF ... |
| f8vem7 | 272 | 36 | 11.0 | SubName: Full=Putative toxin;                                   |
| f8vem4 | 243 | 36 | 11.0 | SubName: Full=Putative pertussis-like toxin subunit; EC=2.4.... |
| f8grg1 | 462 | 51 | 11.0 | SubName: Full=RTX toxin membrane fusion protein RtxD;           |
| f5wm10 | 239 | 36 | 11.0 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f5wgd3 | 239 | 36 | 11.0 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f5w8g1 | 239 | 36 | 11.0 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f4xfn6 | 248 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| f4lg56 | 226 | 36 | 11.0 | SubName: Full=Toxin subunit 2;                                  |
| f4lg55 | 269 | 36 | 11.0 | SubName: Full=Toxin subunit 1;                                  |
| f4fx55 | 362 | 40 | 11.0 | SubName: Full=Putative toxin regulator;                         |
| f4fp13 | 231 | 36 | 11.0 | SubName: Full=Staphylococcal enterotoxin-like toxin;            |
| f3xmz2 | 149 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system toxin component, PIN fa... |
| f3tuk2 | 153 | 36 | 11.0 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| f3tkb6 | 260 | 36 | 11.0 | SubName: Full=Exfoliative toxin B; EC=3.4.21.-;                 |
| f3the8 | 239 | 36 | 11.0 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f3q2g6 | 178 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| f2jhg1 | 185 | 36 | 11.0 | SubName: Full=Zeta toxin family protein;                        |
| f0xgw6 | 372 | 41 | 11.0 | SubName: Full=Zeta toxin;                                       |
| f0nqp1 | 144 | 36 | 11.0 | SubName: Full=VapC-type toxin;                                  |
| f0ncv0 | 144 | 36 | 11.0 | SubName: Full=VapC-type toxin;                                  |
| f0hbr7 | 253 | 36 | 11.0 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e9uui0 | 268 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| e9f3k7 | 244 | 36 | 11.0 | SubName: Full=Toxin cluster protein 2;                          |
| e9e6g5 | 211 | 36 | 11.0 | SubName: Full=HC-toxin synthetase;                              |
| e8qb96 | 305 | 36 | 11.0 | SubName: Full=Putative exfoliative toxin;                       |
| e7rzi7 | 244 | 36 | 11.0 | SubName: Full=HipA family toxin-antitoxin system;               |



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|--------|-----|----|------|---|
| e7b8i9 | 292 | 36 | 11.0 | SubName: Full=Toxin subunit S1;                                 |
| e7abp0 | 238 | 36 | 11.0 | SubName: Full=Fic family protein,Toxin-antitoxin system;        |
| e6iq39 | 190 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| e5zcb9 | 256 | 36 | 11.0 | SubName: Full=Cytolethal distending toxin subunit A;            |
| e5sxx0 | 212 | 36 | 11.0 | SubName: Full=Putative toxin-antitoxin system, antitoxin com... |
| e5rma1 | 268 | 36 | 11.0 | SubName: Full=Cytolethal distending toxin A;                    |
| e5rm87 | 268 | 36 | 11.0 | SubName: Full=Cytolethal distending toxin A;                    |
| e5rm82 | 268 | 36 | 11.0 | SubName: Full=Cytolethal distending toxin A;                    |
| e5r7q8 | 239 | 36 | 11.0 | SubName: Full=Staphylococcal/Streptococcal toxin, beta-grasp... |
| e5r7f8 | 232 | 36 | 11.0 | SubName: Full=Staphylococcal/Streptococcal toxin, beta-grasp... |
| e5r7f7 | 231 | 36 | 11.0 | SubName: Full=Staphylococcal/Streptococcal toxin, beta-grasp... |
| e4iq66 | 258 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| e4iq60 | 382 | 42 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e3zpv3 | 257 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| e3r8x9 | 261 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| e3r3r7 | 265 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| e3q380 | 318 | 36 | 11.0 | SubName: Full=Zeta toxin;                                       |
| e3gev4 | 178 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system;                           |
| e3g1h7 | 175 | 36 | 11.0 | SubName: Full=RTX toxin-activating protein C;                   |
| e3ddf4 | 247 | 36 | 11.0 | SubName: Full=Probable toxin transcriptional activator ToxR;... |
| e2xvn6 | 247 | 36 | 11.0 | SubName: Full=Insecticidal toxin protein;                       |
| e1mea3 | 309 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, Fic d... |
| e1h335 | 299 | 36 | 11.0 | SubName: Full=Exfoliative toxin, putative;                      |
| e1esl5 | 190 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| e0tn06 | 256 | 36 | 11.0 | SubName: Full=Zeta toxin;                                       |
| e0q1v3 | 303 | 36 | 11.0 | SubName: Full=MazF family toxin-antitoxin system;               |
| e0hc58 | 190 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| e0f4h1 | 197 | 36 | 11.0 | SubName: Full=RTX toxin protein;                                |
| e0efd8 | 190 | 36 | 11.0 | SubName: Full=RTX-III toxin-activating lysine-acyltransferas... |
| d9y838 | 117 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, MazF ... |
| d9wtn2 | 291 | 36 | 11.0 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9wsa0 | 288 | 36 | 11.0 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9we78 | 293 | 36 | 11.0 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9wca7 | 285 | 36 | 11.0 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9w8i1 | 275 | 36 | 11.0 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9nyu6 | 299 | 36 | 11.0 | SubName: Full=Exfoliative toxin, putative;                      |
| d9ntw7 | 299 | 36 | 11.0 | SubName: Full=Exfoliative toxin, putative;                      |
| d9nmq1 | 299 | 36 | 11.0 | SubName: Full=Exfoliative toxin, putative;                      |
| d9nf15 | 299 | 36 | 11.0 | SubName: Full=Exfoliative toxin, putative;                      |
| d9n895 | 299 | 36 | 11.0 | SubName: Full=Exfoliative toxin, putative;                      |
| d8mr58 | 410 | 45 | 11.0 | SubName: Full=Putative toxin secretion, membrane fusion prot... |
| d8ezd7 | 166 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d8cjj6 | 209 | 36 | 11.0 | SubName: Full=RTX toxin acyltransferase family protein;         |
| d7yyr5 | 209 | 36 | 11.0 | SubName: Full=RTX toxin acyltransferase family protein;         |
| d7k6x6 | 428 | 47 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d7j3j8 | 428 | 47 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d7it82 | 162 | 36 | 11.0 | SubName: Full=RelE family toxin-antitoxin system;               |
| d6rgq3 | 184 | 36 | 11.0 | SubName: Full=Multidrug and toxin extrusion protein 1;          |
| d6kge5 | 198 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component;          |
| d6hlt6 | 264 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| d5yws3 | 202 | 36 | 11.0 | RecName: Full=Probable ribonuclease VapC; Short=Probable RNA... |
| d5rwt1 | 249 | 36 | 11.0 | SubName: Full=Toxin A;  |
| d5nx35 | 212 | 36 | 11.0 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| d5l5r6 | 224 | 36 | 11.0 | SubName: Full=Toxin co-regulated pilus;                         |
| d4wxh5 | 382 | 42 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d4vss5 | 382 | 42 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d4lfn4 | 147 | 36 | 11.0 | SubName: Full=Toxin secretion/phage lysis holin;                |
| d4j534 | 177 | 36 | 11.0 | SubName: Full=Toxin secretion/phage lysis holin;                |

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|--------|-----|----|------|---|
| d4crs1 | 202 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d4cbs6 | 243 | 36 | 11.0 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| d4cba2 | 170 | 36 | 11.0 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| d4c556 | 203 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| d4c1n5 | 121 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| d4bv75 | 202 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d4bgn0 | 174 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d3l5t9 | 259 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| d3acg8 | 253 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| d2yuv6 | 399 | 44 | 11.0 | SubName: Full=Zona occludens toxin;                             |
| d1y197 | 176 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| d1w5n2 | 245 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, Bro d... |
| d1vv29 | 180 | 36 | 11.0 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| d1p6y6 | 153 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, antitoxin component, M... |
| d0fpp9 | 249 | 36 | 11.0 | SubName: Full=Probable toxin transcriptional activator ToxR;... |
| c9q5c1 | 336 | 37 | 11.0 | SubName: Full=General secretion pathway protein K (Cholera t... |
| c9mxb8 | 224 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| c9mx25 | 183 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| c9m6z4 | 187 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system protein;                   |
| c9lu74 | 247 | 36 | 11.0 | SubName: Full=Prophage antirepressor; SubName: Full=Toxin-an... |
| c9l3x9 | 215 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| c9kj85 | 184 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| c9cdq7 | 188 | 36 | 11.0 | SubName: Full=Zeta toxin;                                       |
| c9c6w9 | 188 | 36 | 11.0 | SubName: Full=Zeta toxin;                                       |
| c8m196 | 239 | 36 | 11.0 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8mcl3 | 239 | 36 | 11.0 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8m7q8 | 239 | 36 | 11.0 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8m6y6 | 229 | 36 | 11.0 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8m0m1 | 239 | 36 | 11.0 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8lv21 | 239 | 36 | 11.0 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8lh29 | 239 | 36 | 11.0 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8lgu4 | 231 | 36 | 11.0 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8l7s7 | 231 | 36 | 11.0 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8l2z8 | 239 | 36 | 11.0 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c7qwr3 | 233 | 36 | 11.0 | SubName: Full=Addiction module toxin, Txe/YoeB family;          |
| c7gfd7 | 337 | 37 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| c7g555 | 210 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| c6m4h5 | 323 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| c6m3i7 | 325 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| c6lb00 | 326 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| c5f0g3 | 223 | 36 | 11.0 | SubName: Full=Cytolethal distending toxin subunit A;            |
| c5d546 | 199 | 36 | 11.0 | SubName: Full=Transcriptional modulator of MazE/toxin, MazF;... |
| c4u9t1 | 231 | 36 | 11.0 | SubName: Full=RTX toxin and Ca2+-binding protein;               |
| c4tiw0 | 237 | 36 | 11.0 | SubName: Full=Cytolethal distending toxin A;                    |
| c4tir7 | 190 | 36 | 11.0 | SubName: Full=Cytolethal distending toxin C;                    |
| c3ism2 | 526 | 58 | 11.0 | SubName: Full=Mosquitocidal toxin protein;                      |
| c3fu92 | 249 | 36 | 11.0 | SubName: Full=Zeta toxin;                                       |
| c3dav4 | 249 | 36 | 11.0 | SubName: Full=Zeta toxin;                                       |
| c2u736 | 526 | 58 | 11.0 | SubName: Full=Mosquitocidal toxin protein;                      |
| c2lhq0 | 335 | 37 | 11.0 | SubName: Full=Toxin;  |
| c1cps0 | 299 | 36 | 11.0 | SubName: Full=Exfoliative toxin A;                              |
| c1cch6 | 299 | 36 | 11.0 | SubName: Full=Exfoliative toxin A;                              |
| c1c5e7 | 299 | 36 | 11.0 | SubName: Full=Exfoliative toxin A;                              |
| c0mpk7 | 226 | 36 | 11.0 | SubName: Full=Pertussis toxin subunit 2; Flags: Precursor;      |
| c0mpk6 | 269 | 36 | 11.0 | SubName: Full=Pertussis toxin subunit 1; SubName: Full=Toxin... |
| b9wg07 | 298 | 36 | 11.0 | SubName: Full=Subunit of Elongator complex, putative (Elonga... |
| b9jfi9 | 185 | 36 | 11.0 | SubName: Full=RTX toxin hemolysin-type calcium-binding prote... |
| b8ndv4 | 174 | 36 | 11.0 | SubName: Full=Killer toxin sensitivity protein (Iki1), putat... |

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|--------|-----|----|------|---|
| b8i8d9 | 166 | 36 | 11.0 | SubName: Full=Transcriptional modulator of MazE/toxin, MazF;... |
| b8i7p2 | 138 | 36 | 11.0 | SubName: Full=Toxin secretion/phage lysis holin;                |
| b8f3v9 | 226 | 36 | 11.0 | SubName: Full=Cytolethal distending toxin protein A;            |
| b8f3q7 | 226 | 36 | 11.0 | SubName: Full=Cytolethal distending toxin protein A;            |
| b8dhf6 | 337 | 37 | 11.0 | SubName: Full=Exfoliative toxin;                                |
| b7tgw6 | 221 | 36 | 11.0 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| b6yv16 | 156 | 36 | 11.0 | RecName: Full=Putative ribonuclease VapC; Short=Putative RNA... |
| b5gdi9 | 290 | 36 | 11.0 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| b5gcj6 | 277 | 36 | 11.0 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| b5g7j6 | 282 | 36 | 11.0 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| b5e7f1 | 299 | 36 | 11.0 | SubName: Full=Exfoliative toxin A, putative;                    |
| b4f0p7 | 454 | 50 | 11.0 | SubName: Full=Putative HlyD-family toxin secretion protein;     |
| b4ez45 | 335 | 37 | 11.0 | SubName: Full=Putative toxin;                                   |
| b2wc59 | 661 | 73 | 11.0 | SubName: Full=Protoplast regeneration and killer toxin resis... |
| b2jb89 | 170 | 36 | 11.0 | SubName: Full=Transcriptional modulator of MazE/toxin, MazF;... |
| b2ilv6 | 303 | 36 | 11.0 | SubName: Full=Exfoliative toxin, putative;                      |
| b2fs66 | 337 | 37 | 11.0 | SubName: Full=Putative phage-related protein, similar to zon... |
| b2e7a3 | 299 | 36 | 11.0 | SubName: Full=Exfoliative toxin A;                              |
| b2dlt8 | 300 | 36 | 11.0 | SubName: Full=Exfoliative toxin A;                              |
| b2dg75 | 299 | 36 | 11.0 | SubName: Full=Exfoliative toxin A;                              |
| b1ryz2 | 299 | 36 | 11.0 | SubName: Full=Exfoliative toxin A;                              |
| b1r9k9 | 553 | 61 | 11.0 | SubName: Full=Lambda toxin;                                     |
| b1q6n3 | 178 | 36 | 11.0 | SubName: Full=Clostridium toxin-associated regulator BotR;      |
| b1i9k4 | 299 | 36 | 11.0 | SubName: Full=Exfoliative toxin A;                              |
| b0y2h3 | 247 | 36 | 11.0 | SubName: Full=Toxin biosynthesis ketoreductase, putative;       |
| b0mk87 | 142 | 36 | 11.0 | SubName: Full=Toxin secretion/phage lysis holin;                |
| a9lsg2 | 301 | 36 | 11.0 | SubName: Full=Exfoliative toxin ExhB;                           |
| a7l035 | 456 | 50 | 11.0 | RecName: Full=Toxin CfTX-1; Short=Toxin 1; Flags: Precursor;... |
| a7hzs6 | 294 | 36 | 11.0 | SubName: Full=Zeta toxin superfamily;                           |
| a7gsq5 | 146 | 36 | 11.0 | SubName: Full=Toxin secretion/phage lysis holin;                |
| a7b617 | 189 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| a6xzb3 | 294 | 36 | 11.0 | SubName: Full=Cholera toxin transcriptional activator;          |
| a6u2t2 | 239 | 36 | 11.0 | SubName: Full=Toxin beta-grasp domain protein; Flags: Precu...  |
| a6tyq4 | 232 | 36 | 11.0 | SubName: Full=Toxin beta-grasp domain protein; Flags: Precu...  |
| a6tyq3 | 231 | 36 | 11.0 | SubName: Full=Toxin beta-grasp domain protein; Flags: Precu...  |
| a6qe79 | 231 | 36 | 11.0 | SubName: Full=Staphylococcal enterotoxin-like toxin;            |
| a6bhh9 | 173 | 36 | 11.0 | SubName: Full=Toxin-antitoxin system, toxin component, MazF ... |
| a6aes3 | 294 | 36 | 11.0 | SubName: Full=Cholera toxin transcriptional activator;          |
| a6a482 | 294 | 36 | 11.0 | SubName: Full=Cholera toxin transcriptional activator;          |
| a5itz4 | 239 | 36 | 11.0 | SubName: Full=Toxin, beta-grasp domain protein; Flags: Precu... |
| a5gfi8 | 118 | 36 | 11.0 | SubName: Full=Transcriptional modulator of MazE/toxin, MazF;... |
| a4iis8 | 574 | 63 | 11.0 | RecName: Full=Multidrug and toxin extrusion protein 1; Short... |
| a4f298 | 267 | 36 | 11.0 | SubName: Full=Cytolethal distending toxin B;                    |
| a3ke17 | 270 | 36 | 11.0 | SubName: Full=Cytolethal distending toxin A;                    |
| a3i2v3 | 194 | 36 | 11.0 | SubName: Full=Putative toxin-antitoxin system, antitoxin com... |
| a2pbr6 | 294 | 36 | 11.0 | SubName: Full=Cholera toxin transcriptional activator;          |
| a1zsf2 | 208 | 36 | 11.0 | SubName: Full=RTX toxins and related Ca2+-binding protein;      |
| a1tt59 | 336 | 37 | 11.0 | SubName: Full=Zonular occludens toxin;                          |
| a1jv41 | 287 | 36 | 11.0 | SubName: Full=Putative zeta toxin; SubName: Full=Zeta toxin;... |
| a1eic2 | 250 | 36 | 11.0 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| a1ab04 | 190 | 36 | 11.0 | SubName: Full=Cytolethal distending toxin type IV subunit C;... |
| q9y6f1 | 533 | 58 | 10.9 | RecName: Full=Poly [ADP-ribose] polymerase 3; Short=PARP-3; ... |
| q8gi67 | 440 | 48 | 10.9 | SubName: Full=Alpha-toxin;                                      |
| q5aym6 | 350 | 38 | 10.9 | SubName: Full=Killer toxin sensitivity protein (Iki1), putat... |
| p32893 | 560 | 61 | 10.9 | RecName: Full=Trafficking protein particle complex II-specif... |
| k5vba9 | 458 | 50 | 10.9 | SubName: Full=Zonular occludens toxin family protein;           |
| k5tim5 | 458 | 50 | 10.9 | SubName: Full=Zonular occludens toxin family protein;           |
| k4su70 | 457 | 50 | 10.9 | SubName: Full=Multidrug and toxin extrusion (MATE) family ef... |

|         |     |    |      |   |
|---------|-----|----|------|---|
| k4seg3  | 457 | 50 | 10.9 | SubName: Full=Multidrug and toxin extrusion (MATE) family ef... |
| k4ryg4  | 457 | 50 | 10.9 | SubName: Full=Multidrug and toxin extrusion (MATE) family ef... |
| i5btb3  | 560 | 61 | 10.9 | SubName: Full=Toxin secretion protein, HlyB family;             |
| i0dy11  | 442 | 48 | 10.9 | SubName: Full=RTX toxin transporter;                            |
| h8fle5  | 394 | 43 | 10.9 | SubName: Full=Zonular occludens toxin family protein;           |
| g6cmi4  | 458 | 50 | 10.9 | SubName: Full=Diphtheria toxin resistance protein;              |
| f5kxt4  | 432 | 47 | 10.9 | SubName: Full=Toxin-antitoxin system toxin component, PIN fa... |
| f3puk2  | 514 | 56 | 10.9 | SubName: Full=Toxin secretion/phage lysis holin;                |
| f3pdy3  | 375 | 41 | 10.9 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| f2t8e1  | 449 | 49 | 10.9 | SubName: Full=Toxin biosynthesis protein;                       |
| e7nci5  | 430 | 47 | 10.9 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| e4zfy5  | 560 | 61 | 10.9 | SubName: Full=Similar to MFS toxin efflux pump (AflT);          |
| e2z9s9  | 329 | 36 | 10.9 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| e0wu7j8 | 432 | 47 | 10.9 | SubName: Full=Putative RTX-like toxin;                          |
| d5es42  | 430 | 47 | 10.9 | SubName: Full=Putative toxin secretion protein;                 |
| d4wsd8  | 421 | 46 | 10.9 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d4vep4  | 421 | 46 | 10.9 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d3ikr6  | 422 | 46 | 10.9 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d2txi8  | 540 | 59 | 10.9 | SubName: Full=Toxin complex component ORF-X2;                   |
| d1ylh0  | 386 | 42 | 10.9 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| d1y3n1  | 504 | 55 | 10.9 | SubName: Full=General secretion pathway protein E (Type II t... |
| d1pq95  | 331 | 36 | 10.9 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| c9nyc0  | 616 | 67 | 10.9 | SubName: Full=Cytolysin and hemolysin HlyA Pore-forming toxi... |
| c8mil5  | 338 | 37 | 10.9 | SubName: Full=Leukocidin/Hemolysin toxin family protein;        |
| c6bnq7  | 448 | 49 | 10.9 | SubName: Full=Zonular occludens toxin;                          |
| c5jil4  | 449 | 49 | 10.9 | SubName: Full=Toxin biosynthesis protein;                       |
| c5gfm6  | 449 | 49 | 10.9 | SubName: Full=Toxin biosynthesis protein;                       |
| c4se14  | 475 | 52 | 10.9 | SubName: Full=RTX toxin and Ca2+-binding protein;               |
| b8mhp6  | 568 | 62 | 10.9 | SubName: Full=MFS toxin efflux pump (AflT), putative;           |
| b3raw2  | 460 | 50 | 10.9 | SubName: Full=Type I protease secretion protein, haemolytica... |
| a9bv73  | 341 | 37 | 10.9 | SubName: Full=Zonular occludens toxin;                          |
| a8t3l5  | 704 | 77 | 10.9 | SubName: Full=Toxin secretion ATP-binding protein;              |
| a6zuh6  | 560 | 61 | 10.9 | SubName: Full=Killer toxin resistant protein;                   |
| a4xu57  | 396 | 43 | 10.9 | SubName: Full=Zonular occludens toxin;                          |
| a1d5b5  | 421 | 46 | 10.9 | SubName: Full=Toxin biosynthesis protein, putative;             |
| a1cse4  | 458 | 50 | 10.9 | SubName: Full=Toxin biosynthesis protein, putative;             |
| a0y7q8  | 551 | 60 | 10.9 | SubName: Full=Putative toxin secretion atp-binding abc trans... |
| q5dz52  | 445 | 48 | 10.8 | SubName: Full=Toxin coregulated pilus biosynthesis protein T... |
| q487y5  | 455 | 49 | 10.8 | SubName: Full=Zona occludens toxin-like protein;                |
| q0tus0  | 500 | 54 | 10.8 | RecName: Full=Perfringolysin O; AltName: Full=Theta-toxin; A... |
| o94089  | 398 | 43 | 10.8 | SubName: Full=T-2 toxin biosynthesis protein;                   |
| k9bd02  | 500 | 54 | 10.8 | SubName: Full=Zeta toxin;                                       |
| k6kzm5  | 500 | 54 | 10.8 | SubName: Full=Zeta toxin;                                       |
| k5ptu8  | 500 | 54 | 10.8 | SubName: Full=Zeta toxin;                                       |
| k5pnq2  | 500 | 54 | 10.8 | SubName: Full=Zeta toxin;                                       |
| k5efp5  | 500 | 54 | 10.8 | SubName: Full=Zeta toxin;                                       |
| k1ele4  | 500 | 54 | 10.8 | SubName: Full=Zeta toxin;                                       |
| j5iih6  | 500 | 54 | 10.8 | SubName: Full=Zeta toxin;                                       |
| j4ktu5  | 370 | 40 | 10.8 | SubName: Full=Zonula occludens toxin;                           |
| j1mdn6  | 500 | 54 | 10.8 | SubName: Full=Zeta toxin;                                       |
| j1lai9  | 500 | 54 | 10.8 | SubName: Full=Zeta toxin;                                       |
| j1bdm5  | 500 | 54 | 10.8 | SubName: Full=Zeta toxin;                                       |
| g6glz8  | 509 | 55 | 10.8 | SubName: Full=Zeta toxin family protein;                        |
| g3kgv3  | 472 | 51 | 10.8 | SubName: Full=RTX toxin-related Ca2+-binding protein;           |
| g0djh5  | 455 | 49 | 10.8 | SubName: Full=Zonular occludens toxin;                          |
| e9fbd7  | 445 | 48 | 10.8 | SubName: Full=Toxin biosynthesis protein, putative;             |
| e5cu7j6 | 592 | 64 | 10.8 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e3dhh7  | 535 | 58 | 10.8 | SubName: Full=Putative toxin-like protein;                      |

|        |     |    |      |  |
|--------|-----|----|------|--|
| e1sqk4 | 415 | 45 | 10.8 | SubName: Full=Toxin secretion, membrane fusion protein;          |
| e1gwk8 | 343 | 37 | 10.8 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f...  |
| d7j633 | 351 | 38 | 10.8 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f...  |
| d4xda6 | 437 | 47 | 10.8 | SubName: Full=HipA family toxin-antitoxin system;                |
| d0yyq7 | 603 | 65 | 10.8 | SubName: Full=Cytolysin and hemolysin HlyA Pore-forming toxi...  |
| d0fwh4 | 535 | 58 | 10.8 | SubName: Full=Putative toxin-related protein;                    |
| b9sx45 | 499 | 54 | 10.8 | SubName: Full=Diphtheria toxin resistance protein 2, dph2, pu... |
| b5gvz5 | 398 | 43 | 10.8 | SubName: Full=Putative Zeta toxin;                               |
| b1pnb0 | 443 | 48 | 10.8 | SubName: Full=Alpha-toxin;                                       |
| a7jyu1 | 453 | 49 | 10.8 | SubName: Full=RTX toxins and related Ca2+-binding proteins;      |
| a3d4m9 | 455 | 49 | 10.8 | SubName: Full=Zonular occludens toxin;                           |
| a1zpk1 | 445 | 48 | 10.8 | SubName: Full=Putative insecticidal toxin complex;               |
| q9yd10 | 139 | 35 | 10.7 | RecName: Full=Putative ribonuclease VapC3; Short=Putative RN...  |
| q9f5r4 | 276 | 35 | 10.7 | SubName: Full=Toxin co-regulated pilus virulence regulatory ...  |
| q9f5r1 | 277 | 35 | 10.7 | SubName: Full=Toxin co-regulated pilus virulence regulatory ...  |
| q93tt6 | 221 | 35 | 10.7 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ...  |
| q8gi68 | 440 | 47 | 10.7 | SubName: Full=Alpha-toxin;                                       |
| q8gi66 | 440 | 47 | 10.7 | SubName: Full=Alpha-toxin;                                       |
| q8gi65 | 440 | 47 | 10.7 | SubName: Full=Alpha-toxin;                                       |
| q76b45 | 282 | 35 | 10.7 | RecName: Full=Blarina toxin; Short=BLTX; EC=3.4.21.-; Flags:...  |
| q5hf12 | 166 | 35 | 10.7 | RecName: Full=HTH-type transcriptional regulator rot; AltNam...  |
| q5dz60 | 286 | 35 | 10.7 | SubName: Full=Toxin coregulated pilus biosynthesis protein T...  |
| q5dz53 | 170 | 35 | 10.7 | SubName: Full=Toxin coregulated pilus biosynthesis protein T...  |
| q589w8 | 296 | 35 | 10.7 | SubName: Full=HMG-CoA hydrolase for ACT-toxin synthesis;         |
| q4wym3 | 178 | 35 | 10.7 | SubName: Full=Toxin biosynthesis protein, putative;              |
| q4w164 | 596 | 64 | 10.7 | SubName: Full=MFS toxin transporter, putative;                   |
| q4w8a5 | 190 | 35 | 10.7 | SubName: Full=Cytolethal distending toxin C;                     |
| q4unb2 | 134 | 35 | 10.7 | SubName: Full=Toxin of toxin-antitoxin system;                   |
| q45723 | 263 | 35 | 10.7 | RecName: Full=Type-2Ba cytolytic delta-endotoxin; AltName: F...  |
| q1ni34 | 562 | 60 | 10.7 | SubName: Full=Toxin secretion ABC transporter ATP-binding pr...  |
| q182u3 | 248 | 35 | 10.7 | SubName: Full=Clostridium difficile binary toxin regulatory ...  |
| q12ly8 | 441 | 47 | 10.7 | SubName: Full=Aerolysin/hemolysin/leukocidin toxin; Flags: P...  |
| p67863 | 145 | 35 | 10.7 | RecName: Full=Snake venom vascular endothelial growth factor...  |
| p38874 | 309 | 35 | 10.7 | RecName: Full=Elongator complex protein 5; AltName: Full=Gam...  |
| p22313 | 296 | 35 | 10.7 | RecName: Full=Killer toxin KHR; AltName: Full=Killer of heat...  |
| p21454 | 591 | 63 | 10.7 | RecName: Full=Mono(ADP-ribosyl)transferase SpvB; Short=mADPR...  |
| p20974 | 275 | 35 | 10.7 | RecName: Full=T-cell ecto-ADP-ribosyltransferase 2; EC=2.4.2...  |
| p20897 | 202 | 35 | 10.7 | RecName: Full=Snake venom metalloproteinase HT-2; Short=SVMP...  |
| o06524 | 186 | 35 | 10.7 | SubName: Full=Cytolethal distending toxin protein C;             |
| k9c214 | 178 | 35 | 10.7 | SubName: Full=Putative toxin-antitoxin system, toxin compone...  |
| k8wct9 | 439 | 47 | 10.7 | SubName: Full=RTX toxin transporter;                             |
| k6n5w2 | 178 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ...  |
| k5s836 | 552 | 59 | 10.7 | SubName: Full=Toxin RTX-I translocation ATP-binding protein;...  |
| k5s7r4 | 552 | 59 | 10.7 | SubName: Full=Toxin RTX-I translocation ATP-binding protein;...  |
| k5qqa6 | 178 | 35 | 10.7 | SubName: Full=Putative toxin-antitoxin system, toxin compone...  |
| k5hh14 | 355 | 38 | 10.7 | SubName: Full=Toxin co-regulated pilus biosynthesis Q family...  |
| k5cf68 | 134 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X...  |
| k4yzk2 | 178 | 35 | 10.7 | SubName: Full=Putative toxin-antitoxin system, toxin compone...  |
| k4thx6 | 152 | 35 | 10.7 | SubName: Full=Pertussis toxin subunit 4;                         |
| k4rfw7 | 255 | 35 | 10.7 | SubName: Full=ArsR family toxin-antitoxin system, antitoxin ...  |
| k3iiq8 | 214 | 35 | 10.7 | SubName: Full=Antitoxin of the YeeV-YeeU toxin-antitoxin sys...  |
| k3hvg4 | 214 | 35 | 10.7 | SubName: Full=Antitoxin of the YeeV-YeeU toxin-antitoxin sys...  |
| k2vk70 | 552 | 59 | 10.7 | SubName: Full=Toxin RTX-I translocation ATP-binding protein;...  |
| k2v2c6 | 552 | 59 | 10.7 | SubName: Full=Toxin RTX-I translocation ATP-binding protein;...  |
| k2v1m7 | 552 | 59 | 10.7 | SubName: Full=Toxin RTX-I translocation ATP-binding protein;...  |
| k2urc5 | 552 | 59 | 10.7 | SubName: Full=Toxin RTX-I translocation ATP-binding protein;...  |
| k2th68 | 552 | 59 | 10.7 | SubName: Full=Toxin RTX-I translocation ATP-binding protein;...  |
| k1z4k8 | 197 | 35 | 10.7 | SubName: Full=Fic family toxin-antitoxin system;                 |

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| j8xzb4 | 162 | 35 | 10.7 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j8pux6 | 162 | 35 | 10.7 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j8cx19 | 141 | 35 | 10.7 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j6ueu4 | 135 | 35 | 10.7 | SubName: Full=Programmed cell death toxin protein;              |
| j6lhs2 | 152 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component domain... |
| j5w2t9 | 154 | 35 | 10.7 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j4zl77 | 178 | 35 | 10.7 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j4vvx5 | 549 | 59 | 10.7 | SubName: Full=Multidrug and toxin extrusion protein;            |
| j4kmi6 | 294 | 35 | 10.7 | SubName: Full=Zeta toxin;                                       |
| j3p3w0 | 392 | 42 | 10.7 | SubName: Full=Uncharacterized protein; SubName: Full=Zeta to... |
| j3nnu3 | 657 | 70 | 10.7 | SubName: Full=Multidrug and toxin extrusion protein 1; SubNa... |
| j3jan1 | 243 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| j3gf74 | 302 | 35 | 10.7 | SubName: Full=Zeta toxin; Flags: Precursor;                     |
| j1u4p9 | 252 | 35 | 10.7 | SubName: Full=Toxin PezT;                                       |
| j1ttn0 | 252 | 35 | 10.7 | SubName: Full=Toxin PezT;                                       |
| j1p8r8 | 252 | 35 | 10.7 | SubName: Full=Zeta toxin family protein;                        |
| j1mi80 | 178 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| j1lju3 | 178 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| j0yum8 | 252 | 35 | 10.7 | SubName: Full=Toxin PezT;                                       |
| j0ved4 | 252 | 35 | 10.7 | SubName: Full=Zeta toxin family protein;                        |
| i8u494 | 347 | 37 | 10.7 | SubName: Full=Killer toxin sensitivity protein;                 |
| i7lh80 | 121 | 35 | 10.7 | SubName: Full=TTE0859 replicon stabilization toxin;             |
| i7hcn4 | 207 | 35 | 10.7 | SubName: Full=Putative cytolethal distending toxin subunit C... |
| i4xuu7 | 198 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system antitoxin component, TI... |
| i3vas1 | 486 | 52 | 10.7 | SubName: Full=Toxin TX1;  |
| i2v5k8 | 224 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| i2j6r1 | 346 | 37 | 10.7 | SubName: Full=Zonula occludens toxin;                           |
| i2fc54 | 207 | 35 | 10.7 | SubName: Full=Putative cytolethal distending toxin subunit C... |
| i0zvi4 | 121 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| i0zrj3 | 172 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| i0h0g8 | 326 | 35 | 10.7 | SubName: Full=Putative zeta toxin;                              |
| h9yg56 | 158 | 35 | 10.7 | SubName: Full=50S ribosomal subunit-binding toxin of a predi... |
| h8jwh4 | 282 | 35 | 10.7 | SubName: Full=Cholera toxin transcriptional activator;          |
| h8f7z5 | 244 | 35 | 10.7 | SubName: Full=RTX toxin transporter, ATP-binding protein;       |
| h7wtz5 | 190 | 35 | 10.7 | SubName: Full=Cytolethal distending toxin, subunit CdtC;        |
| h7wp32 | 190 | 35 | 10.7 | SubName: Full=Cytolethal distending toxin, subunit CdtC;        |
| h7wj53 | 190 | 35 | 10.7 | SubName: Full=Cytolethal distending toxin, subunit CdtC;        |
| h7vyr9 | 190 | 35 | 10.7 | SubName: Full=Cytolethal distending toxin, subunit CdtC;        |
| h7v250 | 267 | 35 | 10.7 | SubName: Full=Cytolethal distending toxin subunit B-like pro... |
| h7ud25 | 190 | 35 | 10.7 | SubName: Full=Cytolethal distending toxin, subunit CdtC;        |
| h7u7d4 | 190 | 35 | 10.7 | SubName: Full=Cytolethal distending toxin, subunit CdtC;        |
| h7twh6 | 190 | 35 | 10.7 | SubName: Full=Cytolethal distending toxin, subunit CdtC;        |
| h7trs1 | 190 | 35 | 10.7 | SubName: Full=Cytolethal distending toxin, subunit CdtC;        |
| h7tiu8 | 190 | 35 | 10.7 | SubName: Full=Cytolethal distending toxin, subunit CdtC;        |
| h7tcc6 | 190 | 35 | 10.7 | SubName: Full=Cytolethal distending toxin, subunit CdtC;        |
| h7t911 | 190 | 35 | 10.7 | SubName: Full=Cytolethal distending toxin, subunit CdtC;        |
| h7r3i9 | 190 | 35 | 10.7 | SubName: Full=Cytolethal distending toxin, subunit CdtC;        |
| h7qws2 | 190 | 35 | 10.7 | SubName: Full=Cytolethal distending toxin, subunit CdtC;        |
| h7e704 | 171 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| h6lxq6 | 513 | 55 | 10.7 | SubName: Full=Toxin secretion ABC transporter HlyB;             |
| h6lvh3 | 513 | 55 | 10.7 | SubName: Full=Toxin secretion ABC transporter HlyB;             |
| h6ll97 | 578 | 62 | 10.7 | SubName: Full=Toxin exporting ABC transporter, permease;        |
| h4w9t7 | 374 | 40 | 10.7 | SubName: Full=Zonular occludens toxin family protein;           |
| h4hn16 | 238 | 35 | 10.7 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4a241 | 232 | 35 | 10.7 | SubName: Full=Enterotoxin-like toxin;                           |
| h3yw83 | 239 | 35 | 10.7 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3xjt0 | 356 | 38 | 10.7 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3x055 | 180 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |

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|--------|-----|----|------|---|
| h3u510 | 167 | 35 | 10.7 | SubName: Full=Toxin, OB domain protein;                         |
| h3tue8 | 167 | 35 | 10.7 | SubName: Full=Toxin, OB domain protein;                         |
| h2dgl8 | 226 | 35 | 10.7 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h2dkg7 | 226 | 35 | 10.7 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h1t166 | 167 | 35 | 10.7 | SubName: Full=Toxin, OB domain protein;                         |
| h1s163 | 238 | 35 | 10.7 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h1qz16 | 237 | 35 | 10.7 | SubName: Full=Zeta toxin family protein;                        |
| h1ldw1 | 242 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| h1c911 | 174 | 35 | 10.7 | SubName: Full=Toxin secretion/phage lysis holin;                |
| h1bav0 | 137 | 35 | 10.7 | SubName: Full=Toxin secretion/phage lysis holin;                |
| h0er47 | 188 | 35 | 10.7 | SubName: Full=Putative HC-toxin efflux carrier TOXA;            |
| h0ceb0 | 250 | 35 | 10.7 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| g9za26 | 184 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| g9xqy8 | 135 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, H... |
| g9xqb5 | 149 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| g6iab2 | 140 | 35 | 10.7 | SubName: Full=Toxin secretion/phage lysis holin;                |
| g6i914 | 132 | 35 | 10.7 | SubName: Full=Toxin secretion/phage lysis holin; Flags: Prec... |
| g5yk21 | 158 | 35 | 10.7 | SubName: Full=Putative toxin YfjG;                              |
| g5y057 | 158 | 35 | 10.7 | SubName: Full=Putative toxin YfjG;                              |
| g5xg62 | 158 | 35 | 10.7 | SubName: Full=Putative toxin YfjG;                              |
| g5xb66 | 158 | 35 | 10.7 | SubName: Full=Putative toxin YfjG;                              |
| g5wwi7 | 158 | 35 | 10.7 | SubName: Full=Putative toxin YfjG;                              |
| g5w975 | 158 | 35 | 10.7 | SubName: Full=Putative toxin YfjG;                              |
| g5vs14 | 158 | 35 | 10.7 | SubName: Full=Putative toxin YfjG;                              |
| g5vcw0 | 158 | 35 | 10.7 | SubName: Full=Putative toxin YfjG;                              |
| g5utw3 | 158 | 35 | 10.7 | SubName: Full=Putative toxin YfjG;                              |
| g5ubj7 | 158 | 35 | 10.7 | SubName: Full=Putative toxin YfjG;                              |
| g5ulj9 | 158 | 35 | 10.7 | SubName: Full=Putative toxin YfjG;                              |
| g5tm74 | 158 | 35 | 10.7 | SubName: Full=Putative toxin YfjG;                              |
| g5qk51 | 242 | 35 | 10.7 | SubName: Full=Putative pertussis-like toxin subunit;            |
| g5jj36 | 578 | 62 | 10.7 | SubName: Full=Toxin exporting ABC transporter, permease;        |
| g5jlj5 | 206 | 35 | 10.7 | SubName: Full=Insecticidal toxin complex-like protein;          |
| g4hnw9 | 153 | 35 | 10.7 | SubName: Full=Toxin secretion/phage lysis holin;                |
| g4hel0 | 153 | 35 | 10.7 | SubName: Full=Toxin secretion/phage lysis holin;                |
| g4c912 | 204 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| g3jnv8 | 356 | 38 | 10.7 | SubName: Full=Killer toxin sensitivity protein;                 |
| g3cai8 | 176 | 35 | 10.7 | SubName: Full=GNAT family toxin-antitoxin system;               |
| g2yiq7 | 191 | 35 | 10.7 | SubName: Full=Similar to similar to cercosporin toxin biosyn... |
| g1ub83 | 186 | 35 | 10.7 | SubName: Full=Cytolethal distending toxin protein C;            |
| f9zvc3 | 448 | 48 | 10.7 | SubName: Full=Zonular occludens toxin;                          |
| f9zg51 | 212 | 35 | 10.7 | SubName: Full=Hemolysin-type calcium-binding toxin;             |
| f9pyf1 | 336 | 36 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| f9l1t2 | 153 | 35 | 10.7 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| f9kz23 | 238 | 35 | 10.7 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f9kyl7 | 578 | 62 | 10.7 | SubName: Full=Putative toxin RTX-I translocation ATP-binding... |
| f9jvq0 | 578 | 62 | 10.7 | SubName: Full=Putative toxin RTX-I translocation ATP-binding... |
| f9i017 | 158 | 35 | 10.7 | SubName: Full=Putative toxin YfjG;                              |
| f9hb62 | 256 | 35 | 10.7 | SubName: Full=Zeta toxin;                                       |
| f9blu7 | 552 | 59 | 10.7 | SubName: Full=Toxin RTX-I translocation ATP-binding protein;... |
| f7mis9 | 288 | 35 | 10.7 | SubName: Full=Putative epsilon-toxin type B;                    |
| f7l1k7 | 204 | 35 | 10.7 | SubName: Full=Putative toxin-antitoxin system, antitoxin com... |
| f5vv23 | 250 | 35 | 10.7 | SubName: Full=Zeta toxin;                                       |
| f5t9q6 | 116 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| f5sdc4 | 146 | 35 | 10.7 | SubName: Full=Toxin secretion/phage lysis holin;                |
| f5jy90 | 241 | 35 | 10.7 | SubName: Full=Zeta toxin;                                       |
| f4xa12 | 183 | 35 | 10.7 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| f4fp25 | 225 | 35 | 10.7 | SubName: Full=Staphylococcal enterotoxin-like toxin;            |
| f3qzx3 | 217 | 35 | 10.7 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |

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| f2ux18 | 171 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| f2q003 | 366 | 39 | 10.7 | SubName: Full=Killer toxin sensitivity protein;                 |
| f2ny50 | 251 | 35 | 10.7 | SubName: Full=Zeta toxin family protein;                        |
| f2l756 | 431 | 46 | 10.7 | SubName: Full=Zeta toxin family protein;                        |
| f2bxt9 | 338 | 36 | 10.7 | SubName: Full=Zeta toxin superfamily protein;                   |
| f0z4a4 | 252 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| f0ln58 | 146 | 35 | 10.7 | SubName: Full=Programmed cell death toxin YdcE-like protein;... |
| f0hn17 | 164 | 35 | 10.7 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e9unm2 | 281 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| e9tys3 | 136 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| e9sjc0 | 204 | 35 | 10.7 | SubName: Full=MazF family Toxin-antitoxin system;               |
| e9rmg2 | 149 | 35 | 10.7 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e9dv19 | 249 | 35 | 10.7 | SubName: Full=TRI7-like toxin biosynthesis protein;             |
| e8syt1 | 172 | 35 | 10.7 | SubName: Full=Transcriptional modulator of MazE/toxin, MazF;... |
| e8py71 | 158 | 35 | 10.7 | SubName: Full=50S ribosomal subunit-binding toxin of a predi... |
| e8jp76 | 126 | 35 | 10.7 | SubName: Full=HicB family toxin-antitoxin system;               |
| e7sf88 | 126 | 35 | 10.7 | SubName: Full=Death on curing protein, Doc toxin;               |
| e7p9q2 | 282 | 35 | 10.7 | SubName: Full=Insecticidal toxin protein, putative;             |
| e7n3n7 | 147 | 35 | 10.7 | SubName: Full=Addiction module toxin, RelE/StbE family;         |
| e7mwn7 | 268 | 35 | 10.7 | SubName: Full=Staphylococcal toxin, beta-grasp domain protei... |
| e6ilg4 | 216 | 35 | 10.7 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e6gw49 | 216 | 35 | 10.7 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e6gns5 | 152 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component domain... |
| e6ftt0 | 216 | 35 | 10.7 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e6ewf9 | 152 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component domain... |
| e6bf50 | 121 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| e6a885 | 136 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| e5clh0 | 201 | 35 | 10.7 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e4zua5 | 200 | 35 | 10.7 | SubName: Full=Similar to ras-related C3 botulinum toxin subs... |
| e4lt91 | 160 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| e4la10 | 338 | 36 | 10.7 | SubName: Full=Zeta toxin;                                       |
| e3zfv9 | 239 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| e3ypt7 | 177 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, gnat ... |
| e3r4z8 | 247 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| e3ij98 | 172 | 35 | 10.7 | SubName: Full=Transcriptional modulator of MazE/toxin, MazF;... |
| e3b769 | 226 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| e2sx75 | 169 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| e2sur4 | 178 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| e2skx0 | 173 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| e2nrb7 | 153 | 35 | 10.7 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e2cd00 | 196 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| e1yqt3 | 159 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| e1lsr4 | 256 | 35 | 10.7 | SubName: Full=Zeta toxin family protein;                        |
| e1kxd4 | 180 | 35 | 10.7 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e1j0x6 | 121 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| e1hgy8 | 121 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| e1civ0 | 190 | 35 | 10.7 | SubName: Full=Cytolethal distending toxin C;                    |
| e0qey6 | 199 | 35 | 10.7 | SubName: Full=Cytolethal distending toxin A;                    |
| e0glr2 | 216 | 35 | 10.7 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| d9xzd1 | 279 | 35 | 10.7 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9xy74 | 260 | 35 | 10.7 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9wle3 | 195 | 35 | 10.7 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9rbi7 | 338 | 36 | 10.7 | SubName: Full=Leukocidin/hemolysin toxin family protein;        |
| d9pql6 | 180 | 35 | 10.7 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| d8f708 | 166 | 35 | 10.7 | SubName: Full=Putative toxin-antitoxin system, antitoxin com... |
| d8cdj7 | 136 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| d8bhw6 | 136 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| d8b873 | 121 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |



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| d8ath8 | 121 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| d7zz67 | 121 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| d7yyc5 | 136 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| d7xzl7 | 121 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| d7xs00 | 121 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| d7xfa4 | 121 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| d7k6n9 | 159 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| d7i9t8 | 256 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| d7d5e1 | 172 | 35 | 10.7 | SubName: Full=Transcriptional modulator of MazE/toxin, MazF;... |
| d6hka4 | 346 | 37 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d5l5r5 | 224 | 35 | 10.7 | SubName: Full=Toxin co-regulated pilus;                         |
| d4wgh2 | 317 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d4txy4 | 163 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d4s2f6 | 206 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| d4mut8 | 202 | 35 | 10.7 | SubName: Full=Zeta toxin;                                       |
| d4hqj4 | 137 | 35 | 10.7 | SubName: Full=Putative DNA binding protein, xre family toxin... |
| d4fbz4 | 247 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| d4cjr0 | 138 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| d4b9n1 | 171 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d3i7i9 | 229 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d3afe1 | 169 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| d3acp1 | 188 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d2rcr8 | 139 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, H... |
| d1yg78 | 241 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| d1w1x1 | 153 | 35 | 10.7 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| d1p6g8 | 121 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| d1nyb9 | 201 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| d0k6a6 | 578 | 62 | 10.7 | SubName: Full=Toxin exporting ABC transporter, permease;        |
| d0h654 | 221 | 35 | 10.7 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| d0h269 | 203 | 35 | 10.7 | SubName: Full=Cytolysin and hemolysin HlyA Pore-forming toxi... |
| d0bjs5 | 130 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, H... |
| c9yfg8 | 168 | 35 | 10.7 | SubName: Full=RTX-II toxin-activating lysine-acyltransferase... |
| c9rvv4 | 172 | 35 | 10.7 | SubName: Full=Transcriptional modulator of MazE/toxin, MazF;... |
| c9mp75 | 113 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, H... |
| c9lzx2 | 115 | 35 | 10.7 | SubName: Full=RelE family toxin-antitoxin system;               |
| c9lw65 | 138 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, H... |
| c9lrx3 | 181 | 35 | 10.7 | SubName: Full=Putative zeta-toxin;                              |
| c9l7t6 | 219 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| c9k1m7 | 262 | 35 | 10.7 | SubName: Full=Putative hydrolase for ACT-toxin biosynthesis;... |
| c8t432 | 137 | 35 | 10.7 | SubName: Full=Xre family toxin-antitoxin system;                |
| c8mn42 | 234 | 35 | 10.7 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8m6y5 | 234 | 35 | 10.7 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8a4k8 | 167 | 35 | 10.7 | SubName: Full=Staphylococcal/Streptococcal toxin, OB-fold do... |
| c7gi73 | 277 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| c7g8r8 | 229 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| c6lf31 | 154 | 35 | 10.7 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| c6jj30 | 146 | 35 | 10.7 | SubName: Full=Toxin secretion/phage lysis holin;                |
| c6ec99 | 150 | 35 | 10.7 | SubName: Full=Putative uncharacterized protein yjgK; SubName... |
| c6dxx7 | 288 | 35 | 10.7 | SubName: Full=Putative epsilon-toxin type B;                    |
| c5r8n8 | 382 | 41 | 10.7 | SubName: Full=Membrane protein, toxin regulator;                |
| c5g5t6 | 275 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| c5b940 | 175 | 35 | 10.7 | SubName: Full=RTX toxin, acyltransferase family, putative; E... |
| c4tiy1 | 237 | 35 | 10.7 | SubName: Full=Cytolethal distending toxin A;                    |
| c3xie1 | 183 | 35 | 10.7 | SubName: Full=Cytolethal distending toxin CdtC;                 |
| c0z048 | 149 | 35 | 10.7 | SubName: Full=Toxin secretion/phage lysis holin;                |
| c0eub6 | 143 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, antitoxin component, H... |
| c0atb8 | 181 | 35 | 10.7 | SubName: Full=Pertussis toxin, subunit 1;                       |
| b9mnf9 | 176 | 35 | 10.7 | SubName: Full=Transcriptional modulator of MazE/toxin, MazF;... |

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| b8cp63 | 382 | 41 | 10.7 | SubName: Full=Zonular occludens toxin;                          |
| b7r298 | 129 | 35 | 10.7 | RecName: Full=Putative ribonuclease VapC; Short=Putative RNA... |
| b4wmy1 | 171 | 35 | 10.7 | SubName: Full=RTX toxin acyltransferase family;                 |
| b4v4g7 | 430 | 46 | 10.7 | SubName: Full=Zeta toxin protein;                               |
| b3caf9 | 244 | 35 | 10.7 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| b1nya1 | 450 | 48 | 10.7 | SubName: Full=RTX toxin ABC transporter;                        |
| b1be47 | 179 | 35 | 10.7 | SubName: Full=Clostridium toxin-associated regulator BotR;      |
| b0xwe7 | 178 | 35 | 10.7 | SubName: Full=Toxin biosynthesis protein, putative;             |
| b0nse0 | 292 | 35 | 10.7 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| b0mkv4 | 143 | 35 | 10.7 | SubName: Full=Toxin secretion/phage lysis holin;                |
| b0map4 | 239 | 35 | 10.7 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| a8lg84 | 383 | 41 | 10.7 | SubName: Full=Zeta toxin family protein;                        |
| a7vy34 | 161 | 35 | 10.7 | SubName: Full=Toxin secretion/phage lysis holin;                |
| a6zt93 | 309 | 35 | 10.7 | SubName: Full=Insensitive to killer toxin;                      |
| a6qe90 | 225 | 35 | 10.7 | SubName: Full=Staphylococcal enterotoxin-like toxin;            |
| a6fg02 | 698 | 75 | 10.7 | SubName: Full=RTX toxin transporter;                            |
| a5f390 | 221 | 35 | 10.7 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| a4f2a2 | 190 | 35 | 10.7 | SubName: Full=Cytolethal distending toxin C;                    |
| a1x2j6 | 137 | 35 | 10.7 | SubName: Full=Putative toxin I;                                 |
| a1wqc4 | 117 | 35 | 10.7 | SubName: Full=RelE-like cytotoxic translational repressor of... |
| a1eic7 | 221 | 35 | 10.7 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| a1d5u9 | 325 | 35 | 10.7 | SubName: Full=Toxin biosynthesis proten (Fum3), putative;       |
| a1cgg2 | 412 | 44 | 10.7 | SubName: Full=Toxin biosynthesis protein, putative;             |
| q8cff0 | 331 | 35 | 10.6 | RecName: Full=Poly [ADP-ribose] polymerase 11; Short=PARP-11... |
| q7n2f4 | 462 | 49 | 10.6 | SubName: Full=Similar to toxin secretion transporter;           |
| q5zyy7 | 529 | 56 | 10.6 | SubName: Full=Toxin secretion ABC transporter HlyB/MsbA fami... |
| q5aud5 | 539 | 57 | 10.6 | SubName: Full=MFS toxin efflux pump (AflT), putative (AFU_or... |
| q2jag7 | 350 | 37 | 10.6 | SubName: Full=Zeta toxin;                                       |
| q01498 | 491 | 52 | 10.6 | SubName: Full=NRRL Y-18665 plasmid pPac1-2 killer toxin; Sub... |
| k5the3 | 536 | 57 | 10.6 | SubName: Full=Toxin RTX-I translocation ATP-binding protein;... |
| k2wsg4 | 536 | 57 | 10.6 | SubName: Full=Toxin RTX-I translocation ATP-binding protein;... |
| k1vut0 | 461 | 49 | 10.6 | SubName: Full=Protoplast regeneration and killer toxin resis... |
| j7k7g4 | 358 | 38 | 10.6 | SubName: Full=Anthrax toxin receptor 1 transcript variant 5;... |
| j5sdr7 | 461 | 49 | 10.6 | SubName: Full=Protoplast regeneration and killer toxin resis... |
| j4x0g4 | 339 | 36 | 10.6 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| i7a394 | 395 | 42 | 10.6 | SubName: Full=Zonular occludens toxin;                          |
| h8ghf5 | 369 | 39 | 10.6 | SubName: Full=Zonula occludens toxin;                           |
| h4qh28 | 658 | 70 | 10.6 | SubName: Full=Toxin B domain protein;                           |
| h0sf43 | 574 | 61 | 10.6 | SubName: Full=Putative secretion ATP-binding protein (ABC-ty... |
| h0esg0 | 555 | 59 | 10.6 | SubName: Full=Putative HC-toxin efflux carrier TOXA;            |
| h0esf2 | 451 | 48 | 10.6 | SubName: Full=Putative HC-toxin efflux carrier TOXA;            |
| g8us73 | 529 | 56 | 10.6 | SubName: Full=Toxin secretion ABC transporter HlyB/MsbA fami... |
| g7xuh0 | 348 | 37 | 10.6 | SubName: Full=Killer toxin sensitivity protein;                 |
| g7tra4 | 453 | 48 | 10.6 | SubName: Full=RTX toxin transporter;                            |
| g5k6i5 | 357 | 38 | 10.6 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| f4abd8 | 436 | 46 | 10.6 | SubName: Full=Alpha-toxin;                                      |
| f3qja9 | 330 | 35 | 10.6 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| f3liq7 | 398 | 42 | 10.6 | SubName: Full=RTX toxin;  |
| f2tme2 | 357 | 38 | 10.6 | SubName: Full=Killer toxin sensitivity protein;                 |
| f2qqg6 | 529 | 56 | 10.6 | SubName: Full=Multidrug and toxin extrusion protein 1;          |
| f2iq19 | 453 | 48 | 10.6 | SubName: Full=RTX toxin transporter;                            |
| e4bhg7 | 593 | 63 | 10.6 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4afv4 | 593 | 63 | 10.6 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e3bql2 | 453 | 48 | 10.6 | SubName: Full=RTX toxin transporter;                            |
| e1m9k4 | 686 | 73 | 10.6 | SubName: Full=Toxin expression-transcriptional accessory pro... |
| e0hcg4 | 387 | 41 | 10.6 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| d7ixm3 | 529 | 56 | 10.6 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| d7ixm1 | 509 | 54 | 10.6 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |

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|--------|-----|----|------|--|
| d4s2q2 | 511 | 54 | 10.6 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f...  |
| d3lwe4 | 330 | 35 | 10.6 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f...  |
| d1j6q5 | 603 | 64 | 10.6 | SubName: Full=Cytolysin and hemolysin, HlyA, Pore-forming to...  |
| d0z5b0 | 603 | 64 | 10.6 | SubName: Full=Cytolysin and hemolysin HlyA Pore-forming toxi...  |
| d0h7l5 | 453 | 48 | 10.6 | SubName: Full=RTX toxin transporter;                             |
| c9npw1 | 453 | 48 | 10.6 | SubName: Full=Zona occludens toxin;                              |
| c6rzf3 | 453 | 48 | 10.6 | SubName: Full=RTX toxin transporter;                             |
| c6dh63 | 348 | 37 | 10.6 | SubName: Full=Zonular occludens toxin; Flags: Precursor;         |
| c5jrt3 | 357 | 38 | 10.6 | SubName: Full=Killer toxin sensitivity protein;                  |
| c5gq58 | 357 | 38 | 10.6 | SubName: Full=Killer toxin sensitivity protein;                  |
| b9jje1 | 479 | 51 | 10.6 | SubName: Full=Rhizobiocin/RTX toxin and hemolysin-type calci...  |
| b1pnb4 | 443 | 47 | 10.6 | SubName: Full=Alpha-toxin;                                       |
| b1pnb3 | 443 | 47 | 10.6 | SubName: Full=Alpha-toxin;                                       |
| b1pna9 | 443 | 47 | 10.6 | SubName: Full=Alpha-toxin;                                       |
| a8nix4 | 615 | 65 | 10.6 | SubName: Full=Killer toxin resistant protein;                    |
| a6zqy7 | 464 | 49 | 10.6 | SubName: Full=Killer toxin resistant protein;                    |
| a5eig3 | 573 | 61 | 10.6 | SubName: Full=Putative toxin/protease secretion system;          |
| a3upp1 | 453 | 48 | 10.6 | SubName: Full=RTX toxin transporter;                             |
| a2r6y0 | 539 | 57 | 10.6 | SubName: Full=Remark: TOXA of Cochliobolus carbonum encodes ...  |
| a2qc98 | 568 | 60 | 10.6 | SubName: Full=Function: TOXA of C. carbonum exports the cycl...  |
| q93q17 | 475 | 50 | 10.5 | RecName: Full=ADP-ribosyltransferase toxin AexT; EC=2.4.2.-;...  |
| q8pma4 | 588 | 62 | 10.5 | SubName: Full=Toxin secretion ABC transporter ATP-binding pr...  |
| q8g8k0 | 440 | 46 | 10.5 | SubName: Full=Alpha-toxin;                                       |
| q8d6p5 | 467 | 49 | 10.5 | SubName: Full=RTX toxin transporter;                             |
| q7mdk1 | 467 | 49 | 10.5 | SubName: Full=RTX toxin transporter;                             |
| q5dz54 | 484 | 51 | 10.5 | SubName: Full=Toxin coregulated pilus outer membrane protein...  |
| q4wbi0 | 591 | 62 | 10.5 | SubName: Full=TRI7-like toxin biosynthesis protein, putative...  |
| q489z5 | 455 | 48 | 10.5 | SubName: Full=Zona occludens toxin;                              |
| q3qza9 | 354 | 37 | 10.5 | SubName: Full=Zonular occludens toxin;                           |
| q1ciy2 | 333 | 35 | 10.5 | SubName: Full=Putative ABC associated RTX toxin transporter,...  |
| q02884 | 456 | 48 | 10.5 | RecName: Full=Elongator complex protein 4; AltName: Full=Gam...  |
| p05516 | 370 | 39 | 10.5 | RecName: Full=41.9 kDa insecticidal toxin; AltName: Full=Str...  |
| k9gzu7 | 420 | 44 | 10.5 | SubName: Full=TRI7-like toxin biosynthesis protein, putative...  |
| k9fa82 | 420 | 44 | 10.5 | SubName: Full=TRI7-like toxin biosynthesis protein, putative...  |
| k4im59 | 428 | 45 | 10.5 | SubName: Full=Toxin of toxin-antitoxin module, HipA family;      |
| k4ibc8 | 440 | 46 | 10.5 | SubName: Full=Addiction module toxin protein HipA;               |
| k1xme8 | 655 | 69 | 10.5 | SubName: Full=Multidrug and toxin extrusion protein;             |
| j3nfs5 | 535 | 56 | 10.5 | SubName: Full=Multidrug and toxin extrusion protein 1; SubNa...  |
| j3fkb1 | 487 | 51 | 10.5 | SubName: Full=Ca2+-binding protein, RTX toxin; Flags: Precur...  |
| j2kpp1 | 743 | 78 | 10.5 | SubName: Full=Toxin secretion ABC transporter ATP-binding pr...  |
| i3i9e0 | 703 | 74 | 10.5 | SubName: Full=Toxin secretion ATP-binding protein;               |
| i2e2g3 | 370 | 39 | 10.5 | SubName: Full=Binary toxin A;                                    |
| i2e2g0 | 370 | 39 | 10.5 | SubName: Full=Binary toxin A;                                    |
| h0swu5 | 574 | 60 | 10.5 | SubName: Full=Putative secretion ATP-binding protein (ABC-ty...  |
| h0esh3 | 487 | 51 | 10.5 | SubName: Full=Putative HC-toxin synthetase;                      |
| f4fi70 | 342 | 36 | 10.5 | SubName: Full=Zeta toxin family protein;                         |
| f3p8l3 | 572 | 60 | 10.5 | SubName: Full=Toxin secretion/phage lysis holin;                 |
| f0gyy6 | 552 | 58 | 10.5 | SubName: Full=Toxin secretion/phage lysis holin;                 |
| e8nw53 | 333 | 35 | 10.5 | SubName: Full=Putative ABC associated RTX toxin transporter,...  |
| e0w1w1 | 466 | 49 | 10.5 | SubName: Full=Diphtheria toxin resistance protein 2, dph2, pu... |
| d9rjj5 | 351 | 37 | 10.5 | SubName: Full=Toxin regulatorly-like protein;                    |
| d9rdz4 | 351 | 37 | 10.5 | SubName: Full=Toxin regulatorly-like protein;                    |
| d6e6k1 | 354 | 37 | 10.5 | SubName: Full=Predicted membrane protein, putative toxin reg...  |
| d4cne1 | 506 | 53 | 10.5 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f...  |
| d4b5i0 | 430 | 45 | 10.5 | SubName: Full=TRI7-like toxin biosynthesis protein, putative...  |
| d1qmp6 | 430 | 45 | 10.5 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f...  |
| d1p0c2 | 344 | 36 | 10.5 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f...  |
| d0z4z3 | 514 | 54 | 10.5 | SubName: Full=ADP-ribosyltransferase toxin aexT (Exoenzyme T...  |

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| d0h262 | 332 | 35 | 10.5 | SubName: Full=Cytolysin and hemolysin HlyA Pore-forming toxi... |
| d0gkz8 | 352 | 37 | 10.5 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| c8vq97 | 620 | 65 | 10.5 | SubName: Full=MFS toxin efflux pump (AflT), putative (AFU_or... |
| c4hv83 | 333 | 35 | 10.5 | SubName: Full=Putative ABC associated RTX toxin transporter,... |
| c4hpm3 | 333 | 35 | 10.5 | SubName: Full=Putative ABC associated RTX toxin transporter,... |
| c4h6b6 | 333 | 35 | 10.5 | SubName: Full=Putative ABC associated RTX toxin transporter,... |
| b0yac9 | 591 | 62 | 10.5 | SubName: Full=TRI7-like toxin biosynthesis protein, putative... |
| b0i1u1 | 560 | 59 | 10.5 | SubName: Full=Diphtheria toxin;                                 |
| a7kau3 | 601 | 63 | 10.5 | RecName: Full=Multidrug and toxin extrusion protein 2; Short... |
| a6ae97 | 455 | 48 | 10.5 | SubName: Full=Zonular occludens toxin (Zot) family;             |
| a5txj1 | 363 | 38 | 10.5 | SubName: Full=Possible zeta toxin;                              |
| a5ivz5 | 351 | 37 | 10.5 | SubName: Full=Membrane protein putative toxin regulator-like... |
| a3gly2 | 455 | 48 | 10.5 | SubName: Full=Zonular occludens toxin (Zot) family;             |
| q9rfy6 | 231 | 34 | 10.4 | RecName: Full=Cytolethal distending toxin subunit A; Short=C... |
| q9rfj6 | 166 | 34 | 10.4 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| q9r5v2 | 190 | 34 | 10.4 | SubName: Full=CDT=CYTOLETHAL DISTENDING toxin C CDTC product... |
| q91878 | 263 | 34 | 10.4 | SubName: Full=Cytolytic toxin Cyt2Ba8;                          |
| q9f280 | 186 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin C;                    |
| q9anx9 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| q9anx8 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| q96115 | 291 | 34 | 10.4 | RecName: Full=Ecto-ADP-ribosyltransferase 5; EC=2.4.2.31; Al... |
| q8gj13 | 258 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin A;                    |
| q8fre4 | 150 | 34 | 10.4 | SubName: Full=PIN family toxin-antitoxin system, toxin compo... |
| q8ej37 | 164 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system toxin GNAT family;         |
| q7w2u8 | 269 | 34 | 10.4 | RecName: Full=Pertussis toxin subunit 1 homolog; Flags: Prec... |
| q7vsx5 | 273 | 34 | 10.4 | RecName: Full=Type IV secretion system protein PtlF; AltName... |
| q7dk11 | 186 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin; SubName: Full=Cyt... |
| q7bgc9 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| q7bgc8 | 224 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilin; SubName: Full=Toxin-... |
| q74dc5 | 194 | 34 | 10.4 | SubName: Full=Toxin, Fic family;                                |
| q6upc3 | 258 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin A;                    |
| q6lvj0 | 189 | 34 | 10.4 | SubName: Full=Hypothetical toxin secretion, membrane fusionp... |
| q60153 | 224 | 34 | 10.4 | RecName: Full=Toxin coregulated pilin; AltName: Full=Pilus c... |
| q5phn0 | 240 | 34 | 10.4 | RecName: Full=Guanine nucleotide exchange factor sopE2; AltN... |
| q5mq79 | 265 | 34 | 10.4 | SubName: Full=Beta-2 toxin; SubName: Full=Beta2 toxin; SubNa... |
| q5mq78 | 265 | 34 | 10.4 | SubName: Full=Beta2 toxin;                                      |
| q5mq71 | 265 | 34 | 10.4 | SubName: Full=Beta2 toxin; SubName: Full=Beta2-toxin;           |
| q5mq69 | 265 | 34 | 10.4 | SubName: Full=Beta2 toxin;                                      |
| q5jhw8 | 143 | 34 | 10.4 | RecName: Full=Putative ribonuclease VapC; Short=Putative RNA... |
| q5iqz5 | 258 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin A;                    |
| q5hne7 | 136 | 34 | 10.4 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| q56ub9 | 190 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin C; SubName: Full=C... |
| q53482 | 443 | 46 | 10.4 | SubName: Full=Alpha-toxin;                                      |
| q4wdb5 | 347 | 36 | 10.4 | SubName: Full=Killer toxin sensitivity protein (Iki1), putat... |
| q4hru1 | 239 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin A;                    |
| q48tz3 | 366 | 38 | 10.4 | SubName: Full=Putative exfoliative toxin;                       |
| q3dcj5 | 242 | 34 | 10.4 | SubName: Full=Exfoliative toxin A;                              |
| q2ffx6 | 166 | 34 | 10.4 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| q2a1d3 | 155 | 34 | 10.4 | SubName: Full=Toxin secretion ABC transporter ATP-binding pr... |
| q04474 | 173 | 34 | 10.4 | RecName: Full=RTX-III toxin-activating lysine-acyltransferas... |
| p64880 | 134 | 34 | 10.4 | RecName: Full=Probable VapC ribonuclease Mb1587; Short=Proba... |
| p64879 | 134 | 34 | 10.4 | RecName: Full=Ribonuclease VapC11; Short=RNase VapC11; EC=3.... |
| p64595 | 154 | 34 | 10.4 | RecName: Full=Toxin YhaV; EC=3.1.-.-; AltName: Full=Ribonucl... |
| p64594 | 154 | 34 | 10.4 | RecName: Full=Toxin YhaV; EC=3.1.-.-; AltName: Full=Ribonucl... |
| p62561 | 251 | 34 | 10.4 | RecName: Full=Exotoxin type A; AltName: Full=Erythrogenic to... |
| p62560 | 251 | 34 | 10.4 | RecName: Full=Exotoxin type A; AltName: Full=Erythrogenic to... |
| p62023 | 138 | 34 | 10.4 | RecName: Full=Basic phospholipase A2 Mtx-b; Short=svPLA2; EC... |
| p57674 | 194 | 34 | 10.4 | RecName: Full=Putative ribonuclease VapC1; Short=Putative RN... |

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| p29485 | 221 | 34 | 10.4 | RecName: Full=Toxin coregulated pilus biosynthesis protein P... |
| o87122 | 186 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin C;                    |
| k9btq8 | 178 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| k9a823 | 182 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| k8zcl7 | 325 | 34 | 10.4 | SubName: Full=Exfoliative toxin A;                              |
| k8wda5 | 442 | 46 | 10.4 | SubName: Full=RTX toxin transporter;                            |
| k8mw87 | 134 | 34 | 10.4 | SubName: Full=Toxin secretion/phage lysis holin;                |
| k6nvp8 | 178 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| k6n2f5 | 178 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| k6mq99 | 178 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| k6mhm7 | 178 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| k6ici7 | 178 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| k6kd10 | 178 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| k6j8a5 | 139 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system toxin component, PIN fa... |
| k6fvz4 | 139 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system toxin component, PIN fa... |
| k5u058 | 537 | 56 | 10.4 | SubName: Full=Toxin RTX-I translocation ATP-binding protein;... |
| k5tp72 | 537 | 56 | 10.4 | SubName: Full=Toxin RTX-I translocation ATP-binding protein;... |
| k5sm15 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k5shv6 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k5sev0 | 537 | 56 | 10.4 | SubName: Full=Toxin RTX-I translocation ATP-binding protein;... |
| k5ryz6 | 537 | 56 | 10.4 | SubName: Full=Toxin RTX-I translocation ATP-binding protein;... |
| k5rxl4 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k5rs94 | 537 | 56 | 10.4 | SubName: Full=Toxin RTX-I translocation ATP-binding protein;... |
| k5r8d5 | 178 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| k5r0b4 | 178 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| k5qax5 | 178 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| k5pnz2 | 178 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| k5pie7 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k5l8s8 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k5kap9 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k5k787 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k5j1z3 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k5j0m5 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k5ikh2 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k5icx1 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k5huq6 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k5hu85 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k5hes7 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k5fmp2 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k5f4z5 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k5ew73 | 178 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| k5end5 | 178 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| k5e8j3 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k5e811 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k5e2d2 | 178 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| k5d9n6 | 178 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| k5c4y4 | 154 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| k4qt12 | 192 | 34 | 10.4 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| k4qp91 | 226 | 34 | 10.4 | SubName: Full=Pertussis toxin subunit 2;                        |
| k4qhn4 | 269 | 34 | 10.4 | SubName: Full=Pertussis toxin subunit 1; EC=2.4.2.-;            |
| k3v9d3 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3tmh6 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3sws3 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3scx2 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3s9t1 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3rxb6 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3rk34 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3qq05 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |

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| k3qbz7 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3q4h1 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3pvq5 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3ney4 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3ne11 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3n2g8 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3m454 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3lyx1 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3lwn9 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3lj85 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3kew1 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3jcg7 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3isf9 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3hur5 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3hrb9 | 258 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin A;                    |
| k3hmd7 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3gvy3 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3gbx7 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3g8h7 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3fp45 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3fcx3 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3ezr1 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3ekg8 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3edp3 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3eda1 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3cgc8 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3c1p7 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3bzh3 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3bha8 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3bc22 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3b9y5 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k3abd2 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k2zpa9 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k2z8a0 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k2yh15 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k2yf93 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k2y2x3 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| k2xex8 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k2xbu4 | 224 | 34 | 10.4 | SubName: Full=Toxin coregulated pilin;                          |
| k2wrs7 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k2wqr1 | 224 | 34 | 10.4 | SubName: Full=Toxin coregulated pilin;                          |
| k2wj67 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k2vzm0 | 224 | 34 | 10.4 | SubName: Full=Toxin coregulated pilin;                          |
| k2vxa5 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k2vur8 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k2ucq0 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k2ttp4 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| k2d3e0 | 127 | 34 | 10.4 | SubName: Full=Transcriptional modulator of MazE/toxin, MazF;... |
| k1ul76 | 151 | 34 | 10.4 | SubName: Full=Holin, toxin secretion/phage lysis;               |
| k1l055 | 566 | 59 | 10.4 | SubName: Full=RTX-I toxin determinant B;                        |
| k1fcu6 | 178 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| k1f715 | 178 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| k0yx22 | 151 | 34 | 10.4 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j9ef80 | 509 | 53 | 10.4 | SubName: Full=Multidrug and toxin extrusion protein 2;          |
| j8i851 | 141 | 34 | 10.4 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j8hhh8 | 141 | 34 | 10.4 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j8h9x0 | 165 | 34 | 10.4 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j8fzi8 | 141 | 34 | 10.4 | SubName: Full=Toxin secretion/phage lysis holin;                |

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| j7swn0 | 196 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j7b1w0 | 141 | 34 | 10.4 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j6pw96 | 215 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j6pvn7 | 215 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j6ply4 | 215 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j6p6g8 | 215 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j6p2j9 | 215 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j6mux5 | 215 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j6ei12 | 215 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j6e9g7 | 141 | 34 | 10.4 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j6cdm6 | 215 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j6azf1 | 215 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j5z2f4 | 215 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j5bdr2 | 216 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j5bci5 | 215 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j4vj90 | 178 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j4tq62 | 123 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, Fic d... |
| j4kh65 | 178 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| j4jby2 | 178 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j3dc57 | 215 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j2a4m5 | 224 | 34 | 10.4 | SubName: Full=Toxin coregulated pilin;                          |
| j2a4b4 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j2a0s9 | 224 | 34 | 10.4 | SubName: Full=Toxin coregulated pilin;                          |
| j2a0g2 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1ytr1 | 145 | 34 | 10.4 | SubName: Full=Ribosome association toxin Rata;                  |
| j1wzv4 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1wvf1 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1wp01 | 224 | 34 | 10.4 | SubName: Full=Toxin coregulated pilin;                          |
| j1w0m3 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1v3y5 | 258 | 34 | 10.4 | SubName: Full=Toxin PezT;                                       |
| j1ud39 | 258 | 34 | 10.4 | SubName: Full=Toxin PezT;                                       |
| j1nq03 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1nxx1 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1mem7 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1m885 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1khq4 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1iax4 | 242 | 34 | 10.4 | SubName: Full=Toxin secretion protein;                          |
| j1g270 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1ffz9 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1edc0 | 258 | 34 | 10.4 | SubName: Full=Zeta toxin family protein;                        |
| j1dkw7 | 164 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| j1cp76 | 164 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| j1cnw3 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| j1cb59 | 224 | 34 | 10.4 | SubName: Full=Toxin coregulated pilin;                          |
| j1c8j0 | 224 | 34 | 10.4 | SubName: Full=Toxin coregulated pilin;                          |
| j1bjb0 | 178 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| j1ajc5 | 164 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| j0zyh7 | 258 | 34 | 10.4 | SubName: Full=Toxin PezT;                                       |
| j0zrt4 | 164 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| j0yt51 | 164 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| j0v924 | 136 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system antitoxin comp... |
| j0v2n2 | 261 | 34 | 10.4 | SubName: Full=Zeta toxin family protein;                        |
| j0um11 | 258 | 34 | 10.4 | SubName: Full=Zeta toxin family protein;                        |
| j0trm3 | 164 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| j0sqr0 | 152 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j0rxi1 | 164 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| j0rbd4 | 164 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| j0qzi4 | 164 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |

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| j0qbj0 | 164 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| j0ntu4 | 164 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| j0jb84 | 164 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| j0j605 | 164 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| j0ivp1 | 164 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| j0ifs8 | 152 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j0e352 | 164 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| i9wqq0 | 221 | 34 | 10.4 | SubName: Full=Zeta toxin family protein;                        |
| i8r7j9 | 223 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component,zeta t... |
| i8f5g3 | 308 | 34 | 10.4 | SubName: Full=Zonular occludens toxin family protein;           |
| i7l927 | 280 | 34 | 10.4 | SubName: Full=Toxin secretion/phage lysis holin;                |
| i6xbs7 | 134 | 34 | 10.4 | SubName: Full=Toxin;  |
| i6r2a8 | 134 | 34 | 10.4 | SubName: Full=Toxin;  |
| i6fuf2 | 214 | 34 | 10.4 | SubName: Full=Antitoxin of the YeeV-YeeU toxin-antitoxin sys... |
| i6d361 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5zih9 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5zf62 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5yn47 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5y095 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5xlq5 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5xfi1 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5wr31 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5wbm9 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5vql4 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5ve97 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5v1x2 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5uaf1 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5tx46 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5tur6 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5sth8 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5sl55 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5sfq1 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5rqi0 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5r142 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5qsf8 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5q5m9 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5ppw2 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5pkx7 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5pdf0 | 258 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin A;                    |
| i5p0w6 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5n1x9 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5mwb9 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5mt92 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5m810 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5l997 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5l0h0 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5ky31 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5jy60 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5jn30 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5jhm6 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5iy63 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5hxx8 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5hvt1 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5hjd8 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5gp04 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5geh2 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5g5a0 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5ewn3 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |



|        |     |    |      |   |
|--------|-----|----|------|---|
| i5ewj1 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5dlg2 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5dke6 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i5dfz0 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i4x0t4 | 151 | 34 | 10.4 | SubName: Full=Transcriptional modulator of MazE/toxin, MazF;... |
| i4rl76 | 169 | 34 | 10.4 | SubName: Full=Toxin B;  |
| i4lr86 | 110 | 34 | 10.4 | SubName: Full=Addiction module toxin, RelE/StbE family prote... |
| i4lkq2 | 110 | 34 | 10.4 | SubName: Full=Addiction module toxin, RelE/StbE family prote... |
| i4j6t8 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV;                                       |
| i3ytk5 | 178 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system antitoxin comp... |
| i3dru1 | 123 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| i3aa39 | 154 | 34 | 10.4 | SubName: Full=Toxin with endonuclease activity YhaV;            |
| i2zq96 | 154 | 34 | 10.4 | SubName: Full=Toxin with endonuclease activity YhaV;            |
| i2ypi9 | 154 | 34 | 10.4 | SubName: Full=Toxin with endonuclease activity YhaV;            |
| i2y8h0 | 154 | 34 | 10.4 | SubName: Full=Toxin with endonuclease activity YhaV;            |
| i2x6v2 | 154 | 34 | 10.4 | SubName: Full=Toxin with endonuclease activity YhaV;            |
| i2wee0 | 175 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| i2vz41 | 154 | 34 | 10.4 | SubName: Full=Toxin with endonuclease activity YhaV;            |
| i2v128 | 154 | 34 | 10.4 | SubName: Full=Toxin with endonuclease activity YhaV;            |
| i2uhc4 | 154 | 34 | 10.4 | SubName: Full=Toxin with endonuclease activity YhaV;            |
| i2t3u8 | 258 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin A/C family;           |
| i2ry54 | 154 | 34 | 10.4 | SubName: Full=Toxin with endonuclease activity YhaV;            |
| i2rcx9 | 154 | 34 | 10.4 | SubName: Full=Toxin with endonuclease activity YhaV;            |
| i2qy83 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV;                                       |
| i2pk93 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV;                                       |
| i2nj95 | 235 | 34 | 10.4 | SubName: Full=Zeta toxin;                                       |
| i2nct7 | 246 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, HipA ... |
| i2j4e2 | 256 | 34 | 10.4 | SubName: Full=Zeta toxin;                                       |
| i1xuc7 | 186 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin protein C;            |
| i1b599 | 172 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| i0zdu9 | 604 | 63 | 10.4 | SubName: Full=Toxin-like outer membrane protein;                |
| i0xer3 | 238 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| i0tw91 | 238 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| i0d6p0 | 141 | 34 | 10.4 | SubName: Full=Toxin secretion/phage lysis holin;                |
| h8nty1 | 321 | 34 | 10.4 | SubName: Full=Insecticidal toxin complex protein TcaC;          |
| h8jv55 | 224 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilin A;                       |
| h8jv53 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| h7w751 | 258 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7pmf6 | 256 | 34 | 10.4 | SubName: Full=Zeta toxin family protein;                        |
| h6uj61 | 226 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin A;                    |
| h6nny6 | 248 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin protein B;            |
| h6lss7 | 166 | 34 | 10.4 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| h5ny34 | 214 | 34 | 10.4 | SubName: Full=Antitoxin of the YeeV-YeeU toxin-antitoxin sys... |
| h5ai76 | 200 | 34 | 10.4 | SubName: Full=Antitoxin of the YeeV-YeeU toxin-antitoxin sys... |
| h4z1h0 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| h4yni6 | 214 | 34 | 10.4 | SubName: Full=Antitoxin of the YeeV-YeeU toxin-antitoxin sys... |
| h4y8a5 | 214 | 34 | 10.4 | SubName: Full=Antitoxin of the YeeV-YeeU toxin-antitoxin sys... |
| h4xsm6 | 214 | 34 | 10.4 | SubName: Full=Antitoxin of the YeeV-YeeU toxin-antitoxin sys... |
| h4wy77 | 214 | 34 | 10.4 | SubName: Full=Antitoxin of the YeeV-YeeU toxin-antitoxin sys... |
| h4w1p4 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| h4vla1 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| h4upi3 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| h4u7e6 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| h4p1p4 | 258 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin A/C family protein... |
| h4j2z6 | 110 | 34 | 10.4 | SubName: Full=Addiction module toxin HigB;                      |
| h4hn17 | 210 | 34 | 10.4 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4hfc8 | 238 | 34 | 10.4 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4ggv9 | 238 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |

|        |     |    |      |   |
|--------|-----|----|------|---|
| h4g774 | 208 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h4g1t0 | 238 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h4g0i6 | 238 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h4fsg5 | 258 | 34 | 10.4 | SubName: Full=Type III cytolethal distending toxin protein C... |
| h4en47 | 238 | 34 | 10.4 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4egy5 | 166 | 34 | 10.4 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| h4edl9 | 238 | 34 | 10.4 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4e6m4 | 238 | 34 | 10.4 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4ds00 | 238 | 34 | 10.4 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4d9g9 | 238 | 34 | 10.4 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4c168 | 238 | 34 | 10.4 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4ccq7 | 238 | 34 | 10.4 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4bpq5 | 238 | 34 | 10.4 | SubName: Full=Toxin beta-grasp domain protein;                  |
| h4b0z8 | 238 | 34 | 10.4 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4atj1 | 238 | 34 | 10.4 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4ake8 | 238 | 34 | 10.4 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4ac74 | 238 | 34 | 10.4 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4a408 | 238 | 34 | 10.4 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h3zzu8 | 238 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3z880 | 182 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| h3z1v8 | 238 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3ysn7 | 238 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3ye85 | 238 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3xz96 | 238 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3xtx8 | 238 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3xif0 | 238 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3xfi2 | 238 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3x2j6 | 238 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3vwf9 | 182 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| h3vp19 | 182 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| h3vg34 | 182 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| h3ufb7 | 182 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| h3u7x4 | 239 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3txh8 | 238 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3tsb7 | 239 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h3rx37 | 238 | 34 | 10.4 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h3keu5 | 144 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, antitoxin component, H... |
| h2dgm5 | 226 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h2dgm2 | 226 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h2dgl9 | 226 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h2dgl3 | 226 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h2dgm9 | 226 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h2d740 | 226 | 34 | 10.4 | SubName: Full=Putative zeta toxin;                              |
| h1z225 | 136 | 34 | 10.4 | RecName: Full=Putative ribonuclease VapC; Short=Putative RNA... |
| h1ttv3 | 238 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h1tta0 | 168 | 34 | 10.4 | SubName: Full=Toxin, OB domain protein;                         |
| h1tra8 | 203 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h1tik9 | 238 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h1tdt1 | 238 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h1tiu5 | 239 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h1stf0 | 238 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h1ll34 | 162 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, Fic d... |
| h1g4q0 | 120 | 34 | 10.4 | SubName: Full=Transcriptional modulator of MazE/toxin, MazF;... |
| h1fdm0 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV;                                       |
| h1bxe2 | 154 | 34 | 10.4 | SubName: Full=Toxin YhaV;                                       |
| h0dqk6 | 182 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| h0dc34 | 238 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h0d2b7 | 238 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |

|        |     |    |      |   |
|--------|-----|----|------|---|
| h0cxm9 | 238 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h0cl38 | 238 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h0b1v4 | 238 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| h0all7 | 238 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| g9ys52 | 169 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| g8v184 | 238 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| g8mrb5 | 186 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin protein C;            |
| g7zmr9 | 314 | 34 | 10.4 | SubName: Full=Exfoliative toxin A;                              |
| g7uze6 | 356 | 37 | 10.4 | SubName: Full=Toxin anion resistance protein TelA;              |
| g7tmz2 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g7c4u7 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g7bvz6 | 537 | 56 | 10.4 | SubName: Full=Toxin RTX-I translocation ATP-binding protein;... |
| g7bu94 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g7bgk0 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g7b5q8 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g7av65 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g7aln4 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g7aai6 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g7a1b0 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g6zqs8 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g6zd79 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g6z4p6 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| g6bpp7 | 256 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| g6bnu0 | 275 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, Bro d... |
| g6bm29 | 128 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, MazF ... |
| g6al08 | 215 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| g5khy4 | 134 | 34 | 10.4 | SubName: Full=Toxin secretion/phage lysis holin;                |
| g5gz64 | 195 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, MazF ... |
| g5dsd0 | 265 | 34 | 10.4 | SubName: Full=Beta2-toxin;                                      |
| g4r2p1 | 250 | 34 | 10.4 | SubName: Full=Clostridial binary toxin A family protein;        |
| g4pqd1 | 154 | 34 | 10.4 | SubName: Full=Toxin of the SohB(PrlF)-YhaV toxin-antitoxin s... |
| g4egp4 | 142 | 34 | 10.4 | SubName: Full=Toxin secretion/phage lysis holin; Flags: Prec... |
| g4did4 | 139 | 34 | 10.4 | SubName: Full=Transcriptional modulator of MazE/toxin, MazF;... |
| g4c4u6 | 171 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| g4b6m0 | 186 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin protein C;            |
| g4auf9 | 186 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin protein C;            |
| g4api8 | 186 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin C;                    |
| g4a1r3 | 186 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin protein C;            |
| g3zht0 | 186 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin C;                    |
| g3zas8 | 186 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin C;                    |
| g2pzc4 | 147 | 34 | 10.4 | SubName: Full=Transcriptional modulator of MazE/toxin, MazF;... |
| g2llw7 | 172 | 34 | 10.4 | SubName: Full=RTX toxin;  |
| g1yxi6 | 258 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin A/C family protein... |
| g1ygt6 | 258 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin A/C family protein... |
| g1y8g7 | 260 | 34 | 10.4 | SubName: Full=Shiga-like toxin 2 subunit A; EC=3.2.2.22;        |
| g0smx3 | 704 | 73 | 10.4 | SubName: Full=Toxin secretion ATP-binding protein;              |
| g0slx4 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| f9xuy0 | 233 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin A;                    |
| f9mww5 | 280 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| f9ltf1 | 164 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| f9lh99 | 164 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| f9ldr7 | 164 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| f9kwt8 | 239 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f9kl63 | 238 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f9kkh0 | 142 | 34 | 10.4 | SubName: Full=Toxin, OB-fold domain protein;                    |
| f9kax0 | 163 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| f9k446 | 238 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f9jnz7 | 239 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |

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|--------|-----|----|------|---|
| f9c554 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| f9b8r6 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| f8zty3 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| f8zj36 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| f8z7p8 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| f8ywr8 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| f7vgj2 | 138 | 34 | 10.4 | SubName: Full=Toxin-antitoxin systems (TAS) HicB;               |
| f7mm82 | 434 | 45 | 10.4 | SubName: Full=Alpha-toxin;                                      |
| f5wj49 | 238 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f5vs19 | 261 | 34 | 10.4 | SubName: Full=Zeta toxin;                                       |
| f5t8d8 | 345 | 36 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| f5rrs2 | 258 | 34 | 10.4 | SubName: Full=Toxin transcriptional activator ToxR;             |
| f5lm96 | 192 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| f5l2j1 | 355 | 37 | 10.4 | SubName: Full=Zeta toxin;                                       |
| f5iem5 | 178 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| f5hyq5 | 178 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| f4xhn6 | 166 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| f4xfe1 | 237 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| f4xei0 | 182 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| f4v8n1 | 161 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| f4v6n2 | 154 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| f4uzh7 | 305 | 34 | 10.4 | SubName: Full=Insecticidal toxin;                               |
| f4uzh3 | 189 | 34 | 10.4 | SubName: Full=RTX toxin RtxA;                                   |
| f4udn5 | 154 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| f4u358 | 110 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| f4tjh0 | 154 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| f4t503 | 175 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| f4t442 | 162 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| f4snk7 | 154 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| f4ggx0 | 560 | 58 | 10.4 | SubName: Full=Zeta toxin family protein;                        |
| f3ziw9 | 295 | 34 | 10.4 | SubName: Full=Putative xre family toxin-antitoxin system, an... |
| f3u0h8 | 164 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| f3tsi3 | 164 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| f3tn09 | 238 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f3ta38 | 238 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f3t4e8 | 238 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f3s1a1 | 157 | 34 | 10.4 | SubName: Full=Toxin resistance protein;                         |
| f3r8u2 | 215 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| f3qjg2 | 161 | 34 | 10.4 | SubName: Full=Toxin secretion/phage lysis holin;                |
| f3q4x4 | 177 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| f3m038 | 177 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| f3kn74 | 188 | 34 | 10.4 | SubName: Full=RTX toxins and related Ca2+-binding protein;      |
| f2v7h1 | 134 | 34 | 10.4 | SubName: Full=Toxin;  |
| f2q1d2 | 258 | 34 | 10.4 | SubName: Full=Toxin biosynthesis ketoreductase;                 |
| f1zbf7 | 527 | 55 | 10.4 | SubName: Full=Rhizobiocin/RTX toxin and hemolysin-type calci... |
| f0qff7 | 568 | 59 | 10.4 | SubName: Full=RTX toxin;  |
| f0nt35 | 116 | 34 | 10.4 | SubName: Full=RelE family toxin-antitoxin system;               |
| f0hrr9 | 125 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component family... |
| e9zj07 | 134 | 34 | 10.4 | SubName: Full=Toxin protein;                                    |
| e9uwd5 | 194 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e9uc39 | 117 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| e9sh18 | 205 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| e7n992 | 217 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| e7mtw7 | 166 | 34 | 10.4 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| e7mtt8 | 152 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e7mr02 | 154 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| e7mgy9 | 152 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e7mes0 | 166 | 34 | 10.4 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |

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|--------|-----|----|------|---|
| e7ex57 | 443 | 46 | 10.4 | SubName: Full=Multidrug and toxin extrusion protein 1;          |
| e6lh76 | 131 | 34 | 10.4 | SubName: Full=PIN family toxin-antitoxin system;                |
| e6ih28 | 134 | 34 | 10.4 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e6ige2 | 126 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, antitoxin com... |
| e6icu4 | 215 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e6ht18 | 215 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e6gs05 | 215 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e6fj33 | 215 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e6fdb2 | 126 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, antitoxin com... |
| e6f231 | 215 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e6ey47 | 127 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, antitoxin com... |
| e6es05 | 215 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e6apq4 | 136 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| e5tmh7 | 166 | 34 | 10.4 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| e5rm77 | 268 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin A;                    |
| e5rm67 | 189 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin C;                    |
| e5rm56 | 191 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin C;                    |
| e5rm47 | 191 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin C;                    |
| e5ray2 | 238 | 34 | 10.4 | SubName: Full=Staphylococcal/Streptococcal toxin, beta-grasp... |
| e5r8h0 | 242 | 34 | 10.4 | SubName: Full=Staphylococcal/Streptococcal toxin, beta-grasp... |
| e5cq74 | 186 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| e5azk4 | 258 | 34 | 10.4 | SubName: Full=Staphylococcal/Streptococcal toxin, beta-grasp... |
| e4sb41 | 147 | 34 | 10.4 | SubName: Full=Transcriptional modulator of MazE/toxin, MazF;... |
| e4s423 | 147 | 34 | 10.4 | SubName: Full=Transcriptional modulator of MazE/toxin, MazF;... |
| e4q799 | 147 | 34 | 10.4 | SubName: Full=Transcriptional modulator of MazE/toxin, MazF;... |
| e4q3t3 | 147 | 34 | 10.4 | SubName: Full=Transcriptional modulator of MazE/toxin, MazF;... |
| e4nmf6 | 299 | 34 | 10.4 | SubName: Full=Zonular occludens toxin (Zot);                    |
| e4lr80 | 137 | 34 | 10.4 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4hmw9 | 264 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| e3r4y6 | 199 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, antitoxin com... |
| e3e9d7 | 165 | 34 | 10.4 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e3bzu4 | 177 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e2znw2 | 238 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, MazF ... |
| e2znk2 | 242 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, MazF ... |
| e2z800 | 126 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, antitoxin com... |
| e2ytc8 | 215 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e2wh74 | 134 | 34 | 10.4 | SubName: Full=Toxin;  |
| e2w590 | 134 | 34 | 10.4 | SubName: Full=Toxin;  |
| e2vtt8 | 134 | 34 | 10.4 | SubName: Full=Toxin;  |
| e2vhr7 | 134 | 34 | 10.4 | SubName: Full=Toxin;  |
| e2v8g2 | 134 | 34 | 10.4 | SubName: Full=Toxin;  |
| e2uy93 | 134 | 34 | 10.4 | SubName: Full=Toxin;  |
| e2ul01 | 134 | 34 | 10.4 | SubName: Full=Toxin;  |
| e2u9g9 | 134 | 34 | 10.4 | SubName: Full=Toxin;  |
| e2ty32 | 134 | 34 | 10.4 | SubName: Full=Toxin;  |
| e2tli3 | 134 | 34 | 10.4 | SubName: Full=Toxin;  |
| e2t961 | 134 | 34 | 10.4 | SubName: Full=Toxin;  |
| e2t5j1 | 560 | 58 | 10.4 | SubName: Full=Zeta toxin superfamily;                           |
| e2sth4 | 170 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| e2sp59 | 190 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| e2sm01 | 148 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| e2nnx9 | 178 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e2csd3 | 229 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| e2caz3 | 163 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e1vvw6 | 310 | 34 | 10.4 | SubName: Full=Zeta toxin-like protein;                          |
| e1nq80 | 150 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, Bro d... |
| e1nnt8 | 177 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e1nit4 | 177 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |

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|--------|-----|----|------|---|
| e1ng30 | 177 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e1mfp6 | 168 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, antitoxin component, M... |
| e1ldi5 | 166 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| e1hkb1 | 154 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| e1h962 | 134 | 34 | 10.4 | SubName: Full=Toxin;  |
| e1eph9 | 212 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e0xv97 | 462 | 48 | 10.4 | SubName: Full=Rtx toxins and related ca2+-binding proteins;     |
| e0p2w6 | 166 | 34 | 10.4 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| e0hh14 | 216 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e0h811 | 218 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e0gcw6 | 216 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e0gba4 | 139 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| e0fzj6 | 218 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e0eli3 | 173 | 34 | 10.4 | SubName: Full=RTX-III toxin-activating lysine-acyltransferas... |
| d9yby7 | 169 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d9y1u1 | 277 | 34 | 10.4 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9y1d5 | 274 | 34 | 10.4 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9ww89 | 299 | 34 | 10.4 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9wm77 | 282 | 34 | 10.4 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9tfl8 | 147 | 34 | 10.4 | SubName: Full=Transcriptional modulator of MazE/toxin, MazF;... |
| d9pbq2 | 173 | 34 | 10.4 | SubName: Full=RTX-III toxin-activating lysine-acyltransferas... |
| d8fes8 | 111 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component family... |
| d8fdl2 | 136 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| d8bz58 | 154 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| d8ayv4 | 154 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| d8ahx8 | 154 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| d8a8r9 | 154 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| d7zeh9 | 154 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| d7xz20 | 154 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| d7xbr4 | 172 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d7x635 | 154 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| d7vnu2 | 297 | 34 | 10.4 | SubName: Full=Fic family toxin-antitoxin system;                |
| d7h1b6 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| d7h1b4 | 224 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilin;                         |
| d7aig4 | 194 | 34 | 10.4 | SubName: Full=Toxin, Fic family;                                |
| d6xzg0 | 147 | 34 | 10.4 | SubName: Full=Toxin secretion/phage lysis holin;                |
| d6t5n9 | 327 | 34 | 10.4 | SubName: Full=Leukocidin/hemolysin toxin family protein;        |
| d6ka78 | 288 | 34 | 10.4 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d6k5i8 | 286 | 34 | 10.4 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d6k0p2 | 226 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component;          |
| d6ft99 | 134 | 34 | 10.4 | SubName: Full=Toxin;  |
| d4ue97 | 327 | 34 | 10.4 | SubName: Full=Leukocidin/hemolysin toxin family protein;        |
| d4u840 | 166 | 34 | 10.4 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| d4quq9 | 224 | 34 | 10.4 | SubName: Full=Zeta toxin;                                       |
| d4fkr6 | 164 | 34 | 10.4 | SubName: Full=GNAT family toxin-antitoxin system; EC=2.3.1.-... |
| d4fi71 | 136 | 34 | 10.4 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| d4cle9 | 184 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, antitoxin component, H... |
| d4ck22 | 155 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system protein;                   |
| d4c3p8 | 144 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| d3kzx9 | 142 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, antitoxin com... |
| d3ajt6 | 153 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| d2yr08 | 704 | 73 | 10.4 | SubName: Full=Toxin secretion ATP-binding protein;              |
| d2yk13 | 221 | 34 | 10.4 | SubName: Full=Toxin coregulated pilus biosynthesis protein P... |
| d2nta5 | 324 | 34 | 10.4 | SubName: Full=RTX toxins;                                       |
| d1wk72 | 164 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d1vv17 | 224 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d1qye7 | 327 | 34 | 10.4 | SubName: Full=Leukocidin/hemolysin toxin family protein;        |
| d1qw49 | 238 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, antitoxin component, P... |

|        |     |    |      |   |
|--------|-----|----|------|---|
| d1qjx3 | 327 | 34 | 10.4 | SubName: Full=Leukocidin/hemolysin toxin family protein;          |
| d1qda7 | 614 | 64 | 10.4 | SubName: Full=ADP-ribosylating toxin;                             |
| d1qcl3 | 166 | 34 | 10.4 | RecName: Full=HTH-type transcriptional regulator rot; AltNam...   |
| d1plp6 | 125 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, MazF ...   |
| d1pha1 | 137 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f...   |
| d1pe42 | 128 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, antitoxin component, X...   |
| d1mau9 | 287 | 34 | 10.4 | SubName: Full=AM13; SubName: Full=Zeta toxin;                     |
| d1ag91 | 138 | 34 | 10.4 | SubName: Full=Toxin secretion/phage lysis holin;                  |
| d0ytp8 | 168 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, antitoxin component, M...   |
| d0wh67 | 598 | 62 | 10.4 | SubName: Full=Toxin-antitoxin system, antitoxin component, X...   |
| d0hrr7 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ...   |
| d0hrr5 | 224 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilin A;                         |
| c9y912 | 168 | 34 | 10.4 | SubName: Full=RTX-II toxin-activating lysine-acyltransferase...   |
| c9r3b9 | 186 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin protein C;              |
| c9lqq8 | 262 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, antitoxin component, X...   |
| c9lnq7 | 236 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, antitoxin component, X...   |
| c9ca79 | 187 | 34 | 10.4 | SubName: Full=Zeta toxin;   |
| c8pbl3 | 137 | 34 | 10.4 | SubName: Full=Insecticidal toxin SepC/TccC;                       |
| c8lnl4 | 211 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, antitoxin component;        |
| c8mig8 | 238 | 34 | 10.4 | SubName: Full=Toxin beta-grasp domain-containing protein;         |
| c8lcx9 | 166 | 34 | 10.4 | RecName: Full=HTH-type transcriptional regulator rot; AltNam...   |
| c8l4c6 | 238 | 34 | 10.4 | SubName: Full=Toxin beta-grasp domain-containing protein;         |
| c7wlr8 | 287 | 34 | 10.4 | SubName: Full=Zeta toxin;   |
| c7h3f3 | 154 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component domain...   |
| c7h0i0 | 133 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, antitoxin component, H...   |
| c7h0h8 | 174 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f...   |
| c6yev5 | 224 | 34 | 10.4 | SubName: Full=Toxin coregulated pilin;                            |
| c6yev3 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ...   |
| c6rw07 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ...   |
| c6ljd6 | 192 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f...   |
| c6lb40 | 216 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f...   |
| c6dsn2 | 134 | 34 | 10.4 | SubName: Full=Toxin;  |
| c5qa00 | 136 | 34 | 10.4 | RecName: Full=HTH-type transcriptional regulator rot; AltNam...   |
| c5a6m7 | 150 | 34 | 10.4 | RecName: Full=Putative ribonuclease VapC; Short=Putative RNase... |
| c4tiw8 | 190 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin C;                      |
| c4tiu2 | 258 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin A;                      |
| c4tis4 | 258 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin A;                      |
| c4tiq8 | 181 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin C;                      |
| c3nt72 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ...   |
| c3nt70 | 224 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilin A;                         |
| c3nqj9 | 537 | 56 | 10.4 | SubName: Full=RTX toxin transporter;                              |
| c3lt79 | 224 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilin;                           |
| c3lt77 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ...   |
| c2ja23 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ...   |
| c2ja21 | 224 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilin A;                         |
| c2j8d8 | 537 | 56 | 10.4 | SubName: Full=RTX toxin transporter;                              |
| c2j3n6 | 537 | 56 | 10.4 | SubName: Full=RTX toxin transporter;                              |
| c2iia8 | 537 | 56 | 10.4 | SubName: Full=RTX toxin transporter;                              |
| c2igm5 | 224 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilin A;                         |
| c2igm3 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ...   |
| c2i5z6 | 537 | 56 | 10.4 | SubName: Full=RTX toxin transporter;                              |
| b8lbe3 | 385 | 40 | 10.4 | SubName: Full=Zonula occludens toxin family protein;              |
| b7tgz8 | 226 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilin;                           |
| b7tgz6 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ...   |
| b7tgy7 | 136 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ...   |
| b7tgy1 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ...   |
| b7tgx6 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ...   |
| b7tgw3 | 224 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilin;                           |

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|--------|-----|----|------|--|
| b6wss8 | 230 | 34 | 10.4 | SubName: Full=Toxin secretion/phage lysis holin;                             |
| b5qj85 | 316 | 34 | 10.4 | SubName: Full=Putative toxin-like outer membrane protein;                    |
| b5g8w8 | 295 | 34 | 10.4 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c...              |
| b5fe86 | 195 | 34 | 10.4 | SubName: Full=Zeta toxin family protein;                                     |
| b3zgv7 | 146 | 34 | 10.4 | SubName: Full=Toxin secretion/phage lysis holin;                             |
| b3jig1 | 278 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f...              |
| b2za55 | 224 | 34 | 10.4 | SubName: Full=Toxin-coregulated pilin;                                       |
| b2za54 | 224 | 34 | 10.4 | SubName: Full=Toxin-coregulated pilin;                                       |
| b2za53 | 224 | 34 | 10.4 | SubName: Full=Toxin-coregulated pilin;                                       |
| b2uip3 | 443 | 46 | 10.4 | SubName: Full=Zonular occludens toxin;                                       |
| b2n3w9 | 258 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin A;                                 |
| b1r976 | 265 | 34 | 10.4 | SubName: Full=Beta2 toxin;   |
| b1qqf5 | 178 | 34 | 10.4 | SubName: Full=Clostridium toxin-associated regulator BotR;                   |
| b1pnb7 | 443 | 46 | 10.4 | SubName: Full=Alpha-toxin;   |
| b1pnb6 | 443 | 46 | 10.4 | SubName: Full=Alpha-toxin;   |
| b1pnb5 | 443 | 46 | 10.4 | SubName: Full=Alpha-toxin;   |
| b1pnb2 | 443 | 46 | 10.4 | SubName: Full=Alpha-toxin;   |
| b1pnb1 | 443 | 46 | 10.4 | SubName: Full=Alpha-toxin;   |
| b1pna8 | 443 | 46 | 10.4 | SubName: Full=Alpha-toxin;   |
| b1bun0 | 265 | 34 | 10.4 | SubName: Full=Beta-2 toxin;  |
| b1fbf2 | 265 | 34 | 10.4 | SubName: Full=Beta-2 toxin;  |
| b0yr14 | 288 | 34 | 10.4 | SubName: Full=Putative RTX toxin-related Ca <sup>2+</sup> -binding protei... |
| b0yd35 | 347 | 36 | 10.4 | SubName: Full=Killer toxin sensitivity protein (Iki1), putat...              |
| b0qxi0 | 226 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin protein A;                         |
| b0n8i2 | 157 | 34 | 10.4 | SubName: Full=Toxin secretion/phage lysis holin;                             |
| b0mky6 | 189 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone...              |
| a9kk14 | 160 | 34 | 10.4 | SubName: Full=Toxin secretion/phage lysis holin;                             |
| a8z4j0 | 166 | 34 | 10.4 | RecName: Full=HTH-type transcriptional regulator rot; AltNam...              |
| a8y3h3 | 365 | 38 | 10.4 | RecName: Full=Beta-1,3-galactosyltransferase bre-2; EC=2.4.1...              |
| a8sej9 | 242 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, toxin component, MazF ...              |
| a7zf54 | 374 | 39 | 10.4 | SubName: Full=Zonula occludens toxin (Zot) family;                           |
| a7i2k3 | 233 | 34 | 10.4 | SubName: Full=RTX toxins and related Ca <sup>2+</sup> -binding protein;      |
| a6u0y5 | 238 | 34 | 10.4 | SubName: Full=Toxin beta-grasp domain protein; Flags: Precu...               |
| a6nyj2 | 174 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, antitoxin component, X...              |
| a6nug2 | 206 | 34 | 10.4 | SubName: Full=Putative toxin-antitoxin system, toxin compone...              |
| a6nf34 | 565 | 59 | 10.4 | RecName: Full=Anthrax toxin receptor-like; Flags: Precursor;...              |
| a5kpw7 | 225 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, antitoxin component, X...              |
| a5kp98 | 143 | 34 | 10.4 | SubName: Full=Toxin-antitoxin system, antitoxin component, H...              |
| a5is51 | 238 | 34 | 10.4 | SubName: Full=Toxin, beta-grasp domain protein; Flags: Precu...              |
| a4yuz7 | 644 | 67 | 10.4 | SubName: Full=Putative secretion protein (HlyD family); puta...              |
| a4xic2 | 145 | 34 | 10.4 | SubName: Full=Transcriptional modulator of MazE/toxin, MazF;...              |
| a4usb4 | 307 | 34 | 10.4 | RecName: Full=Sphingomyelin phosphodiesterase D LiSicTox-alp...              |
| a4f297 | 258 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin A;                                 |
| a4c772 | 211 | 34 | 10.4 | SubName: Full=Putative toxin secretion protein;                              |
| a3jmu5 | 197 | 34 | 10.4 | SubName: Full=Putative toxin-activating protein;                             |
| a3hsq6 | 568 | 59 | 10.4 | SubName: Full=Toxin secretion ABC transporter ATP-binding pr...              |
| a3gyr5 | 224 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilin; SubName: Full=Toxin ...              |
| a3gyr3 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ...              |
| a3gme5 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ...              |
| a3eid5 | 335 | 35 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ...              |
| a3eic6 | 136 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ...              |
| a3eic5 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ...              |
| a2vk12 | 141 | 34 | 10.4 | RecName: Full=Probable ribonuclease VapC; Short=Probable RNA...              |
| a1f0y3 | 224 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilin;                                      |
| a1f0y1 | 221 | 34 | 10.4 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ...              |
| a0rpf2 | 233 | 34 | 10.4 | SubName: Full=Cytolethal distending toxin A;                                 |
| q6p6p7 | 630 | 65 | 10.3 | RecName: Full=Poly [ADP-ribose] polymerase 6; Short=PARP-6; ...              |
| q5bd08 | 418 | 43 | 10.3 | SubName: Full=Toxin biosynthesis protein (Tri7), putative (A...              |



|         |     |    |      |   |
|---------|-----|----|------|---|
| q5ar60  | 428 | 44 | 10.3 | SubName: Full=Toxin biosynthesis protein (GliH), putative (A... |
| q4wc23  | 409 | 42 | 10.3 | SubName: Full=Toxin biosynthesis protein (Tri7), putative;      |
| q3v050  | 573 | 59 | 10.3 | RecName: Full=Multidrug and toxin extrusion protein 2; Short... |
| q0jyt1  | 445 | 46 | 10.3 | SubName: Full=RTX toxin membrane fusion protein;                |
| p18568  | 448 | 46 | 10.3 | RecName: Full=Larvicidal toxin 51 kDa protein; AltName: Full... |
| p12964  | 448 | 46 | 10.3 | RecName: Full=Larvicidal toxin 51 kDa protein; AltName: Full... |
| p10565  | 448 | 46 | 10.3 | RecName: Full=Larvicidal toxin 51 kDa protein; AltName: Full... |
| o32299  | 448 | 46 | 10.3 | SubName: Full=BinB4 protein; SubName: Full=P51 component of ... |
| k2ucq4  | 477 | 49 | 10.3 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| i4kv96  | 419 | 43 | 10.3 | SubName: Full=Pertussis toxin, subunit 1 domain protein;        |
| h914r8  | 467 | 48 | 10.3 | SubName: Full=RTX toxin transporter;                            |
| h8jy54  | 467 | 48 | 10.3 | SubName: Full=RTX toxin transporter;                            |
| h1wkd1  | 663 | 68 | 10.3 | SubName: Full=Putative haemolysin-type calcium-binding toxin... |
| h0rpv6  | 583 | 60 | 10.3 | SubName: Full=Putative secretion ATP-binding protein (ABC-ty... |
| g7xke4  | 419 | 43 | 10.3 | SubName: Full=Toxin biosynthesis protein Tri7-like;             |
| g7b5r3  | 477 | 49 | 10.3 | SubName: Full=Toxin co-regulated pilus biosynthesis outer me... |
| g5swj4  | 330 | 34 | 10.3 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| g5bk19  | 496 | 51 | 10.3 | SubName: Full=Multidrug and toxin extrusion protein 2;          |
| g3jhi5  | 427 | 44 | 10.3 | SubName: Full=Toxin biosynthesis protein, putative;             |
| g0wpm4  | 504 | 52 | 10.3 | SubName: Full=Zeta toxin family protein;                        |
| f8gy53  | 614 | 63 | 10.3 | SubName: Full=Toxin coregulated pilus biosynthesis protein ...  |
| f3y315  | 330 | 34 | 10.3 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| f2puc1  | 418 | 43 | 10.3 | SubName: Full=Cercosporin toxin biosynthesis protein;           |
| f0e1n2  | 504 | 52 | 10.3 | SubName: Full=Zeta toxin family protein;                        |
| e9eqv1  | 516 | 53 | 10.3 | SubName: Full=MFS toxin efflux pump (AflT);                     |
| e6r723  | 486 | 50 | 10.3 | SubName: Full=Protoplast regeneration and killer toxin resis... |
| d7hjp5  | 467 | 48 | 10.3 | SubName: Full=RTX toxin transporter;                            |
| d7h8t1  | 467 | 48 | 10.3 | SubName: Full=RTX toxin ABC transporter;                        |
| d5eym5  | 427 | 44 | 10.3 | SubName: Full=Putative toxin secretion protein;                 |
| d1qt65  | 493 | 51 | 10.3 | SubName: Full=Putative toxin-antitoxin system protein;          |
| c6yc06  | 467 | 48 | 10.3 | SubName: Full=RTX toxin transporter;                            |
| c3lme3  | 467 | 48 | 10.3 | SubName: Full=RTX toxin transporter;                            |
| c2h xv0 | 467 | 48 | 10.3 | SubName: Full=RTX toxin transporter;                            |
| c2ca58  | 467 | 48 | 10.3 | SubName: Full=RTX toxin transporter;                            |
| b1hq59  | 448 | 46 | 10.3 | SubName: Full=Larvicidal toxin 51 kDa protein;                  |
| b0y9m2  | 409 | 42 | 10.3 | SubName: Full=Toxin biosynthesis protein (Tri7), putative;      |
| b0luq9  | 448 | 46 | 10.3 | SubName: Full=Binary toxin B;                                   |
| a6xv18  | 467 | 48 | 10.3 | SubName: Full=RTX toxin transporter;                            |
| a6aeb2  | 467 | 48 | 10.3 | SubName: Full=RTX toxin transporter;                            |
| a5f882  | 467 | 48 | 10.3 | SubName: Full=RTX toxin transporter;                            |
| a4yuz6  | 584 | 60 | 10.3 | SubName: Full=Putative secretion ATP-binding protein (ABC-ty... |
| a3h013  | 467 | 48 | 10.3 | SubName: Full=Membrane-fusion protein; SubName: Full=RTX tox... |
| a3glz6  | 467 | 48 | 10.3 | SubName: Full=RTX toxin transporter;                            |
| a3elq3  | 467 | 48 | 10.3 | SubName: Full=RTX toxin transporter;                            |
| a2psc9  | 467 | 48 | 10.3 | SubName: Full=RTX toxin transporter;                            |
| a1f7f4  | 467 | 48 | 10.3 | SubName: Full=RTX toxin transporter;                            |
| a1epl1  | 467 | 48 | 10.3 | SubName: Full=RTX toxin transporter;                            |
| q6nk15  | 560 | 57 | 10.2 | SubName: Full=Diphtheria toxin; EC=2.4.2.36;                    |
| q08dg9  | 488 | 50 | 10.2 | SubName: Full=Anthrax toxin receptor 2; SubName: Full=Unchar... |
| q00357  | 548 | 56 | 10.2 | RecName: Full=Putative HC-toxin efflux carrier TOXA;            |
| p58762  | 462 | 47 | 10.2 | RecName: Full=Toxin CqTX-A; Short=CQT-A; Short=Toxin A; Flag... |
| k8wpb8  | 442 | 45 | 10.2 | SubName: Full=RTX toxin ABC transporter protein (MFP) RtxD;     |
| k5v9q7  | 655 | 67 | 10.2 | SubName: Full=Toxin secretion ATP-binding protein;              |
| k5v747  | 655 | 67 | 10.2 | SubName: Full=Toxin secretion ATP-binding protein;              |
| k5tu48  | 384 | 39 | 10.2 | SubName: Full=Zonular occludens toxin family protein;           |
| k5swb1  | 384 | 39 | 10.2 | SubName: Full=Zonular occludens toxin family protein;           |
| k5qth8  | 384 | 39 | 10.2 | SubName: Full=Zonular occludens toxin family protein;           |
| k5nx07  | 384 | 39 | 10.2 | SubName: Full=Zonular occludens toxin family protein;           |

|         |     |    |      |   |
|---------|-----|----|------|---|
| k5l1xr9 | 384 | 39 | 10.2 | SubName: Full=Zonular occludens toxin family protein;           |
| k5l1rl0 | 384 | 39 | 10.2 | SubName: Full=Zonular occludens toxin family protein;           |
| k5l1mf2 | 384 | 39 | 10.2 | SubName: Full=Zonular occludens toxin family protein;           |
| k2w5y7  | 384 | 39 | 10.2 | SubName: Full=Zonular occludens toxin family protein;           |
| k2vjv4  | 384 | 39 | 10.2 | SubName: Full=Zonular occludens toxin family protein;           |
| k2v6m5  | 384 | 39 | 10.2 | SubName: Full=Zonular occludens toxin family protein;           |
| k2un80  | 384 | 39 | 10.2 | SubName: Full=Zonular occludens toxin family protein;           |
| k2uct9  | 384 | 39 | 10.2 | SubName: Full=Zonular occludens toxin family protein;           |
| j9i8t8  | 502 | 51 | 10.2 | SubName: Full=Multidrug and toxin extrusion protein 1;          |
| j0qa68  | 402 | 41 | 10.2 | SubName: Full=Vacuolating toxin;                                |
| i4jx10  | 560 | 57 | 10.2 | SubName: Full=Diphtheria toxin;                                 |
| i0s7q6  | 334 | 34 | 10.2 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| i0di06  | 560 | 57 | 10.2 | SubName: Full=Diphtheria toxin;                                 |
| h9cjf7  | 512 | 52 | 10.2 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| h8f552  | 354 | 36 | 10.2 | SubName: Full=RTX toxin transporter, ATP-binding protein;       |
| h4n3v9  | 689 | 70 | 10.2 | SubName: Full=Toxin B domain protein;                           |
| h2hx71  | 560 | 57 | 10.2 | SubName: Full=Diphtheria toxin; EC=2.4.2.36;                    |
| h2h1k3  | 560 | 57 | 10.2 | SubName: Full=Diphtheria toxin; EC=2.4.2.36;                    |
| h2gu79  | 560 | 57 | 10.2 | SubName: Full=Diphtheria toxin; EC=2.4.2.36;                    |
| h2g4h1  | 560 | 57 | 10.2 | SubName: Full=Diphtheria toxin; EC=2.4.2.36;                    |
| g5ekg4  | 560 | 57 | 10.2 | SubName: Full=Diphtheria toxin;                                 |
| g5bkm0  | 569 | 58 | 10.2 | SubName: Full=Multidrug and toxin extrusion protein 1;          |
| g4clj5  | 353 | 36 | 10.2 | SubName: Full=Zonula occludens toxin family protein;            |
| f9bgx1  | 384 | 39 | 10.2 | SubName: Full=Zonular occludens toxin family protein;           |
| f0xgi8  | 441 | 45 | 10.2 | SubName: Full=Toxin biosynthesis regulatory protein;            |
| e3blx2  | 639 | 65 | 10.2 | SubName: Full=RTX toxin RtxA-like protein;                      |
| e1jkj3  | 384 | 39 | 10.2 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e0msi4  | 508 | 52 | 10.2 | SubName: Full=Rhizobiocin/RTX toxin and hemolysin-type calci... |
| d5eun3  | 482 | 49 | 10.2 | SubName: Full=Toxin domain protein;                             |
| d0i736  | 588 | 60 | 10.2 | SubName: Full=RTX cytolytic toxin;                              |
| c6pv69  | 431 | 44 | 10.2 | SubName: Full=Putative uncharacterized protein; SubName: Ful... |
| c4tv43  | 460 | 47 | 10.2 | SubName: Full=Toxin ABC transporter, ATP-binding/permease pr... |
| b3h1n0  | 579 | 59 | 10.2 | SubName: Full=RTX toxin protein;                                |
| q9x7l4  | 142 | 33 | 10.1 | RecName: Full=Probable VapC ribonuclease R02377; Short=Proba... |
| q9v1m4  | 123 | 33 | 10.1 | RecName: Full=Putative ribonuclease VapC; Short=Putative RN...  |
| q99ta4  | 166 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| q99qe5  | 221 | 33 | 10.1 | SubName: Full=Toxin co-regulated pilus biosynthesis protein ... |
| q8vsq6  | 240 | 33 | 10.1 | RecName: Full=Guanine nucleotide exchange factor SopE; AltNa... |
| q8vpm1  | 240 | 33 | 10.1 | RecName: Full=Guanine nucleotide exchange factor SopE; AltNa... |
| q8pak3  | 563 | 57 | 10.1 | SubName: Full=Toxin secretion ABC transporter ATP-binding pr... |
| q8jfx7  | 103 | 33 | 10.1 | RecName: Full=Muscarinic toxin BM14; Flags: Precursor;          |
| q8fey4  | 158 | 33 | 10.1 | RecName: Full=Persistence and stress-resistance toxin PasT; ... |
| q8fdb4  | 154 | 33 | 10.1 | RecName: Full=Toxin YhaV; EC=3.1.-.-; AltName: Full=Ribonucl... |
| q7tmm8  | 322 | 33 | 10.1 | RecName: Full=Mono [ADP-ribose] polymerase PARP16; EC=2.4.2.... |
| q7a514  | 166 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| q7a018  | 166 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| q6ueh3  | 514 | 52 | 10.1 | SubName: Full=Potential toxin transporter;                      |
| q6mx40  | 93  | 33 | 10.1 | RecName: Full=Probable toxin MazF1; EC=3.1.-.-; AltName: Ful... |
| q6g8g5  | 166 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| q60288  | 153 | 33 | 10.1 | RecName: Full=Putative ribonuclease VapC6; Short=Putative RN... |
| q5iqz3  | 258 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin A;                    |
| q5hx88  | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin, subunit C;           |
| q5f1k4  | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| q54944  | 287 | 33 | 10.1 | RecName: Full=Toxin zeta; AltName: Full=UDP-N-acetylglucosam... |
| q54326  | 310 | 33 | 10.1 | SubName: Full=Synergohymenotropic toxin;                        |
| q4w8a7  | 258 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin A;                    |
| q4ut18  | 563 | 57 | 10.1 | SubName: Full=Toxin secretion ABC transporter ATP-binding pr... |
| q4ulj0  | 134 | 33 | 10.1 | SubName: Full=Toxin of toxin-antitoxin system;                  |

|        |     |    |      |  |
|--------|-----|----|------|--|
| q4hg81 | 179 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                     |
| q4hg79 | 258 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin A;                     |
| q46102 | 189 | 33 | 10.1 | SubName: Full=CdtC; SubName: Full=Cytolethal distending toxi...  |
| q3ath3 | 116 | 33 | 10.1 | SubName: Full=Transcriptional modulator of MazE/toxin, MazF;...  |
| q306k8 | 335 | 34 | 10.1 | SubName: Full=40kDa insecticidal toxin;                          |
| q2yth5 | 166 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam...  |
| q2pta3 | 249 | 33 | 10.1 | SubName: Full=Cytolytic toxin Cyt1;                              |
| q0pc58 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C; Flags: Precurso...  |
| p96917 | 135 | 33 | 10.1 | RecName: Full=Ribonuclease VapC5; Short=RNase VapC5; EC=3.1.1... |
| p45781 | 336 | 34 | 10.1 | RecName: Full=Type II secretion system protein K; Short=T2SS...  |
| p45776 | 221 | 33 | 10.1 | RecName: Full=Type II secretion system protein J; Short=T2SS...  |
| p0a383 | 249 | 33 | 10.1 | RecName: Full=Type-1Aa cytolitic delta-endotoxin; AltName: F...  |
| p0a382 | 249 | 33 | 10.1 | RecName: Full=Type-1Aa cytolitic delta-endotoxin; AltName: F...  |
| o06949 | 240 | 33 | 10.1 | RecName: Full=Guanine nucleotide exchange factor SopE; AltNa...  |
| k9c513 | 178 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone...  |
| k9c1x7 | 124 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, X...  |
| k81lc9 | 205 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, Fic d...  |
| k8ja97 | 205 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, Fic d...  |
| k8f5q0 | 202 | 33 | 10.1 | SubName: Full=Zeta toxin;  |
| k6ls47 | 178 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ...  |
| k6kuk2 | 178 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ...  |
| k5ugs0 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                           |
| k5ug18 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                           |
| k5s129 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                           |
| k5rt76 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                           |
| k5pun5 | 178 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone...  |
| k5gh52 | 145 | 33 | 10.1 | SubName: Full=Ribosome association toxin Rata;                   |
| k5fli9 | 308 | 33 | 10.1 | SubName: Full=Shiga-like toxin 1 subunit A; EC=3.2.2.22;         |
| k5cci3 | 138 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system toxin component, PIN fa...  |
| k4lgs4 | 133 | 33 | 10.1 | SubName: Full=Toxin secretion/phage lysis holin;                 |
| k419a3 | 133 | 33 | 10.1 | SubName: Full=Toxin secretion/phage lysis holin;                 |
| k3v2z1 | 154 | 33 | 10.1 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                            |
| k3jd74 | 145 | 33 | 10.1 | SubName: Full=Ribosome association toxin Rata;                   |
| k3ipc9 | 145 | 33 | 10.1 | SubName: Full=Ribosome association toxin Rata;                   |
| k3b7x7 | 308 | 33 | 10.1 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;                |
| k2y8n4 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                           |
| k2wy97 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                           |
| k2v4z0 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                           |
| k2ul60 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                           |
| k1uzm0 | 133 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam...  |
| k1t605 | 126 | 33 | 10.1 | SubName: Full=Transcriptional modulator of MazE/toxin, MazF;...  |
| k1jhm0 | 151 | 33 | 10.1 | SubName: Full=Toxin secretion/phage lysis holin;                 |
| k1f5b1 | 178 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone...  |
| k1efa6 | 178 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone...  |
| k0yv43 | 464 | 47 | 10.1 | SubName: Full=Multidrug and toxin extrusion (MATE) family ef...  |
| k0ykt9 | 464 | 47 | 10.1 | SubName: Full=Multidrug and toxin extrusion (MATE) family ef...  |
| k0ped6 | 536 | 54 | 10.1 | SubName: Full=Putative toxin secretion ATP-binding ABC trans...  |
| k0lgn1 | 166 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam...  |
| k0lbs9 | 258 | 33 | 10.1 | SubName: Full=Enterotoxin type G; SubName: Full=Toxin beta-g...  |
| k0hnf8 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                     |
| j9vsg5 | 485 | 49 | 10.1 | SubName: Full=Protoplast regeneration and killer toxin resis...  |
| j9b8p6 | 141 | 33 | 10.1 | SubName: Full=Toxin secretion/phage lysis holin;                 |
| j9b1z8 | 141 | 33 | 10.1 | SubName: Full=Toxin secretion/phage lysis holin;                 |
| j819l1 | 141 | 33 | 10.1 | SubName: Full=Toxin secretion/phage lysis holin;                 |
| j814v9 | 171 | 33 | 10.1 | SubName: Full=Toxin secretion/phage lysis holin;                 |
| j8i168 | 162 | 33 | 10.1 | SubName: Full=Toxin secretion/phage lysis holin;                 |
| j8edv9 | 165 | 33 | 10.1 | SubName: Full=Toxin secretion/phage lysis holin;                 |
| j8dcc2 | 165 | 33 | 10.1 | SubName: Full=Toxin secretion/phage lysis holin;                 |

|        |     |    |      |   |
|--------|-----|----|------|---|
| j8cyv3 | 141 | 33 | 10.1 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j8cwi9 | 165 | 33 | 10.1 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j7vez8 | 171 | 33 | 10.1 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j7udl3 | 243 | 33 | 10.1 | SubName: Full=Zeta toxin;                                       |
| j7tdp3 | 202 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j7qvm4 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| j7qui2 | 168 | 33 | 10.1 | SubName: Full=Putative antidote epsilon protein, zeta toxin ... |
| j7qsp1 | 138 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, H... |
| j7q5l6 | 256 | 33 | 10.1 | SubName: Full=Putative zeta-toxin/signal recognition particl... |
| j7cr42 | 180 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, PIN d... |
| j7bhx9 | 287 | 33 | 10.1 | SubName: Full=Zeta toxin;                                       |
| j6yes3 | 287 | 33 | 10.1 | SubName: Full=Zeta toxin;                                       |
| j6xic5 | 287 | 33 | 10.1 | SubName: Full=Zeta toxin;                                       |
| j6xgb8 | 129 | 33 | 10.1 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j6vgq2 | 287 | 33 | 10.1 | SubName: Full=Zeta toxin;                                       |
| j6uie8 | 131 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, H... |
| j6ug98 | 287 | 33 | 10.1 | SubName: Full=Zeta toxin;                                       |
| j6ppq0 | 108 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, MazF ... |
| j6pba4 | 287 | 33 | 10.1 | SubName: Full=Zeta toxin;                                       |
| j6i5j9 | 161 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| j6hdi9 | 118 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| j6h6b9 | 180 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, PIN d... |
| j6glb5 | 131 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, H... |
| j6e1h0 | 287 | 33 | 10.1 | SubName: Full=Zeta toxin;                                       |
| j6d2c3 | 131 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, H... |
| j6crg0 | 131 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, H... |
| j6agk0 | 163 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| j6ag58 | 166 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| j5ygg3 | 287 | 33 | 10.1 | SubName: Full=Zeta toxin;                                       |
| j5xgk4 | 131 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, H... |
| j5wgi4 | 287 | 33 | 10.1 | SubName: Full=Zeta toxin;                                       |
| j5w1v5 | 345 | 35 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| j5uj49 | 160 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| j3zxc9 | 141 | 33 | 10.1 | SubName: Full=Toxin secretion/phage lysis holin;                |
| j3xai7 | 183 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, H... |
| j3fi30 | 711 | 72 | 10.1 | SubName: Full=Ca2+-binding protein, RTX toxin;                  |
| j2nu64 | 299 | 33 | 10.1 | SubName: Full=Zeta toxin; Flags: Precursor;                     |
| j1yzl9 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                          |
| j1yvh9 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                          |
| j1xpg6 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                          |
| j1xie4 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                          |
| j1nx19 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                          |
| j1msc8 | 178 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| j1l5s0 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                          |
| j1g1v3 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                          |
| j1drw6 | 182 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j1dgc5 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                          |
| j1ch57 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                          |
| j1bpx5 | 133 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| j1bca9 | 182 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j0zzk5 | 133 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| j0yif4 | 133 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| j0yau7 | 133 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| j0y8f1 | 182 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j0xxc8 | 175 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| j0xuw4 | 133 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| j0tbb1 | 133 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| j0tap6 | 178 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |

|        |     |    |      |   |
|--------|-----|----|------|---|
| j0rn85 | 175 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| j0qf16 | 182 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j0plp1 | 175 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| j0mq72 | 170 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j0mpy2 | 164 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| j0l278 | 166 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| j0j431 | 133 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| j0j1r3 | 182 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j0izx0 | 133 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| j0ina9 | 182 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j0i911 | 164 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| j0i3j7 | 133 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| j0i0m5 | 182 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j0hxc3 | 182 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j0h8h1 | 133 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| j0g6t5 | 133 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| j0g4t3 | 175 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| j0fdp3 | 182 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j0f6b2 | 182 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j0evl2 | 164 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| j0eaf8 | 164 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| j0e930 | 182 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| j0e7p7 | 133 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| j0e348 | 133 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| i6y8b0 | 135 | 33 | 10.1 | SubName: Full=Toxin;  |
| i6xvb6 | 93  | 33 | 10.1 | SubName: Full=Toxin;  |
| i6qsl2 | 135 | 33 | 10.1 | SubName: Full=Toxin;  |
| i6qsg4 | 93  | 33 | 10.1 | SubName: Full=Toxin;  |
| i6gye4 | 145 | 33 | 10.1 | SubName: Full=Putative toxin YfjG;                              |
| i6fxl8 | 154 | 33 | 10.1 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| i6cw68 | 145 | 33 | 10.1 | SubName: Full=Putative toxin YfjG;                              |
| i5n3f4 | 308 | 33 | 10.1 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| i5led4 | 308 | 33 | 10.1 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| i5ibd3 | 308 | 33 | 10.1 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| i5f5z9 | 308 | 33 | 10.1 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| i5f1n0 | 308 | 33 | 10.1 | SubName: Full=Shiga toxin subunit A; EC=3.2.2.22;               |
| i4xtv6 | 713 | 72 | 10.1 | SubName: Full=Putative toxin secretion ABC transporter, ATP-... |
| i3zw79 | 149 | 33 | 10.1 | RecName: Full=Putative ribonuclease VapC; Short=Putative RNA... |
| i3zr97 | 153 | 33 | 10.1 | RecName: Full=Putative ribonuclease VapC; Short=Putative RNA... |
| i3ysd8 | 167 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system antitoxin comp... |
| i3d9c3 | 345 | 35 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| i2xus8 | 175 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| i2xuh1 | 154 | 33 | 10.1 | SubName: Full=Toxin with endonuclease activity YhaV;            |
| i2xtm3 | 300 | 33 | 10.1 | SubName: Full=Putative shiga-like toxin 2 subunit A;            |
| i2x794 | 147 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| i2x1c1 | 154 | 33 | 10.1 | SubName: Full=Toxin with endonuclease activity YhaV;            |
| i2w8d7 | 154 | 33 | 10.1 | SubName: Full=Toxin with endonuclease activity YhaV;            |
| i2vlv8 | 154 | 33 | 10.1 | SubName: Full=Toxin with endonuclease activity YhaV;            |
| i2vha2 | 175 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| i2tz89 | 154 | 33 | 10.1 | SubName: Full=Toxin with endonuclease activity YhaV;            |
| i2tp89 | 154 | 33 | 10.1 | SubName: Full=Toxin with endonuclease activity YhaV;            |
| i2t3b8 | 154 | 33 | 10.1 | SubName: Full=Toxin with endonuclease activity YhaV;            |
| i2svn3 | 154 | 33 | 10.1 | SubName: Full=Toxin with endonuclease activity YhaV;            |
| i2svg2 | 175 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| i2sel4 | 175 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| i2sbs5 | 154 | 33 | 10.1 | SubName: Full=Toxin with endonuclease activity YhaV;            |
| i2pjc4 | 154 | 33 | 10.1 | SubName: Full=Toxin YhaV;                                       |
| i0xs70 | 132 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system toxin component, PIN fa... |

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|--------|-----|----|------|---|
| i0ttm2 | 133 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| i0tmf9 | 182 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| i0tjj7 | 133 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| i0tgt0 | 182 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| i0t735 | 252 | 33 | 10.1 | SubName: Full=Zeta toxin;                                       |
| i0r4i6 | 152 | 33 | 10.1 | SubName: Full=Zeta toxin domain protein;                        |
| i0je58 | 166 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| h9brr4 | 166 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| h8lpy1 | 134 | 33 | 10.1 | SubName: Full=Toxin of toxin-antitoxin (TA) system, containi... |
| h8kfv7 | 134 | 33 | 10.1 | SubName: Full=Toxin of toxin-antitoxin (TA) system VapC, con... |
| h8kdt9 | 134 | 33 | 10.1 | SubName: Full=Toxin of toxin-antitoxin (TA) system, containi... |
| h8hgr6 | 250 | 33 | 10.1 | SubName: Full=VIP2-like ADP-ribosyltransferase toxin;           |
| h8hcu4 | 250 | 33 | 10.1 | SubName: Full=VIP2-like ADP-ribosyltransferase toxin;           |
| h8d1b7 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin;                      |
| h8cun3 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h8clw0 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h8ch30 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h8cec9 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h8c800 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h8c237 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h8byi2 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h8bpz9 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h8bpj8 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h8bgr6 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h8bdn5 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h8b732 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h8b0u8 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h8axd7 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h8anx0 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h8amf2 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h8agv3 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h8abu6 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h8a4r9 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h8a2n9 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h7zxy0 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h7zs75 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h7zfx3 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h7z908 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h7z7e8 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h7z2m3 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h7ynn4 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h7yi89 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h7yaj5 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin;                      |
| h7y8x4 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h7y022 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h7xxc4 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h7xsi0 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h7xn79 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h7xgi4 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h7x6v2 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h7wzc0 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| h7wp34 | 258 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7wj55 | 258 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7w8e4 | 195 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7vyr7 | 258 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7vvx9 | 258 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7vjd5 | 258 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7vcp8 | 258 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin subunit A;            |

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|--------|-----|----|------|---|
| h7vb45 | 258 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7ums6 | 258 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7ud27 | 258 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7u7d6 | 258 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7twh4 | 258 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7trs3 | 258 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7tiu6 | 258 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7tcc4 | 258 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7t913 | 258 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7sz72 | 170 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin, subunit CdtC;        |
| h7slb7 | 258 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7yq5  | 258 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7qws4 | 258 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin subunit A;            |
| h7egk2 | 158 | 33 | 10.1 | SubName: Full=RTX toxin acyltransferase family protein;         |
| h7c8h9 | 249 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin A;                    |
| h7c8g6 | 249 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin A;                    |
| h6rm62 | 133 | 33 | 10.1 | RecName: Full=Probable ribonuclease VapC; Short=Probable RNA... |
| h6q314 | 134 | 33 | 10.1 | SubName: Full=Toxin of toxin-antitoxin system;                  |
| h6ptw0 | 134 | 33 | 10.1 | SubName: Full=Toxin of toxin-antitoxin system;                  |
| h6lca3 | 143 | 33 | 10.1 | SubName: Full=Putative toxin secretion/phage lysis holin;       |
| h5n0t5 | 141 | 33 | 10.1 | SubName: Full=Toxin YkfI domain protein;                        |
| h5mzf2 | 154 | 33 | 10.1 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| h5i908 | 154 | 33 | 10.1 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| h5hut9 | 154 | 33 | 10.1 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| h5hcx1 | 154 | 33 | 10.1 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| h4yl19 | 154 | 33 | 10.1 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| h4yjb7 | 145 | 33 | 10.1 | SubName: Full=Putative toxin YfjG;                              |
| h4wvu1 | 154 | 33 | 10.1 | SubName: Full=Toxin YhaV; EC=3.1.-.-;                           |
| h4wu96 | 145 | 33 | 10.1 | SubName: Full=Putative toxin YfjG;                              |
| h4umq8 | 145 | 33 | 10.1 | SubName: Full=Putative toxin YfjG;                              |
| h4qta7 | 178 | 33 | 10.1 | SubName: Full=Toxin B domain protein;                           |
| h4pun3 | 178 | 33 | 10.1 | SubName: Full=Toxin B domain protein;                           |
| h4nu53 | 178 | 33 | 10.1 | SubName: Full=Toxin B domain protein;                           |
| h4ng97 | 178 | 33 | 10.1 | SubName: Full=Toxin B domain protein;                           |
| h4h4q0 | 203 | 33 | 10.1 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4f2v8 | 207 | 33 | 10.1 | SubName: Full=Zeta toxin family protein;                        |
| h4et03 | 203 | 33 | 10.1 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4eqi9 | 166 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| h4by56 | 233 | 33 | 10.1 | SubName: Full=Beta-grasp domain toxin protein;                  |
| h4b2f9 | 166 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| h3z4h3 | 133 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| h3wrn0 | 182 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| h3wkv3 | 182 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| h3wds8 | 133 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| h3wbh4 | 182 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| h3w7j1 | 182 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| h3w1t6 | 133 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| h3vvp0 | 133 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| h3v201 | 182 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| h3uw72 | 182 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| h3uv28 | 133 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| h3ul07 | 182 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| h3uja8 | 133 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| h3ua87 | 239 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, MazF ... |
| h3twb7 | 239 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, MazF ... |
| h1yxs2 | 112 | 33 | 10.1 | SubName: Full=Transcriptional modulator of MazE/toxin, MazF;... |
| h1t5l0 | 239 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, MazF ... |
| h1pwb0 | 150 | 33 | 10.1 | SubName: Full=Toxin secretion/phage lysis holin;                |

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|--------|-----|----|------|---|
| h1lm32 | 153 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, H... |
| h1f807 | 154 | 33 | 10.1 | SubName: Full=Toxin YhaV;                                       |
| h0uhu5 | 160 | 33 | 10.1 | SubName: Full=Toxin secretion/phage lysis holin family prote... |
| h0ta22 | 584 | 59 | 10.1 | SubName: Full=Putative secretion ATP-binding protein (ABC-ty... |
| h0dy86 | 131 | 33 | 10.1 | SubName: Full=Toxin secretion/phage lysis holin;                |
| h0dxn8 | 182 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| h0drx2 | 133 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| h0cwy3 | 203 | 33 | 10.1 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| g9yku1 | 127 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, MazF ... |
| g9ydc2 | 222 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, Bro d... |
| g9y1z9 | 147 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| g9xtb4 | 156 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| g9qxa8 | 157 | 33 | 10.1 | SubName: Full=Toxin secretion/phage lysis holin;                |
| g9edb4 | 725 | 73 | 10.1 | SubName: Full=Toxin RTX-I translocation ATP-binding protein;... |
| g8s377 | 487 | 49 | 10.1 | SubName: Full=Hansenula MRAKII killer toxin-resistant protei... |
| g8pyb9 | 246 | 33 | 10.1 | SubName: Full=Zeta toxin;                                       |
| g8laq6 | 134 | 33 | 10.1 | SubName: Full=Toxin of toxin-antitoxin (TA) system, containi... |
| g8fee9 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| g8fai0 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| g7xaq6 | 249 | 33 | 10.1 | SubName: Full=Toxin biosynthesis ketoreductase;                 |
| g7tmz4 | 224 | 33 | 10.1 | SubName: Full=Toxin co-regulated pilin;                         |
| g7ehr4 | 174 | 33 | 10.1 | SubName: Full=Exfoliative toxin A/B;                            |
| g7c4u9 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                          |
| g7bu96 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                          |
| g7bgk2 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                          |
| g7b5r0 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                          |
| g7av67 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                          |
| g7aln6 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                          |
| g7aai8 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                          |
| g7a1b2 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                          |
| g6zqt0 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                          |
| g6zd81 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                          |
| g6z4p8 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                          |
| g6ant7 | 243 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, Bro d... |
| g5y7j2 | 154 | 33 | 10.1 | SubName: Full=Toxin YhaV;                                       |
| g5y1v7 | 154 | 33 | 10.1 | SubName: Full=Toxin YhaV;                                       |
| g5xhs3 | 154 | 33 | 10.1 | SubName: Full=Toxin YhaV;                                       |
| g5wz30 | 154 | 33 | 10.1 | SubName: Full=Toxin YhaV;                                       |
| g5wj30 | 154 | 33 | 10.1 | SubName: Full=Toxin YhaV;                                       |
| g5waw4 | 154 | 33 | 10.1 | SubName: Full=Toxin YhaV;                                       |
| g5vua6 | 154 | 33 | 10.1 | SubName: Full=Toxin YhaV;                                       |
| g5vek3 | 154 | 33 | 10.1 | SubName: Full=Toxin YhaV;                                       |
| g5uwq7 | 154 | 33 | 10.1 | SubName: Full=Toxin YhaV;                                       |
| g5ud85 | 154 | 33 | 10.1 | SubName: Full=Toxin YhaV;                                       |
| g5u2t4 | 154 | 33 | 10.1 | SubName: Full=Toxin YhaV;                                       |
| g5tmh5 | 154 | 33 | 10.1 | SubName: Full=Toxin YhaV;                                       |
| g5qk48 | 270 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin subunit B;            |
| g5q3v3 | 303 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin subunit B;            |
| g5p6a2 | 270 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin subunit B;            |
| g5gvv1 | 184 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| g4mb17 | 140 | 33 | 10.1 | SubName: Full=VapC toxin protein;                               |
| g3iew6 | 178 | 33 | 10.1 | SubName: Full=Ras-related C3 botulinum toxin substrate 2;       |
| g2s7e9 | 182 | 33 | 10.1 | SubName: Full=RTX toxin-activating protein C;                   |
| g2pae3 | 131 | 33 | 10.1 | SubName: Full=Toxin;  |
| g0z027 | 203 | 33 | 10.1 | SubName: Full=Enterotoxin-like toxin X;                         |
| f9uf78 | 114 | 33 | 10.1 | SubName: Full=Transcriptional modulator of MazE/toxin, MazF;... |
| f9nr78 | 232 | 33 | 10.1 | SubName: Full=Diphtheria toxin repressor;                       |
| f9ncu7 | 232 | 33 | 10.1 | SubName: Full=Diphtheria toxin repressor;                       |



|        |     |    |      |   |
|--------|-----|----|------|---|
| f9lwa6 | 150 | 33 | 10.1 | SubName: Full=Toxin secretion/phage lysis holin;                |
| f9lsn7 | 133 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| f9ljg3 | 133 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| f9lc66 | 133 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| f9l1i0 | 163 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| f9kwt7 | 254 | 33 | 10.1 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f9knu1 | 163 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| f9k9l4 | 203 | 33 | 10.1 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f9k480 | 163 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| f9jyc0 | 163 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| f9jqy5 | 163 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| f9hyf8 | 154 | 33 | 10.1 | SubName: Full=Toxin YhaV;                                       |
| f9c556 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                          |
| f9b8r8 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                          |
| f9apc3 | 704 | 71 | 10.1 | SubName: Full=Toxin secretion ATP-binding protein;              |
| f9a319 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                          |
| f8zty5 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                          |
| f8zj38 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                          |
| f8z7q0 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                          |
| f8yws0 | 224 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                          |
| f8xhc7 | 154 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| f8dxc7 | 109 | 33 | 10.1 | SubName: Full=Transcriptional modulator of MazE/toxin, MazF;... |
| f6fx20 | 114 | 33 | 10.1 | SubName: Full=Transcriptional modulator of MazE/toxin, MazF;... |
| f6dmh5 | 133 | 33 | 10.1 | SubName: Full=Toxin secretion/phage lysis holin;                |
| f5w439 | 203 | 33 | 10.1 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| f5tt36 | 232 | 33 | 10.1 | SubName: Full=Diphtheria toxin repressor;                       |
| f5tle0 | 232 | 33 | 10.1 | SubName: Full=Diphtheria toxin repressor;                       |
| f5s3r9 | 174 | 33 | 10.1 | SubName: Full=GNAT family toxin-antitoxin system;               |
| f5rkg6 | 131 | 33 | 10.1 | SubName: Full=HicB family toxin-antitoxin system;               |
| f5lk48 | 257 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| f5jvv1 | 202 | 33 | 10.1 | SubName: Full=RTX toxin;  |
| f5ikd0 | 178 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| f4xgn7 | 149 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| f4wku9 | 195 | 33 | 10.1 | SubName: Full=Ras-related C3 botulinum toxin substrate 1;       |
| f4w024 | 154 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| f4vk98 | 175 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| f4vjd3 | 154 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| f4uuk4 | 175 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| f4ut41 | 154 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| f4txn5 | 154 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| f4tlk4 | 175 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| f4t3f3 | 154 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| f3xp45 | 148 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system toxin component, PIN fa... |
| f3twk9 | 133 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| f3tp10 | 133 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| f3tl72 | 163 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| f3tfk9 | 163 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| f3t427 | 163 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| f3sxs2 | 164 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| f3svw3 | 133 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| f3r426 | 118 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| f3q1i1 | 200 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| f3pu71 | 161 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system toxin component, PIN fa... |
| f3pgf1 | 145 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| f3mfz4 | 155 | 33 | 10.1 | SubName: Full=Toxin secretion/phage lysis holin;                |
| f3lyx3 | 127 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, antitoxin com... |
| f2v3x5 | 135 | 33 | 10.1 | SubName: Full=Toxin;  |
| f2v1v3 | 93  | 33 | 10.1 | SubName: Full=Toxin;  |

|        |     |    |      |   |
|--------|-----|----|------|---|
| f2l5r7 | 125 | 33 | 10.1 | RecName: Full=Putative ribonuclease VapC; Short=Putative RNA... |
| f1zrj0 | 110 | 33 | 10.1 | SubName: Full=RelE-like cytotoxic translational repressor of... |
| f0v1c8 | 700 | 71 | 10.1 | SubName: Full=Putative RTX toxin transporter (RtxB);            |
| f0nn85 | 132 | 33 | 10.1 | SubName: Full=VapC-type toxin;                                  |
| f0nh58 | 132 | 33 | 10.1 | SubName: Full=VapC-type toxin;                                  |
| f0lre8 | 169 | 33 | 10.1 | SubName: Full=General secretion pathway protein M (Cholera t... |
| f0hbl1 | 139 | 33 | 10.1 | SubName: Full=Toxin secretion/phage lysis holin;                |
| f0gx14 | 183 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| f0gqe0 | 127 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, H... |
| f0dq40 | 178 | 33 | 10.1 | SubName: Full=Transcriptional modulator of MazE/toxin, MazF;... |
| e9zg78 | 135 | 33 | 10.1 | SubName: Full=Toxin protein;                                    |
| e9zfp7 | 93  | 33 | 10.1 | SubName: Full=Toxin protein;                                    |
| e9us96 | 184 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e9tzn2 | 154 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| e9tgz1 | 154 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| e9fk27 | 125 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, H... |
| e9aah1 | 146 | 33 | 10.1 | SubName: Full=Cholera toxin homolog transcriptional activato... |
| e7s9e2 | 261 | 33 | 10.1 | SubName: Full=Zeta toxin; SubName: Full=Zeta-toxin;             |
| e7nbh9 | 161 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e7nas9 | 572 | 58 | 10.1 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e7myv4 | 163 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| e7mut5 | 156 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e7me77 | 156 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e7mct8 | 163 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| e7g268 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin A/C family protein... |
| e6rt80 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin subunit C;            |
| e6l7n9 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| e6hr45 | 134 | 33 | 10.1 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e6hjb7 | 287 | 33 | 10.1 | SubName: Full=Zeta toxin;                                       |
| e6hdq8 | 118 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| e6bi19 | 175 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| e6bfi2 | 154 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| e6awp0 | 200 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| e6ar69 | 154 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| e6af15 | 209 | 33 | 10.1 | SubName: Full=RTX toxin acyltransferase family protein;         |
| e6a3p0 | 154 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| e5zh45 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin A/C family protein... |
| e5z3u9 | 150 | 33 | 10.1 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e5tta9 | 166 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| e5rm96 | 190 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| e5rm89 | 190 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| e5rm79 | 190 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| e5r7q3 | 258 | 33 | 10.1 | SubName: Full=Staphylococcal/Streptococcal toxin, beta-grasp... |
| e5bfc9 | 154 | 33 | 10.1 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e4m8p8 | 176 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| e4lfa8 | 116 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| e4jgv1 | 131 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, H... |
| e4j573 | 131 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, H... |
| e4iwb4 | 131 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, H... |
| e4igx3 | 131 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, H... |
| e4i4l6 | 131 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, H... |
| e3zpp8 | 150 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e3r6h2 | 141 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| e3kbn7 | 196 | 33 | 10.1 | SubName: Full=Ras-like C3 botulinum toxin substrate 1;          |
| e2wej0 | 135 | 33 | 10.1 | SubName: Full=Toxin;  |
| e2we15 | 93  | 33 | 10.1 | SubName: Full=Toxin;  |
| e2w2k7 | 135 | 33 | 10.1 | SubName: Full=Toxin;  |
| e2w239 | 93  | 33 | 10.1 | SubName: Full=Toxin;  |

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|---------|-----|----|------|---|
| e2vra6  | 135 | 33 | 10.1 | SubName: Full=Toxin;  |
| e2vqx7  | 93  | 33 | 10.1 | SubName: Full=Toxin;  |
| e2vey8  | 135 | 33 | 10.1 | SubName: Full=Toxin;  |
| e2vei7  | 93  | 33 | 10.1 | SubName: Full=Toxin;  |
| e2v5q0  | 135 | 33 | 10.1 | SubName: Full=Toxin;  |
| e2uuh2  | 135 | 33 | 10.1 | SubName: Full=Toxin;  |
| e2utz8  | 93  | 33 | 10.1 | SubName: Full=Toxin;  |
| e2uic5  | 135 | 33 | 10.1 | SubName: Full=Toxin;  |
| e2uhv8  | 93  | 33 | 10.1 | SubName: Full=Toxin;  |
| e2ud46  | 135 | 33 | 10.1 | SubName: Full=Toxin;  |
| e2tve7  | 135 | 33 | 10.1 | SubName: Full=Toxin;  |
| e2tuz8  | 93  | 33 | 10.1 | SubName: Full=Toxin;  |
| e2tir2  | 135 | 33 | 10.1 | SubName: Full=Toxin;  |
| e2tia6  | 93  | 33 | 10.1 | SubName: Full=Toxin;  |
| e2tea5  | 135 | 33 | 10.1 | SubName: Full=Toxin;  |
| e2t8g4  | 93  | 33 | 10.1 | SubName: Full=Toxin;  |
| e2sxxv9 | 298 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| e2cst7  | 158 | 33 | 10.1 | SubName: Full=Putative RTX-I toxin-activating lysine-acyltra... |
| e2bnn7  | 195 | 33 | 10.1 | SubName: Full=Ras-related C3 botulinum toxin substrate 1;       |
| e2aud8  | 195 | 33 | 10.1 | SubName: Full=Ras-related C3 botulinum toxin substrate 1;       |
| e1pnv5  | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin, subunit C;           |
| e1nwy8  | 127 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, H... |
| e1nhn3  | 127 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, H... |
| e1j220  | 175 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| e1j0j4  | 154 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| e1il80  | 154 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| e1i703  | 175 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| e1i026  | 154 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| e1hyr8  | 161 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| e1hbz9  | 138 | 33 | 10.1 | SubName: Full=Toxin;  |
| e1h6j1  | 135 | 33 | 10.1 | SubName: Full=Toxin;  |
| e1h622  | 93  | 33 | 10.1 | SubName: Full=Toxin;  |
| e1ett1  | 202 | 33 | 10.1 | SubName: Full=Zeta toxin;                                       |
| e1e598  | 166 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| e1df93  | 466 | 47 | 10.1 | SubName: Full=Zonular occludens toxin;                          |
| e0qte5  | 109 | 33 | 10.1 | SubName: Full=PIN family toxin-antitoxin system;                |
| e0qpk4  | 189 | 33 | 10.1 | SubName: Full=PIN family toxin-antitoxin system;                |
| e0qey4  | 176 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| e0gn98  | 108 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, MazF ... |
| e0gib1  | 141 | 33 | 10.1 | SubName: Full=Toxin secretion/phage lysis holin;                |
| e0e214  | 135 | 33 | 10.1 | SubName: Full=Toxin secretion/phage lysis holin;                |
| d9y255  | 176 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component;          |
| d9xzi6  | 176 | 33 | 10.1 | SubName: Full=GNAT family toxin-antitoxin system, toxin comp... |
| d9xuk6  | 155 | 33 | 10.1 | SubName: Full=PIN family toxin-antitoxin system, toxin compo... |
| d9xn51  | 277 | 33 | 10.1 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9wnc8  | 255 | 33 | 10.1 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9wau3  | 207 | 33 | 10.1 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d9sli7  | 136 | 33 | 10.1 | SubName: Full=Toxin secretion/phage lysis holin;                |
| d9sg20  | 169 | 33 | 10.1 | SubName: Full=RTX toxin-activating protein C;                   |
| d9qzh0  | 140 | 33 | 10.1 | SubName: Full=Transcriptional modulator of MazE/toxin, MazF;... |
| d9pqt6  | 132 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, H... |
| d9pqr0  | 182 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| d8utl4  | 552 | 56 | 10.1 | SubName: Full=Toxin secretion ATP-binding protein;              |
| d8un67  | 169 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| d8nme2  | 190 | 33 | 10.1 | SubName: Full=Similar to toxin secretion ABC transporter ATP... |
| d8f0b1  | 134 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| d8ez49  | 168 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| d8enf5  | 154 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |

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|--------|-----|----|------|---|
| d8e7w8 | 175 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d8e527 | 154 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| d8ccm8 | 154 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| d8bdt3 | 154 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| d7yt50 | 154 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| d7yqf5 | 175 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d7ylr5 | 154 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| d7yda2 | 161 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| d7xw57 | 175 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d7xrl9 | 154 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| d7iq56 | 251 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| d7hb74 | 704 | 71 | 10.1 | SubName: Full=Toxin secretion ATP-binding protein;              |
| d6u9f0 | 166 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| d6t5s2 | 166 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| d6l8m0 | 153 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| d6kpq8 | 136 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, H... |
| d6klp2 | 265 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| d6k9y3 | 274 | 33 | 10.1 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d6k3t2 | 286 | 33 | 10.1 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d6jzh5 | 280 | 33 | 10.1 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| d6h4q7 | 163 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d6fxs8 | 93  | 33 | 10.1 | SubName: Full=Toxin;  |
| d6fmd8 | 135 | 33 | 10.1 | SubName: Full=Toxin;  |
| d6fin7 | 135 | 33 | 10.1 | SubName: Full=Toxin;  |
| d4tzd6 | 159 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| d4rtz8 | 287 | 33 | 10.1 | SubName: Full=Zeta toxin;                                       |
| d4rfl2 | 287 | 33 | 10.1 | SubName: Full=Zeta toxin;                                       |
| d4jr52 | 142 | 33 | 10.1 | SubName: Full=Toxin secretion/phage lysis holin;                |
| d4fe79 | 141 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| d4cvp4 | 141 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, H... |
| d4csv9 | 137 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, H... |
| d4ckq5 | 183 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| d4c0v1 | 176 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d3l1b2 | 153 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| d3l0q0 | 134 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| d3imn0 | 337 | 34 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d3fl54 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| d3anr3 | 279 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, Bro f... |
| d2zs29 | 145 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, PIN f... |
| d2y9x8 | 704 | 71 | 10.1 | SubName: Full=Toxin secretion ATP-binding protein;              |
| d2x5w3 | 183 | 33 | 10.1 | RecName: Full=Helofensin-2; AltName: Full=Lethal toxin 2; Fl... |
| d2uv94 | 163 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d2gm12 | 163 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d2fym4 | 163 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d1wmm5 | 133 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| d1vrq5 | 203 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d1qy94 | 166 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| d1qib4 | 166 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| d1pfw4 | 160 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| d1nzb3 | 146 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, GNAT ... |
| d0wi56 | 200 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| d0k603 | 166 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| c9lu72 | 214 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| c9l3x2 | 170 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system protein;          |
| c8ru35 | 255 | 33 | 10.1 | SubName: Full=Bro family toxin-antitoxin system, toxin compo... |
| c8nlg6 | 166 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| c8mx50 | 166 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| c8ml92 | 258 | 33 | 10.1 | SubName: Full=Toxin beta-grasp domain-containing protein;       |

|        |     |    |      |   |
|--------|-----|----|------|---|
| c8ml32 | 166 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| c8mck9 | 258 | 33 | 10.1 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8m890 | 166 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| c8m7q4 | 258 | 33 | 10.1 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8m017 | 258 | 33 | 10.1 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8m0f7 | 166 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| c8lv17 | 258 | 33 | 10.1 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8lre2 | 166 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| c8lh92 | 166 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| c8lh33 | 258 | 33 | 10.1 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8l2z3 | 258 | 33 | 10.1 | SubName: Full=Toxin beta-grasp domain-containing protein;       |
| c8l2t3 | 166 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| c7nmj8 | 144 | 33 | 10.1 | RecName: Full=Putative ribonuclease VapC; Short=Putative RNA... |
| c6xep1 | 108 | 33 | 10.1 | SubName: Full=Transcriptional modulator of MazE/toxin, MazF;... |
| c6rw09 | 224 | 33 | 10.1 | SubName: Full=Toxin co-regulated pilin A;                       |
| c6rab1 | 225 | 33 | 10.1 | SubName: Full=Diphtheria toxin repressor;                       |
| c6pzx8 | 247 | 33 | 10.1 | SubName: Full=Phage protein; SubName: Full=Toxin-antitoxin s... |
| c6lfu3 | 180 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, X... |
| c6gys2 | 287 | 33 | 10.1 | SubName: Full=Toxin of epsilon-zeta postsegregational killin... |
| c6evg6 | 183 | 33 | 10.1 | RecName: Full=Helofensin-1; AltName: Full=Lethal toxin 1; Fl... |
| c6du04 | 135 | 33 | 10.1 | SubName: Full=Toxin;  |
| c6dt36 | 93  | 33 | 10.1 | SubName: Full=Toxin;  |
| c6dix8 | 171 | 33 | 10.1 | SubName: Full=RTX toxin-activating protein C;                   |
| c5g3a0 | 166 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| c5a3z7 | 129 | 33 | 10.1 | RecName: Full=Putative ribonuclease VapC; Short=Putative RNA... |
| c5a2f4 | 128 | 33 | 10.1 | RecName: Full=Putative ribonuclease VapC; Short=Putative RNA... |
| c4tiy3 | 190 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| c4kd61 | 141 | 33 | 10.1 | SubName: Full=Addiction module toxin, Txe/YoeB family;          |
| c4k0e3 | 134 | 33 | 10.1 | SubName: Full=Toxin of toxin-antitoxin system;                  |
| c3thj7 | 155 | 33 | 10.1 | SubName: Full=Putative toxin;                                   |
| c3pn13 | 134 | 33 | 10.1 | SubName: Full=Toxin of toxin-antitoxin (TA) system, containi... |
| c2djr0 | 141 | 33 | 10.1 | SubName: Full=Toxin of the YeeV-YeeU toxin-antitoxin system;... |
| c1ldv5 | 257 | 33 | 10.1 | SubName: Full=Killer toxin REsistant;                           |
| c0esv1 | 126 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, MazF ... |
| c0b4j5 | 146 | 33 | 10.1 | SubName: Full=Toxin secretion/phage lysis holin;                |
| b9z8i2 | 356 | 36 | 10.1 | SubName: Full=Zonular occludens toxin; Flags: Precursor;        |
| b8f5e3 | 220 | 33 | 10.1 | SubName: Full=Antitoxin/toxin system zeta toxin, signal rec...  |
| b6qbs9 | 572 | 58 | 10.1 | SubName: Full=MFS toxin efflux pump (AflT), putative;           |
| b6ga64 | 133 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, antitoxin component, H... |
| b5xa61 | 192 | 33 | 10.1 | SubName: Full=Ras-related C3 botulinum toxin substrate 2;       |
| b5x7a8 | 192 | 33 | 10.1 | SubName: Full=Ras-related C3 botulinum toxin substrate 2;       |
| b5qhw3 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin;                      |
| b5gks8 | 314 | 33 | 10.1 | SubName: Full=Xre family toxin-antitoxin system, antitoxin c... |
| b3c678 | 167 | 33 | 10.1 | SubName: Full=Toxin secretion/phage lysis holin;                |
| b2za56 | 224 | 33 | 10.1 | SubName: Full=Toxin-coregulated pilin;                          |
| b1sfu6 | 157 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, antitoxin com... |
| b1kt89 | 244 | 33 | 10.1 | SubName: Full=General secretion pathway protein E (Type II t... |
| b1er33 | 258 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin A;                    |
| b1ah77 | 148 | 33 | 10.1 | SubName: Full=Ras-related C3 botulinum toxin substrate 2; Su... |
| b0p3b1 | 158 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| b0mri0 | 101 | 33 | 10.1 | SubName: Full=Toxin-antitoxin system, toxin component, RelE ... |
| a9b2d1 | 142 | 33 | 10.1 | SubName: Full=Toxin secretion/phage lysis holin;                |
| a8fjn3 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin;                      |
| a7ve17 | 173 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, toxin compone... |
| a7i269 | 585 | 59 | 10.1 | SubName: Full=General secretion pathway protein E (Type II t... |
| a6zqf9 | 276 | 33 | 10.1 | SubName: Full=Killer toxin resistant protein;                   |
| a6u2s9 | 258 | 33 | 10.1 | SubName: Full=Toxin beta-grasp domain protein;                  |
| a6u2m8 | 166 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |

|        |     |    |      |   |
|--------|-----|----|------|---|
| a6g818 | 336 | 34 | 10.1 | SubName: Full=RTX toxins and related Ca2+-binding protein;      |
| a6fkb6 | 616 | 62 | 10.1 | SubName: Full=RTX toxins and related Ca2+-binding proteins-1... |
| a5khz6 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin;                      |
| a5itz1 | 258 | 33 | 10.1 | SubName: Full=Toxin, beta-grasp domain protein;                 |
| a5itt4 | 166 | 33 | 10.1 | RecName: Full=HTH-type transcriptional regulator rot; AltNam... |
| a5ejn8 | 583 | 59 | 10.1 | SubName: Full=Putative toxin/protease secretion system;         |
| a4f2a0 | 258 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin A;                    |
| a4f281 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| a4f278 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| a4f275 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin C;                    |
| a3zks2 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin, subunit C;           |
| a3zfk4 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin A/C family;           |
| a3yq20 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin, subunit C;           |
| a3ykt8 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin, subunit C;           |
| a3jrr9 | 574 | 58 | 10.1 | SubName: Full=ABC protein toxin exporter, fused ATPase and i... |
| a3i164 | 153 | 33 | 10.1 | SubName: Full=Putative toxin-antitoxin system, antitoxin com... |
| a2pas0 | 704 | 71 | 10.1 | SubName: Full=Toxin secretion ATP-binding protein;              |
| a1vxg2 | 189 | 33 | 10.1 | SubName: Full=Cytolethal distending toxin, subunit C;           |
| a1syn7 | 282 | 33 | 10.1 | SubName: Full=Cholera toxin transcriptional activator-like p... |
| a1fb35 | 218 | 33 | 10.1 | SubName: Full=Toxin coregulated pilin;                          |
| q7n885 | 697 | 70 | 10.0 | SubName: Full=Similar to toxin secretion ABC transporter ATP... |
| q208m1 | 440 | 44 | 10.0 | SubName: Full=Alpha-toxin;                                      |
| q1i6g2 | 449 | 45 | 10.0 | SubName: Full=Putative type I toxin efflux outer membrane pr... |
| q0mqm8 | 448 | 45 | 10.0 | SubName: Full=Binary toxin B;                                   |
| j7kf88 | 528 | 53 | 10.0 | SubName: Full=Anthrax toxin receptor 1 transcript variant 4;... |
| j2ish5 | 428 | 43 | 10.0 | SubName: Full=Toxin co-regulated pilus biosynthesis Q family... |
| g6dys5 | 350 | 35 | 10.0 | SubName: Full=Aerolysin/hemolysin/leukocidin toxin; Flags: P... |
| g4nf92 | 659 | 66 | 10.0 | SubName: Full=Multidrug and toxin extrusion protein 1;          |
| e6zn87 | 599 | 60 | 10.0 | SubName: Full=Related to MAK11 protein (Maintenance of kille... |
| d9yal7 | 369 | 37 | 10.0 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d5t775 | 529 | 53 | 10.0 | SubName: Full=Toxin secretion ABC transporter HlyB/MsbA fami... |
| d1tuq4 | 389 | 39 | 10.0 | SubName: Full=Toxin-antitoxin system, toxin component, Fic f... |
| d0z466 | 618 | 62 | 10.0 | SubName: Full=Toxin;  |
| c9p680 | 609 | 61 | 10.0 | SubName: Full=Cytolysin and hemolysin HlyA Pore-forming toxi... |
| b6sd13 | 329 | 33 | 10.0 | SubName: Full=Cytolethal distending toxin subunit B;            |
| a9ydv2 | 588 | 59 | 10.0 | SubName: Full=Alpha-glucosidase binding-toxin receptor;         |
| a5ia95 | 529 | 53 | 10.0 | SubName: Full=Toxin secretion ABC transporter HlyB/MsbA fami... |
| a4yte1 | 598 | 60 | 10.0 | SubName: Full=Putative secretion ATP-binding protein (ABC-ty... |
| a2qz18 | 569 | 57 | 10.0 | SubName: Full=Remark: confer resistance to various antibioti... |
| a1wdl4 | 560 | 56 | 10.0 | SubName: Full=Zeta toxin family protein;                        |

## C Scripts for allergen analysis

### Script for making the search for identity over a window

```
#!/bin/csh
#
# USAGE: windowmatch <query sequence> <library> <windowlength> <cutoff>
# e.g. windowmatch BG025.fasta 80 35.0
#
awk -v window=$3 -f ./makewindows.awk $1
find . -name "window$3_*.fasta" -exec /z/linux/fasta/fasta34 -Q -b 100000 -d 100000 -w 1000000 {} \
    $2 2 \; | grep -A 2 ">>" \
    | awk -v window=$3 -v threshold=$4 '/^>>/ {name= substr($1,3,200); getline; getline; percent=gensub("%","", "g", $4); \
    overlap= int($9); if (1.0*percent >= 1.0*threshold && 1*overlap >= 1*window) \
    {printf "%s\t%3.1f%% identity i %2d aa overlap.\n", \
    name, percent, overlap}}' | sort -r -n --key=10
```

The script is invoked by the following command, where parameter 2 is the length of the window, and parameter 3 is the identity threshold:

```
windowmatch MOL2940.fasta allergenonline.fasta 80 35.0 >
allergenonline_window80_result.txt
```

and

```
windowmatch MOL2940.fasta allergen.org.fasta 80 35.0 >
allergenorg_window80_result.txt
```

### Script for making the search for scaled identity over a window

```
#!/bin/csh
#
# USAGE: windowmatch_scale <query sequence> <Library> <windowlength> <cutoff>
# e.g. windowmatch BG025.fasta 80 35.0
#
awk -v window=$3 -f ./makewindows.awk $1
find . -name "window80_*.fasta" -exec /z/linux/fasta/fasta34 -Q -b 100000 -d 100000 -w 1000000 {} \
    $2 2 \; | tee windowmatch_scale_$3.fasta.txt | grep -A 2 ">>" \
    | awk -v window=$3 -v threshold=$4 '/^>>/ {name= substr($1,3,200); getline; getline; percent=$4; \
    overlap= int($9); newpercent=(1.0*percent*overlap)/(1.0*window); if (newpercent >= 1.0*threshold && overlap < window) \
    {printf "%s\t%3.1f%% identity i %2d aa overlap, scaled to %3.1f%% identity i %d aa overlap\n", \
    name, percent, overlap, newpercent, window }}' | sort -r -n --key=10
```

The script is invoked by the following command, where parameter 2 is the length of the window,

and parameter 3 is the identity threshold. This script allows identification of matches with higher identity over shorter windows than 80 amino acids. For example a match with 50% identity over 60 amino acids would still have enough identical amino acids to exceed the 35% threshold over 80 amino acids:  $60 \cdot 0.50 / 80 = 0.375 = 37.5\%$ .

```
windowmatch_scale MOL2940.fasta allergenonline.fasta 80 35.0 >
allergenonline.window80_result_scale.txt
```

and

```
windowmatch_scale MOL2940.fasta allergen.org.fasta 80 35.0 >
allergenorg.window80_result_scale.txt
```

## Common awk script used by the two previous scripts

The file is named `makewindows.awk`

```
BEGIN { seq=""
  if (window < 1)
    window = 6
}
{
  if (substr($0,1,1) != ">")
  {
    gsub("[^A-Za-z]", "")
    seq = sprintf("%s%s", seq, $0)
  }
}
END {
  for (i=1; i<length(seq)-window+2; i++)
  {
    filename = sprintf ("window%d_%04d.fasta", window, i)
    printf ">window%d_%04d\n", window, i > filename
    printf "%s\n", substr(seq,i>window) > filename
  }
}
```

## Script for making the Needleman-Wunsch alignment and comparison

```
#!/bin/csh
#
# USAGE: fullmatch <query sequence> <library> <cutoff>
# e.g. fullmatch BG025.fasta 35.0
#
```



```

needle -asequence $1 -bsequence $2 \
-gapopen 10.0 -gapextend 0.5 -outfile /dev/stdout \
| awk -v threshold=$3 '2:/{name = substr($3,1,80) } \
/Identity/{ matches = $3; percent = strtonum(gensub("\\(", "", 1, $NF)); \
if (percent >= threshold) {printf "%-80s %-10s = %5.1f%%\n", \
name, matches, percent } } ' | sort -r -n --key=4

```

The script is invoked by the following command, where parameter 1 is the identity threshold:

```

fullmatch MOL2940.fasta allergenonline.fasta 10.0 >
allergenonline_fullresult.txt

```

and

```

fullmatch MOL2940.fasta allergen.org.fasta 10.0 >
allergenorg_fullresult.txt

```

## D List of allergens from allergenonline

List of allergens that have been tested by the EFSA scientific opinion recommended allergen analysis described in section 2. The sequences were downloaded via <http://allergenonline.org>.

| Count | Species             | Common                | IUIS Allergen | Type              | Group                              | Length | GI#       | FirstVersion |
|-------|---------------------|-----------------------|---------------|-------------------|------------------------------------|--------|-----------|--------------|
| 1     | Acarus siro         | Mite                  | Unassigned    | Aero Mite         | Acarus Aca s 13                    | 131    | 118638268 | 9            |
| 2     | Actinidia chinensis | Kiwi                  | Unassigned    | Food Plant        | Actinidia Act c 1<br>Act d 1       | 380    | 190358935 | 9            |
| 3     | Actinidia deliciosa | Kiwi                  | Unassigned    | Food Plant        | Actinidia Act c 1<br>Act d 1       | 380    | 15984     | 7            |
| 4     | Actinidia deliciosa | Kiwi                  | Unassigned    | Food Plant        | Actinidia Act c 1<br>Act d 1       | 380    | 166317    | 7            |
| 5     | Actinidia deliciosa | Kiwi                  | Unassigned    | Food Plant        | Actinidia Act c 1<br>Act d 1       | 380    | 193806686 | 12           |
| 6     | Actinidia chinensis | Kiwi                  | Unassigned    | Food Plant        | Actinidia Act c 8<br>Act d 8 PR-10 | 159    | 281552896 | 11           |
| 7     | Actinidia deliciosa | Kiwi                  | Unassigned    | Food Plant        | Actinidia Act c 8<br>Act d 8 PR-10 | 157    | 281552898 | 11           |
| 8     | Actinidia deliciosa | Kiwi                  | Unassigned    | Unassigned        | Actinidia Act d 11<br>Kirola MLP   | 150    | 332319679 | 12           |
| 9     | Actinidia chinensis | Kiwi                  | Unassigned    | Food Plant        | Actinidia Kiwellin                 | 189    | 85701136  | 7            |
| 10    | Actinidia deliciosa | Kiwi                  | Unassigned    | Food Plant        | Actinidia<br>Phytocystatin Act d 4 | 116    | 40807635  | 7            |
| 11    | Actinidia chinensis | Kiwi                  | Unassigned    | Food Plant        | Actinidia thaumatin<br>Act d 2     | 20     | 68064399  | 7            |
| 12    | Actinidia deliciosa | Kiwi                  | Act c 2       | Food Plant        | Actinidia thaumatin<br>Act d 2     | 225    | 71057064  | 7            |
| 13    | Actinidia deliciosa | Kiwi                  | Unassigned    | Food Plant        | Actinidia thaumatin<br>Act d 2     | 201    | 146737976 | 9            |
| 14    | Aedes aegypti       | Yellow fever mosquito | Aed a 2       | Venom or Salivary | Aedes Aed a 2                      | 321    | 118216    | 7            |
| 15    | Aedes aegypti       | Yellow fever mosquito | Aed a 2       | Venom or Salivary | Aedes Aed a 2                      | 321    | 205525919 | 9            |
| 16    | Aedes aegypti       | Yellow fever mosquito | Unassigned    | Venom or Salivary | Aedes Aed a 3                      | 253    | 2114497   | 7            |
| 17    | Aedes aegypti       | Yellow fever mosquito | Unassigned    | Venom or Salivary | Aedes Aed a 3                      | 273    | 94468546  | 7            |
| 18    | Aedes aegypti       | Yellow fever mosquito | Unassigned    | Venom or Salivary | Aedes Aed a 3                      | 258    | 94468552  | 7            |
| 19    | Aedes aegypti       | Yellow fever          | Aed a 1       | Venom or          | Aedes apyrase Aed a                | 562    | 556272    | 7            |

|    |                         |                       |            |                   |                                     |     |           |    |
|----|-------------------------|-----------------------|------------|-------------------|-------------------------------------|-----|-----------|----|
|    |                         | mosquito              |            | Salivary          | 1                                   |     |           |    |
| 20 | Aedes aegypti           | Yellow fever mosquito | Unassigned | Venom or Salivary | Aedes apyrase Aed a                 | 562 | 193806340 | 10 |
| 21 | Agrostis alba           | Bent grass            | Unassigned | Aero Plant        | Agrostis Agr a 1                    | 26  | 320606    | 7  |
| 22 | Agrostis alba           | Bent grass            | Unassigned | Aero Plant        | Agrostis Agr a 1                    | 35  | 75139987  | 7  |
| 23 | Agrostis alba           | Bent grass            | Unassigned | Aero Plant        | Agrostis Agr a 1                    | 35  | 75139989  | 7  |
| 24 | Alnus glutinosa         | Alder                 | Aln g 1    | Aero Plant        | Alnus Aln g 1                       | 160 | 261407    | 7  |
| 25 | Alnus glutinosa         | Alder                 | Unassigned | Aero Plant        | Alnus Aln g 4                       | 85  | 3319651   | 7  |
| 26 | Alternaria alternata    | Fungus                | Unassigned | Aero Fungi        | Alternaria ADH Alta a 10            | 497 | 76666767  | 7  |
| 27 | Alternaria alternata    | Fungus                | Unassigned | Aero Fungi        | Alternaria Alt a 13                 | 231 | 74611808  | 10 |
| 28 | Alternaria alternata    | Fungus                | Alt a 1    | Aero Fungi        | Alternaria Alt a I                  | 157 | 1842045   | 7  |
| 29 | Alternaria alternata    | Fungus                | Alt a 1    | Aero Fungi        | Alternaria Alt a I                  | 115 | 21913174  | 7  |
| 30 | Alternaria alternata    | Fungus                | Unassigned | Aero Fungi        | Alternaria Alt a I                  | 157 | 45680856  | 7  |
| 31 | Alternaria alternata    | Fungus                | Alt a 6    | Aero Fungi        | Alternaria enolase Alt a 6          | 438 | 14423684  | 7  |
| 32 | Alternaria alternata    | Fungus                | Unassigned | Aero Fungi        | Alternaria flavodoxin Alt a 7       | 204 | 1168402   | 9  |
| 33 | Alternaria alternata    | Fungus                | Alt a 3    | Aero Fungi        | Alternaria HSP Alt a 3              | 152 | 14423730  | 7  |
| 34 | Alternaria alternata    | Fungus                | Unassigned | Aero Plant        | Alternaria MnSOD                    | 25  | 292630881 | 12 |
| 35 | Alternaria alternata    | Fungus                | Unassigned | Aero Fungi        | Alternaria Nuc Transport 2          | 124 | 21748153  | 7  |
| 36 | Alternaria alternata    | Fungus                | Alt a 12   | Aero Fungi        | Alternaria Ribosomal BP P1 Alt a 12 | 110 | 1350779   | 7  |
| 37 | Alternaria alternata    | Fungus                | Alt a 5    | Aero Fungi        | Alternaria ribosomal P2 Alt a 5     | 113 | 1850540   | 7  |
| 38 | Alternaria alternata    | Fungus                | Unassigned | Aero Fungi        | Alternaria ribosomal P2 Alt a 5     | 113 | 1173071   | 10 |
| 39 | Alternaria alternata    | Fungus                | Unassigned | Aero Fungi        | Alternaria TCTP IgE binding         | 169 | 112824341 | 11 |
| 40 | Alternaria alternata    | Fungus                | Alt a 4    | Aero Fungi        | Alternaria thioredoxin Alt a 4      | 436 | 85701160  | 7  |
| 41 | Amaranthus retroflexus  | Common Amaranth       | Unassigned | Aero Plant        | Amaranthus Ama r 2 Profilin         | 133 | 227937304 | 10 |
| 42 | Ambrosia artemisiifolia | Short ragweed         | Amb a 1.1  | Aero Plant        | Ambrosia Amb a 1                    | 396 | 113475    | 7  |

|    |  |               |            |            |                  |     |           |    |
|----|--|---------------|------------|------------|------------------|-----|-----------|----|
| 43 | Ambrosia<br> artemisiifolia              | Short ragweed | Amb a 1.2  | Aero Plant | Ambrosia Amb a 1 | 398 | 113476    | 7  |
| 44 | Ambrosia<br> artemisiifolia              | Short ragweed | Amb a 1.3  | Aero Plant | Ambrosia Amb a 1 | 397 | 113477    | 7  |
| 45 | Ambrosia<br> artemisiifolia              | Short ragweed | Amb a 1.4  | Aero Plant | Ambrosia Amb a 1 | 392 | 113478    | 7  |
| 46 | Ambrosia<br> artemisiifolia              | Short ragweed | Amb a 1.3  | Aero Plant | Ambrosia Amb a 1 | 397 | 166443    | 7  |
| 47 | Ambrosia<br> artemisiifolia              | Short ragweed | Unassigned | Aero Plant | Ambrosia Amb a 1 | 396 | 302127810 | 12 |
| 48 | Ambrosia<br> artemisiifolia              | Short ragweed | Unassigned | Aero Plant | Ambrosia Amb a 1 | 398 | 302127812 | 12 |
| 49 | Ambrosia<br> artemisiifolia              | Short ragweed | Unassigned | Aero Plant | Ambrosia Amb a 1 | 397 | 302127814 | 12 |
| 50 | Ambrosia<br> artemisiifolia              | Short ragweed | Unassigned | Aero Plant | Ambrosia Amb a 1 | 397 | 302127816 | 12 |
| 51 | Ambrosia<br> artemisiifolia              | Short ragweed | Unassigned | Aero Plant | Ambrosia Amb a 1 | 397 | 302127818 | 12 |
| 52 | Ambrosia<br> artemisiifolia              | Short ragweed | Unassigned | Aero Plant | Ambrosia Amb a 1 | 397 | 302127820 | 12 |
| 53 | Ambrosia<br> artemisiifolia              | Short ragweed | Unassigned | Aero Plant | Ambrosia Amb a 1 | 397 | 302127822 | 12 |
| 54 | Ambrosia<br> artemisiifolia              | Short ragweed | Unassigned | Aero Plant | Ambrosia Amb a 1 | 387 | 302127824 | 12 |
| 55 | Ambrosia<br> artemisiifolia              | Short ragweed | Unassigned | Aero Plant | Ambrosia Amb a 1 | 397 | 302127826 | 12 |
| 56 | Ambrosia<br> artemisiifolia              | Short ragweed | Unassigned | Aero Plant | Ambrosia Amb a 1 | 397 | 302127828 | 12 |
| 57 | Ambrosia<br> artemisiifolia              | Short ragweed | Amb a 2    | Aero Plant | Ambrosia Amb a 2 | 397 | 113479    | 7  |
| 58 | Ambrosia<br> artemisiifolia<br> (elator) | Short ragweed | Amb a 3    | Aero Plant | Ambrosia Amb a 3 | 101 | 416636    | 7  |
| 59 | Ambrosia<br> artemisiifolia              | Short ragweed | Unassigned | Aero Plant | Ambrosia Amb a 4 | 164 | 285005079 | 11 |
| 60 | Ambrosia<br> artemisiifolia              | Short ragweed | Unassigned | Aero Plant | Ambrosia Amb a 4 | 164 | 291197394 | 12 |
| 61 | Ambrosia<br> artemisiifolia              | Short ragweed | Unassigned | Aero Plant | Ambrosia Amb a 4 | 111 | 291482306 | 12 |
| 62 | Ambrosia<br> artemisiifolia              | Short ragweed | Unassigned | Aero Plant | Ambrosia Amb a 4 | 140 | 291482308 | 12 |
| 63 | Ambrosia<br> artemisiifolia              | Short ragweed | Unassigned | Aero Plant | Ambrosia Amb a 4 | 134 | 291482310 | 12 |
| 64 | Ambrosia<br> artemisiifolia              | Short ragweed | Unassigned | Aero Plant | Ambrosia Amb a 4 | 96  | 291482314 | 12 |
| 65 | Ambrosia<br> artemisiifolia              | Short ragweed | Unassigned | Aero Plant | Ambrosia Amb a 4 | 110 | 291482316 | 12 |

|    |  |                         |            |                     |   |     |           |    |
|----|--|-------------------------|------------|---------------------|---|-----|-----------|----|
| 66 | Ambrosia<br> artemisiifolia              | Short ragweed           | Unassigned | Aero Plant          | Ambrosia Amb a 4                        | 116 | 291482318 | 12 |
| 67 | Ambrosia<br> artemisiifolia<br> (elator) | Short ragweed           | Amb a 5    | Aero Plant          | Ambrosia Amb a 5                        | 145 | 114090    | 7  |
| 68 | Ambrosia<br> psilostachya                | Western<br>ragweed      | Unassigned | Aero Plant          | Ambrosia Amb a 5                        | 177 | 515953    | 7  |
| 69 | Ambrosia<br> psilostachya                | Western<br>ragweed      | Unassigned | Aero Plant          | Ambrosia Amb a 5                        | 177 | 515954    | 7  |
| 70 | Ambrosia<br> psilostachya                | Western<br>ragweed      | Unassigned | Aero Plant          | Ambrosia Amb a 5                        | 177 | 515955    | 7  |
| 71 | Ambrosia<br> psilostachya                | Western<br>ragweed      | Unassigned | Aero Plant          | Ambrosia Amb a 5                        | 177 | 515956    | 7  |
| 72 | Ambrosia<br> psilostachya                | Western<br>ragweed      | Unassigned | Aero Plant          | Ambrosia Amb a 5                        | 177 | 515957    | 7  |
| 73 | Ambrosia<br> artemisiifolia              | Short ragweed           | Amb a 6    | Aero Plant          | Ambrosia Amb a 6                        | 118 | 14285595  | 7  |
| 74 | Ambrosia<br> artemisiifolia              | Short ragweed           | Unassigned | Aero Plant          | Ambrosia Amb a 8<br> profilin           | 133 | 34851182  | 7  |
| 75 | Ambrosia<br> artemisiifolia              | Short ragweed           | Unassigned | Aero Plant          | Ambrosia Amb a 8<br> profilin           | 131 | 34851180  | 7  |
| 76 | Ambrosia<br> artemisiifolia              | Short ragweed           | Unassigned | Aero Plant          | Ambrosia Amb a 8<br> profilin           | 131 | 34851178  | 7  |
| 77 | Ambrosia<br> artemisiifolia              | Short ragweed           | Unassigned | Aero Plant          | Ambrosia Amb a 8<br> profilin           | 133 | 62249502  | 7  |
| 78 | Ambrosia<br> artemisiifolia              | Short ragweed           | Unassigned | Aero Plant          | Ambrosia Amb a 8<br> profilin           | 133 | 62249512  | 7  |
| 79 | Ambrosia trifida<br>                     | Giant ragweed           | Amb t 5    | Aero Plant          | Ambrosia trifida<br> Amb t 5            | 173 | 114091    | 7  |
| 80 | Anacardium<br> occidentale               | Cashew                  | Ana o 1    | Food Plant          | Anacardium Ana o 1                      | 536 | 21666498  | 7  |
| 81 | Anacardium<br> occidentale               | Cashew                  | Ana o 1    | Food Plant          | Anacardium Ana o 1                      | 538 | 21914823  | 7  |
| 82 | Anacardium<br> occidentale               | Cashew                  | Ana o 2    | Food Plant          | Anacardium Ana o 2                      | 457 | 25991543  | 7  |
| 83 | Anacardium<br> occidentale               | Cashew                  | Ana o 3    | Food Plant          | Anacardium Ana o 3                      | 138 | 24473800  | 7  |
| 84 | Ananas comosus<br>                       | Pineapple               | Unassigned | Aero Plant          | Ananas Ana c 2<br> Bromelain precursor  | 351 | 75277440  | 7  |
| 85 | Ananas comosus                           | Pineapple               | Unassigned | Food Plant          | Ananas profilin                         | 131 | 75306610  | 10 |
| 86 | Anisakis simplex<br>                     | Parasitic<br> fish worm | Ani s 1    | Worm<br> (parasite) | Anisakis Ani s 1<br> protease inhibitor | 194 | 47605452  | 7  |
| 87 | Anisakis simplex<br>                     | Parasitic<br> fish worm | Unassigned | Food<br> Animal     | Anisakis Ani s 11                       | 307 | 323575361 | 12 |
| 88 | Anisakis simplex<br>                     | Parasitic<br> fish worm | Unassigned | Food<br> Animal     | Anisakis Ani s 11                       | 160 | 323575363 | 12 |

|     |                  |                        |            |                    |   |      |           |    |
|-----|------------------|------------------------|------------|--------------------|---|------|-----------|----|
| 89  | Anisakis simplex | Parasitic<br>fish worm | Unassigned | Food<br>Animal     | Anisakis Ani s 11                                 | 287  | 323575365 | 12 |
| 90  | Anisakis simplex | Parasitic<br>fish worm | Unassigned | Food<br>Animal     | Anisakis Ani s 12                                 | 295  | 323575367 | 12 |
| 91  | Anisakis simplex | Parasitic<br>fish worm | Ani s 2    | Worm<br>(parasite) | Anisakis Ani s 2<br>paramyosin                    | 473  | 8453086   | 7  |
| 92  | Anisakis simplex | Parasitic<br>fish worm | Unassigned | Worm<br>(parasite) | Anisakis Ani s 2<br>paramyosin                    | 869  | 42559536  | 9  |
| 93  | Anisakis simplex | Parasitic<br>fish worm | Ani s 4    | Worm<br>(parasite) | Anisakis Ani s 4                                  | 14   | 47605398  | 7  |
| 94  | Anisakis simplex | Parasitic<br>fish worm | Unassigned | Worm<br>(parasite) | Anisakis Ani s 4                                  | 115  | 110346534 | 8  |
| 95  | Anisakis simplex | Parasitic<br>fish worm | Unassigned | Worm<br>(parasite) | Anisakis Ani s 5<br>SXP/RAL-2 family<br>protein   | 152  | 121308878 | 8  |
| 96  | Anisakis simplex | Parasitic<br>fish worm | Unassigned | Worm<br>(parasite) | Anisakis Ani s 7<br>UA3-recognized<br>allergen    | 1096 | 119524036 | 9  |
| 97  | Anisakis simplex | Parasitic<br>fish worm | Unassigned | Worm<br>(parasite) | Anisakis Ani s 8<br>SXP/RAL-2 family<br>protein 2 | 150  | 155676636 | 9  |
| 98  | Anisakis simplex | Parasitic<br>fish worm | Unassigned | Worm<br>(parasite) | Anisakis Ani s 8<br>SXP/RAL-2 family<br>protein 2 | 150  | 155676682 | 9  |
| 99  | Anisakis simplex | Parasitic<br>fish worm | Unassigned | Worm<br>(parasite) | Anisakis Ani s 8<br>SXP/RAL-2 family<br>protein 2 | 150  | 155676684 | 9  |
| 100 | Anisakis simplex | Parasitic<br>fish worm | Unassigned | Worm<br>(parasite) | Anisakis Ani s 8<br>SXP/RAL-2 family<br>protein 2 | 150  | 155676686 | 9  |
| 101 | Anisakis simplex | Parasitic<br>fish worm | Unassigned | Worm<br>(parasite) | Anisakis Ani s 8<br>SXP/RAL-2 family<br>protein 2 | 150  | 155676688 | 9  |
| 102 | Anisakis simplex | Parasitic<br>fish worm | Unassigned | Worm<br>(parasite) | Anisakis Ani s 8<br>SXP/RAL-2 family<br>protein 2 | 150  | 155676690 | 9  |
| 103 | Anisakis simplex | Parasitic<br>fish worm | Unassigned | Worm<br>(parasite) | Anisakis Ani s 8<br>SXP/RAL-2 family<br>protein 2 | 150  | 155676692 | 9  |
| 104 | Anisakis simplex | Parasitic<br>fish worm | Unassigned | Worm<br>(parasite) | Anisakis Ani s 8<br>SXP/RAL-2 family<br>protein 2 | 150  | 155676694 | 9  |
| 105 | Anisakis simplex | Parasitic<br>fish worm | Unassigned | Worm<br>(parasite) | Anisakis Ani s 8<br>SXP/RAL-2 family<br>protein 2 | 150  | 155676696 | 9  |
| 106 | Anisakis simplex | Parasitic<br>fish worm | Unassigned | Worm<br>(parasite) | Anisakis Ani s 8<br>SXP/RAL-2 family<br>protein 2 | 150  | 155676698 | 9  |
| 107 | Anisakis simplex | Parasitic<br>fish worm | Unassigned | Worm<br>(parasite) | Anisakis Ani s 9                                  | 147  | 157418806 | 9  |

|     |                          |                        |                 |                      |                                     |     |           |    |
|-----|--------------------------|------------------------|-----------------|----------------------|-------------------------------------|-----|-----------|----|
| 108 | Anisakis simplex         | Parasitic<br>fish worm | Unassigned      | Worm<br>(parasite)   | Anisakis simplex<br>troponin-like   | 161 | 6065738   | 7  |
| 109 | Anthoxanthum<br>odoratum | Sweet vernal<br>grass  | Unassigned      | Aero Plant           | Anthoxanthum Ant o<br>1             | 26  | 320607    | 7  |
| 110 | Anthoxanthum<br>odoratum | Sweet vernal<br>grass  | Unassigned      | Aero Plant           | Anthoxanthum Ant o<br>1             | 32  | 75139986  | 7  |
| 111 | Anthoxanthum<br>odoratum | Sweet vernal<br>grass  | Unassigned      | Aero Plant           | Anthoxanthum Ant o<br>1             | 32  | 75139990  | 7  |
| 112 | Apis cerana              | Indian<br>honeybee     | Unassigned      | Venom or<br>Salivary | Apis Api m 1                        | 134 | 7435005   | 7  |
| 113 | Apis cerana<br>cerana    | Indian<br>honeybee     | Unassigned      | Venom or<br>Salivary | Apis Api m 1                        | 134 | 24638082  | 7  |
| 114 | Apis dorsata             | Giant<br>honeybee      | Unassigned      | Venom or<br>Salivary | Apis Api m 1                        | 134 | 47117012  | 7  |
| 115 | Apis mellifera           | Honeybee               | Api m 1         | Venom or<br>Salivary | Apis Api m 1                        | 167 | 24418862  | 7  |
| 116 | Apis mellifera           | Honeybee               | Api m 2         | Venom or<br>Salivary | Apis Api m 2                        | 382 | 585279    | 7  |
| 117 | Apis mellifera           | Honeybee               | Unassigned      | Venom or<br>Salivary | Apis Api m 3 acid<br>phosphatase    | 388 | 208342441 | 10 |
| 118 | Apis mellifera           | Honeybee               | Unassigned      | Venom or<br>Salivary | Apis Api m 3 acid<br>phosphatase    | 388 | 60652325  | 11 |
| 119 | Apis dorsata             | Giant<br>honeybee      | Unassigned      | Venom or<br>Salivary | Apis Api m 4<br>Melittin            | 26  | 126955    | 7  |
| 120 | Apis mellifera           | Honeybee               | Unassigned      | Venom or<br>Salivary | Apis Api m 4<br>Melittin            | 27  | 69552     | 7  |
| 121 | Apis mellifera           | Honeybee               | Unassigned      | Venom or<br>Salivary | Apis Api m 4<br>Melittin            | 70  | 126949    | 8  |
| 122 | Apis mellifera           | Honeybee               | Unassigned      | Venom or<br>Salivary | Apis Api m 5<br>dipeptidylpeptidase | 775 | 313471719 | 12 |
| 123 | Apis mellifera           | Honeybee               | Unassigned      | Venom or<br>Salivary | Apis Api m 6                        | 92  | 94400907  | 7  |
| 124 | Apis mellifera           | Honeybee               | Unassigned      | Venom or<br>Salivary | Apis Api m 6                        | 94  | 88770352  | 10 |
| 125 | Apis mellifera           | Honeybee               | Unassigned      | Venom or<br>Salivary | Apis icarapin Api m<br>10           | 223 | 94471622  | 7  |
| 126 | Apis mellifera           | Honeybee               | Unassigned      | Venom or<br>Salivary | Apis icarapin Api m<br>10           | 175 | 94471624  | 7  |
| 127 | Apium graveolens         | Celery                 | Api g<br>1.0101 | Food Plant           | Apium Api g 1                       | 154 | 1346568   | 7  |
| 128 | Apium graveolens         | Celery                 | Api g<br>1.0201 | Food Plant           | Apium Api g 1                       | 159 | 14423646  | 9  |
| 129 | Apium graveolens         | Celery                 | Api g<br>2.0101 | Food Plant           | Apium Api g 2                       | 118 | 256600126 | 12 |
| 130 | Apium graveolens         | Celery                 | Api g 4         | Food Plant           | Apium Api g 4                       | 134 | 4761578   | 7  |

|     |                  |        |            |            |                                       |     |           |    |
|-----|------------------|--------|------------|------------|---------------------------------------|-----|-----------|----|
| 131 | Apium graveolens | Celery | Unassigned | Food Plant | Apium Api g 5                         | 22  | 33300921  | 7  |
| 132 | Apium graveolens | Celery | Unassigned | Food Plant | Apium Api g 5                         | 30  | 32363124  | 7  |
| 133 | Apium graveolens | Celery | Unassigned | Food Plant | Apium Api g 5                         | 24  | 32363125  | 7  |
| 134 | Apium graveolens | Celery | Unassigned | Food Plant | Apium Api g 5                         | 10  | 32363126  | 7  |
| 135 | Arachis hypogaea | Peanut | Unassigned | Food Plant | Arachis Agglutinin<br>(lectin)        | 273 | 253289    | 7  |
| 136 | Arachis hypogaea | Peanut | Ara h 1    | Food Plant | Arachis Ara h 1                       | 614 | 1168390   | 7  |
| 137 | Arachis hypogaea | Peanut | Ara h 1    | Food Plant | Arachis Ara h 1                       | 626 | 1168391   | 7  |
| 138 | Arachis hypogaea | Peanut | Unassigned | Food Plant | Arachis Ara h 1                       | 299 | 46560474  | 7  |
| 139 | Arachis hypogaea | Peanut | Unassigned | Food Plant | Arachis Ara h 1                       | 303 | 46560472  | 7  |
| 140 | Arachis hypogaea | Peanut | Unassigned | Food Plant | Arachis Ara h 1                       | 428 | 46560476  | 7  |
| 141 | Arachis hypogaea | Peanut | Unassigned | Food Plant | Arachis Ara h 1                       | 619 | 312233063 | 12 |
| 142 | Arachis hypogaea | Peanut | Ara h 2.02 | Food Plant | Arachis Ara h 2                       | 172 | 26245447  | 7  |
| 143 | Arachis hypogaea | Peanut | Ara h 2    | Food Plant | Arachis Ara h 2                       | 169 | 31322017  | 7  |
| 144 | Arachis hypogaea | Peanut | Unassigned | Food Plant | Arachis Ara h 2                       | 156 | 15418705  | 10 |
| 145 | Arachis hypogaea | Peanut | Unassigned | Food Plant | Arachis Ara h 2                       | 158 | 224747150 | 10 |
| 146 | Arachis hypogaea | Peanut | Ara h 5    | Food Plant | Arachis Ara h 5                       | 131 | 5902968   | 7  |
| 147 | Arachis hypogaea | Peanut | Unassigned | Food Plant | Arachis Ara h 5                       | 131 | 284810529 | 11 |
| 148 | Arachis hypogaea | Peanut | Ara h 6    | Food Plant | Arachis Ara h 6                       | 129 | 5923742   | 7  |
| 149 | Arachis hypogaea | Peanut | Unassigned | Food Plant | Arachis Ara h 6                       | 144 | 17225991  | 7  |
| 150 | Arachis hypogaea | Peanut | Unassigned | Food Plant | Arachis Ara h 6                       | 127 | 159163254 | 9  |
| 151 | Arachis hypogaea | Peanut | Unassigned | Food Plant | Arachis Ara h 6                       | 145 | 75114094  | 10 |
| 152 | Arachis hypogaea | Peanut | Ara h 7    | Food Plant | Arachis Ara h 7                       | 160 | 5931948   | 7  |
| 153 | Arachis hypogaea | Peanut | Unassigned | Food Plant | Arachis Ara h 7                       | 164 | 158121995 | 10 |
| 154 | Arachis hypogaea | Peanut | Ara h 8    | Food Plant | Arachis Ara h 8                       | 157 | 37499626  | 7  |
| 155 | Arachis hypogaea | Peanut | Unassigned | Food Plant | Arachis Ara h 8                       | 153 | 145904610 | 9  |
| 156 | Arachis hypogaea | Peanut | Unassigned | Food Plant | Arachis Ara h 8                       | 157 | 169786740 | 9  |
| 157 | Arachis hypogaea | Peanut | Unassigned | Food Plant | Arachis Ara h 8                       | 157 | 110676574 | 12 |
| 158 | Arachis hypogaea | Peanut | Unassigned | Food Plant | Arachis Ara h 9 LTP<br>isoallergens   | 116 | 161087230 | 10 |
| 159 | Arachis hypogaea | Peanut | Unassigned | Food Plant | Arachis Ara h 9 LTP<br>isoallergens   | 92  | 161610580 | 10 |
| 160 | Arachis hypogaea | Peanut | Ara h 3    | Food Plant | Arachis Glycinin<br>(Ara h 3/Ara h 4) | 507 | 3703107   | 7  |
| 161 | Arachis hypogaea | Peanut | Ara h 4    | Food Plant | Arachis Glycinin<br>(Ara h 3/Ara h 4) | 530 | 5712199   | 7  |
| 162 | Arachis hypogaea | Peanut | Unassigned | Food Plant | Arachis Glycinin<br>(Ara h 3/Ara h 4) | 538 | 21314465  | 7  |



|     |                         |                         |            |                      |                                       |     |           |    |
|-----|-------------------------|-------------------------|------------|----------------------|---------------------------------------|-----|-----------|----|
| 163 | Arachis hypogaea        | Peanut                  | Unassigned | Food Plant           | Arachis Glycinin<br>(Ara h 3/Ara h 4) | 219 | 22135348  | 7  |
| 164 | Arachis hypogaea        | Peanut                  | Unassigned | Food Plant           | Arachis Glycinin<br>(Ara h 3/Ara h 4) | 512 | 112380623 | 8  |
| 165 | Arachis hypogaea        | Peanut                  | Unassigned | Food Plant           | Arachis Glycinin<br>(Ara h 3/Ara h 4) | 530 | 199732457 | 10 |
| 166 | Arachis hypogaea        | Peanut                  | Unassigned | Food Plant           | Arachis Glycinin<br>(Ara h 3/Ara h 4) | 510 | 224036293 | 10 |
| 167 | Arachis hypogaea        | Peanut                  | Unassigned | Food Plant           | Arachis Glycinin<br>(Ara h 3/Ara h 4) | 512 | 312233065 | 12 |
| 168 | Argas reflexus          | European<br>pigeon tick | Arg r 1    | Venom or<br>Salivary | Argas Arg r 1                         | 159 | 58371884  | 7  |
| 169 | Argas reflexus          | European<br>pigeon tick | Unassigned | Venom or<br>Salivary | Argas Arg r 1                         | 144 | 322812205 | 12 |
| 170 | Artemisia<br>vulgaris   | Mugwort                 | Unassigned | Aero Plant           | Artemisia Amb a<br>1-like             | 396 | 62530263  | 8  |
| 171 | Artemisia<br>vulgaris   | Mugwort                 | Art v 1    | Aero Plant           | Artemisia Art v 1                     | 132 | 27818335  | 7  |
| 172 | Artemisia<br>vulgaris   | Mugwort                 | Unassigned | Aero Plant           | Artemisia Art v 2                     | 162 | 148887203 | 9  |
| 173 | Artemisia<br>vulgaris   | Mugwort                 | Unassigned | Aero Plant           | Artemisia Art v 3                     | 37  | 73621307  | 7  |
| 174 | Artemisia<br>vulgaris   | Mugwort                 | Unassigned | Aero Plant           | Artemisia Art v 3                     | 114 | 189544578 | 11 |
| 175 | Artemisia<br>vulgaris   | Mugwort                 | Unassigned | Aero Plant           | Artemisia Art v 3                     | 116 | 189544584 | 11 |
| 176 | Artemisia<br>vulgaris   | Mugwort                 | Unassigned | Aero Plant           | Artemisia Art v 3                     | 117 | 189544590 | 11 |
| 177 | Artemisia<br>vulgaris   | Mugwort                 | Unassigned | Aero Plant           | Artemisia Art v 3                     | 117 | 189544595 | 11 |
| 178 | Artemisia<br>vulgaris   | Mugwort                 | Unassigned | Aero Plant           | Artemisia Art v 4                     | 133 | 73621415  | 7  |
| 179 | Artemisia<br>vulgaris   | Mugwort                 | Unassigned | Aero Plant           | Artemisia Art v 4                     | 133 | 73621416  | 7  |
| 180 | Ascaris<br>lumbricoides | Parasitic<br>roundworm  | Unassigned | Worm<br>(parasite)   | Ascaris Asc s 1                       | 134 | 2735096   | 7  |
| 181 | Ascaris<br>lumbricoides | Parasitic<br>roundworm  | Unassigned | Worm<br>(parasite)   | Ascaris Asc s 1                       | 134 | 2735098   | 7  |
| 182 | Ascaris<br>lumbricoides | Parasitic<br>roundworm  | Unassigned | Worm<br>(parasite)   | Ascaris Asc s 1                       | 133 | 2735102   | 7  |
| 183 | Ascaris<br>lumbricoides | Parasitic<br>roundworm  | Unassigned | Worm<br>(parasite)   | Ascaris Asc s 1                       | 133 | 2735106   | 7  |
| 184 | Ascaris<br>lumbricoides | Parasitic<br>roundworm  | Unassigned | Worm<br>(parasite)   | Ascaris Asc s 1                       | 267 | 2735108   | 7  |
| 185 | Ascaris<br>lumbricoides | Parasitic<br>roundworm  | Unassigned | Worm<br>(parasite)   | Ascaris Asc s 1                       | 267 | 2735110   | 7  |

|     |                             |                     |            |                 |                             |      |           |    |
|-----|-----------------------------|---------------------|------------|-----------------|-----------------------------|------|-----------|----|
| 186 | Ascaris lumbricoides        | Parasitic roundworm | Unassigned | Worm (parasite) | Ascaris Asc s 1             | 267  | 2735112   | 7  |
| 187 | Ascaris lumbricoides        | Parasitic roundworm | Unassigned | Worm (parasite) | Ascaris Asc s 1             | 134  | 2735114   | 7  |
| 188 | Ascaris lumbricoides        | Parasitic roundworm | Unassigned | Worm (parasite) | Ascaris Asc s 1             | 134  | 2735118   | 7  |
| 189 | Ascaris lumbricoides        | Parasitic roundworm | Unassigned | Worm (parasite) | Ascaris Asc s 1             | 134  | 2735100   | 7  |
| 190 | Ascaris lumbricoides        | Parasitic roundworm | Unassigned | Worm (parasite) | Ascaris Asc s 1             | 133  | 2735104   | 11 |
| 191 | Ascaris suum                | Parasitic roundworm | Asc s 1    | Worm (parasite) | Ascaris Asc s 1             | 68   | 299550    | 7  |
| 192 | Ascaris suum                | Parasitic roundworm | Asc s 1    | Worm (parasite) | Ascaris Asc s 1             | 1365 | 77416849  | 7  |
| 193 | Ascaris suum                | Parasitic roundworm | Unassigned | Worm (parasite) | Ascaris Asc s 1             | 134  | 343197079 | 12 |
| 194 | Ascaris lumbricoides        | Parasitic roundworm | Unassigned | Worm (parasite) | Ascaris tropomyosin         | 287  | 224016002 | 10 |
| 195 | Aspergillus oryzae          | Fungus              | Asp o 21   | Aero Fungi      | Aspergillus Alpha-amylase A | 499  | 94706935  | 7  |
| 196 | Aspergillus fumigatus       | Fungus              | Asp f 1    | Aero Fungi      | Aspergillus Asp f 1         | 125  | 3021324   | 7  |
| 197 | Aspergillus fumigatus       | Fungus              | Asp f 1    | Aero Fungi      | Aspergillus Asp f 1         | 150  | 9280360   | 7  |
| 198 | Aspergillus fumigatus       | Fungus              | Unassigned | Aero Fungi      | Aspergillus Asp f 1         | 176  | 54039254  | 7  |
| 199 | Aspergillus fumigatus       | Fungus              | Asp f 10   | Aero Fungi      | Aspergillus Asp f 10        | 395  | 963013    | 7  |
| 200 | Aspergillus fumigatus       | Fungus              | Asp f 11   | Aero Fungi      | Aspergillus Asp f 11        | 178  | 5019414   | 7  |
| 201 | Aspergillus fumigatus       | Fungus              | Asp f 12   | Aero Fungi      | Aspergillus Asp f 12        | 706  | 83303658  | 7  |
| 202 | Aspergillus fumigatus       | Fungus              | Asp f 2    | Aero Fungi      | Aspergillus Asp f 2         | 250  | 664852    | 7  |
| 203 | Aspergillus fumigatus       | Fungus              | Asp f 2    | Aero Fungi      | Aspergillus Asp f 2         | 310  | 83300352  | 7  |
| 204 | Aspergillus fumigatus Af293 | Fungus              | Unassigned | Aero Fungi      | Aspergillus Asp f 2         | 304  | 66849502  | 7  |
| 205 | Aspergillus fumigatus       | Fungus              | Asp f 22   | Aero Fungi      | Aspergillus Asp f 22        | 438  | 13925873  | 7  |
| 206 | Aspergillus fumigatus       | Fungus              | Unassigned | Aero Fungi      | Aspergillus Asp f 22        | 438  | 83288046  | 7  |
| 207 | Aspergillus fumigatus       | Fungus              | Asp f 3    | Aero Fungi      | Aspergillus Asp f 3         | 168  | 2769700   | 7  |
| 208 | Aspergillus fumigatus Af293 | Fungus              | Unassigned | Aero Fungi      | Aspergillus Asp f 3         | 168  | 66845476  | 8  |

|     |                                |        |            |                    |  |     |          |   |
|-----|--------------------------------|--------|------------|--------------------|--|-----|----------|---|
| 209 | Aspergillus<br>fumigatus       | Fungus | Asp f 4    | Aero Fungi         | Aspergillus Asp f 4                        | 286 | 3005839  | 7 |
| 210 | Aspergillus<br>fumigatus       | Fungus | Unassigned | Aero Fungi         | Aspergillus Asp f 4                        | 322 | 83300369 | 7 |
| 211 | Aspergillus<br>fumigatus Af293 | Fungus | Unassigned | Aero Fungi         | Aspergillus Asp f 4                        | 322 | 66847146 | 8 |
| 212 | Aspergillus<br>fumigatus       | Fungus | Asp f 6    | Aero Fungi         | Aspergillus Asp f 6                        | 221 | 1648970  | 7 |
| 213 | Aspergillus<br>fumigatus       | Fungus | Unassigned | Aero Fungi         | Aspergillus Asp f 6                        | 210 | 83305645 | 7 |
| 214 | Aspergillus<br>fumigatus       | Fungus | Asp f 7    | Aero Fungi         | Aspergillus Asp f 7                        | 270 | 83300389 | 7 |
| 215 | Aspergillus<br>fumigatus       | Fungus | Asp f 8    | Aero Fungi         | Aspergillus Asp f 8                        | 111 | 6686524  | 7 |
| 216 | Aspergillus<br>fumigatus       | Fungus | Unassigned | Aero Fungi         | Aspergillus Asp f 8                        | 111 | 83305635 | 7 |
| 217 | Aspergillus<br>fumigatus       | Fungus | Unassigned | Aero Fungi         | Aspergillus Asp f 9                        | 395 | 85540942 | 7 |
| 218 | Aspergillus<br>niger           | Fungus | Asp n 14   | Aero Fungi         | Aspergillus Asp n<br>14                    | 804 | 2181180  | 7 |
| 219 | Aspergillus<br>niger           | Fungus | Asp n 14   | Aero Fungi         | Aspergillus Asp n<br>14                    | 804 | 4235093  | 7 |
| 220 | Aspergillus<br>flavus          | Fungus | Unassigned | Aero Fungi         | Aspergillus Oryzin<br>Asp o 13, fl 13      | 403 | 74665726 | 7 |
| 221 | Aspergillus<br>oryzae          | Fungus | Asp o 13   | Aero Fungi         | Aspergillus Oryzin<br>Asp o 13, fl 13      | 403 | 129235   | 7 |
| 222 | Aspergillus<br>fumigatus       | Fungus | Unassigned | Aero Fungi         | Aspergillus<br>Ribosomal protein<br>L3     | 392 | 21215170 | 7 |
| 223 | Aspergillus<br>fumigatus       | Fungus | Unassigned | Aero Fungi         | Aspergillus<br>Ribosomal protein<br>L3     | 392 | 83305621 | 7 |
| 224 | Aspergillus<br>fumigatus       | Fungus | Unassigned | Aero Fungi         | Aspergillus<br>Vacuolar Serine<br>protease | 495 | 2143220  | 7 |
| 225 | Aspergillus<br>niger           | Fungus | Unassigned | Aero Fungi         | Aspergillus<br>Vacuolar Serine<br>protease | 533 | 289172   | 7 |
| 226 | Bacillus sp.                   |        | Unassigned | Bacteria<br>airway | Bacillus lentus<br>Esperase                | 361 | 1225905  | 9 |
| 227 | Bacillus lentus                |        | Unassigned | Bacteria<br>airway | Bacillus lentus<br>subtilisin              | 269 | 267048   | 9 |
| 228 | Bacillus<br>licheniformis      |        | Unassigned | Bacteria<br>airway | Bacillus<br>licheniformis<br>subtlilisin   | 379 | 135016   | 9 |
| 229 | Bacillus<br>licheniformis      |        | Unassigned | Bacteria<br>airway | Bacillus<br>licheniformis<br>subtlilisin   | 374 | 11127680 | 9 |

|     |                      |                       |              |             |                           |     |           |    |
|-----|----------------------|-----------------------|--------------|-------------|---------------------------|-----|-----------|----|
| 230 | Balanus rostratus    |                       | Unassigned   | Food Animal | Balanus r tropomyosin     | 284 | 125659386 | 9  |
| 231 | Batillus cornutus    | Japanese turban shell | Unassigned   | Food Animal | Batillus Tur c1           | 20  | 47117350  | 7  |
| 232 | Batillus cornutus    | Japanese turban shell | Unassigned   | Food Animal | Batillus Tur c1           | 27  | 47117351  | 7  |
| 233 | Batillus cornutus    | Japanese turban shell | Unassigned   | Food Animal | Batillus Tur c1           | 284 | 219806588 | 10 |
| 234 | Bertholletia excelsa | Brazil nut            | Ber e 2      | Food Plant  | Bertholletia 11S globulin | 465 | 30313867  | 7  |
| 235 | Bertholletia excelsa | Brazil nut            | Unassigned   | Food Plant  | Bertholletia Ber e 1      | 154 | 17713     | 7  |
| 236 | Bertholletia excelsa | Brazil nut            | Ber e 1      | Food Plant  | Bertholletia Ber e 1      | 146 | 112754    | 7  |
| 237 | Betula pendula       | European white birch  | Bet v 2      | Aero Plant  | Bet v 2                   | 133 | 130975    | 7  |
| 238 | Betula pendula       | European white birch  | Unassigned   | Aero Plant  | Bet v 2                   | 133 | 157830684 | 9  |
| 239 | Betula pendula       | European white birch  | Bet v 1      | Aero Plant  | Betula Bet v 1            | 51  | 320545    | 7  |
| 240 | Betula pendula       | European white birch  | Bet v 1      | Aero Plant  | Betula Bet v 1            | 160 | 534898    | 7  |
| 241 | Betula pendula       | European white birch  | Bet v 1      | Aero Plant  | Betula Bet v 1            | 159 | 534900    | 7  |
| 242 | Betula pendula       | European white birch  | Bet v 1      | Aero Plant  | Betula Bet v 1            | 160 | 534910    | 7  |
| 243 | Betula pendula       | European white birch  | Bet v 1.0301 | Aero Plant  | Betula Bet v 1            | 160 | 1168702   | 7  |
| 244 | Betula pendula       | European white birch  | Bet v 1.1001 | Aero Plant  | Betula Bet v 1            | 160 | 1168709   | 7  |
| 245 | Betula pendula       | European white birch  | Bet v 1.1601 | Aero Plant  | Betula Bet v 1            | 160 | 1321714   | 7  |
| 246 | Betula pendula       | European white birch  | Bet v 1.1701 | Aero Plant  | Betula Bet v 1            | 160 | 1321716   | 7  |
| 247 | Betula pendula       | European white birch  | Bet v 1.1801 | Aero Plant  | Betula Bet v 1            | 160 | 1321718   | 7  |
| 248 | Betula pendula       | European white birch  | Bet v 1.1502 | Aero Plant  | Betula Bet v 1            | 160 | 1321720   | 7  |
| 249 | Betula pendula       | European white birch  | Bet v 1.1901 | Aero Plant  | Betula Bet v 1            | 160 | 1321722   | 7  |
| 250 | Betula pendula       | European white birch  | Bet v 1.2001 | Aero Plant  | Betula Bet v 1            | 160 | 1321724   | 7  |
| 251 | Betula pendula       | European white birch  | Bet v 1.2101 | Aero Plant  | Betula Bet v 1            | 160 | 1321726   | 7  |
| 252 | Betula pendula       | European white birch  | Bet v 1.2201 | Aero Plant  | Betula Bet v 1            | 160 | 1321728   | 7  |

|     |                |             |            |            |                |     |         |   |
|-----|----------------|-------------|------------|------------|----------------|-----|---------|---|
| 253 | Betula pendula | European    | Bet v 1    | Aero Plant | Betula Bet v 1 | 160 | 1168703 | 7 |
|     |                | white birch |            |            |                |     |         |   |
| 254 | Betula pendula | European    | Bet v      | Aero Plant | Betula Bet v 1 | 160 | 1168704 | 7 |
|     |                | white birch | 1.0501     |            |                |     |         |   |
| 255 | Betula pendula | European    | Bet v 1f/I | Aero Plant | Betula Bet v 1 | 160 | 1168705 | 7 |
|     |                | white birch |            |            |                |     |         |   |
| 256 | Betula pendula | European    | Bet v      | Aero Plant | Betula Bet v 1 | 160 | 1168707 | 7 |
|     |                | white birch | 1.0801     |            |                |     |         |   |
| 257 | Betula pendula | European    | Bet v      | Aero Plant | Betula Bet v 1 | 160 | 1168708 | 7 |
|     |                | white birch | 1.0901     |            |                |     |         |   |
| 258 | Betula pendula | European    | Bet v 1m/n | Aero Plant | Betula Bet v 1 | 160 | 1168710 | 7 |
|     |                | white birch |            |            |                |     |         |   |
| 259 | Betula pendula | European    | Bet v      | Aero Plant | Betula Bet v 1 | 160 | 1168701 | 7 |
|     |                | white birch | 1.0201     |            |                |     |         |   |
| 260 | Betula pendula | European    | Bet v      | Aero Plant | Betula Bet v 1 | 160 | 1542861 | 7 |
|     |                | white birch | 1.2401     |            |                |     |         |   |
| 261 | Betula pendula | European    | Bet v      | Aero Plant | Betula Bet v 1 | 160 | 1542863 | 7 |
|     |                | white birch | 1.2501     |            |                |     |         |   |
| 262 | Betula pendula | European    | Bet v      | Aero Plant | Betula Bet v 1 | 160 | 1542865 | 7 |
|     |                | white birch | 1.2601     |            |                |     |         |   |
| 263 | Betula pendula | European    | Bet v      | Aero Plant | Betula Bet v 1 | 160 | 1542867 | 7 |
|     |                | white birch | 1.2701     |            |                |     |         |   |
| 264 | Betula pendula | European    | Bet v      | Aero Plant | Betula Bet v 1 | 160 | 1542869 | 7 |
|     |                | white birch | 1.2801     |            |                |     |         |   |
| 265 | Betula pendula | European    | Bet v      | Aero Plant | Betula Bet v 1 | 160 | 1542871 | 7 |
|     |                | white birch | 1.2901     |            |                |     |         |   |
| 266 | Betula pendula | European    | Bet v      | Aero Plant | Betula Bet v 1 | 160 | 1542873 | 7 |
|     |                | white birch | 1.3001     |            |                |     |         |   |
| 267 | Betula pendula | European    | Bet v      | Aero Plant | Betula Bet v 1 | 160 | 2414158 | 7 |
|     |                | white birch | 1.2301     |            |                |     |         |   |
| 268 | Betula pendula | European    | Bet v 1    | Aero Plant | Betula Bet v 1 | 160 | 2564220 | 7 |
|     |                | white birch |            |            |                |     |         |   |
| 269 | Betula pendula | European    | Bet v 1    | Aero Plant | Betula Bet v 1 | 160 | 2564222 | 7 |
|     |                | white birch |            |            |                |     |         |   |
| 270 | Betula pendula | European    | Bet v 1    | Aero Plant | Betula Bet v 1 | 160 | 2564224 | 7 |
|     |                | white birch |            |            |                |     |         |   |
| 271 | Betula pendula | European    | Bet v 1    | Aero Plant | Betula Bet v 1 | 160 | 2564228 | 7 |
|     |                | white birch |            |            |                |     |         |   |
| 272 | Betula pendula | European    | Bet v 1    | Aero Plant | Betula Bet v 1 | 160 | 4006928 | 7 |
|     |                | white birch |            |            |                |     |         |   |
| 273 | Betula pendula | European    | Bet v 1    | Aero Plant | Betula Bet v 1 | 160 | 4006945 | 7 |
|     |                | white birch |            |            |                |     |         |   |
| 274 | Betula pendula | European    | Bet v 1    | Aero Plant | Betula Bet v 1 | 160 | 4006953 | 7 |
|     |                | white birch |            |            |                |     |         |   |
| 275 | Betula pendula | European    | Bet v 1    | Aero Plant | Betula Bet v 1 | 160 | 4006955 | 7 |
|     |                | white birch |            |            |                |     |         |   |

|     |                       |                         |                 |            |                |     |           |   |
|-----|-----------------------|-------------------------|-----------------|------------|----------------|-----|-----------|---|
| 276 | Betula pendula        | European<br>white birch | Bet v 1         | Aero Plant | Betula Bet v 1 | 160 | 4006957   | 7 |
| 277 | Betula pendula        | European<br>white birch | Bet v 1         | Aero Plant | Betula Bet v 1 | 160 | 4006959   | 7 |
| 278 | Betula pendula        | European<br>white birch | Bet v 1         | Aero Plant | Betula Bet v 1 | 160 | 4006961   | 7 |
| 279 | Betula pendula        | European<br>white birch | Bet v 1         | Aero Plant | Betula Bet v 1 | 160 | 4006965   | 7 |
| 280 | Betula pendula        | European<br>white birch | Bet v 1         | Aero Plant | Betula Bet v 1 | 160 | 4006967   | 7 |
| 281 | Betula pendula        | European<br>white birch | Bet v 1         | Aero Plant | Betula Bet v 1 | 159 | 4376216   | 7 |
| 282 | Betula pendula        | European<br>white birch | Bet v 1         | Aero Plant | Betula Bet v 1 | 159 | 4376219   | 7 |
| 283 | Betula pendula        | European<br>white birch | Bet v 1         | Aero Plant | Betula Bet v 1 | 159 | 4376220   | 7 |
| 284 | Betula pendula        | European<br>white birch | Bet v 1         | Aero Plant | Betula Bet v 1 | 159 | 4376221   | 7 |
| 285 | Betula pendula        | European<br>white birch | Bet v 1         | Aero Plant | Betula Bet v 1 | 159 | 4376222   | 7 |
| 286 | Betula pendula        | European<br>white birch | Bet v 1 b1      | Aero Plant | Betula Bet v 1 | 160 | 4590392   | 7 |
| 287 | Betula pendula        | European<br>white birch | Bet v 1 b2      | Aero Plant | Betula Bet v 1 | 160 | 4590394   | 7 |
| 288 | Betula pendula        | European<br>white birch | Bet v 1 b3      | Aero Plant | Betula Bet v 1 | 160 | 4590396   | 7 |
| 289 | Betula pendula        | European<br>white birch | Bet v<br>1.0701 | Aero Plant | Betula Bet v 1 | 160 | 1168706   | 7 |
| 290 | Betula pendula        | European<br>white birch | Bet v 1         | Aero Plant | Betula Bet v 1 | 159 | 11514622  | 7 |
| 291 | Betula pendula        | European<br>white birch | Bet v 1x        | Aero Plant | Betula Bet v 1 | 21  | 30908931  | 7 |
| 292 | Betula pendula        | European<br>white birch | Bet v 1         | Aero Plant | Betula Bet v 1 | 159 | 38492423  | 7 |
| 293 | Betula pendula        | European<br>white birch | Unassigned      | Aero Plant | Betula Bet v 1 | 43  | 239734    | 7 |
| 294 | Betula pendula        | European<br>white birch | Unassigned      | Aero Plant | Betula Bet v 1 | 120 | 4006963   | 7 |
| 295 | Betula pendula        | European<br>white birch | Unassigned      | Aero Plant | Betula Bet v 1 | 120 | 4006947   | 7 |
| 296 | Betula pendula        | European<br>white birch | Bet v 1         | Aero Plant | Betula Bet v 1 | 160 | 114922    | 8 |
| 297 | Betula pendula        | European<br>white birch | Bet v 1         | Aero Plant | Betula Bet v 1 | 159 | 159162097 | 9 |
| 298 | Betula<br>platyphylla | Japanese<br>white birch | Unassigned      | Aero Plant | Betula Bet v 1 | 160 | 12583681  | 7 |

|     |                         |                          |                  |                 |                   |     |           |    |
|-----|-------------------------|--------------------------|------------------|-----------------|-------------------|-----|-----------|----|
| 299 | Betula<br> platyphylla  | Japanese<br> white birch | Unassigned       | Aero Plant      | Betula Bet v 1    | 160 | 12583683  | 7  |
| 300 | Betula<br> platyphylla  | Japanese<br> white birch | Unassigned       | Aero Plant      | Betula Bet v 1    | 160 | 12583685  | 7  |
| 301 | Betula sp.              | Birch                    | Unassigned       | Aero Plant      | Betula Bet v 1    | 51  | 298736    | 7  |
| 302 | Betula pendula          | European<br> white birch | Unassigned       | Aero Plant      | Betula Bet v 1b   | 51  | 320546    | 7  |
| 303 | Betula sp.              | Birch                    | Unassigned       | Aero Plant      | Betula Bet v 1b   | 51  | 298737    | 7  |
| 304 | Betula pendula          | European<br> white birch | Bet v 3          | Aero Plant      | Betula Bet v 3    | 205 | 1168696   | 7  |
| 305 | Betula pendula          | European<br> white birch | Bet v 4          | Aero Plant      | Betula Bet v 4    | 85  | 14423850  | 7  |
| 306 | Betula pendula          | European<br> white birch | Bet v<br> 6.0102 | Aero Plant      | Betula Bet v 6    | 308 | 10764491  | 7  |
| 307 | Betula pendula          | European<br> white birch | Bet v 7          | Aero Plant      | Betula Bet v 7    | 173 | 21886603  | 7  |
| 308 | Blattella<br> germanica | German<br> cockroach     | Bla g 1.02       | Aero<br> Insect | Blattella Bla g 1 | 492 | 4240395   | 7  |
| 309 | Blattella<br> germanica | German<br> cockroach     | Bla g<br> 1.0101 | Aero<br> Insect | Blattella Bla g 1 | 412 | 4572592   | 7  |
| 310 | Blattella<br> germanica | German<br> cockroach     | Bla g 2          | Aero<br> Insect | Blattella Bla g 2 | 352 | 1703445   | 7  |
| 311 | Blattella<br> germanica | German<br> cockroach     | Unassigned       | Aero<br> Insect | Blattella Bla g 2 | 330 | 62738637  | 7  |
| 312 | Blattella<br> germanica | German<br> cockroach     | Unassigned       | Aero<br> Insect | Blattella Bla g 2 | 352 | 145105726 | 9  |
| 313 | Blattella<br> germanica | German<br> cockroach     | Unassigned       | Aero<br> Insect | Blattella Bla g 2 | 334 | 315113421 | 12 |
| 314 | Blattella<br> germanica | German<br> cockroach     | Bla g 4          | Aero<br> Insect | Blattella Bla g 4 | 182 | 1166573   | 7  |
| 315 | Blattella<br> germanica | German<br> cockroach     | Unassigned       | Aero<br> Insect | Blattella Bla g 4 | 182 | 144952778 | 9  |
| 316 | Blattella<br> germanica | German<br> cockroach     | Unassigned       | Aero<br> Insect | Blattella Bla g 4 | 181 | 212675308 | 10 |
| 317 | Blattella<br> germanica | German<br> cockroach     | Unassigned       | Aero<br> Insect | Blattella Bla g 4 | 191 | 194350815 | 11 |
| 318 | Blattella<br> germanica | German<br> cockroach     | Unassigned       | Aero<br> Insect | Blattella Bla g 4 | 190 | 194350817 | 11 |
| 319 | Blattella<br> germanica | German<br> cockroach     | Unassigned       | Aero<br> Insect | Blattella Bla g 5 | 204 | 6225491   | 7  |
| 320 | Blattella<br> germanica | German<br> cockroach     | Unassigned       | Aero<br> Insect | Blattella Bla g 5 | 200 | 144952780 | 9  |
| 321 | Blattella<br> germanica | German<br> cockroach     | Unassigned       | Unassigned      | Blattella Bla g 6 | 151 | 82704032  | 8  |
| 322 | Blattella               | German                   | Unassigned       | Unassigned      | Blattella Bla g 6 | 151 | 82704034  | 8  |

|     |                        |                     |            |                |                              |     |           |    |
|-----|------------------------|---------------------|------------|----------------|------------------------------|-----|-----------|----|
|     | germanica              | cockroach           |            |                |                              |     |           |    |
| 323 | Blattella<br>germanica | German<br>cockroach | Unassigned | Unassigned     | Blattella Bla g 6            | 154 | 82704036  | 8  |
| 324 | Blattella<br>germanica | German<br>cockroach | Unassigned | Aero<br>Insect | Blattella delta GST          | 216 | 161137518 | 11 |
| 325 | Blattella<br>germanica | German<br>cockroach | Unassigned | Aero<br>Insect | Blattella<br>tropomyosin     | 284 | 8101069   | 7  |
| 326 | Blattella<br>germanica | German<br>cockroach | Unassigned | Aero<br>Insect | Blattella uncertain          | 20  | 544618    | 7  |
| 327 | Blattella<br>germanica | German<br>cockroach | Unassigned | Aero<br>Insect | Blattella uncertain          | 25  | 544619    | 7  |
| 328 | Blomia<br>tropicalis   | Mite                | Blo t 1    | Aero Mite      | Blomia Blo t 1.01            | 221 | 14276828  | 7  |
| 329 | Blomia<br>tropicalis   | Mite                | Unassigned | Aero Mite      | Blomia Blo t 1.02            | 333 | 33667928  | 8  |
| 330 | Blomia<br>tropicalis   | Mite                | Unassigned | Aero Mite      | Blomia Blo t 1.02            | 333 | 2         | 8  |
| 331 | Blomia<br>tropicalis   | Mite                | Unassigned | Aero Mite      | Blomia Blo t 10              | 284 | 156938889 | 9  |
| 332 | Blomia<br>tropicalis   | Mite                | Blo t 11   | Aero Mite      | Blomia Blo t 11              | 875 | 21954740  | 7  |
| 333 | Blomia<br>tropicalis   | Mite                | Unassigned | Aero Mite      | Blomia Blo t 13.01           | 130 | 37958153  | 8  |
| 334 | Blomia<br>tropicalis   | Mite                | Unassigned | Aero Mite      | Blomia Blo t 13.01           | 130 | 14423698  | 9  |
| 335 | Blomia<br>tropicalis   | Mite                | Unassigned | Aero Mite      | Blomia Blo t 21<br>tentative | 129 | 111120432 | 8  |
| 336 | Blomia<br>tropicalis   | Mite                | Unassigned | Aero Mite      | Blomia Blo t 21<br>tentative | 129 | 111494253 | 8  |
| 337 | Blomia<br>tropicalis   | Mite                | Unassigned | Aero Mite      | Blomia Blo t 21<br>tentative | 129 | 111120424 | 8  |
| 338 | Blomia<br>tropicalis   | Mite                | Unassigned | Aero Mite      | Blomia Blo t 21<br>tentative | 129 | 111120428 | 8  |
| 339 | Blomia<br>tropicalis   | Mite                | Unassigned | Aero Mite      | Blomia Blo t 21<br>tentative | 129 | 111120420 | 8  |
| 340 | Blomia<br>tropicalis   | Mite                | Unassigned | Aero Mite      | Blomia Blo t 3               | 266 | 25989482  | 7  |
| 341 | Blomia<br>tropicalis   | Mite                | Unassigned | Aero Mite      | Blomia Blo t 3               | 266 | 33667930  | 8  |
| 342 | Blomia<br>tropicalis   | Mite                | Blo t 5    | Aero Mite      | Blomia Blo t 5               | 134 | 4204917   | 7  |
| 343 | Blomia<br>tropicalis   | Mite                | Unassigned | Aero Mite      | Blomia Blo t 5               | 134 | 111120436 | 9  |
| 344 | Blomia<br>tropicalis   | Mite                | Unassigned | Aero Mite      | Blomia Blo t 5               | 134 | 111120450 | 9  |
| 345 | Blomia                 | Mite                | Unassigned | Aero Mite      | Blomia Blo t 5               | 119 | 160285626 | 9  |



|     |                       |           |            |                   |                              |     |           |    |
|-----|-----------------------|-----------|------------|-------------------|------------------------------|-----|-----------|----|
|     | tropicalis            |           |            |                   |                              |     |           |    |
| 346 | Bombus pennsylvanicus | Bumblebee | Unassigned | Venom or Salivary | Bombus Bom p 1 phospholipase | 136 | 47117013  | 12 |
| 347 | Bombus pennsylvanicus | Bumblebee | Unassigned | Venom or Salivary | Bombus Bom p 4 protease      | 243 | 75009997  | 12 |
| 348 | Bombus terrestris     | Bumblebee | Unassigned | Venom or Salivary | Bombus Bom t 1               | 136 | 14423832  | 7  |
| 349 | Bombus terrestris     | Bumblebee | Unassigned | Venom or Salivary | Bombus Bom t 4 protease      | 20  | 313471465 | 12 |
| 350 | Bombyx mori           | Silkworm  | Unassigned | Food insect       | Bombyx arginine kinase       | 355 | 204324083 | 10 |
| 351 | Bos taurus            | Bovine    | Unassigned | Food Animal       | Bos Alpha-s1 casein          | 93  | 162650    | 7  |
| 352 | Bos taurus            | Bovine    | Unassigned | Food Animal       | Bos Alpha-s1 casein          | 214 | 162792    | 7  |
| 353 | Bos taurus            | Bovine    | Unassigned | Food Animal       | Bos Alpha-s1 casein          | 214 | 162794    | 7  |
| 354 | Bos taurus            | Bovine    | Unassigned | Food Animal       | Bos Alpha-s1 casein          | 76  | 162927    | 7  |
| 355 | Bos taurus            | Bovine    | Unassigned | Food Animal       | Bos Alpha-s1 casein          | 205 | 159793197 | 9  |
| 356 | Bos taurus            | Bovine    | Unassigned | Food Animal       | Bos Alpha-s1 casein          | 172 | 159793201 | 9  |
| 357 | Bos taurus            | Bovine    | Unassigned | Food Animal       | Bos Alpha-s1 casein          | 129 | 159793217 | 9  |
| 358 | Bos taurus            | Bovine    | Unassigned | Food Animal       | Bos Alpha-s2-like casein     | 222 | 162929    | 7  |
| 359 | Bos taurus            | Bovine    | Unassigned | Food Animal       | Bos Beta-casein              | 224 | 162797    | 7  |
| 360 | Bos taurus            | Bovine    | Unassigned | Food Animal       | Bos Beta-casein              | 224 | 162805    | 7  |
| 361 | Bos taurus            | Bovine    | Unassigned | Food Animal       | Bos Beta-casein              | 224 | 162931    | 7  |
| 362 | Bos taurus            | Bovine    | Unassigned | Food Animal       | Bos Beta-casein              | 224 | 459292    | 7  |
| 363 | Bos taurus            | Bovine    | Unassigned | Aero Animal       | Bos Bos d 2                  | 172 | 2497701   | 9  |
| 364 | Bos taurus            | Bovine    | Bos d 3    | Aero Animal       | Bos Bos d 3                  | 101 | 2493414   | 7  |
| 365 | Bos taurus            | Bovine    | Bos d 4    | Food Animal       | Bos Bos d 4                  | 142 | 295774    | 7  |
| 366 | Bos taurus            | Bovine    | Unassigned | Food Animal       | Bos Bos d 4                  | 142 | 125996    | 9  |
| 367 | Bos taurus            | Bovine    | Bos d 5    | Food Animal       | Bos Bos d 5                  | 178 | 520       | 7  |
| 368 | Bos taurus            | Bovine    | Unassigned | Food              | Bos Bos d 5                  | 14  | 162750    | 7  |

|     |                              |         |            |                |   |      |           |    |
|-----|------------------------------|---------|------------|----------------|---|------|-----------|----|
|     |                              |         |            | Animal         |   |      |           |    |
| 369 | Bos taurus                   | Bovine  | Unassigned | Food<br>Animal | Bos Bos d 5                                   | 178  | 125910    | 9  |
| 370 | Bos taurus                   | Bovine  | Unassigned | Food<br>Animal | Bos Bos d 5                                   | 178  | 195957138 | 10 |
| 371 | Bos taurus                   | Bovine  | Unassigned | Food<br>Animal | Bos Bos d 6                                   | 607  | 3336842   | 7  |
| 372 | Bos taurus                   | Bovine  | Unassigned | Food<br>Animal | Bos Bos d 6                                   | 607  | 1351907   | 10 |
| 373 | Bos taurus                   | Bovine  | Unassigned | Vaccine        | Bos collagen alpha2                           | 1364 | 27806257  | 11 |
| 374 | Bos taurus                   | Bovine  | Unassigned | Food<br>Animal | Bos Kappa-casein                              | 190  | 162811    | 7  |
| 375 | Bos taurus                   | Bovine  | Unassigned | Food<br>Animal | Bos<br>lactotransferrin                       | 708  | 30794292  | 8  |
| 376 | Brassica napus               | Rape    | Bra n 1    | Food Plant     | Bra n 1                                       | 125  | 75107016  | 9  |
| 377 | Brassica juncea              | Mustard | Bra j 1    | Food Plant     | Brassica Bra j 1 2S<br>albumin                | 129  | 32363444  | 9  |
| 378 | Brassica<br>oleracea         | Cabbage | Unassigned | Food Plant     | Brassica Bra o 3<br>LTP manual entry          | 20   | 1         | 8  |
| 379 | Brassica rapa<br>subsp. rapa | Turnip  | Unassigned | Contact        | Brassica Bra r 2                              | 91   | 32363456  | 9  |
| 380 | Brassica napus               | Rape    | Unassigned | Aero Plant     | Brassica Calcim<br>binding protein<br>Group I | 79   | 59800143  | 7  |
| 381 | Brassica rapa<br>subsp. rapa | Turnip  | Unassigned | Aero Plant     | Brassica Calcim<br>binding protein<br>Group I | 79   | 59800144  | 7  |
| 382 | Brassica napus               | Rape    | Unassigned | Food Plant     | Brassica napus 2S<br>albumin                  | 109  | 26985163  | 7  |
| 383 | Brassica napus               | Rape    | Unassigned | Aero Plant     | Brassica Polcalcic<br>Group II                | 83   | 2129801   | 7  |
| 384 | Brassica napus               | Rape    | Unassigned | Aero Plant     | Brassica Polcalcic<br>Group II                | 83   | 2129802   | 7  |
| 385 | Brassica napus               | Rape    | Unassigned | Aero Plant     | Brassica Polcalcic<br>Group II                | 83   | 59800145  | 7  |
| 386 | Brassica rapa                | Turnip  | Unassigned | Aero Plant     | Brassica Polcalcic<br>Group II                | 80   | 2129805   | 7  |
| 387 | Brassica rapa<br>subsp. rapa | Turnip  | Unassigned | Aero Plant     | Brassica Polcalcic<br>Group II                | 83   | 59800146  | 7  |
| 388 | Candida albicans             | Yeast   | Cand a 3   | Contact        | Candida Cand a 3                              | 236  | 37548637  | 7  |
| 389 | Candida albicans             | Yeast   | Unassigned | Contact        | Candida Enolase 1                             | 440  | 232054    | 7  |
| 390 | Canis familiaris             | Dog     | Can f 1    | Aero<br>Animal | Canis Can f 1                                 | 174  | 3121745   | 7  |
| 391 | Canis familiaris             | Dog     | Can f 2    | Aero<br>Animal | Canis Can f 2                                 | 180  | 3121746   | 7  |

|     |                              |            |            |                   |     |           |    |
|-----|------------------------------|------------|------------|-------------------|-----|-----------|----|
| 392 | Canis familiaris Dog         | Can f 2    | Aero       | Canis Can f 2     | 177 | 29292272  | 7  |
|     |                              |            | Animal     |                   |     |           |    |
| 393 | Canis familiaris Dog         | Can f 2    | Aero       | Canis Can f 2     | 179 | 29292274  | 7  |
|     |                              |            | Animal     |                   |     |           |    |
| 394 | Canis familiaris Dog         | Can f 3    | Aero       | Canis Can f 3     | 265 | 633938    | 7  |
|     |                              |            | Animal     |                   |     |           |    |
| 395 | Canis familiaris Dog         | Can f 3    | Aero       | Canis Can f 3     | 585 | 3319897   | 7  |
|     |                              |            | Animal     |                   |     |           |    |
| 396 | Canis familiaris Dog         | Can f 3    | Aero       | Canis Can f 3     | 608 | 6687188   | 7  |
|     |                              |            | Animal     |                   |     |           |    |
| 397 | Canis familiaris Dog         | Unassigned | Aero       | Canis Can f       | 174 | 262232390 | 12 |
|     |                              |            | Animal     | epithelial 18 kDa |     |           |    |
| 398 | Capsicum annuum  Bell pepper | Cap a 2    | Food Plant | Capsicum Cap a 2  | 131 | 16555785  | 7  |
| 399 | Carica papaya  Papaya        | Unassigned | Food Plant | Carica Car p 1    | 345 | 129614    | 9  |
| 400 | Carpinus betulus Hornbeam    | Car b 1    | Aero Plant | Carpinus Car b 1  | 159 | 402745    | 7  |
| 401 | Carpinus betulus Hornbeam    | Car b 1    | Aero Plant | Carpinus Car b 1  | 160 | 730048    | 7  |
| 402 | Carpinus betulus Hornbeam    | Car b 1    | Aero Plant | Carpinus Car b 1  | 160 | 730049    | 7  |
| 403 | Carpinus betulus Hornbeam    | Car b      | Aero Plant | Carpinus Car b 1  | 160 | 1545875   | 7  |
|     |                              | 1.0103     |            |                   |     |           |    |
| 404 | Carpinus betulus Hornbeam    | Car b      | Aero Plant | Carpinus Car b 1  | 160 | 1545877   | 7  |
|     |                              | 1.0104     |            |                   |     |           |    |
| 405 | Carpinus betulus Hornbeam    | Car b      | Aero Plant | Carpinus Car b 1  | 160 | 1545879   | 7  |
|     |                              | 1.0104     |            |                   |     |           |    |
| 406 | Carpinus betulus Hornbeam    | Car b      | Aero Plant | Carpinus Car b 1  | 160 | 1545887   | 7  |
|     |                              | 1.0105     |            |                   |     |           |    |
| 407 | Carpinus betulus Hornbeam    | Car b 1    | Aero Plant | Carpinus Car b 1  | 160 | 1545891   | 7  |
| 408 | Carpinus betulus Hornbeam    | Car b      | Aero Plant | Carpinus Car b 1  | 160 | 1545893   | 7  |
|     |                              | 1.0108     |            |                   |     |           |    |
| 409 | Carpinus betulus Hornbeam    | Car b      | Aero Plant | Carpinus Car b 1  | 161 | 1545895   | 7  |
|     |                              | 1.0301     |            |                   |     |           |    |
| 410 | Carpinus betulus Hornbeam    | Car b      | Aero Plant | Carpinus Car b 1  | 161 | 1545897   | 7  |
|     |                              | 1.0302     |            |                   |     |           |    |
| 411 | Carpinus betulus Hornbeam    | Unassigned | Aero Plant | Carpinus Car b 1  | 40  | 239735    | 7  |
| 412 | Carpinus betulus Hornbeam    | Unassigned | Aero Plant | Carpinus Car b 1  | 160 | 167472845 | 10 |
| 413 | Carpinus betulus Hornbeam    | Unassigned | Aero Plant | Carpinus Car b 1  | 160 | 167472837 | 10 |
| 414 | Carpinus betulus Hornbeam    | Unassigned | Aero Plant | Carpinus Car b 1  | 160 | 167472843 | 10 |
| 415 | Carpinus betulus Hornbeam    | Unassigned | Aero Plant | Carpinus Car b 1  | 160 | 167472841 | 10 |
| 416 | Carpinus betulus Hornbeam    | Unassigned | Aero Plant | Carpinus Car b 1  | 160 | 167472839 | 10 |
| 417 | Carpinus betulus Hornbeam    | Unassigned | Aero Plant | Carpinus Car b 1  | 80  | 1008578   | 12 |
| 418 | Carpinus betulus Hornbeam    | Unassigned | Aero Plant | Carpinus Car b 1  | 80  | 1008579   | 12 |
| 419 | Carpinus betulus Hornbeam    | Unassigned | Aero Plant | Carpinus Car b 1  | 80  | 1008580   | 12 |

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| 420 | Castanea sativa European Cas s 1 Aero Plant Castanea Cas s 1 160 16555781 7      |
|     | chestnut   |
| 421 | Castanea sativa European Unassigned Aero Plant Castanea Cas s 1 159 212291466 10 |
|     | chestnut   |
| 422 | Castanea sativa European Unassigned Aero Plant Castanea Cas s 1 159 212291464 10 |
|     | chestnut   |
| 423 | Castanea sativa European Unassigned Aero Plant Castanea Cas s 1 159 212291468 10 |
|     | chestnut   |
| 424 | Castanea sativa European Unassigned Aero Plant Castanea Cas s 5 298 307159110 12 |
|     | chestnut   |
| 425 | Castanea sativa European Cas s 5 Food Plant Castanea Cas s 5 316 1359600 7       |
|     | chestnut   |
| 426 | Cavia porcellus Domestic Cav p 1 Aero Cavia Cav p 1 15 32469617 7                |
|     | guinea pig Animal  |
| 427 | Cavia porcellus Domestic Unassigned Aero Cavia Cav p 2 170 325910590 12          |
|     | guinea pig Animal  |
| 428 | Cavia porcellus Domestic Unassigned Aero Cavia Cav p 3 170 325910592 12          |
|     | guinea pig Animal lipocalin  |
| 429 | Chamaecyparis Japanese Unassigned Aero Plant Chamaecyparis Cha o 375 9087163 9   |
|     | lobtusa cypress 1  |
| 430 | Chamaecyparis Japanese Unassigned Aero Plant Chamaecyparis Cha o 514 47606004 7  |
|     | lobtusa cypress 2  |
| 431 | Chamaecyparis Japanese Unassigned Aero Plant Chamaecyparis Cha o 419 114841683 8 |
|     | lobtusa cypress 2  |
| 432 | Charybdis Crab Cha f 1 Food Charybdis Cha f 1 264 14285800 9                     |
|     | feriatus Animal  |
| 433 | Chenopodium Pigweed Unassigned Aero Plant Chenopodium Che a 1 168 47605504 9     |
|     | album  |
| 434 | Chenopodium Pigweed Che a 2 Aero Plant Chenopodium Che a 2 131 29465666 7        |
|     | album  |
| 435 | Chenopodium Pigweed Unassigned Aero Plant Chenopodium Che a 2 133 238886048 11   |
|     | album  |
| 436 | Chenopodium Pigweed Che a 3 Aero Plant Chenopodium Che a 3 86 29465668 7         |
|     | album  |
| 437 | Chionoecetes Snow Crab Unassigned Food Chionoecetes 284 308191588 12             |
|     | lopilio Animal tropomyosin   |
| 438 | Chironomus Midge Unassigned Aero Chironomus Chi k 10 285 42559556 9              |
|     | kiiensis Insect  |
| 439 | Chironomus Midge Chi t 1.01 Aero Chironomus Chi t 1 151 121219 7                 |
|     | thummi thummi Insect   |
| 440 | Chironomus Midge Chi t 1.02 Aero Chironomus Chi t 1 151 121227 7                 |
|     | thummi thummi Insect   |
| 441 | Chironomus Midge Chi t 2 Aero Chironomus Chi t 2 158 2506460 7                   |
|     | thummi thummi Insect   |
| 442 | Chironomus Midge Chi t 3 Aero Chironomus Chi t 3 160 1707908 7                   |
|     | thummi thummi Insect   |

|     |                              |              |            |                 |  |     |           |    |  |
|-----|------------------------------|--------------|------------|-----------------|--|-----|-----------|----|--|
| 443 | Chironomus<br> thummi thummi | Midge        | Chi t 4    | Aero<br> Insect | Chironomus Chi t 4   | 151 | 121256    | 7  |  |
| 444 | Chironomus<br> thummi thummi | Midge        | Chi t 5    | Aero<br> Insect | Chironomus Chi t 5   | 162 | 2506461   | 7  |  |
| 445 | Chironomus<br> thummi thummi | Midge        | Chi t 7    | Aero<br> Insect | Chironomus Chi t 7   | 161 | 56405052  | 7  |  |
| 446 | Chironomus<br> thummi thummi | Midge        | Chi t 7    | Aero<br> Insect | Chironomus Chi t 7   | 161 | 121244    | 7  |  |
| 447 | Chironomus<br> thummi thummi | Midge        | Chi t 7    | Aero<br> Insect | Chironomus Chi t 7   | 161 | 56405054  | 7  |  |
| 448 | Chironomus<br> thummi thummi | Midge        | Chi t 7    | Aero<br> Insect | Chironomus Chi t 7   | 161 | 121248    | 7  |  |
| 449 | Chironomus<br> thummi thummi | Midge        | Chi t 7    | Aero<br> Insect | Chironomus Chi t 7   | 162 | 121249    | 7  |  |
| 450 | Chironomus<br> thummi thummi | Midge        | Chi t 8    | Aero<br> Insect | Chironomus Chi t 8   | 151 | 121237    | 7  |  |
| 451 | Chironomus<br> thummi thummi | Midge        | Chi t 9    | Aero<br> Insect | Chironomus Chi t 9   | 151 | 121259    | 7  |  |
| 452 | Citrus sinensis              | Navel orange | Unassigned | Food Plant      | Citrus Cit s 1   | 25  | 52782810  | 7  |  |
| 453 | Citrus sinensis              | Navel orange | Unassigned | Food Plant      | Citrus Cit s 2   | 131 | 261260074 | 11 |  |
| 454 | Citrus limon                 | Lemon        | Unassigned | Food Plant      | Citrus LTP Cit s 3   | 20  | 52783176  | 7  |  |
| 455 | Citrus sinensis              | Navel orange | Unassigned | Food Plant      | Citrus LTP Cit s 3   | 20  | 52783177  | 7  |  |
| 456 | Citrus sinensis              | Navel orange | Cit s 3    | Food Plant      | Citrus LTP Cit s 3   | 91  | 50199132  | 7  |  |
| 457 | Davidiella<br> tassiana      | Fungus       | Unassigned | Aero Fungi      | Cladosporium /<br> Davidiella Cla h 10                     | 496 | 108935817 | 8  |  |
| 458 | Davidiella<br> tassiana      | Fungus       | Cla h 5    | Aero Fungi      | Cladosporium /<br> Davidiella Cla h 5                      | 111 | 1173074   | 7  |  |
| 459 | Davidiella<br> tassiana      | Fungus       | Cla h 5    | Aero Fungi      | Cladosporium /<br> Davidiella Cla h 5                      | 111 | 21542440  | 7  |  |
| 460 | Davidiella<br> tassiana      | Fungus       | Cla h 6    | Aero Fungi      | Cladosporium /<br> Davidiella Cla h 6                      | 440 | 467660    | 7  |  |
| 461 | Davidiella<br> tassiana      | Fungus       | Cla h 6    | Aero Fungi      | Cladosporium /<br> Davidiella Cla h 6                      | 440 | 6015094   | 7  |  |
| 462 | Davidiella<br> tassiana      | Fungus       | Cla h 7    | Aero Fungi      | Cladosporium /<br> Davidiella Cla h 7                      | 204 | 1168970   | 7  |  |
| 463 | Davidiella<br> tassiana      | Fungus       | Unassigned | Aero Fungi      | Cladosporium /<br> Davidiella Cla h 8                      | 267 | 85701146  | 7  |  |
| 464 | Davidiella<br> tassiana      | Fungus       | Unassigned | Aero Fungi      | Cladosporium /<br> Davidiella Cla h 9 <br> vacuolar serine | 518 | 60116876  | 10 |  |
| 465 | Davidiella<br> tassiana      | Fungus       | Unassigned | Aero Fungi      | Cladosporium /<br> Davidiella Heat<br> shock 70 kDa protei | 643 | 729764    | 7  |  |
| 466 | Davidiella<br> tassiana      | Fungus       | Unassigned | Aero Fungi      | Cladosporium /<br> Davidiella<br> Hydrophobin              | 105 | 22796153  | 7  |  |

|     |                                 |             |                 |            |  |     |           |    |
|-----|---------------------------------|-------------|-----------------|------------|--|-----|-----------|----|
| 467 | Davidiella<br>tassiana          | Fungus      | Unassigned      | Aero Fungi | Cladosporium /<br>Davidiella Putative<br>nuclear transpo | 125 | 21748151  | 7  |
| 468 | Cladosporium<br>cladosporioides |             | Unassigned      | Aero Fungi | Cladosporium Cla c<br>9 Davidiella                       | 388 | 148361511 | 11 |
| 469 | Cochliobolus<br>lunatus         |             | Unassigned      | Aero Fungi | Cochliobolus<br>(Curvularia) Cur l<br>3 * ver 10         | 108 | 20137645  | 8  |
| 470 | Cochliobolus<br>lunatus         |             | Cur l 2.01      | Aero Fungi | Cochliobolus<br>(Curvularia)<br>enolase Cur l 2.01       | 440 | 14585753  | 8  |
| 471 | Coprinus comatus                | Shaggy mane | Cop c 1         | Food Fungi | Coprinus Cop c 1   | 81  | 4538529   | 7  |
| 472 | Corylus avellana<br>hazelnut    | European    | Cor a<br>1.0103 | Aero Plant | Corylus Cor a 1  | 160 | 22684     | 7  |
| 473 | Corylus avellana<br>hazelnut    | European    | Cor a<br>1.0104 | Aero Plant | Corylus Cor a 1  | 160 | 22686     | 7  |
| 474 | Corylus avellana<br>hazelnut    | European    | Cor a<br>1.0102 | Aero Plant | Corylus Cor a 1  | 160 | 22690     | 7  |
| 475 | Corylus avellana<br>hazelnut    | European    | Cor a<br>1.0201 | Aero Plant | Corylus Cor a 1  | 160 | 1321731   | 7  |
| 476 | Corylus avellana<br>hazelnut    | European    | Cor a<br>1.0301 | Aero Plant | Corylus Cor a 1  | 160 | 1321733   | 7  |
| 477 | Corylus avellana<br>hazelnut    | European    | Cor a I         | Aero Plant | Corylus Cor a 1  | 160 | 584968    | 7  |
| 478 | Corylus avellana<br>hazelnut    | European    | Cor a<br>1.0401 | Food Plant | Corylus Cor a 1  | 161 | 5726304   | 7  |
| 479 | Corylus avellana<br>hazelnut    | European    | Cor a<br>1.0402 | Food Plant | Corylus Cor a 1  | 161 | 11762102  | 7  |
| 480 | Corylus avellana<br>hazelnut    | European    | Cor a<br>1.0403 | Food Plant | Corylus Cor a 1  | 161 | 11762104  | 7  |
| 481 | Corylus avellana<br>hazelnut    | European    | Cor a<br>1.0404 | Food Plant | Corylus Cor a 1  | 161 | 11762106  | 7  |
| 482 | Corylus avellana<br>hazelnut    | European    | Cor a 10        | Aero Plant | Corylus Cor a 10   | 668 | 10944737  | 7  |
| 483 | Corylus avellana<br>hazelnut    | European    | Cor a 11        | Food Plant | Corylus Cor a 11   | 448 | 19338630  | 7  |
| 484 | Corylus avellana<br>hazelnut    | European    | Unassigned      | Food Plant | Corylus Cor a 14 2S<br>albumin                           | 147 | 226437844 | 11 |
| 485 | Corylus avellana<br>hazelnut    | European    | Cor a 2         | Aero Plant | Corylus Cor a 2  | 131 | 12659206  | 7  |
| 486 | Corylus avellana<br>hazelnut    | European    | Cor a 2         | Aero Plant | Corylus Cor a 2  | 131 | 12659208  | 7  |
| 487 | Corylus avellana<br>hazelnut    | European    | Cor a 8         | Food Plant | Corylus Cor a 8  | 115 | 13507262  | 7  |
| 488 | Corylus avellana<br>hazelnut    | European    | Cor a 9         | Food Plant | Corylus Cor a 9  | 515 | 18479082  | 7  |

|     |                       |                   |            |             |  |     |           |    |
|-----|-----------------------|-------------------|------------|-------------|--|-----|-----------|----|
| 489 | Corylus avellana      | European hazelnut | Unassigned | Food Plant  | Corylus Oleosin                                    | 140 | 29170509  | 7  |
| 490 | Crangon crangon       |                   | Unassigned | Food Animal | Crangon Cra c 1 tropomyosin                        | 284 | 238477263 | 12 |
| 491 | Crangon crangon       |                   | Unassigned | Food Animal | Crangon Cra c 2 arginine kinase                    | 356 | 238477265 | 12 |
| 492 | Crangon crangon       |                   | Unassigned | Food Animal | Crangon Cra c 4 sarcoplasmic calcium-binding prote | 193 | 238477327 | 12 |
| 493 | Crangon crangon       |                   | Unassigned | Food Animal | Crangon Cra c 5 myosin light chain                 | 153 | 238477331 | 12 |
| 494 | Crangon crangon       |                   | Unassigned | Food Animal | Crangon Cra c 6 troponin C                         | 150 | 238477333 | 12 |
| 495 | Crangon crangon       |                   | Unassigned | Food Animal | Crangon Cra c 8 triosephosphate isomerase          | 249 | 238477329 | 12 |
| 496 | Crassostrea gigas     | American oyster   | Unassigned | Food Animal | Crassostrea Tropomyosin                            | 233 | 15419048  | 7  |
| 497 | Crassostrea gigas     | American oyster   | Unassigned | Food Animal | Crassostrea Tropomyosin                            | 284 | 219806594 | 10 |
| 498 | Crassostrea virginica | Eastern oyster    | Unassigned | Food Animal | Crassostrea Tropomyosin                            | 160 | 3668408   | 7  |
| 499 | Crocus sativus        | Saffron crocus    | Unassigned | Aero Plant  | Crocus profilin Cro s 2                            | 131 | 58700651  | 7  |
| 500 | Cryptomeria japonica  | Japanese cedar    | Unassigned | Aero Plant  | Cryptomeria class IV chitinase                     | 281 | 56550550  | 7  |
| 501 | Cryptomeria japonica  | Japanese cedar    | Cry j 1    | Aero Plant  | Cryptomeria Cry j 1                                | 374 | 1173367   | 7  |
| 502 | Cryptomeria japonica  | Japanese cedar    | Cry j 1    | Aero Plant  | Cryptomeria Cry j 1                                | 374 | 19570315  | 7  |
| 503 | Cryptomeria japonica  | Japanese cedar    | Unassigned | Aero Plant  | Cryptomeria Cry j 1                                | 374 | 493634    | 8  |
| 504 | Cryptomeria japonica  | Japanese cedar    | Cry j 2    | Aero Plant  | Cryptomeria Cry j 2                                | 514 | 1171004   | 7  |
| 505 | Cryptomeria japonica  | Japanese cedar    | Cry j 2    | Aero Plant  | Cryptomeria Cry j 2                                | 514 | 24898904  | 7  |
| 506 | Cryptomeria japonica  | Japanese cedar    | Cry j 2    | Aero Plant  | Cryptomeria Cry j 2                                | 514 | 24898906  | 7  |
| 507 | Cryptomeria japonica  | Japanese cedar    | Cry j 2    | Aero Plant  | Cryptomeria Cry j 2                                | 514 | 24898908  | 7  |
| 508 | Cryptomeria japonica  | Japanese cedar    | Unassigned | Aero Plant  | Cryptomeria Cry j 2                                | 514 | 114841607 | 8  |
| 509 | Cryptomeria japonica  | Japanese cedar    | Unassigned | Aero Plant  | Cryptomeria Cry j 2                                | 514 | 114841617 | 8  |
| 510 | Cryptomeria japonica  | Japanese cedar    | Unassigned | Aero Plant  | Cryptomeria Cry j 2                                | 514 | 114841629 | 8  |

|     |                               |                       |              |            |   |     |           |    |
|-----|-------------------------------|-----------------------|--------------|------------|---|-----|-----------|----|
| 511 | Cryptomeria japonica          | Japanese cedar        | Unassigned   | Aero Plant | Cryptomeria Cry j 2                           | 514 | 114841635 | 8  |
| 512 | Cryptomeria japonica          | Japanese cedar        | Unassigned   | Aero Plant | Cryptomeria Cry j 2                           | 514 | 114841641 | 8  |
| 513 | Cryptomeria japonica          | Japanese cedar        | Unassigned   | Aero Plant | Cryptomeria Cry j 2                           | 514 | 114841653 | 8  |
| 514 | Cryptomeria japonica          | Japanese cedar        | Unassigned   | Aero Plant | Cryptomeria Cry j 2                           | 514 | 114841657 | 8  |
| 515 | Cryptomeria japonica          | Japanese cedar        | Unassigned   | Aero Plant | Cryptomeria Cry j 2                           | 514 | 114841663 | 8  |
| 516 | Cryptomeria japonica          | Japanese cedar        | Unassigned   | Aero Plant | Cryptomeria Cry j 2                           | 514 | 114841665 | 8  |
| 517 | Cryptomeria japonica          | Japanese cedar        | Unassigned   | Aero Plant | Cryptomeria Cry j 2                           | 514 | 114841671 | 8  |
| 518 | Cryptomeria japonica          | Japanese cedar        | Unassigned   | Aero Plant | Cryptomeria Cry j 2                           | 65  | 123299282 | 9  |
| 519 | Cryptomeria japonica          | Japanese cedar        | Unassigned   | Aero Plant | Cryptomeria Isoflavone reductase-like protein | 306 | 19847822  | 7  |
| 520 | Cryptomeria japonica          | Japanese cedar        | Unassigned   | Aero Plant | Cryptomeria pollen allergen CJP-8             | 165 | 291621332 | 12 |
| 521 | Cryptomeria japonica          | Japanese cedar        | Unassigned   | Aero Plant | Cryptomeria pollen allergen CPA63             | 472 | 293329689 | 12 |
| 522 | Cryptomeria japonica          | Japanese cedar        | Unassigned   | Aero Plant | Cryptomeria thaumatin like Cry j 3.8          | 225 | 139002766 | 8  |
| 523 | Cucumis melo                  | Muskmelon             | Unassigned   | Food Plant | Cucumis Cuc m 1                               | 731 | 71153243  | 9  |
| 524 | Cucumis melo                  | Muskmelon             | Cuc m 2      | Food Plant | Cucumis Cuc m 2                               | 131 | 31559374  | 7  |
| 525 | Cucumis melo                  | Muskmelon             | Cuc m 2      | Food Plant | Cucumis Cuc m 2                               | 131 | 58263793  | 7  |
| 526 | Cucumis melo var. reticulatus | Netted muskmelon      | Cuc m 2      | Food Plant | Cucumis Cuc m 2                               | 131 | 57021110  | 7  |
| 527 | Cucumis melo                  | Muskmelon             | Cuc m 3      | Food Plant | Cucumis Cuc m 3                               | 21  | 46396596  | 7  |
| 528 | Cucumis melo                  | Muskmelon             | Cuc m 3      | Food Plant | Cucumis Cuc m 3                               | 10  | 46396597  | 7  |
| 529 | Cucumis melo                  | Muskmelon             | Cuc m 3      | Food Plant | Cucumis Cuc m 3                               | 10  | 46396598  | 7  |
| 530 | Cucumis melo var. inodorus    | Muskmelon             | Unassigned   | Food Plant | Cucumis Cuc m 3                               | 151 | 171464770 | 9  |
| 531 | Cupressus arizonica           | Arizona Cypress       | Cup a 1      | Aero Plant | Cupressus Cup a 1                             | 367 | 19069497  | 7  |
| 532 | Cupressus arizonica           | Arizona Cypress       | Unassigned   | Aero Plant | Cupressus Cup a 1                             | 347 | 118197955 | 8  |
| 533 | Cupressus arizonica           | Arizona Cypress       | Unassigned   | Aero Plant | Cupressus Cup a 1                             | 346 | 9087167   | 9  |
| 534 | Cupressus sempervirens        | Mediterranean Cypress | Cup s 1.0101 | Aero Plant | Cupressus Cup a 1                             | 367 | 8101711   | 7  |



|     |                           |                          |                 |                |  |     |           |    |
|-----|---------------------------|--------------------------|-----------------|----------------|--|-----|-----------|----|
| 535 | Cupressus<br>sempervirens | Mediterranean<br>Cypress | Cup s<br>1.0102 | Aero Plant     | Cupressus Cup a 1                      | 367 | 8101713   | 7  |
| 536 | Cupressus<br>sempervirens | Mediterranean<br>Cypress | Cup s<br>1.0103 | Aero Plant     | Cupressus Cup a 1                      | 367 | 8101715   | 7  |
| 537 | Cupressus<br>sempervirens | Mediterranean<br>Cypress | Cup s<br>1.0104 | Aero Plant     | Cupressus Cup a 1                      | 367 | 8101717   | 7  |
| 538 | Cupressus<br>sempervirens | Mediterranean<br>Cypress | Cup s<br>1.0105 | Aero Plant     | Cupressus Cup a 1                      | 367 | 8101719   | 7  |
| 539 | Cupressus<br>arizonica    | Arizona<br>Cypress       | Unassigned      | Aero Plant     | Cupressus Cup s 3                      | 199 | 9929163   | 7  |
| 540 | Cupressus<br>sempervirens | Mediterranean<br>Cypress | Unassigned      | Aero Plant     | Cupressus Cup s 3                      | 225 | 38456230  | 7  |
| 541 | Cupressus<br>sempervirens | Mediterranean<br>Cypress | Unassigned      | Aero Plant     | Cupressus Cup s 3                      | 225 | 38456228  | 7  |
| 542 | Cupressus<br>arizonica    | Arizona<br>Cypress       | Unassigned      | Aero Plant     | Cupressus putative<br>allergen Cup a 4 | 165 | 261865475 | 11 |
| 543 | Cynodon dactylon          | Bermuda grass            | Cyn d 1         | Aero Plant     | Cynodon Cyn d 1                        | 25  | 451274    | 7  |
| 544 | Cynodon dactylon          | Bermuda grass            | Cyn d 1         | Aero Plant     | Cynodon Cyn d 1                        | 38  | 451275    | 7  |
| 545 | Cynodon dactylon          | Bermuda grass            | Cyn d 1         | Aero Plant     | Cynodon Cyn d 1                        | 34  | 691726    | 7  |
| 546 | Cynodon dactylon          | Bermuda grass            | Cyn d<br>1.0204 | Aero Plant     | Cynodon Cyn d 1                        | 244 | 10314021  | 7  |
| 547 | Cynodon dactylon          | Bermuda grass            | Cyn d 1         | Aero Plant     | Cynodon Cyn d 1                        | 246 | 14423757  | 7  |
| 548 | Cynodon dactylon          | Bermuda grass            | Cyn d<br>1.0201 | Aero Plant     | Cynodon Cyn d 1                        | 244 | 15384338  | 7  |
| 549 | Cynodon dactylon          | Bermuda grass            | Cyn d<br>1.0202 | Aero Plant     | Cynodon Cyn d 1                        | 262 | 16076693  | 7  |
| 550 | Cynodon dactylon          | Bermuda grass            | Cyn d 1         | Aero Plant     | Cynodon Cyn d 1                        | 262 | 16076695  | 7  |
| 551 | Cynodon dactylon          | Bermuda grass            | Cyn d<br>1.0203 | Aero Plant     | Cynodon Cyn d 1                        | 262 | 16076697  | 7  |
| 552 | Cynodon dactylon          | Bermuda grass            | Cyn d 12        | Aero Plant     | Cynodon Cyn d 12                       | 131 | 2154730   | 7  |
| 553 | Cynodon dactylon          | Bermuda grass            | Unassigned      | Aero Plant     | Cynodon Cyn d 7                        | 71  | 1247373   | 7  |
| 554 | Cynodon dactylon          | Bermuda grass            | Unassigned      | Aero Plant     | Cynodon Cyn d 7                        | 73  | 1247375   | 7  |
| 555 | Cynodon dactylon          | Bermuda grass            | Cyn d 7         | Aero Plant     | Cynodon Cyn d 7                        | 82  | 1871507   | 7  |
| 556 | Cyprinus carpio           | Carp                     | Unassigned      | Food<br>Animal | Cyprinus<br>Parvalbumin                | 109 | 17977825  | 7  |
| 557 | Cyprinus carpio           | Carp                     | Unassigned      | Food<br>Animal | Cyprinus<br>Parvalbumin                | 109 | 17977827  | 7  |
| 558 | Dactylis<br>glomerata     | Orchard grass            | Dac g 1         | Aero Plant     | Dactylis Dac g 1                       | 264 | 18093991  | 7  |
| 559 | Dactylis<br>glomerata     | Orchard grass            | Unassigned      | Aero Plant     | Dactylis Dac g 1                       | 240 | 33149333  | 7  |
| 560 | Dactylis<br>glomerata     | Orchard grass            | Dac g 2         | Aero Plant     | Dactylis Dac g 2                       | 196 | 1093120   | 7  |

|     |                             |                    |                 |            |                                     |     |           |    |
|-----|-----------------------------|--------------------|-----------------|------------|-------------------------------------|-----|-----------|----|
| 561 | Dactylis<br>glomerata       | Orchard grass      | Dac g 2         | Aero Plant | Dactylis Dac g 2                    | 122 | 4007040   | 7  |
| 562 | Dactylis<br>glomerata       | Orchard grass      | Unassigned      | Aero Plant | Dactylis Dac g 3                    | 96  | 14423759  | 8  |
| 563 | Dactylis<br>glomerata       | Orchard grass      | Unassigned      | Aero Plant | Dactylis Dac g 4                    | 12  | 32363464  | 7  |
| 564 | Dactylis<br>glomerata       | Orchard grass      | Unassigned      | Aero Plant | Dactylis Dac g 4                    | 11  | 32363465  | 7  |
| 565 | Dactylis<br>glomerata       | Orchard grass      | Unassigned      | Aero Plant | Dactylis Dac g 4                    | 17  | 32363466  | 7  |
| 566 | Dactylis<br>glomerata       | Orchard grass      | Unassigned      | Aero Plant | Dactylis Dac g 4                    | 15  | 32363467  | 7  |
| 567 | Dactylis<br>glomerata       | Orchard grass      | Dac g 5         | Aero Plant | Dactylis Dac g 5                    | 290 | 14423124  | 7  |
| 568 | Dactylis<br>glomerata       | Orchard grass      | Dac g 5         | Aero Plant | Dactylis Dac g 5                    | 265 | 18093971  | 7  |
| 569 | Daucus carota               | Carrot             | Dau c<br>1.0101 | Food Plant | Daucus Dau c 1                      | 168 | 1335877   | 7  |
| 570 | Daucus carota               | Carrot             | Dau c<br>1.0102 | Food Plant | Daucus Dau c 1                      | 154 | 1663522   | 7  |
| 571 | Daucus carota               | Carrot             | Dau c<br>1.0103 | Food Plant | Daucus Dau c 1                      | 154 | 2154732   | 7  |
| 572 | Daucus carota               | Carrot             | Dau c<br>1.0104 | Food Plant | Daucus Dau c 1                      | 154 | 2154734   | 7  |
| 573 | Daucus carota               | Carrot             | Dau c<br>1.0201 | Food Plant | Daucus Dau c 1                      | 154 | 18652047  | 7  |
| 574 | Daucus carota               | Carrot             | Unassigned      | Food Plant | Daucus Dau c 1                      | 154 | 19912791  | 7  |
| 575 | Daucus carota               | Carrot             | Dau c<br>1.0105 | Food Plant | Daucus Dau c 1                      | 154 | 8928058   | 9  |
| 576 | Daucus carota               | Carrot             | Dau c<br>1.0301 | Food Plant | Daucus Dau c 1                      | 154 | 302379147 | 12 |
| 577 | Daucus carota               | Carrot             | Unassigned      | Food Plant | Daucus Dau c 1                      | 154 | 302379149 | 12 |
| 578 | Daucus carota               | Carrot             | Unassigned      | Food Plant | Daucus Dau c 1                      | 154 | 302379151 | 12 |
| 579 | Daucus carota               | Carrot             | Unassigned      | Food Plant | Daucus Dau c 1                      | 154 | 302379153 | 12 |
| 580 | Daucus carota               | Carrot             | Unassigned      | Food Plant | Daucus Dau c 1                      | 154 | 302379155 | 12 |
| 581 | Daucus carota               | Carrot             | Unassigned      | Food Plant | Daucus Dau c 1                      | 154 | 302379157 | 12 |
| 582 | Daucus carota               | Carrot             | Unassigned      | Food Plant | Daucus Dau c 1                      | 154 | 302379159 | 12 |
| 583 | Daucus carota               | Carrot             | Unassigned      | Food Plant | Daucus Dau c 4                      | 134 | 47606043  | 10 |
| 584 | Dermatophagoides<br>farinae | House dust<br>mite | Unassigned      | Aero Mite  | Dermatophagoides<br>Der f 13        | 131 | 99031759  | 7  |
| 585 | Dermatophagoides<br>farinae | House dust<br>mite | Der f 16        | Aero Mite  | Dermatophagoides<br>Der f 16        | 480 | 21591547  | 7  |
| 586 | Dermatophagoides<br>farinae | House dust<br>mite | Der f 1         | Aero Mite  | Dermatophagoides<br>Der p 1 Der f 1 | 321 | 730035    | 7  |

|     |                                   |                     |            |           |                                      |     |           |    |
|-----|-----------------------------------|---------------------|------------|-----------|--------------------------------------|-----|-----------|----|
| 587 | Dermatophagoides<br> farinae      | House dust<br> mite | Der f 1    | Aero Mite | Dermatophagoides<br> Der p 1 Der f 1 | 321 | 27530349  | 7  |
| 588 | Dermatophagoides<br> farinae      | House dust<br> mite | Unassigned | Aero Mite | Dermatophagoides<br> Der p 1 Der f 1 | 276 | 76097507  | 7  |
| 589 | Dermatophagoides<br> farinae      | House dust<br> mite | Unassigned | Aero Mite | Dermatophagoides<br> Der p 1 Der f 1 | 321 | 156106765 | 9  |
| 590 | Dermatophagoides<br> farinae      | House dust<br> mite | Unassigned | Aero Mite | Dermatophagoides<br> Der p 1 Der f 1 | 263 | 37958161  | 12 |
| 591 | Dermatophagoides<br> microceras   | House dust<br> mite | Der m 1    | Aero Mite | Dermatophagoides<br> Der p 1 Der f 1 | 30  | 127205    | 7  |
| 592 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Der p 1    | Aero Mite | Dermatophagoides<br> Der p 1 Der f 1 | 320 | 730036    | 7  |
| 593 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Der p 1    | Aero Mite | Dermatophagoides<br> Der p 1 Der f 1 | 222 | 21725560  | 7  |
| 594 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Der p 1    | Aero Mite | Dermatophagoides<br> Der p 1 Der f 1 | 222 | 21725562  | 7  |
| 595 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Der p 1    | Aero Mite | Dermatophagoides<br> Der p 1 Der f 1 | 222 | 21725564  | 7  |
| 596 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Der p 1    | Aero Mite | Dermatophagoides<br> Der p 1 Der f 1 | 222 | 21725566  | 7  |
| 597 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Der p 1    | Aero Mite | Dermatophagoides<br> Der p 1 Der f 1 | 222 | 21725568  | 7  |
| 598 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Der p 1    | Aero Mite | Dermatophagoides<br> Der p 1 Der f 1 | 222 | 21725570  | 7  |
| 599 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Der p 1    | Aero Mite | Dermatophagoides<br> Der p 1 Der f 1 | 222 | 21725572  | 7  |
| 600 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Der p 1    | Aero Mite | Dermatophagoides<br> Der p 1 Der f 1 | 222 | 21725574  | 7  |
| 601 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Der p 1    | Aero Mite | Dermatophagoides<br> Der p 1 Der f 1 | 222 | 21725576  | 7  |
| 602 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Der p 1    | Aero Mite | Dermatophagoides<br> Der p 1 Der f 1 | 222 | 21725578  | 7  |
| 603 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Der p 1    | Aero Mite | Dermatophagoides<br> Der p 1 Der f 1 | 222 | 21725580  | 7  |
| 604 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Unassigned | Aero Mite | Dermatophagoides<br> Der p 1 Der f 1 | 216 | 61608445  | 7  |
| 605 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Unassigned | Aero Mite | Dermatophagoides<br> Der p 1 Der f 1 | 222 | 83754033  | 7  |
| 606 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Unassigned | Aero Mite | Dermatophagoides<br> Der p 1 Der f 1 | 211 | 1460058   | 8  |
| 607 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Unassigned | Aero Mite | Dermatophagoides<br> Der p 1 Der f 1 | 223 | 157696052 | 9  |
| 608 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Unassigned | Aero Mite | Dermatophagoides<br> Der p 1 Der f 1 | 222 | 223365887 | 10 |
| 609 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Unassigned | Aero Mite | Dermatophagoides<br> Der p 1 Der f 1 | 320 | 195933901 | 10 |

|     |                                     |                      |            |           |   |      |           |    |
|-----|-------------------------------------|----------------------|------------|-----------|---|------|-----------|----|
| 610 | Dermatophagoides<br>  pteronyssinus | House dust<br>  mite | Unassigned | Aero Mite | Dermatophagoides<br>  Der p 1 Der f 1     | 302  | 256095986 | 11 |
| 611 | Dermatophagoides<br>  pteronyssinus | House dust<br>  mite | Unassigned | Aero Mite | Dermatophagoides<br>  Der p 1 Der f 1     | 96   | 387592    | 11 |
| 612 | Dermatophagoides<br>  farinae       | House dust<br>  mite | Unassigned | Aero Mite | Dermatophagoides<br>  Der p 10 / Der f 10 | 284  | 42559584  | 9  |
| 613 | Dermatophagoides<br>  pteronyssinus | House dust<br>  mite | Der p 10   | Aero Mite | Dermatophagoides<br>  Der p 10 / Der f 10 | 284  | 2353266   | 17 |
| 614 | Dermatophagoides<br>  pteronyssinus | House dust<br>  mite | Der p 10   | Aero Mite | Dermatophagoides<br>  Der p 10 / Der f 10 | 284  | 2440053   | 17 |
| 615 | Dermatophagoides<br>  pteronyssinus | House dust<br>  mite | Unassigned | Aero Mite | Dermatophagoides<br>  Der p 10 / Der f 10 | 281  | 80553470  | 17 |
| 616 | Dermatophagoides<br>  pteronyssinus | House dust<br>  mite | Unassigned | Aero Mite | Dermatophagoides<br>  Der p 10 / Der f 10 | 284  | 208970286 | 10 |
| 617 | Dermatophagoides<br>  farinae       | House dust<br>  mite | Unassigned | Aero Mite | Dermatophagoides<br>  Der p 11 / Der f 11 | 692  | 42559514  | 9  |
| 618 | Dermatophagoides<br>  pteronyssinus | House dust<br>  mite | Der p 11   | Aero Mite | Dermatophagoides<br>  Der p 11 / Der f 11 | 875  | 37778944  | 17 |
| 619 | Dermatophagoides<br>  pteronyssinus | House dust<br>  mite | Unassigned | Aero Mite | Dermatophagoides<br>  Der p 13            | 131  | 302035350 | 12 |
| 620 | Dermatophagoides<br>  farinae       | House dust<br>  mite | Unassigned | Aero Mite | Dermatophagoides<br>  Der p 14 / Der f 14 | 341  | 729979    | 17 |
| 621 | Dermatophagoides<br>  farinae       | House dust<br>  mite | Der f 14   | Aero Mite | Dermatophagoides<br>  Der p 14 / Der f 14 | 349  | 1545803   | 17 |
| 622 | Dermatophagoides<br>  pteronyssinus | House dust<br>  mite | Der p 14   | Aero Mite | Dermatophagoides<br>  Der p 14 / Der f 14 | 1662 | 20385544  | 17 |
| 623 | Dermatophagoides<br>  farinae       | House dust<br>  mite | Der f 2    | Aero Mite | Dermatophagoides<br>  Der p 2 / Der f 2   | 138  | 217308    | 17 |
| 624 | Dermatophagoides<br>  farinae       | House dust<br>  mite | Der f 2    | Aero Mite | Dermatophagoides<br>  Der p 2 / Der f 2   | 142  | 546852    | 17 |
| 625 | Dermatophagoides<br>  farinae       | House dust<br>  mite | Der f 2    | Aero Mite | Dermatophagoides<br>  Der p 2 / Der f 2   | 129  | 17978844  | 17 |
| 626 | Dermatophagoides<br>  farinae       | House dust<br>  mite | Unassigned | Aero Mite | Dermatophagoides<br>  Der p 2 / Der f 2   | 146  | 55859470  | 17 |
| 627 | Dermatophagoides<br>  farinae       | House dust<br>  mite | Unassigned | Aero Mite | Dermatophagoides<br>  Der p 2 / Der f 2   | 146  | 55859468  | 17 |
| 628 | Dermatophagoides<br>  farinae       | House dust<br>  mite | Unassigned | Aero Mite | Dermatophagoides<br>  Der p 2 / Der f 2   | 146  | 55859466  | 17 |
| 629 | Dermatophagoides<br>  farinae       | House dust<br>  mite | Unassigned | Aero Mite | Dermatophagoides<br>  Der p 2 / Der f 2   | 129  | 76097511  | 17 |
| 630 | Dermatophagoides<br>  farinae       | House dust<br>  mite | Unassigned | Aero Mite | Dermatophagoides<br>  Der p 2 / Der f 2   | 175  | 156480837 | 9  |
| 631 | Dermatophagoides<br>  farinae       | House dust<br>  mite | Unassigned | Aero Mite | Dermatophagoides<br>  Der p 2 / Der f 2   | 146  | 218203834 | 10 |
| 632 | Dermatophagoides<br>  farinae       | House dust<br>  mite | Unassigned | Aero Mite | Dermatophagoides<br>  Der p 2 / Der f 2   | 146  | 256631558 | 11 |

|     |                                   |                     |            |           |  |     |           |    |
|-----|-----------------------------------|---------------------|------------|-----------|--|-----|-----------|----|
| 633 | Dermatophagoides<br> farinae      | House dust<br> mite | Unassigned | Aero Mite | Dermatophagoides<br> Der p 2 / Der f 2 | 140 | 37958157  | 12 |
| 634 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Der p 2    | Aero Mite | Dermatophagoides<br> Der p 2 / Der f 2 | 146 | 1352237   | 17 |
| 635 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Der p 2    | Aero Mite | Dermatophagoides<br> Der p 2 / Der f 2 | 129 | 21465915  | 17 |
| 636 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Der p 2    | Aero Mite | Dermatophagoides<br> Der p 2 / Der f 2 | 129 | 21725582  | 17 |
| 637 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Der p 2    | Aero Mite | Dermatophagoides<br> Der p 2 / Der f 2 | 129 | 21725584  | 17 |
| 638 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Der p 2    | Aero Mite | Dermatophagoides<br> Der p 2 / Der f 2 | 129 | 21725586  | 17 |
| 639 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Der p 2    | Aero Mite | Dermatophagoides<br> Der p 2 / Der f 2 | 129 | 21725588  | 17 |
| 640 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Der p 2    | Aero Mite | Dermatophagoides<br> Der p 2 / Der f 2 | 129 | 21725590  | 17 |
| 641 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Der p 2    | Aero Mite | Dermatophagoides<br> Der p 2 / Der f 2 | 129 | 21725592  | 17 |
| 642 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Der p 2    | Aero Mite | Dermatophagoides<br> Der p 2 / Der f 2 | 129 | 21725594  | 17 |
| 643 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Der p 2    | Aero Mite | Dermatophagoides<br> Der p 2 / Der f 2 | 129 | 21725596  | 17 |
| 644 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Der p 2    | Aero Mite | Dermatophagoides<br> Der p 2 / Der f 2 | 129 | 21725600  | 17 |
| 645 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Der p 2    | Aero Mite | Dermatophagoides<br> Der p 2 / Der f 2 | 129 | 21725602  | 17 |
| 646 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Der p 2    | Aero Mite | Dermatophagoides<br> Der p 2 / Der f 2 | 129 | 21725604  | 17 |
| 647 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Unassigned | Aero Mite | Dermatophagoides<br> Der p 2 / Der f 2 | 129 | 76097509  | 17 |
| 648 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Unassigned | Aero Mite | Dermatophagoides<br> Der p 2 / Der f 2 | 146 | 99644635  | 17 |
| 649 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Unassigned | Aero Mite | Dermatophagoides<br> Der p 2 / Der f 2 | 130 | 110560872 | 19 |
| 650 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Unassigned | Aero Mite | Dermatophagoides<br> Der p 2 / Der f 2 | 129 | 157829757 | 19 |
| 651 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Unassigned | Aero Mite | Dermatophagoides<br> Der p 2 / Der f 2 | 145 | 164415595 | 19 |
| 652 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Unassigned | Aero Mite | Dermatophagoides<br> Der p 2 / Der f 2 | 129 | 256095984 | 11 |
| 653 | Dermatophagoides<br> siboney      | House dust<br> mite | Unassigned | Aero Mite | Dermatophagoides<br> Der p 2 / Der f 2 | 146 | 86450747  | 17 |
| 654 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Unassigned | Aero Mite | Dermatophagoides<br> Der p 21          | 140 | 85687540  | 17 |
| 655 | Dermatophagoides<br> farinae      | House dust<br> mite | Der f 3    | Aero Mite | Dermatophagoides<br> Der p 3 / Der f 3 | 232 | 1314736   | 17 |

|     |                                   |                     |            |           |  |     |           |    |
|-----|-----------------------------------|---------------------|------------|-----------|--|-----|-----------|----|
| 656 | Dermatophagoides<br> farinae      | House dust<br> mite | Der f 3    | Aero Mite | Dermatophagoides<br> Der p 3 / Der f 3 | 259 | 2507248   | 7  |
| 657 | Dermatophagoides<br> farinae      | House dust<br> mite | Unassigned | Aero Mite | Dermatophagoides<br> Der p 3 / Der f 3 | 259 | 163638970 | 9  |
| 658 | Dermatophagoides<br> farinae      | House dust<br> mite | Unassigned | Aero Mite | Dermatophagoides<br> Der p 3 / Der f 3 | 259 | 218203816 | 10 |
| 659 | Dermatophagoides<br> farinae      | House dust<br> mite | Unassigned | Aero Mite | Dermatophagoides<br> Der p 3 / Der f 3 | 259 | 218203818 | 10 |
| 660 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Der p 3    | Aero Mite | Dermatophagoides<br> Der p 3 / Der f 3 | 261 | 511476    | 7  |
| 661 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Der p 4    | Aero Mite | Dermatophagoides<br> Der p 4           | 496 | 5059162   | 7  |
| 662 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Unassigned | Aero Mite | Dermatophagoides<br> Der p 4           | 19  | 1351935   | 7  |
| 663 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Der p 5    | Aero Mite | Dermatophagoides<br> Der p 5           | 132 | 1352238   | 7  |
| 664 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Der p 5    | Aero Mite | Dermatophagoides<br> Der p 5           | 132 | 913285    | 7  |
| 665 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Der p 5    | Aero Mite | Dermatophagoides<br> Der p 5           | 132 | 28798085  | 7  |
| 666 | Dermatophagoides<br> farinae      | House dust<br> mite | Unassigned | Aero Mite | Dermatophagoides<br> Der p 6 / Der f 6 | 279 | 14424450  | 7  |
| 667 | Dermatophagoides<br> farinae      | House dust<br> mite | Unassigned | Aero Mite | Dermatophagoides<br> Der p 6 / Der f 6 | 20  | 404371    | 7  |
| 668 | Dermatophagoides<br> farinae      | House dust<br> mite | Unassigned | Aero Mite | Dermatophagoides<br> Der p 6 / Der f 6 | 279 | 218203826 | 10 |
| 669 | Dermatophagoides<br> farinae      | House dust<br> mite | Unassigned | Aero Mite | Dermatophagoides<br> Der p 6 / Der f 6 | 279 | 218203828 | 10 |
| 670 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Der p 6    | Aero Mite | Dermatophagoides<br> Der p 6 / Der f 6 | 20  | 1352239   | 7  |
| 671 | Dermatophagoides<br> farinae      | House dust<br> mite | Der f 7    | Aero Mite | Dermatophagoides<br> Der p 7 / Der f 7 | 213 | 2498299   | 7  |
| 672 | Dermatophagoides<br> farinae      | House dust<br> mite | Unassigned | Aero Mite | Dermatophagoides<br> Der p 7 / Der f 7 | 213 | 37958165  | 8  |
| 673 | Dermatophagoides<br> farinae      | House dust<br> mite | Unassigned | Aero Mite | Dermatophagoides<br> Der p 7 / Der f 7 | 213 | 218203832 | 10 |
| 674 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Der p 7    | Aero Mite | Dermatophagoides<br> Der p 7 / Der f 7 | 215 | 10189811  | 7  |
| 675 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Unassigned | Aero Mite | Dermatophagoides<br> Der p 7 / Der f 7 | 215 | 1352240   | 9  |
| 676 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Unassigned | Aero Mite | Dermatophagoides<br> Der p 8           | 219 | 60920878  | 7  |
| 677 | Dermatophagoides<br> pteronysinus | House dust<br> mite | Unassigned | Aero Mite | Dermatophagoides<br> Der p 8           | 219 | 1170095   | 9  |
| 678 | Dermatophagoides<br> farinae      | House dust<br> mite | Der f 18   | Aero Mite | Dermatophagoides<br> farinae Der f 18  | 462 | 27550039  | 7  |

|     |                                |                  |              |                   |   |     |           |   |
|-----|--------------------------------|------------------|--------------|-------------------|---|-----|-----------|---|
|     |                                |                  |              |                   | Der p chitinase                                   |     |           |   |
| 679 | Dermatophagoides pteronyssinus | House dust mite  | Unassigned   | Aero Mite         | Dermatophagoides farinae Der f 18 Der p chitinase | 462 | 67975085  | 7 |
| 680 | Dermatophagoides farinae       | House dust mite  | Unassigned   | Aero Mite         | Dermatophagoides farinae Der f 21 Chew            | 136 | 60679572  | 9 |
| 681 | Dermatophagoides farinae       | House dust mite  | Unassigned   | Aero Mite         | Dermatophagoides farinae Der f 21 Chew            | 136 | 140089314 | 9 |
| 682 | Dermatophagoides farinae       | House dust mite  | Unassigned   | Aero Mite         | Dermatophagoides farinae Der f 21 Chew            | 136 | 140089316 | 9 |
| 683 | Dermatophagoides farinae       | House dust mite  | Unassigned   | Aero Mite         | Dermatophagoides farinae Der f 21 Chew            | 136 | 140089320 | 9 |
| 684 | Dermatophagoides farinae       | House dust mite  | Unassigned   | Aero Mite         | Dermatophagoides farinae Der f 21 Chew            | 136 | 140089322 | 9 |
| 685 | Dermatophagoides farinae       | House dust mite  | Unassigned   | Aero Mite         | Dermatophagoides farinae Der f 21 Chew            | 136 | 140089324 | 9 |
| 686 | Dermatophagoides farinae       | House dust mite  | Unassigned   | Aero Mite         | Dermatophagoides farinae Der f 21 Chew            | 136 | 140089326 | 9 |
| 687 | Dolichovespula maculata        | Whiteface hornet | Dol m 1      | Venom or Salivary | Dolichovespula Dol m 1                            | 317 | 548449    | 7 |
| 688 | Dolichovespula maculata        | Whiteface hornet | Dol m 1      | Venom or Salivary | Dolichovespula Dol m 1                            | 303 | 1709542   | 7 |
| 689 | Dolichovespula maculata        | Whiteface hornet | Dol m 2      | Venom or Salivary | Dolichovespula Dol m 2                            | 331 | 1346322   | 7 |
| 690 | Dolichovespula arenaria        | Yellow jacket    | Dol a 5      | Venom or Salivary | Dolichovespula Venom allergen 5                   | 203 | 465052    | 7 |
| 691 | Dolichovespula maculata        | Whiteface hornet | Dol m 5      | Venom or Salivary | Dolichovespula Venom allergen 5                   | 227 | 137395    | 7 |
| 692 | Dolichovespula maculata        | Whiteface hornet | Dol m 5      | Venom or Salivary | Dolichovespula Venom allergen 5                   | 215 | 549186    | 7 |
| 693 | Epicoccum nigrum               | Fungus           | Unassigned   | Aero Fungi        | Epicoccum Epi p 1                                 | 18  | 24636820  | 9 |
| 694 | Equus caballus                 | Horse            | Equ c 1      | Aero Animal       | Equus Equ c 1                                     | 187 | 3121758   | 7 |
| 695 | Equus caballus                 | Horse            | Equ c 2.0101 | Aero Animal       | Equus Equ c 2                                     | 29  | 3121755   | 7 |
| 696 | Equus caballus                 | Horse            | Equ c 2.0102 | Aero Animal       | Equus Equ c 2                                     | 19  | 3121756   | 7 |
| 697 | Equus caballus                 | Horse            | Unassigned   | Aero Animal       | Equus Equ c 3                                     | 607 | 543794    | 9 |
| 698 | Equus caballus                 | Horse            | Unassigned   | Aero Animal       | Equus Equ c 4                                     | 228 | 38258932  | 8 |

|     |                 |            |            |            |                     |     |           |    |
|-----|-----------------|------------|------------|------------|---------------------|-----|-----------|----|
| 699 | Equus caballus  | Horse      | Unassigned | Aero       | Equus Equ c 4       | 228 | 152031631 | 9  |
|     |                 |            |            | Animal     |                     |     |           |    |
| 700 | Erimacrus       |            | Unassigned | Food       | Erimacrus           | 284 | 125995169 | 8  |
|     | isenbeckii      |            |            | Animal     | tropomyosin         |     |           |    |
| 701 | Erimacrus       |            | Unassigned | Food       | Erimacrus           | 284 | 125995171 | 8  |
|     | isenbeckii      |            |            | Animal     | tropomyosin         |     |           |    |
| 702 | Euphausia       |            | Unassigned | Food       | Euphausia           | 284 | 156712754 | 9  |
|     | pacificica      |            |            | Animal     |                     |     |           |    |
| 703 | Euphausia       |            | Unassigned | Food       | Euphausia           | 284 | 156712752 | 9  |
|     | superba         |            |            | Animal     |                     |     |           |    |
| 704 | Euroglyphus     | House dust | Eur m      | Aero Mite  | Euroglyphus Eur m 2 | 135 | 3941386   | 7  |
|     | maynei          | mite       | 2.0102     |            |                     |     |           |    |
| 705 | Euroglyphus     | House dust | Eur m 2    | Aero Mite  | Euroglyphus Eur m 2 | 145 | 14423649  | 7  |
|     | maynei          | mite       |            |            |                     |     |           |    |
| 706 | Fagopyrum       | Buckwheat  | Unassigned | Food Plant | Fagopyrum BW 16kDa  | 127 | 61970231  | 7  |
|     | esculentum      |            |            |            | allergen            |     |           |    |
| 707 | Fagopyrum       | Buckwheat  | Unassigned | Food Plant | Fagopyrum BW 16kDa  | 149 | 83416591  | 7  |
|     | esculentum      |            |            |            | allergen            |     |           |    |
| 708 | Fagopyrum       | Buckwheat  | Unassigned | Food Plant | Fagopyrum BW 16kDa  | 149 | 320445237 | 12 |
|     | tataricum       |            |            |            | allergen            |     |           |    |
| 709 | Fagopyrum       | Buckwheat  | Unassigned | Food Plant | Fagopyrum BW 8 kDa  | 133 | 17907758  | 7  |
|     | esculentum      |            |            |            | protein             |     |           |    |
| 710 | Fagopyrum       | Buckwheat  | Unassigned | Food Plant | Fagopyrum BW 8 kDa  | 133 | 144228127 | 8  |
|     | tataricum       |            |            |            | protein             |     |           |    |
| 711 | Fagopyrum       | Buckwheat  | Unassigned | Food Plant | Fagopyrum           |     |           |    |
|     | esculentum      |            |            |            | Legumin-like        | 565 | 29839254  | 9  |
|     |                 |            |            |            | protein             |     |           |    |
| 712 | Fagopyrum       | Buckwheat  | Unassigned | Food Plant | Fagopyrum           | 504 | 29839255  | 9  |
|     | esculentum      |            |            |            | Legumin-like        |     |           |    |
|     |                 |            |            |            | protein             |     |           |    |
| 713 | Fagopyrum       | Buckwheat  | Unassigned | Food Plant | Fagopyrum           | 538 | 29839419  | 9  |
|     | esculentum      |            |            |            | Legumin-like        |     |           |    |
|     |                 |            |            |            | protein             |     |           |    |
| 714 | Fagopyrum       | Buckwheat  | Unassigned | Food Plant | Fagopyrum           | 191 | 6979766   | 7  |
|     | gracilipes      |            |            |            | Legumin-like        |     |           |    |
|     |                 |            |            |            | protein             |     |           |    |
| 715 | Fagopyrum       | Buckwheat  | Unassigned | Food Plant | Fagopyrum           | 515 | 113200131 | 9  |
|     | tataricum       |            |            |            | Legumin-like        |     |           |    |
|     |                 |            |            |            | protein             |     |           |    |
| 716 | Fagopyrum       | Buckwheat  | Unassigned | Food Plant | Fagopyrum           | 136 | 146217148 | 9  |
|     | esculentum      |            |            |            | vicilin-like        |     |           |    |
|     |                 |            |            |            | protein             |     |           |    |
| 717 | Fagus sylvatica | European   | Unassigned | Aero Plant | Fagus Fag s 1       | 160 | 212291472 | 10 |
|     |                 | Beech      |            |            |                     |     |           |    |
| 718 | Fagus sylvatica | European   | Fag s 1    | Aero Plant | Fagus Fag s 1       | 160 | 212291470 | 10 |
|     |                 | Beech      |            |            |                     |     |           |    |
| 719 | Fagus sylvatica | European   | Unassigned | Aero Plant | Fagus Fag s 1       | 160 | 212291474 | 10 |
|     |                 | Beech      |            |            |                     |     |           |    |



|     |                              |               |            |                       |   |     |           |    |
|-----|------------------------------|---------------|------------|-----------------------|---|-----|-----------|----|
| 720 | Farfantepenaeus<br> aztecus  | Brown shrimp  | Pen a 1    | Food<br> Animal       | Farfantepenaeus Pen<br> a 1               | 284 | 73532979  | 7  |
| 721 | Felis catus                  | Cat           | Fel d 1    | Aero<br> Animal       | Felis Fel d 1 Chain<br> 1                 | 88  | 1364212   | 7  |
| 722 | Felis catus                  | Cat           | Fel d 1    | Aero<br> Animal       | Felis Fel d 1 Chain<br> 1                 | 92  | 1364213   | 7  |
| 723 | Felis catus                  | Cat           | Fel d 1    | Aero<br> Animal       | Felis Fel d 1 Chain<br> 1                 | 92  | 1169665   | 7  |
| 724 | Felis catus                  | Cat           | Fel d 1    | Aero<br> Animal       | Felis Fel d 1 Chain<br> 1                 | 92  | 163825    | 7  |
| 725 | Felis catus                  | Cat           | Unassigned | Aero<br> Animal       | Felis Fel d 1 Chain<br> 1                 | 88  | 114326420 | 8  |
| 726 | Felis catus                  | Cat           | Fel d 1    | Aero<br> Animal       | Felis Fel d 1 chain<br> 2                 | 109 | 232086    | 7  |
| 727 | Felis catus                  | Cat           | Unassigned | Aero<br> Animal       | Felis Fel d 1 chain<br> 2                 | 107 | 395407    | 8  |
| 728 | Felis catus                  | Cat           | Unassigned | Aero<br> Animal       | Felis Fel d 2                             | 608 | 1351908   | 9  |
| 729 | Felis catus                  | Cat           | Unassigned | Aero<br> Animal       | Felis Fel d 3                             | 98  | 47605720  | 9  |
| 730 | Felis catus                  | Cat           | Unassigned | Aero<br> Animal       | Felis Fel d 4                             | 186 | 75062228  | 8  |
| 731 | Felis catus                  | Cat           | Unassigned | Aero<br> Animal       | Felis Fel d 7 von<br> Ebner gland protein | 180 | 301072397 | 12 |
| 732 | Felis catus                  | Cat           | Unassigned | Aero<br> Animal       | Felis Fel d 8<br> latherin-like           | 228 | 303387468 | 12 |
| 733 | Schedonorus<br> arundinaceus | Tall fescue   | Unassigned | Aero Plant            | Festuca group 1<br> allergen              | 35  | 75139991  | 7  |
| 734 | Schedonorus<br> arundinaceus | Tall fescue   | Unassigned | Aero Plant            | Festuca group 1<br> allergen              | 17  | 320610    | 7  |
| 735 | Schedonorus<br> arundinaceus | Tall fescue   | Unassigned | Aero Plant            | Festuca group 1<br> allergen              | 20  | 320611    | 7  |
| 736 | Forcipomyia<br> taiwana      | biting midges | Unassigned | Venom or<br> Salivary | Forcipomyia For t 1                       | 118 | 188572341 | 10 |
| 737 | Forcipomyia<br> taiwana      | biting midges | Unassigned | Venom or<br> Salivary | Forcipomyia For t 2                       | 325 | 188572343 | 10 |
| 738 | Fragaria x<br> ananassa      | Strawberry    | Fra a 1    | Food Plant            | Fragaria Fra a 1                          | 14  | 60389904  | 7  |
| 739 | Fragaria x<br> ananassa      | Strawberry    | Fra a 1    | Food Plant            | Fragaria Fra a 1                          | 74  | 60389905  | 7  |
| 740 | Fragaria x<br> ananassa      | Strawberry    | Fra a 1    | Food Plant            | Fragaria Fra a 1                          | 160 | 90185692  | 7  |
| 741 | Fragaria x<br> ananassa      | Strawberry    | Fra a 1    | Food Plant            | Fragaria Fra a 1                          | 159 | 90185688  | 7  |
| 742 | Fragaria x<br> ananassa      | Strawberry    | Fra a 1    | Food Plant            | Fragaria Fra a 1                          | 160 | 90185684  | 7  |

|     |                        |              |            |                |                             |     |           |    |
|-----|------------------------|--------------|------------|----------------|-----------------------------|-----|-----------|----|
| 743 | Fragaria x<br>ananassa | Strawberry   | Fra a 1    | Food Plant     | Fragaria Fra a 1            | 160 | 90185682  | 7  |
| 744 | Fragaria x<br>ananassa | Strawberry   | Fra a 1    | Food Plant     | Fragaria Fra a 1            | 160 | 88082485  | 7  |
| 745 | Fraxinus<br>excelsior  | European ash | Fra e 1    | Aero Plant     | Fraxinus Fra e 1            | 146 | 34978692  | 7  |
| 746 | Fraxinus<br>excelsior  | European ash | Fra e 1    | Aero Plant     | Fraxinus Fra e 1            | 145 | 56122438  | 7  |
| 747 | Fraxinus<br>excelsior  | European ash | Fra e 1    | Aero Plant     | Fraxinus Fra e 1            | 145 | 33327133  | 7  |
| 748 | Fulvia mutica          |              | Unassigned | Food<br>Animal | Fulvia tropomyosin          | 284 | 219806596 | 10 |
| 749 | Fusarium<br>culmorum   | Fungus       | Unassigned | Aero Fungi     | Fusarium claimed<br>Fus c 3 | 450 | 25361513  | 7  |
| 750 | Fusarium<br>culmorum   | Fungus       | Unassigned | Aero Fungi     | Fusarium Fus c 1            | 109 | 41688715  | 10 |
| 751 | Fusarium<br>culmorum   | Fungus       | Unassigned | Aero Fungi     | Fusarium Fus c 2            | 121 | 52783462  | 9  |
| 752 | Gadus callarias        | Baltic cod   | Gad c 1    | Food<br>Animal | Gadus Gad c 1               | 113 | 131112    | 7  |
| 753 | Gadus morhua           | Atlantic cod | Unassigned | Food<br>Animal | Gadus Gad c 1               | 109 | 14531014  | 7  |
| 754 | Gadus morhua           | Atlantic cod | Unassigned | Food<br>Animal | Gadus Gad c 1               | 109 | 14531016  | 7  |
| 755 | Gadus morhua           | Atlantic cod | Unassigned | Food<br>Animal | Gadus Gad c 1               | 109 | 148356691 | 9  |
| 756 | Gadus morhua           | Atlantic cod | Unassigned | Food<br>Animal | Gadus Gad c 1               | 109 | 148356693 | 9  |
| 757 | Gallus gallus          | Chicken      | Gal d 1    | Food<br>Animal | Gallus Gal d 1              | 210 | 124757    | 7  |
| 758 | Gallus gallus          | Chicken      | Unassigned | Food<br>Animal | Gallus Gal d 1              | 208 | 162952006 | 9  |
| 759 | Gallus gallus          | Chicken      | Unassigned | Food<br>Animal | Gallus Gal d 1              | 210 | 209979542 | 10 |
| 760 | Gallus gallus          | Chicken      | Gal d 2    | Food<br>Animal | Gallus Gal d 2              | 155 | 63052     | 7  |
| 761 | Gallus gallus          | Chicken      | Gal d 2    | Food<br>Animal | Gallus Gal d 2              | 386 | 129293    | 7  |
| 762 | Gallus gallus          | Chicken      | Gal d 2    | Food<br>Animal | Gallus Gal d 2              | 386 | 808969    | 7  |
| 763 | Gallus gallus          | Chicken      | Gal d 2    | Food<br>Animal | Gallus Gal d 2              | 385 | 15826578  | 7  |
| 764 | Gallus gallus          | Chicken      | Unassigned | Food<br>Animal | Gallus Gal d 2              | 385 | 34811333  | 7  |
| 765 | Gallus gallus          | Chicken      | Gal d 3    | Food<br>Animal | Gallus Gal d 3              | 705 | 757851    | 7  |

|     |                         |            |                 |                      |  |     |           |    |
|-----|-------------------------|------------|-----------------|----------------------|--|-----|-----------|----|
| 766 | Gallus gallus           | Chicken    | Gal d 3         | Food<br>Animal       | Gallus Gal d 3                                   | 705 | 1351295   | 7  |
| 767 | Gallus gallus           | Chicken    | Gal d 4         | Food<br>Animal       | Gallus Gal d 4                                   | 147 | 126608    | 7  |
| 768 | Gallus gallus           | Chicken    | Gal d 4         | Food<br>Animal       | Gallus Gal d 4                                   | 24  | 212279    | 7  |
| 769 | Gallus gallus           | Chicken    | Unassigned      | Food<br>Animal       | Gallus Gal d 5                                   | 615 | 113575    | 9  |
| 770 | Gallus gallus           | Chicken    | Unassigned      | Food<br>Animal       | Gallus parvalbumin                               | 110 | 225877920 | 10 |
| 771 | Gibberella zeae<br>PH-1 | Fungus     | Unassigned      | Aero Fungi           | Gibberella 60S<br>acidic ribosomal<br>protein P2 | 109 | 46122455  | 7  |
| 772 | Glossina<br>morsitans   | Tsetse fly | Unassigned      | Venom or<br>Salivary | Glossina Glo m 5                                 | 258 | 289740263 | 11 |
| 773 | Glossina<br>morsitans   | Tsetse fly | Unassigned      | Venom or<br>Salivary | Glossina Glo m 5                                 | 259 | 289742475 | 11 |
| 774 | Glossina<br>morsitans   | Tsetse fly | Unassigned      | Venom or<br>Salivary | Glossina Glo m 5                                 | 222 | 289742483 | 11 |
| 775 | Glossina<br>morsitans   | Tsetse fly | Unassigned      | Venom or<br>Salivary | Glossina Glo m 5                                 | 259 | 8927462   | 11 |
| 776 | Glycine max             | Soybean    | Unassigned      | Food Plant           | Gly m 5 Glycine<br>Beta-conglycinin              | 605 | 18536     | 7  |
| 777 | Glycine max             | Soybean    | Unassigned      | Food Plant           | Gly m 5 Glycine<br>Beta-conglycinin              | 218 | 169927    | 7  |
| 778 | Glycine max             | Soybean    | Unassigned      | Food Plant           | Gly m 5 Glycine<br>Beta-conglycinin              | 639 | 169929    | 7  |
| 779 | Glycine max             | Soybean    | Unassigned      | Food Plant           | Gly m 5 Glycine<br>Beta-conglycinin              | 439 | 256427    | 7  |
| 780 | Glycine max             | Soybean    | Gly m<br>1.0101 | Aero Plant           | Glycine Gly m 1                                  | 42  | 999355    | 7  |
| 781 | Glycine max             | Soybean    | Unassigned      | Food Plant           | Glycine Gly m 1                                  | 134 | 76782247  | 7  |
| 782 | Glycine max             | Soybean    | Unassigned      | Food Plant           | Glycine Gly m 1                                  | 119 | 76782249  | 7  |
| 783 | Glycine max             | Soybean    | Gly m 2         | Aero Plant           | Glycine Gly m 2                                  | 20  | 1362049   | 7  |
| 784 | Glycine max             | Soybean    | Gly m 3         | Food Plant           | Glycine Gly m 3                                  | 131 | 3021373   | 7  |
| 785 | Glycine max             | Soybean    | Gly m 3         | Food Plant           | Glycine Gly m 3                                  | 131 | 3914435   | 7  |
| 786 | Glycine max             | Soybean    | Unassigned      | Food Plant           | Glycine Gly m 3                                  | 131 | 156938901 | 9  |
| 787 | Glycine max             | Soybean    | Unassigned      | Food Plant           | Glycine Gly m 4                                  | 158 | 134194    | 9  |
| 788 | Glycine max             | Soybean    | Unassigned      | Food Plant           | Glycine Gly m Bd<br>28K                          | 473 | 12697782  | 7  |
| 789 | Glycine max             | Soybean    | Unassigned      | Food Plant           | Glycine Gly m Bd<br>28K                          | 373 | 187766751 | 10 |

|     |                        |              |            |            |                                   |     |           |    |
|-----|------------------------|--------------|------------|------------|-----------------------------------|-----|-----------|----|
| 790 | Glycine max            | Soybean      | Unassigned | Food Plant | Glycine Gly m Bd 28K              | 373 | 187766749 | 10 |
| 791 | Glycine max            | Soybean      | Unassigned | Food Plant | Glycine Gly m Bd 28K              | 373 | 187766747 | 10 |
| 792 | Glycine max            | Soybean      | Unassigned | Food Plant | Glycine Gly m Bd 28K              | 455 | 187766755 | 10 |
| 793 | Glycine max            | Soybean      | Unassigned | Food Plant | Glycine Gly m Bd 30 kDa           | 379 | 129353    | 17 |
| 794 | Glycine max            | Soybean      | Unassigned | Food Plant | Glycine Gly m Bd 30 kDa           | 379 | 1199563   | 17 |
| 795 | Glycine max            | Soybean      | Unassigned | Food Plant | Glycine Gly m Bd 30 kDa           | 379 | 3097321   | 17 |
| 796 | Glycine max            | Soybean      | Unassigned | Food Plant | Glycine Glycinin G1               | 495 | 18615     | 17 |
| 797 | Glycine max            | Soybean      | Unassigned | Food Plant | Glycine Glycinin G1               | 495 | 18635     | 17 |
| 798 | Glycine max            | Soybean      | Unassigned | Food Plant | Glycine Glycinin G2               | 485 | 18609     | 17 |
| 799 | Glycine max            | Soybean      | Unassigned | Food Plant | Glycine Glycinin G2               | 485 | 18637     | 17 |
| 800 | Glycine max            | Soybean      | Unassigned | Food Plant | Glycine Glycinin G3               | 481 | 18639     | 17 |
| 801 | Glycine max            | Soybean      | Unassigned | Food Plant | Glycine Glycinin G4               | 562 | 18641     | 17 |
| 802 | Glycine max            | Soybean      | Unassigned | Food Plant | Glycine Glycinin G4               | 562 | 732706    | 17 |
| 803 | Glycine soja           | Soybean      | Unassigned | Food Plant | Glycine Glycinin G4               | 563 | 806556    | 17 |
| 804 | Glycine max            | Soybean      | Unassigned | Food Plant | Glycine Glycinin G5               | 516 | 169969    | 17 |
| 805 | Glycine max            | Soybean      | Unassigned | Food Plant | Glycine Glycinin G5               | 240 | 169971    | 17 |
| 806 | Glycine soja           | Soybean      | Unassigned | Food Plant | Glycine Glycinin G5               | 517 | 736002    | 17 |
| 807 | Glycine max            | Soybean      | Unassigned | Food Plant | Glycine Major Gly 50 kDa allergen | 17  | 85681057  | 17 |
| 808 | Glycine max            | Soybean      | Unassigned | Food Plant | Glycine Trypsin inhibitor         | 217 | 18770     | 17 |
| 809 | Glycine max            | Soybean      | Unassigned | Food Plant | Glycine Trypsin inhibitor         | 217 | 18772     | 17 |
| 810 | Glycine max            | Soybean      | Unassigned | Food Plant | Glycine Trypsin inhibitor         | 216 | 256429    | 17 |
| 811 | Glycine max            | Soybean      | Unassigned | Food Plant | Glycine Trypsin inhibitor         | 203 | 256635    | 17 |
| 812 | Glycine max            | Soybean      | Unassigned | Food Plant | Glycine Trypsin inhibitor         | 204 | 256636    | 17 |
| 813 | Glycine max            | Soybean      | Unassigned | Food Plant | Glycine Trypsin inhibitor         | 208 | 510515    | 17 |
| 814 | Glycyphagus domesticus | Storage mite | Unassigned | Aero Mite  | Glycyphagus Gly d 2               | 141 | 33772588  | 17 |
| 815 | Glycyphagus domesticus | Storage mite | Unassigned | Aero Mite  | Glycyphagus Gly d 2               | 125 | 48428170  | 19 |
| 816 | Glycyphagus            | Storage mite | Unassigned | Aero Mite  | Glycyphagus Gly d 2               | 128 | 48428178  | 19 |

|     |   |                       |                  |                |                                 |     |           |    |
|-----|---|-----------------------|------------------|----------------|---------------------------------|-----|-----------|----|
|     | domesticus                                      |                       |                  |                |                                 |     |           |    |
| 817 | Haliotis discus<br>discus                       | Disk abalone          | Unassigned       | Food<br>Animal | Haliotis Hal m 1<br>tropomyosin | 284 | 219806586 | 10 |
| 818 | Haliotis<br>diversicolor                        | Abalone               | Unassigned       | Food<br>Animal | Haliotis Hal m 1<br>tropomyosin | 284 | 9954249   | 7  |
| 819 | Haliotis discus<br>discus                       | Disk abalone          | Unassigned       | Food<br>Animal | Haliotis paramyosin             | 860 | 318609972 | 12 |
| 820 | Helianthus<br>annuus                            | Sunflower             | Hel a 2          | Aero Plant     | Helianthus Hel a 2              | 133 | 3581965   | 7  |
| 821 | Helianthus<br>annuus                            | Sunflower             | Unassigned       | Food Plant     | Helianthus Seed 2S<br>albumin   | 141 | 112745    | 9  |
| 822 | Helix aspersa<br>                               | Brown garden<br>snail | Unassigned       | Food<br>Animal | Helix Hel as 1<br>tropomyosin   | 284 | 42559558  | 9  |
| 823 | Hevea<br>brasiliensis                           | Para rubber<br>tree   | Hev b 1          | Contact        | Hevea Hev b 1                   | 138 | 132270    | 7  |
| 824 | Hevea<br>brasiliensis                           | Para rubber<br>tree   | Hev b<br>10.0101 | Contact        | Hevea Hev b 10                  | 233 | 348137    | 7  |
| 825 | Hevea<br>brasiliensis                           | Para rubber<br>tree   | Hev b<br>10.0102 | Contact        | Hevea Hev b 10                  | 205 | 5777414   | 7  |
| 826 | Hevea<br>brasiliensis                           | Para rubber<br>tree   | Hev b<br>10.0103 | Contact        | Hevea Hev b 10                  | 205 | 10862818  | 7  |
| 827 | Hevea<br>brasiliensis                           | Para rubber<br>tree   | Hev b 11         | Contact        | Hevea Hev b 11                  | 295 | 14575525  | 7  |
| 828 | Hevea<br>brasiliensis<br>subsp.<br>brasiliensis | Para rubber<br>tree   | Hev b 11         | Contact        | Hevea Hev b 11                  | 295 | 27526732  | 7  |
| 829 | Hevea<br>brasiliensis                           | Para rubber<br>tree   | Hev b 12         | Contact        | Hevea Hev b 12                  | 116 | 20135538  | 7  |
| 830 | Hevea<br>brasiliensis                           | Para rubber<br>tree   | Unassigned       | Contact        | Hevea Hev b 13                  | 391 | 51315784  | 9  |
| 831 | Hevea<br>brasiliensis                           | Para rubber<br>tree   | Unassigned       | Contact        | Hevea Hev b 14<br>hevamine      | 208 | 313870530 | 12 |
| 832 | Hevea<br>brasiliensis                           | Para rubber<br>tree   | Hev b 2          | Contact        | Hevea Hev b 2                   | 374 | 1184668   | 7  |
| 833 | Hevea<br>brasiliensis                           | Para rubber<br>tree   | Hev b 2          | Contact        | Hevea Hev b 2                   | 374 | 32765543  | 7  |
| 834 | Hevea<br>brasiliensis                           | Para rubber<br>tree   | Unassigned       | Contact        | Hevea Hev b 2                   | 374 | 124294783 | 8  |
| 835 | Hevea<br>brasiliensis                           | Para rubber<br>tree   | Unassigned       | Contact        | Hevea Hev b 2                   | 374 | 124294785 | 8  |
| 836 | Hevea<br>brasiliensis                           | Para rubber<br>tree   | Unassigned       | Contact        | Hevea Hev b 2                   | 374 | 124365249 | 8  |
| 837 | Hevea<br>brasiliensis                           | Para rubber<br>tree   | Unassigned       | Contact        | Hevea Hev b 2                   | 374 | 124365251 | 8  |
| 838 | Hevea<br>brasiliensis                           | Para rubber<br>tree   | Unassigned       | Contact        | Hevea Hev b 2                   | 374 | 124365253 | 8  |

|     |                       |                     |                 |         |               |     |           |    |
|-----|-----------------------|---------------------|-----------------|---------|---------------|-----|-----------|----|
| 839 | Hevea<br>brasiliensis | Para rubber<br>tree | Unassigned      | Contact | Hevea Hev b 2 | 316 | 261824817 | 11 |
| 840 | Hevea<br>brasiliensis | Para rubber<br>tree | Unassigned      | Contact | Hevea Hev b 2 | 374 | 268037674 | 11 |
| 841 | Hevea<br>brasiliensis | Para rubber<br>tree | Unassigned      | Contact | Hevea Hev b 2 | 374 | 270315180 | 11 |
| 842 | Hevea<br>brasiliensis | Para rubber<br>tree | Hev b 3         | Contact | Hevea Hev b 3 | 204 | 14423933  | 7  |
| 843 | Hevea<br>brasiliensis | Para rubber<br>tree | Unassigned      | Contact | Hevea Hev b 4 | 366 | 46410859  | 7  |
| 844 | Hevea<br>brasiliensis | Para rubber<br>tree | Unassigned      | Contact | Hevea Hev b 5 | 151 | 7387766   | 8  |
| 845 | Hevea<br>brasiliensis | Para rubber<br>tree | Hev b 6         | Contact | Hevea Hev b 6 | 204 | 123062    | 7  |
| 846 | Hevea<br>brasiliensis | Para rubber<br>tree | Hev b 6         | Contact | Hevea Hev b 6 | 187 | 2832430   | 7  |
| 847 | Hevea<br>brasiliensis | Para rubber<br>tree | Unassigned      | Contact | Hevea Hev b 6 | 43  | 73535415  | 7  |
| 848 | Hevea<br>brasiliensis | Para rubber<br>tree | Unassigned      | Contact | Hevea Hev b 6 | 204 | 158342650 | 9  |
| 849 | Hevea<br>brasiliensis | Para rubber<br>tree | Hev b 7.01      | Contact | Hevea Hev b 7 | 388 | 1916805   | 7  |
| 850 | Hevea<br>brasiliensis | Para rubber<br>tree | Hev b 7.02      | Contact | Hevea Hev b 7 | 388 | 3087805   | 7  |
| 851 | Hevea<br>brasiliensis | Para rubber<br>tree | Unassigned      | Contact | Hevea Hev b 7 | 388 | 3288200   | 7  |
| 852 | Hevea<br>brasiliensis | Para rubber<br>tree | Hev b 7         | Contact | Hevea Hev b 7 | 388 | 6707018   | 7  |
| 853 | Hevea<br>brasiliensis | Para rubber<br>tree | Unassigned      | Contact | Hevea Hev b 7 | 387 | 41581137  | 7  |
| 854 | Hevea<br>brasiliensis | Para rubber<br>tree | Hev b 8         | Contact | Hevea Hev b 8 | 131 | 3183706   | 7  |
| 855 | Hevea<br>brasiliensis | Para rubber<br>tree | Hev b 8         | Contact | Hevea Hev b 8 | 131 | 11513601  | 7  |
| 856 | Hevea<br>brasiliensis | Para rubber<br>tree | Hev b<br>8.0204 | Contact | Hevea Hev b 8 | 131 | 14423856  | 7  |
| 857 | Hevea<br>brasiliensis | Para rubber<br>tree | Hev b<br>8.0203 | Contact | Hevea Hev b 8 | 131 | 14423858  | 7  |
| 858 | Hevea<br>brasiliensis | Para rubber<br>tree | Hev b<br>8.0202 | Contact | Hevea Hev b 8 | 131 | 14423859  | 7  |
| 859 | Hevea<br>brasiliensis | Para rubber<br>tree | Hev b<br>8.0201 | Contact | Hevea Hev b 8 | 131 | 14423860  | 7  |
| 860 | Hevea<br>brasiliensis | Para rubber<br>tree | Hev b<br>8.0102 | Contact | Hevea Hev b 8 | 131 | 14423868  | 7  |
| 861 | Hevea<br>brasiliensis | Para rubber<br>tree | Unassigned      | Contact | Hevea Hev b 9 | 445 | 14423687  | 9  |

|     |                                   |                     |                 |                |  |     |          |   |
|-----|-----------------------------------|---------------------|-----------------|----------------|--|-----|----------|---|
| 862 | Hevea<br>brasiliensis             | Para rubber<br>tree | Unassigned      | Contact        | Hevea Hev b 9  | 445 | 14423688 | 9 |
| 863 | Holcus lanatus                    | Velvet grass        | Unassigned      | Aero Plant     | Holcus group V   | 240 | 2266623  | 7 |
| 864 | Holcus lanatus                    | Velvet grass        | Unassigned      | Aero Plant     | Holcus group V   | 264 | 2266625  | 7 |
| 865 | Holcus lanatus                    | Velvet grass        | Unassigned      | Aero Plant     | Holcus group V   | 296 | 11991229 | 7 |
| 866 | Holcus lanatus                    | Velvet grass        | Hol 1<br>1.0102 | Aero Plant     | Holcus Hol 1 1   | 248 | 1167836  | 7 |
| 867 | Holcus lanatus                    | Velvet grass        | Unassigned      | Aero Plant     | Holcus Hol 1 1   | 263 | 3860384  | 7 |
| 868 | Holcus lanatus                    | Velvet grass        | Unassigned      | Aero Plant     | Holcus Hol 1 1   | 265 | 1171005  | 9 |
| 869 | Homarus<br>americanus             | American<br>lobster | Unassigned      | Food<br>Animal | Homarus Tropomyosin                                    | 284 | 2660868  | 7 |
| 870 | Homarus<br>americanus             | American<br>lobster | Unassigned      | Food<br>Animal | Homarus Tropomyosin                                    | 284 | 14285796 | 7 |
| 871 | Hordeum vulgare<br>subsp. vulgare | Barley              | Unassigned      | Aero Plant     | Hordeum<br>Alpha-amylase<br>inhibitor BDAI-1           | 152 | 3367714  | 7 |
| 872 | Hordeum vulgare<br>subsp. vulgare | Barley              | Unassigned      | Aero Plant     | Hordeum<br>Alpha-amylase<br>inhibitor component<br>Cma | 144 | 18955    | 7 |
| 873 | Hordeum vulgare<br>subsp. vulgare | Barley              | Unassigned      | Aero Plant     | Hordeum<br>Alpha-amylase<br>inhibitor component<br>Cma | 145 | 439275   | 7 |
| 874 | Hordeum vulgare                   | Barley              | Unassigned      | Aero Plant     | Hordeum<br>Alpha-amylase<br>inhibitor component<br>CMb | 149 | 585290   | 7 |
| 875 | Hordeum vulgare                   | Barley              | Hor v 15        | Aero Plant     | Hordeum Hor v 15                                       | 146 | 2506771  | 7 |
| 876 | Hordeum vulgare                   | Barley              | Unassigned      | Aero Plant     | Hordeum LTP 1  | 117 | 167077   | 7 |
| 877 | Hordeum vulgare                   | Barley              | Unassigned      | Food Plant     | Hordeum LTP 1  | 134 | 19039    | 7 |
| 878 | Hordeum vulgare                   | Barley              | Unassigned      | Aero Plant     | Hordeum Trypsin<br>inhibitor CMe                       | 144 | 1405736  | 7 |
| 879 | Hordeum vulgare<br>subsp. vulgare | Barley              | Unassigned      | Aero Plant     | Hordeum Trypsin<br>inhibitor CMe                       | 148 | 19009    | 7 |
| 880 | Humulus<br>japonicus              | Japanese hop        | Hum j 1         | Aero Plant     | Humulus Humj1  | 155 | 33113263 | 7 |
| 881 | Humulus scandens                  | Japanese hop        | Unassigned      | Aero Plant     | Humulus<br>profilin-like<br>protein                    | 131 | 34851176 | 7 |
| 882 | Humulus scandens                  | Japanese hop        | Unassigned      | Aero Plant     | Humulus<br>profilin-like<br>protein                    | 131 | 34851174 | 7 |
| 883 | Juglans nigra                     | Black walnut        | Jug n 1         | Food Plant     | Juglans Jug r 1  | 161 | 31321942 | 7 |
| 884 | Juglans regia                     | English<br>walnut   | Jug r 1         | Food Plant     | Juglans Jug r 1  | 139 | 1794252  | 7 |

|     |                          |                |              |            |                                      |     |           |    |
|-----|--------------------------|----------------|--------------|------------|--------------------------------------|-----|-----------|----|
| 885 | Juglans nigra            | Black walnut   | Jug n 2      | Food Plant | Juglans Jug r 2                      | 481 | 31321944  | 7  |
| 886 | Juglans regia            | English walnut | Jug r 2      | Food Plant | Juglans Jug r 2                      | 593 | 6580762   | 7  |
| 887 | Juglans regia            | English walnut | Unassigned   | Food Plant | Juglans Jug r 3                      | 119 | 209484145 | 11 |
| 888 | Juglans regia            | English walnut | Unassigned   | Food Plant | Juglans Jug r 4 seed storage protein | 507 | 56788031  | 7  |
| 889 | Juniperus ashei          | Mountain cedar | Unassigned   | Aero Plant | Juniperus Jun a 2                    | 507 | 47606048  | 9  |
| 890 | Juniperus ashei          | Mountain cedar | Unassigned   | Aero Plant | Juniperus Jun a 3                    | 225 | 9087177   | 8  |
| 891 | Juniperus rigida         | Cedar          | Unassigned   | Aero Plant | Juniperus Jun a 3                    | 225 | 38456224  | 7  |
| 892 | Juniperus rigida         | Cedar          | Unassigned   | Aero Plant | Juniperus Jun a 3                    | 225 | 38456222  | 7  |
| 893 | Juniperus virginiana     | Red cedar      | Unassigned   | Aero Plant | Juniperus Jun a 3                    | 110 | 51316532  | 7  |
| 894 | Juniperus ashei          | Mountain cedar | Unassigned   | Aero Plant | Juniperus Jun a/v 1                  | 367 | 9087152   | 9  |
| 895 | Juniperus oxycedrus      | Juniper        | Unassigned   | Aero Plant | Juniperus Jun a/v 1                  | 367 | 15139849  | 7  |
| 896 | Juniperus virginiana     | Red cedar      | Jun v 1      | Aero Plant | Juniperus Jun a/v 1                  | 367 | 8843917   | 7  |
| 897 | Juniperus virginiana     | Red cedar      | Jun v 1      | Aero Plant | Juniperus Jun a/v 1                  | 367 | 8843921   | 7  |
| 898 | Juniperus oxycedrus      | Juniper        | Unassigned   | Aero Plant | Juniperus Jun o 4                    | 165 | 14423843  | 8  |
| 899 | Lens culinaris           | Lentil         | Len c 1.0101 | Food Plant | Lens Len c 1                         | 418 | 29539109  | 7  |
| 900 | Lens culinaris           | Lentil         | Len c 1.0102 | Food Plant | Lens Len c 1                         | 415 | 29539111  | 7  |
| 901 | Lepidoglyphus destructor | Storage mite   | Lep d 10     | Aero Mite  | Lepidoglyphus Lep d 10               | 284 | 14423956  | 7  |
| 902 | Lepidoglyphus destructor | Storage mite   | Lep d 13     | Aero Mite  | Lepidoglyphus Lep d 13               | 131 | 14423714  | 7  |
| 903 | Lepidoglyphus destructor | Storage mite   | Lep d 2      | Aero Mite  | Lepidoglyphus Lep d 2                | 141 | 2147108   | 7  |
| 904 | Lepidoglyphus destructor | Storage mite   | Lep d 2      | Aero Mite  | Lepidoglyphus Lep d 2                | 141 | 21213898  | 7  |
| 905 | Lepidoglyphus destructor | Storage mite   | Lep d 2      | Aero Mite  | Lepidoglyphus Lep d 2                | 141 | 21213900  | 7  |
| 906 | Lepidoglyphus destructor | Storage mite   | Lep d 2      | Aero Mite  | Lepidoglyphus Lep d 2                | 141 | 1582223   | 7  |
| 907 | Lepidoglyphus destructor | Storage mite   | Lep d 2      | Aero Mite  | Lepidoglyphus Lep d 2                | 141 | 1582222   | 7  |
| 908 | Lepidoglyphus            | Storage mite   | Unassigned   | Aero Mite  | Lepidoglyphus Lep d 141              | 141 | 34495274  | 7  |



|     |                               |              |                 |                |  |     |           |    |
|-----|-------------------------------|--------------|-----------------|----------------|--|-----|-----------|----|
|     | destructor                    |              |                 |                | 2  |     |           |    |
| 909 | Lepidoglyphus<br>destructor   | Storage mite | Unassigned      | Aero Mite      | Lepidoglyphus Lep d<br>2                           | 141 | 34495278  | 7  |
| 910 | Lepidoglyphus<br>destructor   | Storage mite | Unassigned      | Aero Mite      | Lepidoglyphus Lep d<br>2                           | 140 | 34495280  | 7  |
| 911 | Lepidoglyphus<br>destructor   | Storage mite | Unassigned      | Aero Mite      | Lepidoglyphus Lep d<br>2                           | 141 | 34495282  | 7  |
| 912 | Lepidoglyphus<br>destructor   | Storage mite | Unassigned      | Aero Mite      | Lepidoglyphus Lep d<br>2                           | 141 | 34495284  | 7  |
| 913 | Lepidoglyphus<br>destructor   | Storage mite | Unassigned      | Aero Mite      | Lepidoglyphus Lep d<br>2                           | 141 | 34495286  | 7  |
| 914 | Lepidoglyphus<br>destructor   | Storage mite | Unassigned      | Aero Mite      | Lepidoglyphus Lep d<br>2                           | 141 | 34495288  | 7  |
| 915 | Lepidoglyphus<br>destructor   | Storage mite | Unassigned      | Aero Mite      | Lepidoglyphus Lep d<br>2                           | 141 | 34495290  | 7  |
| 916 | Lepidoglyphus<br>destructor   | Storage mite | Unassigned      | Aero Mite      | Lepidoglyphus Lep d<br>2                           | 141 | 1708793   | 9  |
| 917 | Lepidoglyphus<br>destructor   | Storage mite | Lep d 5         | Aero Mite      | Lepidoglyphus Lep d<br>5                           | 110 | 14423651  | 7  |
| 918 | Lepidoglyphus<br>destructor   | Storage mite | Unassigned      | Aero Mite      | Lepidoglyphus Lep d<br>5                           | 171 | 34495292  | 7  |
| 919 | Lepidoglyphus<br>destructor   | Storage mite | Unassigned      | Aero Mite      | Lepidoglyphus Lep d<br>5                           | 169 | 34495294  | 7  |
| 920 | Lepidoglyphus<br>destructor   | Storage mite | Lep d 7         | Aero Mite      | Lepidoglyphus Lep d<br>7                           | 216 | 14423650  | 7  |
| 921 | Lepidorhombus<br>whiffiagonis |              | Unassigned      | Food<br>Animal | Lepidorhombus Lep w<br>1 parvalbumin               | 109 | 208608078 | 10 |
| 922 | Lepisma<br>saccharina         | Silverfish   | Lep s 1         | Aero<br>Insect | Lepisma Tropomyosin                                | 284 | 20387027  | 7  |
| 923 | Lepisma<br>saccharina         | Silverfish   | Unassigned      | Aero<br>Insect | Lepisma Tropomyosin                                | 243 | 20387029  | 7  |
| 924 | Ligustrum<br>vulgare          | Privet       | Lig v<br>1.0102 | Aero Plant     | Ligustrum Lig v 1                                  | 145 | 3256212   | 7  |
| 925 | Ligustrum<br>vulgare          | Privet       | Unassigned      | Aero Plant     | Ligustrum Lig v 1                                  | 145 | 14423737  | 8  |
| 926 | Lilium<br>longiflorum         | Trumpet lily | Unassigned      | Aero Plant     | Lilium<br>polygalacturonase                        | 413 | 73913442  | 8  |
| 927 | Litchi chinensis              | Lychee nut   | Lit c 1         | Food Plant     | Litchi Lit c 1                                     | 131 | 15809696  | 7  |
| 928 | Litchi chinensis              | Lychee nut   | Unassigned      | Food Plant     | Litchi Lit c 1                                     | 131 | 83317152  | 7  |
| 929 | Litopenaeus<br>vannamei       |              | Unassigned      | Food<br>Animal | Litopenaeus Lit v 4<br>sarcoplasmic Ca+<br>binding | 193 | 223403273 | 11 |
| 930 | Litopenaeus<br>vannamei       |              | Unassigned      | Food<br>Animal | Litopenaeus Lit v 2                                | 356 | 115492980 | 8  |
| 931 | Litopenaeus<br>vannamei       |              | Unassigned      | Food<br>Animal | Litopenaeus Lit v 3<br>myosin                      | 177 | 184198734 | 10 |

|     |                           |                    |              |             |                                  |     |           |    |
|-----|---------------------------|--------------------|--------------|-------------|----------------------------------|-----|-----------|----|
| 932 | Lolium perenne            | Perennial ryegrass | Lol p 1      | Aero Plant  | Lolium Lol p 1                   | 263 | 126385    | 7  |
| 933 | Lolium perenne            | Perennial ryegrass | Lol p 1      | Aero Plant  | Lolium Lol p 1                   | 252 | 168314    | 7  |
| 934 | Lolium perenne            | Perennial ryegrass | Lol p 1      | Aero Plant  | Lolium Lol p 1                   | 263 | 75274600  | 7  |
| 935 | Lolium perenne            | Perennial ryegrass | Unassigned   | Aero Plant  | Lolium Lol p 1                   | 263 | 168316    | 10 |
| 936 | Lolium perenne            | Perennial ryegrass | Lol p 11     | Aero Plant  | Lolium Lol p 11                  | 134 | 47605808  | 7  |
| 937 | Lolium perenne            | Perennial ryegrass | Lol p 2      | Aero Plant  | Lolium Lol p 2                   | 97  | 126386    | 7  |
| 938 | Lolium perenne            | Perennial ryegrass | Lol p 2      | Aero Plant  | Lolium Lol p 2                   | 88  | 939932    | 7  |
| 939 | Lolium perenne            | Perennial ryegrass | Lol p 3      | Aero Plant  | Lolium Lol p 3                   | 97  | 126387    | 7  |
| 940 | Lolium perenne            | Perennial ryegrass | Unassigned   | Aero Plant  | Lolium Lol p 4                   | 423 | 55859464  | 7  |
| 941 | Lolium perenne            | Perennial ryegrass | Lol p 5.0101 | Aero Plant  | Lolium Lol p 5 *ver 10           | 339 | 2498582   | 7  |
| 942 | Lolium perenne            | Perennial ryegrass | Lol p 5      | Aero Plant  | Lolium Lol p 5 *ver 10           | 301 | 4416516   | 7  |
| 943 | Lolium perenne            | Perennial ryegrass | Lol p 5      | Aero Plant  | Lolium Lol p 5 *ver 10           | 301 | 6634467   | 7  |
| 944 | Lolium perenne            | Perennial ryegrass | Unassigned   | Aero Plant  | Lolium Lol p 5 *ver 10           | 307 | 332278195 | 12 |
| 945 | Lupinus angustifolius     |                    | Unassigned   | Food Plant  | Lupinus conglutin beta           | 521 | 149208401 | 9  |
| 946 | Lupinus angustifolius     |                    | Unassigned   | Food Plant  | Lupinus conglutin beta           | 455 | 149208403 | 9  |
| 947 | Lupinus angustifolius     |                    | Unassigned   | Food Plant  | Lupinus conglutin beta           | 611 | 169950562 | 10 |
| 948 | Lycopersicon esculentum   | Tomato             | Lyc e 1      | Food Plant  | Lycopersicon Lyc e 1             | 131 | 16555787  | 7  |
| 949 | Lycopersicon esculentum   | Tomato             | Lyc e 1      | Food Plant  | Lycopersicon Lyc e 1             | 131 | 17224229  | 7  |
| 950 | Lycopersicon esculentum   | Tomato             | Lyc e 2.0101 | Food Plant  | Lycopersicon Lyc e 2             | 553 | 18542113  | 7  |
| 951 | Lycopersicon esculentum   | Tomato             | Lyc e 2.0102 | Food Plant  | Lycopersicon Lyc e 2             | 636 | 18542115  | 7  |
| 952 | Lycopersicon esculentum   | Tomato             | Unassigned   | Food Plant  | Lycopersicon Lyc e 3             | 114 | 71360928  | 7  |
| 953 | Lycopersicon esculentum   | Tomato             | Unassigned   | Food Plant  | Lycopersicon Lyc e 3             | 114 | 71360930  | 7  |
| 954 | Macrobrachium rosenbergii |                    | Unassigned   | Food Animal | Macrobrachium rosenbergii shrimp | 284 | 288819271 | 11 |

|     |                           |       |            |            |   |     |           |   |
|-----|---------------------------|-------|------------|------------|---|-----|-----------|---|
|     |                           |       |            |            | tropomyosin                             |     |           |   |
| 955 | Malassezia<br>furfur      | Yeast | Unassigned | Contact    | Malassezia Mala f 2                     | 177 | 3914386   | 8 |
| 956 | Malassezia<br>furfur      | Yeast | Unassigned | Contact    | Malassezia Mala f 3                     | 166 | 3914387   | 8 |
| 957 | Malassezia<br>furfur      | Yeast | Mala f 4   | Contact    | Malassezia Mala f 4                     | 342 | 4587985   | 7 |
| 958 | Malassezia<br>furfur      | Yeast | Unassigned | Contact    | Malassezia Mala s 1                     | 350 | 13959403  | 7 |
| 959 | Malassezia<br>sympodialis | Yeast | Mala s 11  | Contact    | Malassezia Mala s<br>11                 | 237 | 28569698  | 7 |
| 960 | Malassezia<br>sympodialis | Yeast | Unassigned | Contact    | Malassezia Mala s<br>12                 | 618 | 78038796  | 7 |
| 961 | Malassezia<br>sympodialis | Yeast | Unassigned | Contact    | Malassezia Mala s<br>13 Thioredoxin Rev | 121 | 119390336 | 8 |
| 962 | Malassezia<br>sympodialis | Yeast | Mala s 5   | Contact    | Malassezia Mala s 5                     | 172 | 4138171   | 7 |
| 963 | Malassezia<br>sympodialis | Yeast | Mala s 6   | Contact    | Malassezia Mala s 6                     | 162 | 4138173   | 7 |
| 964 | Malassezia<br>sympodialis | Yeast | Mala s 7   | Contact    | Malassezia Mala s 7                     | 187 | 4138175   | 7 |
| 965 | Malassezia<br>sympodialis | Yeast | Mala s 8   | Contact    | Malassezia Mala s 8                     | 179 | 7271239   | 7 |
| 966 | Malassezia<br>sympodialis | Yeast | Mala s 9   | Contact    | Malassezia Mala s 9                     | 342 | 19069920  | 7 |
| 967 | Malus x<br>domestica      | Apple | Mal d 1    | Food Plant | Malus Mal d 1                           | 159 | 1313966   | 7 |
| 968 | Malus x<br>domestica      | Apple | Mal d 1    | Food Plant | Malus Mal d 1                           | 159 | 4590364   | 7 |
| 969 | Malus x<br>domestica      | Apple | Mal d 1    | Food Plant | Malus Mal d 1                           | 159 | 4590366   | 7 |
| 970 | Malus x<br>domestica      | Apple | Mal d 1    | Food Plant | Malus Mal d 1                           | 159 | 4590368   | 7 |
| 971 | Malus x<br>domestica      | Apple | Mal d 1    | Food Plant | Malus Mal d 1                           | 159 | 4590376   | 7 |
| 972 | Malus x<br>domestica      | Apple | Mal d 1    | Food Plant | Malus Mal d 1                           | 159 | 4590378   | 7 |
| 973 | Malus x<br>domestica      | Apple | Mal d 1    | Food Plant | Malus Mal d 1                           | 159 | 4590380   | 7 |
| 974 | Malus x<br>domestica      | Apple | Mal d 1    | Food Plant | Malus Mal d 1                           | 159 | 4590382   | 7 |
| 975 | Malus x<br>domestica      | Apple | Mal d 1    | Food Plant | Malus Mal d 1                           | 159 | 4590388   | 7 |
| 976 | Malus x<br>domestica      | Apple | Mal d 1    | Food Plant | Malus Mal d 1                           | 159 | 16555783  | 7 |
| 977 | Malus x                   | Apple | Mal d 1    | Food Plant | Malus Mal d 1                           | 159 | 27922941  | 7 |

|      |                   |       |            |            |               |     |           |    |
|------|-------------------|-------|------------|------------|---------------|-----|-----------|----|
|      | domestica         |       |            |            |               |     |           |    |
| 978  | Malus x domestica | Apple | Mal d 1    | Food Plant | Malus Mal d 1 | 159 | 1346478   | 7  |
| 979  | Malus x domestica | Apple | Unassigned | Food Plant | Malus Mal d 1 | 159 | 60280829  | 7  |
| 980  | Malus x domestica | Apple | Unassigned | Food Plant | Malus Mal d 1 | 159 | 60280851  | 7  |
| 981  | Malus x domestica | Apple | Unassigned | Food Plant | Malus Mal d 1 | 159 | 42558971  | 9  |
| 982  | Malus x domestica | Apple | Unassigned | Food Plant | Malus Mal d 1 | 159 | 75306008  | 11 |
| 983  | Malus x domestica | Apple | Unassigned | Food Plant | Malus Mal d 1 | 159 | 75306007  | 11 |
| 984  | Malus x domestica | Apple | Unassigned | Food Plant | Malus Mal d 1 | 159 | 886683    | 11 |
| 985  | Malus x domestica | Apple | Unassigned | Food Plant | Malus Mal d 2 | 26  | 1478293   | 7  |
| 986  | Malus x domestica | Apple | Unassigned | Food Plant | Malus Mal d 2 | 246 | 60418842  | 7  |
| 987  | Malus x domestica | Apple | Unassigned | Food Plant | Malus Mal d 2 | 246 | 60418848  | 7  |
| 988  | Malus x domestica | Apple | Unassigned | Food Plant | Malus Mal d 2 | 246 | 30316292  | 8  |
| 989  | Malus x domestica | Apple | Unassigned | Food Plant | Malus Mal d 2 | 158 | 218059718 | 10 |
| 990  | Malus x domestica | Apple | Unassigned | Food Plant | Malus Mal d 2 | 158 | 218059715 | 10 |
| 991  | Malus x domestica | Apple | Unassigned | Food Plant | Malus Mal d 3 | 115 | 50659891  | 7  |
| 992  | Malus x domestica | Apple | Unassigned | Food Plant | Malus Mal d 3 | 115 | 50659889  | 7  |
| 993  | Malus x domestica | Apple | Unassigned | Food Plant | Malus Mal d 3 | 115 | 50659885  | 7  |
| 994  | Malus x domestica | Apple | Unassigned | Food Plant | Malus Mal d 3 | 115 | 50659879  | 7  |
| 995  | Malus x domestica | Apple | Unassigned | Food Plant | Malus Mal d 3 | 115 | 50659859  | 7  |
| 996  | Malus x domestica | Apple | Unassigned | Food Plant | Malus Mal d 3 | 115 | 38492338  | 7  |
| 997  | Malus x domestica | Apple | Unassigned | Food Plant | Malus Mal d 3 | 115 | 14423814  | 9  |
| 998  | Malus x domestica | Apple | Mal d 4    | Food Plant | Malus Mal d 4 | 131 | 14423873  | 7  |
| 999  | Malus x domestica | Apple | Mal d 4    | Food Plant | Malus Mal d 4 | 131 | 14423874  | 7  |
| 1000 | Malus x domestica | Apple | Mal d 4    | Food Plant | Malus Mal d 4 | 131 | 14423875  | 7  |

|      |                        |                      |            |                   |                            |     |           |    |
|------|------------------------|----------------------|------------|-------------------|----------------------------|-----|-----------|----|
|      | domestica              |                      |            |                   |                            |     |           |    |
| 1001 | Malus x domestica      | Apple                | Mal d 4    | Food Plant        | Malus Mal d 4              | 131 | 28881453  | 7  |
| 1002 | Malus x domestica      | Apple                | Mal d 4    | Food Plant        | Malus Mal d 4              | 131 | 28881457  | 7  |
| 1003 | Malus x domestica      | Apple                | Mal d 4    | Food Plant        | Malus Mal d 4              | 131 | 28881455  | 7  |
| 1004 | Malus x domestica      | Apple                | Unassigned | Food Plant        | Malus Mal d 4              | 131 | 60418854  | 7  |
| 1005 | Malus x domestica      | Apple                | Unassigned | Food Plant        | Malus Mal d 4              | 131 | 60418858  | 7  |
| 1006 | Malus x domestica      | Apple                | Unassigned | Food Plant        | Malus Mal d 4              | 131 | 60418862  | 7  |
| 1007 | Malus x domestica      | Apple                | Unassigned | Food Plant        | Malus Mal d 4              | 131 | 60418866  | 7  |
| 1008 | Malus x domestica      | Apple                | Unassigned | Food Plant        | Malus Mal d 4              | 131 | 164510842 | 9  |
| 1009 | Malus x domestica      | Apple                | Unassigned | Food Plant        | Malus Mal d 4              | 131 | 164510858 | 9  |
| 1010 | Malus x domestica      | Apple                | Unassigned | Food Plant        | Malus Mal d 4              | 131 | 164510860 | 9  |
| 1011 | Malus x domestica      | Apple                | Unassigned | Food Plant        | Malus Mal d 4              | 77  | 218059730 | 10 |
| 1012 | Malus x domestica      | Apple                | Unassigned | Food Plant        | Malus Mal d 4              | 115 | 218059733 | 10 |
| 1013 | Malus x domestica      | Apple                | Unassigned | Food Plant        | Malus Mal d 4              | 131 | 218059728 | 10 |
| 1014 | Marsupinaeus japonicus |                      | Unassigned | Food Animal       | Marsupinaeus tropomyosin   | 284 | 125995159 | 8  |
| 1015 | Mercurialis annua      | Annual mercury grass | Mer a 1    | Aero Plant        | Mercurialis Mer a 1        | 133 | 2959898   | 7  |
| 1016 | Metapanaeus ensis      | Greasyback shrimp    | Unassigned | Food Animal       | Metapanaeus Met e 1        | 274 | 6094504   | 9  |
| 1017 | Mimachlamys nobilis    | Noble scallop        | Unassigned | Food Animal       | Mimachlamys Tropomyosin    | 284 | 9954253   | 7  |
| 1018 | Morus nigra            | Black mulberry       | Unassigned | Food Plant        | Morus Mor n 3 mulberry LTP | 91  | 288561913 | 11 |
| 1019 | Mus musculus           | Mouse                | Mus m 1    | Aero Animal       | Mus Mus m 1                | 180 | 20178291  | 7  |
| 1020 | Musa acuminata         | Banana               | Mus xp 1   | Food Plant        | Musa profilin banana       | 131 | 14161635  | 7  |
| 1021 | Myrmecia pilosula      | Jumper ant           | Myr p 1    | Venom or Salivary | Myrmecia Myr p 1           | 112 | 730091    | 7  |
| 1022 | Myrmecia pilosula      | Jumper ant           | Unassigned | Venom or Salivary | Myrmecia Myr p 1           | 112 | 1911819   | 7  |
| 1023 | Myrmecia               | Jumper ant           | Myr p 2    | Venom or          | Myrmecia Myr p 2           | 75  | 1587177   | 7  |

|      |                      |            |              |                   |                      |     |           |    |
|------|----------------------|------------|--------------|-------------------|----------------------|-----|-----------|----|
|      | pilosula             |            |              | Salivary          |                      |     |           |    |
| 1024 | Myrmecia pilosula    | Jumper ant | Myr p 2      | Venom or Salivary | Myrmecia Myr p 2     | 75  | 2498604   | 7  |
| 1025 | Neptunea polycostata |            | Unassigned   | Food Animal       | Neptunea tropomyosin | 284 | 219806590 | 10 |
| 1026 | Nicotiana tabacum    | Tobacco    | Unassigned   | Aero Plant        | Nicotiana villin     | 520 | 57283139  | 7  |
| 1027 | Nicotiana tabacum    | Tobacco    | Unassigned   | Aero Plant        | Nicotiana villin     | 559 | 57283137  | 7  |
| 1028 | Octopus vulgaris     |            | Unassigned   | Food Animal       | Octopus tropomyosin  | 284 | 83715936  | 7  |
| 1029 | Olea europaea        | Olive tree | Ole e 1      | Aero Plant        | Olea Ole e 1         | 145 | 14424429  | 7  |
| 1030 | Olea europaea        | Olive tree | Unassigned   | Aero Plant        | Olea Ole e 1         | 137 | 1362128   | 7  |
| 1031 | Olea europaea        | Olive tree | Unassigned   | Aero Plant        | Olea Ole e 1         | 136 | 1362129   | 7  |
| 1032 | Olea europaea        | Olive tree | Unassigned   | Aero Plant        | Olea Ole e 1         | 136 | 1362130   | 7  |
| 1033 | Olea europaea        | Olive tree | Ole e 1.0104 | Aero Plant        | Olea Ole e 1         | 145 | 1362131   | 7  |
| 1034 | Olea europaea        | Olive tree | Ole e 1      | Aero Plant        | Olea Ole e 1         | 137 | 1362132   | 7  |
| 1035 | Olea europaea        | Olive tree | Unassigned   | Aero Plant        | Olea Ole e 1         | 136 | 1362133   | 7  |
| 1036 | Olea europaea        | Olive tree | Unassigned   | Aero Plant        | Olea Ole e 1         | 136 | 1362134   | 7  |
| 1037 | Olea europaea        | Olive tree | Ole e 1.0102 | Aero Plant        | Olea Ole e 1         | 145 | 1362135   | 7  |
| 1038 | Olea europaea        | Olive tree | Ole e 1.0103 | Aero Plant        | Olea Ole e 1         | 145 | 1362136   | 7  |
| 1039 | Olea europaea        | Olive tree | Unassigned   | Aero Plant        | Olea Ole e 1         | 136 | 1362137   | 7  |
| 1040 | Olea europaea        | Olive tree | Ole e 1.0105 | Aero Plant        | Olea Ole e 1         | 146 | 2465127   | 7  |
| 1041 | Olea europaea        | Olive tree | Ole e 1.0106 | Aero Plant        | Olea Ole e 1         | 146 | 2465129   | 7  |
| 1042 | Olea europaea        | Olive tree | Ole e 1.0107 | Aero Plant        | Olea Ole e 1         | 146 | 2465131   | 7  |
| 1043 | Olea europaea        | Olive tree | Ole e 1.0101 | Aero Plant        | Olea Ole e 1         | 130 | 13195753  | 7  |
| 1044 | Olea europaea        | Olive tree | Unassigned   | Aero Plant        | Olea Ole e 1         | 134 | 37724597  | 7  |
| 1045 | Olea europaea        | Olive tree | Unassigned   | Aero Plant        | Olea Ole e 1         | 135 | 37724593  | 7  |
| 1046 | Olea europaea        | Olive tree | Unassigned   | Aero Plant        | Olea Ole e 1         | 132 | 37548753  | 7  |
| 1047 | Olea europaea        | Olive tree | Unassigned   | Aero Plant        | Olea Ole e 1         | 131 | 33329758  | 7  |
| 1048 | Olea europaea        | Olive tree | Unassigned   | Aero Plant        | Olea Ole e 1         | 132 | 33329756  | 7  |
| 1049 | Olea europaea        | Olive tree | Unassigned   | Aero Plant        | Olea Ole e 1         | 132 | 33329754  | 7  |
| 1050 | Olea europaea        | Olive tree | Unassigned   | Aero Plant        | Olea Ole e 1         | 131 | 33329752  | 7  |
| 1051 | Olea europaea        | Olive tree | Unassigned   | Aero Plant        | Olea Ole e 1         | 131 | 33329750  | 7  |

|      |               |            |                          |            |                                |     |           |    |
|------|---------------|------------|--------------------------|------------|--------------------------------|-----|-----------|----|
| 1052 | Olea europaea | Olive tree | Unassigned               | Aero Plant | Olea Ole e 1                   | 129 | 33329748  | 7  |
| 1053 | Olea europaea | Olive tree | Unassigned               | Aero Plant | Olea Ole e 1                   | 131 | 33329744  | 7  |
| 1054 | Olea europaea | Olive tree | Unassigned               | Aero Plant | Olea Ole e 1                   | 132 | 33329738  | 7  |
| 1055 | Olea europaea | Olive tree | Unassigned               | Aero Plant | Olea Ole e 1                   | 132 | 33329732  | 7  |
| 1056 | Olea europaea | Olive tree | Unassigned               | Aero Plant | Olea Ole e 1                   | 132 | 33325115  | 7  |
| 1057 | Olea europaea | Olive tree | Unassigned               | Aero Plant | Olea Ole e 1                   | 140 | 145313982 | 9  |
| 1058 | Olea europaea | Olive tree | Unassigned               | Aero Plant | Olea Ole e 1                   | 140 | 145313984 | 9  |
| 1059 | Olea europaea | Olive tree | Unassigned               | Aero Plant | Olea Ole e 1                   | 140 | 145313988 | 9  |
| 1060 | Olea europaea | Olive tree | Unassigned               | Aero Plant | Olea Ole e 1                   | 140 | 145313990 | 9  |
| 1061 | Olea europaea | Olive tree | Unassigned               | Aero Plant | Olea Ole e 1                   | 140 | 145313992 | 9  |
| 1062 | Olea europaea | Olive tree | Ole e 10                 | Aero Plant | Olea Ole e 10                  | 123 | 29465664  | 7  |
| 1063 | Olea europaea | Olive tree | Ole e 11.0101<br>11.0102 | Aero Plant | Olea Ole e 11.0101<br>and 0102 | 364 | 68270856  | 11 |
| 1064 | Olea europaea | Olive tree | Ole e 11.0101            | Aero Plant | Olea Ole e 11.0101<br>and 0102 | 364 | 269996495 | 11 |
| 1065 | Olea europaea | Olive tree | Unassigned               | Food Plant | Olea Ole e 13<br>thaumatin     | 226 | 269996497 | 12 |
| 1066 | Olea europaea | Olive tree | Ole e 2                  | Aero Plant | Olea Ole e 2                   | 134 | 3914426   | 7  |
| 1067 | Olea europaea | Olive tree | Ole e 2                  | Aero Plant | Olea Ole e 2                   | 134 | 3914427   | 7  |
| 1068 | Olea europaea | Olive tree | Ole e 2                  | Aero Plant | Olea Ole e 2                   | 134 | 3914428   | 7  |
| 1069 | Olea europaea | Olive tree | Ole e 3                  | Aero Plant | Olea Ole e 3                   | 84  | 3337403   | 7  |
| 1070 | Olea europaea | Olive tree | Ole e 3                  | Aero Plant | Olea Ole e 3                   | 52  | 37725377  | 7  |
| 1071 | Olea europaea | Olive tree | Ole e 5                  | Aero Plant | Olea Ole e 5                   | 30  | 122064581 | 8  |
| 1072 | Olea europaea | Olive tree | Unassigned               | Aero Plant | Olea Ole e 5                   | 152 | 145313972 | 9  |
| 1073 | Olea europaea | Olive tree | Unassigned               | Aero Plant | Olea Ole e 5                   | 152 | 160347106 | 9  |
| 1074 | Olea europaea | Olive tree | Unassigned               | Aero Plant | Olea Ole e 5                   | 144 | 160347108 | 9  |
| 1075 | Olea europaea | Olive tree | Unassigned               | Aero Plant | Olea Ole e 5                   | 152 | 160347112 | 9  |
| 1076 | Olea europaea | Olive tree | Unassigned               | Aero Plant | Olea Ole e 5                   | 152 | 160347120 | 9  |
| 1077 | Olea europaea | Olive tree | Unassigned               | Aero Plant | Olea Ole e 5                   | 152 | 160347122 | 9  |
| 1078 | Olea europaea | Olive tree | Unassigned               | Aero Plant | Olea Ole e 5                   | 152 | 160347124 | 9  |
| 1079 | Olea europaea | Olive tree | Unassigned               | Aero Plant | Olea Ole e 5                   | 152 | 160347126 | 9  |
| 1080 | Olea europaea | Olive tree | Unassigned               | Aero Plant | Olea Ole e 5                   | 152 | 160347130 | 9  |
| 1081 | Olea europaea | Olive tree | Unassigned               | Aero Plant | Olea Ole e 5                   | 152 | 160347134 | 9  |
| 1082 | Olea europaea | Olive tree | Unassigned               | Aero Plant | Olea Ole e 5                   | 152 | 160347138 | 9  |
| 1083 | Olea europaea | Olive tree | Unassigned               | Aero Plant | Olea Ole e 5                   | 152 | 160962543 | 9  |
| 1084 | Olea europaea | Olive tree | Unassigned               | Aero Plant | Olea Ole e 5                   | 152 | 160962547 | 9  |

|      |  |                    |            |                 |   |      |           |    |
|------|--|--------------------|------------|-----------------|---|------|-----------|----|
| 1085 | Olea europaea                          | Olive tree         | Unassigned | Aero Plant      | Olea Ole e 5                                    | 152  | 160962557 | 9  |
| 1086 | Olea europaea                          | Olive tree         | Unassigned | Aero Plant      | Olea Ole e 5                                    | 152  | 160962577 | 9  |
| 1087 | Olea europaea                          | Olive tree         | Unassigned | Aero Plant      | Olea Ole e 5                                    | 152  | 160962583 | 9  |
| 1088 | Olea europaea                          | Olive tree         | Unassigned | Aero Plant      | Olea Ole e 5                                    | 144  | 160962587 | 9  |
| 1089 | Olea europaea                          | Olive tree         | Unassigned | Aero Plant      | Olea Ole e 5                                    | 152  | 160962591 | 9  |
| 1090 | Olea europaea                          | Olive tree         | Unassigned | Aero Plant      | Olea Ole e 5                                    | 152  | 160962597 | 9  |
| 1091 | Olea europaea                          | Olive tree         | Unassigned | Aero Plant      | Olea Ole e 5                                    | 152  | 160962611 | 9  |
| 1092 | Olea europaea                          | Olive tree         | Ole e 6    | Aero Plant      | Olea Ole e 6                                    | 150  | 14423643  | 7  |
| 1093 | Olea europaea                          | Olive tree         | Ole e 7    | Aero Plant      | Olea Ole e 7                                    | 121  | 22002032  | 7  |
| 1094 | Olea europaea                          | Olive tree         | Ole e 8    | Aero Plant      | Olea Ole e 8                                    | 171  | 6901654   | 7  |
| 1095 | Olea europaea                          | Olive tree         | Ole e 8    | Aero Plant      | Olea Ole e 8                                    | 171  | 14423648  | 7  |
| 1096 | Olea europaea                          | Olive tree         | Ole e 9    | Aero Plant      | Olea Ole e 9                                    | 1460 | 14279169  | 7  |
| 1097 | Olea europaea                          | Olive tree         | Unassigned | Aero Plant      | Olea Ole e 9                                    | 101  | 166235350 | 9  |
| 1098 | Ommastrephes bartramii                 |                    | Unassigned | Food Animal     | Ommastrephes tropomyosin                        | 284  | 83715934  | 7  |
| 1099 | Onchocerca volvulus                    | Parasitic nematode | Unassigned | Worm (parasite) | Onchocerca tropomyosin                          | 284  | 42559586  | 12 |
| 1100 | Oncorhynchus mykiss                    |                    | Unassigned | Food Animal     | Oncorhynchus Rainbow trout parv Onc m 1         | 108  | 288559139 | 11 |
| 1101 | Oncorhynchus mykiss                    |                    | Unassigned | Food Animal     | Oncorhynchus Rainbow trout parv Onc m 1         | 107  | 288559140 | 11 |
| 1102 | Oratosquilla oratoria                  |                    | Unassigned | Food Animal     | Oratosquilla tropomyosin                        | 284  | 162286975 | 9  |
| 1103 | Oryza sativa                           | Rice               | Unassigned | Food Plant      | Oryza Glyoxalase I                              | 291  | 84029333  | 7  |
| 1104 | Oryza sativa (japonica cultivar-group) | Rice               | Unassigned | Food Plant      | Oryza Glyoxalase I                              | 291  | 16580747  | 7  |
| 1105 | Oryza sativa                           | Rice               | Ory s 1    | Aero Plant      | Oryza Ory s 1                                   | 263  | 1173557   | 8  |
| 1106 | Oryza sativa                           | Rice               | Unassigned | Aero Plant      | Oryza Ory s 1                                   | 267  | 8118439   | 7  |
| 1107 | Oryza sativa (japonica cultivar-group) | Rice               | Ory s 1    | Aero Plant      | Oryza Ory s 1                                   | 267  | 109913547 | 8  |
| 1108 | Oryza sativa (japonica cultivar-group) | Rice               | Unassigned | Food Plant      | Oryza Trypsin alpha-amylase inhibitor UNCERTAIN | 157  | 23616954  | 8  |
| 1109 | Oryza sativa (japonica cultivar-group) | Rice               | Unassigned | Food Plant      | Oryza Trypsin alpha-amylase inhibitor UNCERTAIN | 165  | 218193    | 7  |
| 1110 | Oryza sativa (japonica cultivar-group) | Rice               | Unassigned | Food Plant      | Oryza Trypsin alpha-amylase inhibitor UNCERTAIN | 157  | 218197    | 7  |



|      |  |         |            |                      |   |     |           |    |
|------|--|---------|------------|----------------------|---|-----|-----------|----|
| 1111 | Oryza sativa<br>(japonica<br>cultivar-group) | Rice    | Unassigned | Food Plant           | Oryza Trypsin<br>alpha-amylase<br>inhibitor UNCERTAIN | 111 | 1304216   | 7  |
| 1112 | Oryza sativa<br>(japonica<br>cultivar-group) | Rice    | Unassigned | Food Plant           | Oryza Trypsin<br>alpha-amylase<br>inhibitor UNCERTAIN | 109 | 1304217   | 7  |
| 1113 | Oryza sativa<br>(japonica<br>cultivar-group) | Rice    | Unassigned | Food Plant           | Oryza Trypsin<br>alpha-amylase<br>inhibitor UNCERTAIN | 113 | 1304218   | 7  |
| 1114 | Oryza sativa<br>(japonica<br>cultivar-group) | Rice    | Unassigned | Food Plant           | Oryza Trypsin<br>alpha-amylase<br>inhibitor UNCERTAIN | 166 | 1398913   | 7  |
| 1115 | Oryza sativa<br>(japonica<br>cultivar-group) | Rice    | Unassigned | Food Plant           | Oryza Trypsin<br>alpha-amylase<br>inhibitor UNCERTAIN | 160 | 1398915   | 7  |
| 1116 | Oryza sativa<br>(japonica<br>cultivar-group) | Rice    | Unassigned | Food Plant           | Oryza Trypsin<br>alpha-amylase<br>inhibitor UNCERTAIN | 157 | 1398916   | 7  |
| 1117 | Oryza sativa<br>(japonica<br>cultivar-group) | Rice    | Unassigned | Food Plant           | Oryza Trypsin<br>alpha-amylase<br>inhibitor UNCERTAIN | 160 | 1398918   | 7  |
| 1118 | Oryza sativa<br>(japonica<br>cultivar-group) | Rice    | Unassigned | Food Plant           | Oryza Trypsin<br>alpha-amylase<br>inhibitor UNCERTAIN | 157 | 2827316   | 7  |
| 1119 | Oryza sativa<br>(japonica<br>cultivar-group) | Rice    | Unassigned | Food Plant           | Oryza Trypsin<br>alpha-amylase<br>inhibitor UNCERTAIN | 166 | 114152865 | 8  |
| 1120 | Oryza sativa<br>(japonica<br>cultivar-group) | Rice    | Unassigned | Food Plant           | Oryza Trypsin<br>alpha-amylase<br>inhibitor UNCERTAIN | 163 | 114152864 | 8  |
| 1121 | Oryza sativa<br>(japonica<br>cultivar-group) | Rice    | Unassigned | Food Plant           | Oryza Trypsin<br>alpha-amylase<br>inhibitor UNCERTAIN | 160 | 23495787  | 8  |
| 1122 | Oryza sativa<br>(japonica<br>cultivar-group) | Rice    | Unassigned | Food Plant           | Oryza Trypsin<br>alpha-amylase<br>inhibitor UNCERTAIN | 160 | 23616947  | 7  |
| 1123 | Ostrya<br>carpinifolia                       |         | Unassigned | Aero Plant           | Ostrya Ost c<br>1pollen allergen                      | 160 | 300872535 | 12 |
| 1124 | Pachycondyla<br>chinensis                    |         | Unassigned | Venom or<br>Salivary | Pachycondyla Pac c<br>3 allergen                      | 199 | 169822894 | 10 |
| 1125 | Pandalus<br>borealis                         |         | Unassigned | Food<br>Animal       | Pandalus Pan b 1                                      | 284 | 312831088 | 12 |
| 1126 | Pandalus eous                                |         | Unassigned | Food<br>Animal       | Pandalus Pan b 1                                      | 284 | 125995161 | 8  |
| 1127 | Panulirus<br>stimpsoni                       | Lobster | Unassigned | Food<br>Animal       | Panulirus Pan s 1                                     | 274 | 14285797  | 7  |
| 1128 | Paralithodes<br>camtschaticus                |         | Unassigned | Food<br>Animal       | Paralithodes<br>tropomyosin                           | 284 | 125995163 | 8  |
| 1129 | Paralithodes<br>camtschaticus                |         | Unassigned | Food<br>Animal       | Paralithodes<br>tropomyosin                           | 284 | 125995165 | 8  |

|      |                        |             |              |            |                                   |     |           |    |
|------|------------------------|-------------|--------------|------------|-----------------------------------|-----|-----------|----|
| 1130 | Parietaria judaica     | Weed        | Par j 1      | Aero Plant | Parietaria Par j 1                | 143 | 741844    | 7  |
| 1131 | Parietaria judaica     | Weed        | Par j 1.0102 | Aero Plant | Parietaria Par j 1                | 176 | 1532058   | 7  |
| 1132 | Parietaria judaica     | Weed        | Par j 1.0201 | Aero Plant | Parietaria Par j 1                | 138 | 2497749   | 7  |
| 1133 | Parietaria judaica     | Weed        | Par j 1.0101 | Aero Plant | Parietaria Par j 1                | 139 | 3915783   | 7  |
| 1134 | Parietaria judaica     | Weed        | Par j 2.0102 | Aero Plant | Parietaria Par j 2                | 133 | 1532056   | 7  |
| 1135 | Parietaria judaica     | Weed        | Par j 2.0101 | Aero Plant | Parietaria Par j 2                | 133 | 2497750   | 7  |
| 1136 | Parietaria judaica     | Weed        | Par j 3      | Aero Plant | Parietaria Par j 3                | 131 | 14423869  | 7  |
| 1137 | Parietaria judaica     | Weed        | Par j 3      | Aero Plant | Parietaria Par j 3                | 132 | 14423876  | 7  |
| 1138 | Parietaria officinalis | Weed        | Par o 1      | Aero Plant | Parietaria Par o 1                | 12  | 75139847  | 7  |
| 1139 | Parietaria officinalis | Weed        | Par o 1      | Aero Plant | Parietaria Par o 1                | 17  | 1311509   | 7  |
| 1140 | Parietaria officinalis | Weed        | Par o 1      | Aero Plant | Parietaria Par o 1                | 15  | 1311510   | 7  |
| 1141 | Parietaria officinalis | Weed        | Par o 1      | Aero Plant | Parietaria Par o 1                | 15  | 1311511   | 7  |
| 1142 | Parietaria officinalis | Weed        | Par o 1      | Aero Plant | Parietaria Par o 1                | 15  | 1311512   | 7  |
| 1143 | Parietaria officinalis | Weed        | Par o 1      | Aero Plant | Parietaria Par o 1                | 30  | 1311513   | 7  |
| 1144 | Parietaria officinalis | Weed        | Par o 1      | Aero Plant | Parietaria Par o 1                | 24  | 1836011   | 7  |
| 1145 | Parietaria officinalis | Weed        | Unassigned   | Aero Plant | Parietaria Par o 1                | 25  | 1836010   | 7  |
| 1146 | Paspalum notatum       | Bahia grass | Unassigned   | Aero Plant | Paspalum group 13 pollen allergen | 169 | 338930686 | 12 |
| 1147 | Paspalum notatum       | Bahia grass | Unassigned   | Aero Plant | Paspalum group 13 pollen allergen | 169 | 338930684 | 12 |
| 1148 | Paspalum notatum       | Bahia grass | Unassigned   | Aero Plant | Paspalum group 13 pollen allergen | 169 | 338930682 | 12 |
| 1149 | Paspalum notatum       | Bahia grass | Unassigned   | Aero Plant | Paspalum group 13 pollen allergen | 169 | 338930680 | 12 |
| 1150 | Paspalum notatum       | Bahia grass | Unassigned   | Aero Plant | Paspalum group 13 pollen allergen | 393 | 338930678 | 12 |
| 1151 | Paspalum notatum       | Bahia grass | Unassigned   | Aero Plant | Paspalum group 13 pollen allergen | 393 | 338930676 | 12 |
| 1152 | Paspalum notatum       | Bahia grass | Unassigned   | Aero Plant | Paspalum group 13 pollen allergen | 391 | 338930674 | 12 |

|      |                               |                       |                 |                |  |     |           |    |
|------|-------------------------------|-----------------------|-----------------|----------------|--|-----|-----------|----|
| 1153 | Paspalum notatum              | Bahia grass           | Unassigned      | Aero Plant     | Paspalum group 13<br>pollen allergen               | 395 | 338930672 | 12 |
| 1154 | Paspalum notatum              | Bahia grass           | Unassigned      | Aero Plant     | Paspalum Pas n 1<br>beta expansin                  | 265 | 168419914 | 10 |
| 1155 | Penaeus monodon               | Black tiger<br>shrimp | Unassigned      | Food<br>Animal | Penaeus Pen m 1<br>tropomyosin                     | 284 | 125995157 | 8  |
| 1156 | Penaeus monodon               | Black tiger<br>shrimp | Pen m 2         | Food<br>Animal | Penaeus Pen m 2                                    | 356 | 27463265  | 7  |
| 1157 | Penaeus monodon               | Black tiger<br>shrimp | Unassigned      | Food<br>Animal | Penaeus Pen m 2                                    | 356 | 308154236 | 12 |
| 1158 | Penaeus monodon               | Black tiger<br>shrimp | Unassigned      | Food<br>Animal | Penaeus Pen m 3<br>myosin light chain              | 177 | 317383196 | 12 |
| 1159 | Penaeus monodon               | Black tiger<br>shrimp | Unassigned      | Food<br>Animal | Penaeus Pen m 4<br>sarcoplasmic<br>calcium binding | 193 | 317383198 | 12 |
| 1160 | Penicillium<br>chrysogenum    | Fungus                | Pen ch 18       | Aero Fungi     | Penicillium Pen 18                                 | 494 | 7963902   | 7  |
| 1161 | Penicillium<br>chrysogenum    | Fungus                | Pen ch 18       | Aero Fungi     | Penicillium Pen 18                                 | 494 | 14215732  | 7  |
| 1162 | Penicillium<br>citrinum       | Fungus                | Unassigned      | Aero Fungi     | Penicillium Pen 18                                 | 457 | 4588118   | 7  |
| 1163 | Penicillium<br>citrinum       | Fungus                | Unassigned      | Aero Fungi     | Penicillium Pen 18                                 | 358 | 12005501  | 7  |
| 1164 | Penicillium<br>oxalicum       | Fungus                | Pen o 18        | Aero Fungi     | Penicillium Pen 18                                 | 503 | 12005497  | 7  |
| 1165 | Penicillium<br>brevicompactum | Fungus                | Unassigned      | Aero Fungi     | Penicillium Pen b<br>26                            | 107 | 59894749  | 7  |
| 1166 | Penicillium<br>citrinum       | Fungus                | Pen c 19        | Aero Fungi     | Penicillium Pen c<br>19                            | 503 | 14423733  | 7  |
| 1167 | Penicillium<br>citrinum       | Fungus                | Unassigned      | Aero Fungi     | Penicillium Pen c<br>22                            | 438 | 74664773  | 9  |
| 1168 | Penicillium<br>citrinum       | Fungus                | Pen c 24        | Aero Fungi     | Penicillium Pen c<br>24                            | 228 | 38326693  | 7  |
| 1169 | Penicillium<br>citrinum       | Fungus                | Pen c 3         | Aero Fungi     | Penicillium Pen c 3                                | 167 | 5326864   | 7  |
| 1170 | Penicillium<br>chrysogenum    | Fungus                | Pen ch 13       | Aero Fungi     | Penicillium Pen ch<br>13                           | 397 | 6684758   | 7  |
| 1171 | Penicillium<br>chrysogenum    | Fungus                | Pen ch 13       | Aero Fungi     | Penicillium Pen ch<br>13                           | 398 | 21069093  | 7  |
| 1172 | Penicillium<br>citrinum       | Fungus                | Unassigned      | Aero Fungi     | Penicillium Pen ch<br>13                           | 397 | 4587983   | 7  |
| 1173 | Penicillium<br>chrysogenum    | Fungus                | Pen ch 20       | Aero Fungi     | Penicillium Pen ch<br>20 68 kDa protein            | 117 | 999009    | 7  |
| 1174 | Periplaneta<br>americana      | American<br>cockroach | Per a<br>7.0101 | Aero<br>Insect | Periplaneta Per 7                                  | 284 | 4378573   | 7  |
| 1175 | Periplaneta                   | American              | Unassigned      | Aero           | Periplaneta Per 7                                  | 284 | 14423957  | 9  |

|      |                        |                      |              |             |                              |     |           |    |
|------|------------------------|----------------------|--------------|-------------|------------------------------|-----|-----------|----|
|      | americana              | cockroach            |              | Insect      |                              |     |           |    |
| 1176 | Periplaneta americana  | American cockroach   | Unassigned   | Aero Insect | Periplaneta Per 7            | 284 | 239740599 | 11 |
| 1177 | Periplaneta fuliginosa | Smokybrown cockroach | Unassigned   | Aero Insect | Periplaneta Per 7            | 284 | 19310971  | 7  |
| 1178 | Periplaneta americana  | American cockroach   | Per a 1      | Aero Insect | Periplaneta Per a 1          | 446 | 2231297   | 7  |
| 1179 | Periplaneta americana  | American cockroach   | Per a 1.0104 | Aero Insect | Periplaneta Per a 1          | 274 | 2253610   | 7  |
| 1180 | Periplaneta americana  | American cockroach   | Per a 1      | Aero Insect | Periplaneta Per a 1          | 395 | 2580504   | 7  |
| 1181 | Periplaneta americana  | American cockroach   | Per a 1.0102 | Aero Insect | Periplaneta Per a 1          | 228 | 2897849   | 7  |
| 1182 | Periplaneta americana  | American cockroach   | Per a 1.0101 | Aero Insect | Periplaneta Per a 1          | 231 | 4240399   | 7  |
| 1183 | Periplaneta americana  | American cockroach   | Unassigned   | Aero Insect | Periplaneta Per a 1          | 124 | 30144660  | 7  |
| 1184 | Periplaneta americana  | American cockroach   | Unassigned   | Aero Insect | Periplaneta Per a 1          | 395 | 284518361 | 11 |
| 1185 | Periplaneta americana  | American cockroach   | Per a 3.0201 | Aero Insect | Periplaneta Per a 3          | 631 | 1531589   | 7  |
| 1186 | Periplaneta americana  | American cockroach   | Per a 3.0202 | Aero Insect | Periplaneta Per a 3          | 470 | 1580794   | 7  |
| 1187 | Periplaneta americana  | American cockroach   | Per a 3.0203 | Aero Insect | Periplaneta Per a 3          | 393 | 1580797   | 7  |
| 1188 | Periplaneta americana  | American cockroach   | Per a 3.0101 | Aero Insect | Periplaneta Per a 3          | 685 | 2833325   | 9  |
| 1189 | Periplaneta americana  | American cockroach   | Unassigned   | Aero Insect | Periplaneta Per a 3          | 688 | 284518363 | 11 |
| 1190 | Periplaneta americana  | American cockroach   | Unassigned   | Aero Insect | Periplaneta Per a 3          | 685 | 289721058 | 11 |
| 1191 | Periplaneta americana  | American cockroach   | Unassigned   | Aero Insect | Periplaneta putative Per a 4 | 183 | 60678787  | 7  |
| 1192 | Periplaneta americana  | American cockroach   | Unassigned   | Aero Insect | Periplaneta putative Per a 4 | 163 | 215794707 | 10 |
| 1193 | Periplaneta americana  | American cockroach   | Unassigned   | Aero Insect | Periplaneta putative Per a 4 | 167 | 212675312 | 10 |
| 1194 | Perna viridis          | Asian green mussell  | Unassigned   | Food Animal | Perna Tropomyosin            | 284 | 9954251   | 7  |
| 1195 | Persea americana       | Avocado              | Pers a 1     | Food Plant  | Persea Pers a 1              | 326 | 3201547   | 7  |
| 1196 | Phalaris aquatica      | Canary grass         | Unassigned   | Aero Plant  | Phalaris Pha a 1             | 20  | 409328    | 7  |
| 1197 | Phalaris aquatica      | Canary grass         | Pha a 1      | Aero Plant  | Phalaris Pha a 1             | 269 | 2498576   | 7  |
| 1198 | Phalaris aquatica      | Canary grass         | Unassigned   | Aero Plant  | Phalaris Pha a 5             | 320 | 2498577   | 7  |

|      |                       |                   |                 |            |                   |     |           |    |
|------|-----------------------|-------------------|-----------------|------------|-------------------|-----|-----------|----|
| 1199 | Phalaris<br>aquatica  | Canary grass      | Unassigned      | Aero Plant | Phalaris Pha a 5  | 305 | 2498578   | 7  |
| 1200 | Phalaris<br>aquatica  | Canary grass      | Unassigned      | Aero Plant | Phalaris Pha a 5  | 294 | 2498579   | 7  |
| 1201 | Phalaris<br>aquatica  | Canary grass      | Unassigned      | Aero Plant | Phalaris Pha a 5  | 175 | 2498580   | 7  |
| 1202 | Phaseolus<br>vulgaris | Kidney bean       | Unassigned      | Food Plant | Phaseolus Pha v 3 | 115 | 289064177 | 11 |
| 1203 | Phaseolus<br>vulgaris | Kidney bean       | Unassigned      | Food Plant | Phaseolus Pha v 3 | 118 | 289064179 | 11 |
| 1204 | Phleum pratense       | Common<br>timothy | Phl p<br>1.0101 | Aero Plant | Phleum Phl p 1    | 263 | 3901094   | 7  |
| 1205 | Phleum pratense       | Common<br>timothy | Phl p 1         | Aero Plant | Phleum Phl p 1    | 241 | 28373838  | 7  |
| 1206 | Phleum pratense       | Common<br>timothy | Unassigned      | Aero Plant | Phleum Phl p 1    | 240 | 45823012  | 7  |
| 1207 | Phleum pratense       | Common<br>timothy | Unassigned      | Aero Plant | Phleum Phl p 1    | 263 | 1171008   | 9  |
| 1208 | Phleum pratense       | Common<br>timothy | Unassigned      | Aero Plant | Phleum Phl p 1    | 262 | 1582250   | 10 |
| 1209 | Phleum pratense       | Common<br>timothy | Unassigned      | Aero Plant | Phleum Phl p 11   | 143 | 47606039  | 9  |
| 1210 | Phleum pratense       | Common<br>timothy | Phl p 12        | Aero Plant | Phleum Phl p 12   | 131 | 464471    | 7  |
| 1211 | Phleum pratense       | Common<br>timothy | Phl p 12        | Aero Plant | Phleum Phl p 12   | 131 | 2415700   | 7  |
| 1212 | Phleum pratense       | Common<br>timothy | Phl p 12        | Aero Plant | Phleum Phl p 12   | 131 | 2415702   | 7  |
| 1213 | Phleum pratense       | Common<br>timothy | Phl p 13        | Aero Plant | Phleum Phl p 13   | 394 | 4826572   | 7  |
| 1214 | Phleum pratense       | Common<br>timothy | Unassigned      | Aero Plant | Phleum Phl p 2    | 122 | 1171009   | 8  |
| 1215 | Phleum pratense       | Common<br>timothy | Unassigned      | Aero Plant | Phleum Phl p 4    | 525 | 82492267  | 7  |
| 1216 | Phleum pratense       | Common<br>timothy | Unassigned      | Aero Plant | Phleum Phl p 4    | 508 | 54144332  | 7  |
| 1217 | Phleum pratense       | Common<br>timothy | Unassigned      | Aero Plant | Phleum Phl p 4    | 500 | 45108973  | 7  |
| 1218 | Phleum pratense       | Common<br>timothy | Unassigned      | Aero Plant | Phleum Phl p 4    | 500 | 45108967  | 7  |
| 1219 | Phleum pratense       | Common<br>timothy | Unassigned      | Aero Plant | Phleum Phl p 4    | 500 | 189014266 | 10 |
| 1220 | Phleum pratense       | Common<br>timothy | Unassigned      | Aero Plant | Phleum Phl p 4    | 500 | 189014268 | 10 |
| 1221 | Phleum pratense       | Common<br>timothy | Unassigned      | Aero Plant | Phleum Phl p 4    | 500 | 189014270 | 10 |

|      |                 |         |            |            |                |     |           |    |
|------|-----------------|---------|------------|------------|----------------|-----|-----------|----|
| 1222 | Phleum pratense | Common  | Unassigned | Aero Plant | Phleum Phl p 4 | 500 | 189014272 | 10 |
|      |                 | timothy |            |            |                |     |           |    |
| 1223 | Phleum pratense | Common  | Phl p      | Aero Plant | Phleum Phl p 5 | 312 | 398830    | 17 |
|      |                 | timothy | 5.0101     |            |                |     |           |    |
| 1224 | Phleum pratense | Common  | Phl p 5    | Aero Plant | Phleum Phl p 5 | 257 | 422005    | 17 |
|      |                 | timothy |            |            |                |     |           |    |
| 1225 | Phleum pratense | Common  | Phl p 5    | Aero Plant | Phleum Phl p 5 | 280 | 481397    | 17 |
|      |                 | timothy |            |            |                |     |           |    |
| 1226 | Phleum pratense | Common  | Phl p 5    | Aero Plant | Phleum Phl p 5 | 24  | 75139900  | 17 |
|      |                 | timothy |            |            |                |     |           |    |
| 1227 | Phleum pratense | Common  | Unassigned | Aero Plant | Phleum Phl p 5 | 285 | 1092249   | 17 |
|      |                 | timothy |            |            |                |     |           |    |
| 1228 | Phleum pratense | Common  | Phl p      | Aero Plant | Phleum Phl p 5 | 281 | 1684718   | 17 |
|      |                 | timothy | 5.0202     |            |                |     |           |    |
| 1229 | Phleum pratense | Common  | Phl p      | Aero Plant | Phleum Phl p 5 | 276 | 1684720   | 17 |
|      |                 | timothy | 5.0104     |            |                |     |           |    |
| 1230 | Phleum pratense | Common  | Phl p 5    | Aero Plant | Phleum Phl p 5 | 286 | 2398757   | 17 |
|      |                 | timothy |            |            |                |     |           |    |
| 1231 | Phleum pratense | Common  | Phl p 5    | Aero Plant | Phleum Phl p 5 | 284 | 2851457   | 17 |
|      |                 | timothy |            |            |                |     |           |    |
| 1232 | Phleum pratense | Common  | Phl p      | Aero Plant | Phleum Phl p 5 | 276 | 3135497   | 17 |
|      |                 | timothy | 5.0105     |            |                |     |           |    |
| 1233 | Phleum pratense | Common  | Phl p      | Aero Plant | Phleum Phl p 5 | 276 | 3135499   | 17 |
|      |                 | timothy | 5.0106     |            |                |     |           |    |
| 1234 | Phleum pratense | Common  | Phl p      | Aero Plant | Phleum Phl p 5 | 276 | 3135501   | 17 |
|      |                 | timothy | 5.0107     |            |                |     |           |    |
| 1235 | Phleum pratense | Common  | Phl p      | Aero Plant | Phleum Phl p 5 | 276 | 3135503   | 17 |
|      |                 | timothy | 5.0108     |            |                |     |           |    |
| 1236 | Phleum pratense | Common  | Phl p      | Aero Plant | Phleum Phl p 5 | 312 | 3309039   | 17 |
|      |                 | timothy | 5.0103     |            |                |     |           |    |
| 1237 | Phleum pratense | Common  | Unassigned | Aero Plant | Phleum Phl p 5 | 295 | 3309041   | 17 |
|      |                 | timothy |            |            |                |     |           |    |
| 1238 | Phleum pratense | Common  | Unassigned | Aero Plant | Phleum Phl p 5 | 290 | 3309045   | 17 |
|      |                 | timothy |            |            |                |     |           |    |
| 1239 | Phleum pratense | Common  | Unassigned | Aero Plant | Phleum Phl p 5 | 287 | 3309047   | 17 |
|      |                 | timothy |            |            |                |     |           |    |
| 1240 | Phleum pratense | Common  | Phl p 5    | Aero Plant | Phleum Phl p 5 | 275 | 13430402  | 17 |
|      |                 | timothy |            |            |                |     |           |    |
| 1241 | Phleum pratense | Common  | Unassigned | Aero Plant | Phleum Phl p 5 | 287 | 21725606  | 17 |
|      |                 | timothy |            |            |                |     |           |    |
| 1242 | Phleum pratense | Common  | Unassigned | Aero Plant | Phleum Phl p 5 | 287 | 21725608  | 17 |
|      |                 | timothy |            |            |                |     |           |    |
| 1243 | Phleum pratense | Common  | Unassigned | Aero Plant | Phleum Phl p 5 | 287 | 21725610  | 17 |
|      |                 | timothy |            |            |                |     |           |    |
| 1244 | Phleum pratense | Common  | Unassigned | Aero Plant | Phleum Phl p 5 | 287 | 21725612  | 17 |
|      |                 | timothy |            |            |                |     |           |    |

|      |                     |                |            |            |                             |     |           |    |
|------|---------------------|----------------|------------|------------|-----------------------------|-----|-----------|----|
| 1245 | Phleum pratense     | Common timothy | Unassigned | Aero Plant | Phleum Phl p 5              | 287 | 21725614  | 7  |
| 1246 | Phleum pratense     | Common timothy | Unassigned | Aero Plant | Phleum Phl p 5              | 287 | 21725616  | 7  |
| 1247 | Phleum pratense     | Common timothy | Unassigned | Aero Plant | Phleum Phl p 5              | 287 | 21725618  | 7  |
| 1248 | Phleum pratense     | Common timothy | Unassigned | Aero Plant | Phleum Phl p 5              | 287 | 21725620  | 7  |
| 1249 | Phleum pratense     | Common timothy | Unassigned | Aero Plant | Phleum Phl p 5              | 287 | 21725622  | 7  |
| 1250 | Phleum pratense     | Common timothy | Unassigned | Aero Plant | Phleum Phl p 5              | 287 | 21725624  | 7  |
| 1251 | Phleum pratense     | Common timothy | Unassigned | Aero Plant | Phleum Phl p 5              | 287 | 21725626  | 7  |
| 1252 | Phleum pratense     | Common timothy | Unassigned | Aero Plant | Phleum Phl p 5              | 287 | 21725628  | 7  |
| 1253 | Phleum pratense     | Common timothy | Unassigned | Aero Plant | Phleum Phl p 5              | 287 | 21725630  | 7  |
| 1254 | Phleum pratense     | Common timothy | Unassigned | Aero Plant | Phleum Phl p 5              | 287 | 21725632  | 7  |
| 1255 | Phleum pratense     | Common timothy | Phl p 5    | Aero Plant | Phleum Phl p 5              | 102 | 28948464  | 7  |
| 1256 | Phleum pratense     | Common timothy | Unassigned | Aero Plant | Phleum Phl p 5              | 284 | 29500897  | 7  |
| 1257 | Phleum pratense     | Common timothy | Phl p 6    | Aero Plant | Phleum Phl p 6              | 138 | 3004465   | 7  |
| 1258 | Phleum pratense     | Common timothy | Phl p 6    | Aero Plant | Phleum Phl p 6              | 138 | 3004467   | 7  |
| 1259 | Phleum pratense     | Common timothy | Unassigned | Aero Plant | Phleum Phl p 6              | 106 | 3004469   | 7  |
| 1260 | Phleum pratense     | Common timothy | Unassigned | Aero Plant | Phleum Phl p 6              | 111 | 28374072  | 7  |
| 1261 | Phleum pratense     | Common timothy | Unassigned | Aero Plant | Phleum Phl p 7              | 78  | 14423846  | 7  |
| 1262 | Phoenix dactylifera | Date palm      | Pho d 2    | Aero Plant | Phoenix Pho d 2             | 131 | 21322677  | 7  |
| 1263 | Pistacia vera       |                | Unassigned | Food Plant | Pistacia 11S globulin       | 472 | 156001070 | 9  |
| 1264 | Pistacia vera       |                | Unassigned | Food Plant | Pistacia 11S globulin       | 496 | 110349083 | 10 |
| 1265 | Pistacia vera       |                | Unassigned | Food Plant | Pistacia 11S globulin       | 472 | 110349085 | 10 |
| 1266 | Pistacia vera       |                | Unassigned | Food Plant | Pistacia Pis v 1 2S albumin | 149 | 110349081 | 10 |
| 1267 | Pistacia vera       |                | Unassigned | Food Plant | Pistacia Pis v 3 vicilin    | 519 | 133711974 | 10 |

|      |                       |                        |            |                   |                                |     |           |   |
|------|-----------------------|------------------------|------------|-------------------|--------------------------------|-----|-----------|---|
| 1268 | Pisum sativum         | Pea                    | Pis s 1    | Food Plant        | Pisum Pis s 1                  | 415 | 42414629  | 7 |
| 1269 | Pisum sativum         | Pea                    | Pis s 1    | Food Plant        | Pisum Pis s 1                  | 415 | 42414627  | 7 |
| 1270 | Plantago lanceolata   | Narrow-leaved plantain | Pla l 1    | Aero Plant        | Plantago Pla l 1               | 131 | 14422359  | 7 |
| 1271 | Plantago lanceolata   | Narrow-leaved plantain | Pla l 1    | Aero Plant        | Plantago Pla l 1               | 131 | 14422361  | 7 |
| 1272 | Plantago lanceolata   | Narrow-leaved plantain | Pla l 1    | Aero Plant        | Plantago Pla l 1               | 131 | 14422363  | 7 |
| 1273 | Plantago lanceolata   | Narrow-leaved plantain | Unassigned | Aero Plant        | Plantago Pla l 1               | 65  | 29163773  | 7 |
| 1274 | Platanus x acerifolia | London plane tree      | Unassigned | Aero Plant        | Platanus Pla a 1               | 179 | 29839547  | 9 |
| 1275 | Platanus x acerifolia | London plane tree      | Pla a 2    | Aero Plant        | Platanus Pla a 2               | 377 | 49523394  | 7 |
| 1276 | Platanus orientalis   |                        | Unassigned | Aero Plant        | Platanus Pla or 1              | 170 | 162949336 | 9 |
| 1277 | Plodia interpunctella | Indian meal moth       | Unassigned | Aero Insect       | Plodia Plo i 1 Arginine kinase | 355 | 15886861  | 7 |
| 1278 | Poa pratensis         | Kentucky bluegrass     | Unassigned | Aero Plant        | Poa group II                   | 122 | 4007655   | 7 |
| 1279 | Poa pratensis         | Kentucky bluegrass     | Poa p 1    | Aero Plant        | Poa Poa p 1                    | 20  | 280414    | 7 |
| 1280 | Poa pratensis         | Kentucky bluegrass     | Poa p 1    | Aero Plant        | Poa Poa p 1                    | 26  | 320620    | 7 |
| 1281 | Poa pratensis         | Kentucky bluegrass     | Poa p 1    | Aero Plant        | Poa Poa p 1                    | 263 | 4090265   | 7 |
| 1282 | Poa pratensis         | Kentucky bluegrass     | Poa p 5    | Aero Plant        | Poa Poa p 5                    | 303 | 11991227  | 7 |
| 1283 | Poa pratensis         | Kentucky bluegrass     | Unassigned | Aero Plant        | Poa Poa p 9                    | 373 | 113560    | 7 |
| 1284 | Poa pratensis         | Kentucky bluegrass     | Unassigned | Aero Plant        | Poa Poa p 9                    | 307 | 113562    | 7 |
| 1285 | Poa pratensis         | Kentucky bluegrass     | Unassigned | Aero Plant        | Poa Poa p 9                    | 131 | 539056    | 7 |
| 1286 | Poa pratensis         | Kentucky bluegrass     | Unassigned | Aero Plant        | Poa Poa p 9                    | 333 | 113561    | 7 |
| 1287 | Polistes annularis    | Paper wasp             | Pol a 1    | Venom or Salivary | Polistes Pol a 1               | 301 | 14423833  | 7 |
| 1288 | Polistes dominulus    | Paper wasp             | Unassigned | Venom or Salivary | Polistes Pol a 1               | 316 | 45510893  | 7 |
| 1289 | Polistes dominulus    | Paper wasp             | Unassigned | Venom or Salivary | Polistes Pol a 1               | 316 | 45510891  | 7 |
| 1290 | Polistes dominulus    | Paper wasp             | Unassigned | Venom or Salivary | Polistes Pol a 1               | 316 | 45510889  | 7 |
| 1291 | Polistes              | Paper wasp             | Unassigned | Venom or          | Polistes Pol a 1               | 337 | 45510887  | 7 |



|      |                                |            |              |                   |   |     |           |    |
|------|--------------------------------|------------|--------------|-------------------|---|-----|-----------|----|
|      | dominulus                      |            |              | Salivary          |   |     |           |    |
| 1292 | Polistes gallicus              | Paper wasp | Unassigned   | Venom or Salivary | Polistes Pol a 1                        | 42  | 41017429  | 7  |
| 1293 | Polistes annularis             | Paper wasp | Pol a 2      | Venom or Salivary | Polistes Pol a 2                        | 367 | 14423735  | 7  |
| 1294 | Polistes annularis             | Paper wasp | Pol a 5      | Venom or Salivary | Polistes Venom allergen 5               | 209 | 160780    | 7  |
| 1295 | Polistes dominulus             | Paper wasp | Pol d 5      | Venom or Salivary | Polistes Venom allergen 5               | 227 | 51093377  | 7  |
| 1296 | Polistes exclamans             | Paper wasp | Pol e 5      | Venom or Salivary | Polistes Venom allergen 5               | 205 | 549187    | 7  |
| 1297 | Polistes exclamans             | Paper wasp | Unassigned   | Venom or Salivary | Polistes Venom allergen 5               | 226 | 51093375  | 7  |
| 1298 | Polistes fuscatus              | Paper wasp | Pol f 5      | Venom or Salivary | Polistes Venom allergen 5               | 205 | 549188    | 7  |
| 1299 | Polistes gallicus              | Paper wasp | Pol g 5      | Venom or Salivary | Polistes Venom allergen 5               | 206 | 25091511  | 7  |
| 1300 | Polistes dominulus             | Paper wasp | Unassigned   | Venom or Salivary | Polistes Venom serine protease          | 277 | 30909091  | 7  |
| 1301 | Polybia paulista               | wasp       | Unassigned   | Venom or Salivary | Polybia p hyaluronidase                 | 345 | 302201583 | 12 |
| 1302 | Polybia paulista               | wasp       | Unassigned   | Venom or Salivary | Polybia p hyaluronidase                 | 288 | 302425085 | 12 |
| 1303 | Polybia paulista               | wasp       | Unassigned   | Venom or Salivary | Polybia p venom allergen 5              | 141 | 290792375 | 11 |
| 1304 | Polybia paulista               | wasp       | Unassigned   | Venom or Salivary | Polybia p venom allergen 5              | 207 | 302595972 | 12 |
| 1305 | Polybia paulista               | wasp       | Pol p 1.0101 | Venom or Salivary | Polybia Pol p 1.0101 phospholipase      | 322 | 166216292 | 9  |
| 1306 | Polybia paulista               | wasp       | Unassigned   | Venom or Salivary | Polybia Pol p 1.0101 phospholipase      | 302 | 315190620 | 12 |
| 1307 | Protortonia cacti              |            | Unassigned   | Food Animal       | Protortonia                             | 335 | 237769615 | 11 |
| 1308 | Prunus dulcis x Prunus persica |            | Unassigned   | Food Plant        | Prunus Almond-peach hybr profilin Pru 4 | 131 | 190613933 | 10 |
| 1309 | Prunus dulcis x Prunus persica |            | Unassigned   | Food Plant        | Prunus Almond-peach hybr profilin Pru 4 | 131 | 190613937 | 10 |
| 1310 | Prunus dulcis x Prunus persica |            | Pru p 2.0201 | Food Plant        | Prunus persica Pru p 2                  | 246 | 190613907 | 10 |
| 1311 | Prunus dulcis x Prunus persica |            | Pru p 2.0101 | Food Plant        | Prunus persica Pru p 2                  | 246 | 190613911 | 10 |
| 1312 | Prunus dulcis x Prunus persica |            | Pru p 2.0301 | Food Plant        | Prunus persica Pru p 2                  | 242 | 190613903 | 10 |
| 1313 | Prunus avium                   | Cherry     | Pru av 1     | Food Plant        | Prunus PRP (Bet v 1 family)             | 160 | 1513216   | 7  |

|      |                             |         |            |             |  |     |           |    |
|------|-----------------------------|---------|------------|-------------|--|-----|-----------|----|
| 1314 | Prunus avium                | Cherry  | Pru av 1   | Food Plant  | Prunus PRP (Bet v 1 family)                        | 160 | 44409496  | 7  |
| 1315 | Prunus avium                | Cherry  | Pru av 1   | Food Plant  | Prunus PRP (Bet v 1 family)                        | 160 | 44409474  | 7  |
| 1316 | Prunus avium                | Cherry  | Pru av 1   | Food Plant  | Prunus PRP (Bet v 1 family)                        | 160 | 44409451  | 7  |
| 1317 | Prunus avium                | Cherry  | Unassigned | Food Plant  | Prunus PRP (Bet v 1 family)                        | 159 | 159162378 | 9  |
| 1318 | Prunus persica              | Peach   | Unassigned | Food Plant  | Prunus PRP (Bet v 1 family)                        | 160 | 82492265  | 7  |
| 1319 | Prunus armeniaca            | Apricot | Unassigned | Food Plant  | Prunus Pru 3                                       | 119 | 313575730 | 12 |
| 1320 | Prunus armeniaca            | Apricot | Unassigned | Food Plant  | Prunus Pru 3                                       | 117 | 313575732 | 12 |
| 1321 | Prunus armeniaca            | Apricot | Unassigned | Food Plant  | Prunus Pru 3                                       | 117 | 313575734 | 12 |
| 1322 | Prunus armeniaca            | Apricot | Unassigned | Food Plant  | Prunus Pru 3                                       | 117 | 313575736 | 12 |
| 1323 | Prunus avium                | Cherry  | Pru av 3   | Food Plant  | Prunus Pru 3                                       | 117 | 6715520   | 7  |
| 1324 | Prunus avium                | Cherry  | Unassigned | Food Plant  | Prunus Pru 3                                       | 117 | 313575726 | 12 |
| 1325 | Prunus avium                | Cherry  | Unassigned | Food Plant  | Prunus Pru 3                                       | 117 | 313575728 | 12 |
| 1326 | Prunus domestica            | Plum    | Pru d 3    | Food Plant  | Prunus Pru 3                                       | 91  | 9297015   | 7  |
| 1327 | Prunus persica              | Peach   | Pru p 3    | Food Plant  | Prunus Pru 3                                       | 91  | 3287877   | 7  |
| 1328 | Prunus persica              | Peach   | Pru p 3    | Food Plant  | Prunus Pru 3                                       | 92  | 83754241  | 7  |
| 1329 | Prunus persica              | Peach   | Unassigned | Food Plant  | Prunus Pru 3                                       | 117 | 54793477  | 7  |
| 1330 | Prunus persica              | Peach   | Unassigned | Food Plant  | Prunus Pru 3                                       | 117 | 313575718 | 12 |
| 1331 | Prunus avium                | Cherry  | Pru av 4   | Food Plant  | Prunus Pru 4 Profilin                              | 131 | 4761582   | 7  |
| 1332 | Prunus dulcis               | Almond  | Pru du 4   | Food Plant  | Prunus Pru 4 Profilin                              | 131 | 24473794  | 7  |
| 1333 | Prunus persica              | Peach   | Pru p 4.01 | Food Plant  | Prunus Pru 4 Profilin                              | 131 | 27528310  | 7  |
| 1334 | Prunus persica              | Peach   | Pru p 4.02 | Food Plant  | Prunus Pru 4 Profilin                              | 131 | 27528312  | 7  |
| 1335 | Prunus avium                | Cherry  | Pru av 2   | Food Plant  | Prunus Pru av 2                                    | 245 | 1144346   | 7  |
| 1336 | Prunus dulcis               | Almond  | Unassigned | Food Plant  | Prunus Pru du 6 Amandin                            | 531 | 258588247 | 11 |
| 1337 | Prunus dulcis               | Almond  | Unassigned | Food Plant  | Prunus Seed allergenic protein 2 (Conglutin gamma) | 25  | 75107131  | 8  |
| 1338 | Pseudocardium sachalinensis |         | Unassigned | Food Animal | Pseudocardium tropomyosin                          | 284 | 219806598 | 10 |
| 1339 | Pyrus communis              | Pear    | Pyr c 1    | Food Plant  | Pyrus Pyr c 1                                      | 159 | 3044216   | 7  |
| 1340 | Pyrus communis              | Pear    | Pyr c 4    | Food Plant  | Pyrus Pyr c 4                                      | 131 | 4761580   | 7  |
| 1341 | Pyrus communis              | Pear    | Pyr c 5    | Food Plant  | Pyrus Pyr c 5                                      | 308 | 3243234   | 7  |

|      |                          |             |            |                |   |     |           |    |
|------|--------------------------|-------------|------------|----------------|---|-----|-----------|----|
| 1342 | Quercus alba             | Oak         | Que a 1    | Aero Plant     | Quercus Que a I                                       | 24  | 543675    | 7  |
| 1343 | Quercus alba             | Oak         | Unassigned | Aero Plant     | Quercus Que a I                                       | 159 | 167472847 | 10 |
| 1344 | Quercus alba             | Oak         | Unassigned | Aero Plant     | Quercus Que a I                                       | 160 | 167472849 | 10 |
| 1345 | Rana esculenta           | Frog        | Ran e 1    | Food<br>Animal | Rana Ran e 1  | 110 | 20796729  | 7  |
| 1346 | Rana sp. CH-2001         | Frog        | Unassigned | Food<br>Animal | Rana Ran e 1  | 110 | 20796733  | 7  |
| 1347 | Rana esculenta           | Frog        | Ran e 2    | Food<br>Animal | Rana Ran e 2  | 109 | 20797081  | 7  |
| 1348 | Rana sp. CH-2001         | Frog        | Unassigned | Food<br>Animal | Rana Ran e 2  | 109 | 20797085  | 7  |
| 1349 | Rattus norvegicus        | Rat         | Rat n 1    | Aero<br>Animal | Rattus Rat n 1  | 181 | 127533    | 7  |
| 1350 | Rattus norvegicus        | Rat         | Rat n 1    | Aero<br>Animal | Rattus Rat n 1  | 181 | 81890324  | 7  |
| 1351 | Rattus norvegicus        | Rat         | Unassigned | Aero<br>Animal | Rattus Rat n 1  | 181 | 109474987 | 8  |
| 1352 | Rhodotorula mucilaginosa | Fungus      | Unassigned | Aero Fungi     | Rhodotorula Rho m 1                                   | 439 | 37078092  | 7  |
| 1353 | Rhodotorula mucilaginosa | Fungus      | Unassigned | Aero Fungi     | Rhodotorula Rho m 2                                   | 342 | 54654335  | 7  |
| 1354 | Ricinus communis         | Castor bean | Ric c 1    | Food Plant     | Ricinus Ric c 1                                       | 258 | 112762    | 7  |
| 1355 | Rubus idaeus             |             | Unassigned | Food Plant     | Rubus putative<br>allergen Rub i 1                    | 137 | 110180525 | 8  |
| 1356 | Rubus idaeus             |             | Unassigned | Food Plant     | Rubus putative<br>allergen Rub i 3                    | 117 | 110180523 | 8  |
| 1357 | Salmo salar              | Salmon      | Sal s 1    | Food<br>Animal | Salmo Sal s 1   | 109 | 2493445   | 7  |
| 1358 | Salmo salar              | Salmon      | Sal s 1    | Food<br>Animal | Salmo Sal s 1   | 108 | 18281421  | 7  |
| 1359 | Salmo salar              | Salmon      | Unassigned | Food<br>Animal | Salmo Sal s 1   | 109 | 209734468 | 10 |
| 1360 | Salsola kali             | Thistle     | Unassigned | Aero Plant     | Salsola pectin<br>methylesterase Sal<br>k 1.01 & 1.02 | 362 | 51242679  | 8  |
| 1361 | Salsola kali             | Thistle     | Unassigned | Aero Plant     | Salsola pectin<br>methylesterase Sal<br>k 1.01 & 1.02 | 339 | 59895728  | 8  |
| 1362 | Salsola kali             | Thistle     | Unassigned | Aero Plant     | Salsola pectin<br>methylesterase Sal<br>k 1.01 & 1.02 | 339 | 59895730  | 8  |
| 1363 | Salsola kali             | Thistle     | Unassigned | Aero Plant     | Salsola pectin<br>methylesterase Sal<br>k 1.01 & 1.02 | 339 | 225810597 | 10 |
| 1364 | Salsola kali             | Thistle     | Sal k 1    | Aero Plant     | Salsola Sal k 1                                       | 11  | 25090948  | 7  |

|      |                                |                   |            |                      |  |     |           |    |
|------|--------------------------------|-------------------|------------|----------------------|--|-----|-----------|----|
| 1365 | Salsola kali                   | Thistle           | Sal k 1    | Aero Plant           | Salsola Sal k 1                        | 8   | 25090949  | 7  |
| 1366 | Salsola kali                   | Thistle           | Sal k 1    | Aero Plant           | Salsola Sal k 1                        | 9   | 25090950  | 7  |
| 1367 | Salsola kali                   | Thistle           | Sal k 1    | Aero Plant           | Salsola Sal k 1                        | 14  | 25090951  | 7  |
| 1368 | Salsola kali                   | Thistle           | Unassigned | Aero Plant           | Salsola Sal k 3<br>pollen allergen     | 757 | 225810599 | 10 |
| 1369 | Salsola kali                   | Thistle           | Unassigned | Aero Plant           | Salsola Sal k 4<br>profilin            | 133 | 239916566 | 11 |
| 1370 | Salvelinus fontinalis          | Brook trout       | Unassigned | Food<br>Animal       | Salvelinus parvalbumin                 | 109 | 288557438 | 11 |
| 1371 | Salvelinus fontinalis          | Brook trout       | Unassigned | Food<br>Animal       | Salvelinus parvalbumin                 | 108 | 288557440 | 11 |
| 1372 | Sarcoptes scabiei type hominis | Scabies mite      | Unassigned | Venom or<br>Salivary | Sarcoptes Apolipoprotein Ssag1.2       | 330 | 27462848  | 7  |
| 1373 | Sarcoptes scabiei type hominis | Scabies mite      | Unassigned | Venom or<br>Salivary | Sarcoptes cysteine protease C08        | 340 | 46406002  | 7  |
| 1374 | Sarcoptes scabiei type hominis | Scabies mite      | Unassigned | Venom or<br>Salivary | Sarcoptes cysteine proteases F04       | 338 | 46406012  | 7  |
| 1375 | Sarcoptes scabiei type hominis | Scabies mite      | Unassigned | Venom or<br>Salivary | Sarcoptes cysteine proteases F04       | 339 | 46406014  | 7  |
| 1376 | Sarcoptes scabiei type hominis | Scabies mite      | Unassigned | Venom or<br>Salivary | Sarcoptes cysteine proteases F04       | 273 | 46406016  | 7  |
| 1377 | Sarcoptes scabiei type hominis | Scabies mite      | Unassigned | Venom or<br>Salivary | Sarcoptes Glutathione S-transferase Mu | 219 | 27462836  | 7  |
| 1378 | Sarcoptes scabiei type hominis | Scabies mite      | Unassigned | Venom or<br>Salivary | Sarcoptes Glutathione S-transferase Mu | 219 | 60920770  | 7  |
| 1379 | Sardinops sagax                |                   | Unassigned | Food<br>Animal       | Sardinops Sar sa 1 parvalbumin         | 109 | 193247972 | 10 |
| 1380 | Scapharca broughtonii          |                   | Unassigned | Food<br>Animal       | Scapharca tropomyosin                  | 284 | 219806592 | 10 |
| 1381 | Schistosoma japonicum          | Schistosoma       | Unassigned | Protozoan            | Schistosoma Putative profilin          | 129 | 29841461  | 7  |
| 1382 | Schistosoma japonicum          | Schistosoma       | Unassigned | Protozoan            | Schistosoma tegumental antigen         | 191 | 2739154   | 7  |
| 1383 | Scomber japonicus              | Chub mackerel     | Unassigned | Food<br>Animal       | Scomber Parvalbumin                    | 109 | 29420793  | 7  |
| 1384 | Scomber scombrus               | Atlantic mackerel | Unassigned | Food<br>Animal       | Scomber Parvalbumin                    | 109 | 288557436 | 11 |
| 1385 | Secale cereale                 | Rye               | Unassigned | Aero Plant           | Secale 30K pollen grp 5                | 16  | 75140047  | 7  |
| 1386 | Secale cereale                 | Rye               | Unassigned | Food Plant           | Secale 30K pollen grp 5                | 292 | 332205751 | 12 |

|      |                            |               |                 |                |                                    |     |           |    |
|------|----------------------------|---------------|-----------------|----------------|------------------------------------|-----|-----------|----|
| 1387 | Secale cereale             | Rye           | Sec c 1         | Aero Plant     | Secale sec c 1                     | 26  | 75198875  | 7  |
| 1388 | Secale cereale             | Rye           | Unassigned      | Aero Plant     | Secale Sec c 4                     | 520 | 55859456  | 7  |
| 1389 | Secale cereale             | Rye           | Unassigned      | Aero Plant     | Secale Sec c 4                     | 518 | 55859454  | 7  |
| 1390 | Sepia esculenta            |               | Unassigned      | Food<br>Animal | Sepia tropomyosin                  | 284 | 83715928  | 7  |
| 1391 | Sepioteuthis<br>lessoniana |               | Unassigned      | Food<br>Animal | Sepioteuthis<br>tropomyosin        | 284 | 83715930  | 7  |
| 1392 | Sesamum indicum            | Sesame        | Ses i 1         | Food Plant     | Sesamum Ses i 1                    | 153 | 13183175  | 7  |
| 1393 | Sesamum indicum            | Sesame        | Unassigned      | Food Plant     | Sesamum Ses i 1                    | 153 | 209165427 | 10 |
| 1394 | Sesamum indicum            | Sesame        | Ses i 2         | Food Plant     | Sesamum Ses i 2                    | 148 | 5381323   | 7  |
| 1395 | Sesamum indicum            | Sesame        | Ses i 3         | Food Plant     | Sesamum Ses i 3                    | 585 | 13183177  | 7  |
| 1396 | Sesamum indicum            | Sesame        | Unassigned      | Food Plant     | Sesamum Ses i 5                    | 145 | 198250343 | 10 |
| 1397 | Sesamum indicum            | Sesame        | Unassigned      | Food Plant     | Sesamum Ses i 5                    | 145 | 75315271  | 10 |
| 1398 | Sinapis alba               | White mustard | Sin a 1         | Food Plant     | Sinapis Sin a 1.01                 | 145 | 1009434   | 7  |
| 1399 | Sinapis alba               | White mustard | Sin a 1         | Food Plant     | Sinapis Sin a 1.01                 | 145 | 1009436   | 7  |
| 1400 | Sinapis alba               | White mustard | Sin a 1         | Food Plant     | Sinapis Sin a 1.01                 | 145 | 1009438   | 7  |
| 1401 | Sinapis alba               | White mustard | Sin a 1         | Food Plant     | Sinapis Sin a 1.01                 | 145 | 1009440   | 7  |
| 1402 | Sinapis alba               | White mustard | Sin a 1         | Food Plant     | Sinapis Sin a 1.01                 | 145 | 1009442   | 7  |
| 1403 | Sinapis alba               | White mustard | Sin a 1         | Food Plant     | Sinapis Sin a 1.01                 | 145 | 51338758  | 7  |
| 1404 | Sinapis alba               | White mustard | Sin a<br>2.0101 | Food Plant     | Sinapis Sin a 2.01<br>11S globulin | 510 | 62240390  | 7  |
| 1405 | Sinapis alba               | White mustard | Unassigned      | Food Plant     | Sinapis Sin a 2.01<br>11S globulin | 523 | 62240392  | 7  |
| 1406 | Sinapis alba               | White mustard | Sin a<br>3.0101 | Food Plant     | Sinapis Sin a 3.01<br>LTP          | 92  | 156778059 | 12 |
| 1407 | Sinapis alba               | White mustard | Sin a<br>4.0101 | Food Plant     | Sinapis Sin a 4.01<br>profilin     | 131 | 156778061 | 12 |
| 1408 | Solanum<br>tuberosum       | Potato        | Unassigned      | Food Plant     | Solanum<br>profilin-like           | 131 | 77416979  | 7  |
| 1409 | Solanum<br>tuberosum       | Potato        | Unassigned      | Food Plant     | Solanum<br>profilin-like           | 131 | 77999277  | 7  |
| 1410 | Solanum<br>tuberosum       | Potato        | Unassigned      | Food Plant     | Solanum Sola t 1                   | 386 | 21510     | 7  |
| 1411 | Solanum<br>tuberosum       | Potato        | Unassigned      | Food Plant     | Solanum Sola t 1                   | 386 | 21512     | 7  |
| 1412 | Solanum<br>tuberosum       | Potato        | Unassigned      | Food Plant     | Solanum Sola t 1                   | 386 | 21514     | 7  |
| 1413 | Solanum<br>tuberosum       | Potato        | Unassigned      | Food Plant     | Solanum Sola t 1                   | 386 | 169500    | 7  |
| 1414 | Solanum<br>tuberosum       | Potato        | Sola t 1        | Food Plant     | Solanum Sola t 1                   | 386 | 158517845 | 9  |

|      |                           |                       |            |                      |  |     |           |    |
|------|---------------------------|-----------------------|------------|----------------------|--|-----|-----------|----|
| 1415 | Solanum<br>tuberosum      | Potato                | Sola t 2   | Food Plant           | Solanum Sola t 2                                   | 188 | 124148    | 7  |
| 1416 | Solanum<br>tuberosum      | Potato                | Sola t 3   | Food Plant           | Solanum Sola t 3                                   | 222 | 20141344  | 7  |
| 1417 | Solanum<br>tuberosum      | Potato                | Unassigned | Food Plant           | Solanum Sola t 4                                   | 217 | 21413     | 7  |
| 1418 | Solanum<br>tuberosum      | Potato                | Sola t 4   | Food Plant           | Solanum Sola t 4                                   | 221 | 20141714  | 7  |
| 1419 | Solen strictus            |                       | Unassigned | Food<br>Animal       | Solen tropomyosin                                  | 284 | 219806602 | 10 |
| 1420 | Solenopsis<br>invicta     | Red fire ant          | Unassigned | Venom or<br>Salivary | Solenopsis Sol i 1                                 | 58  | 1336809   | 7  |
| 1421 | Solenopsis<br>invicta     | Red fire ant          | Unassigned | Venom or<br>Salivary | Solenopsis Sol i 1                                 | 25  | 1336811   | 7  |
| 1422 | Solenopsis<br>invicta     | Red fire ant          | Unassigned | Venom or<br>Salivary | Solenopsis Sol i 1                                 | 26  | 1336812   | 7  |
| 1423 | Solenopsis<br>invicta     | Red fire ant          | Unassigned | Venom or<br>Salivary | Solenopsis Sol i 1                                 | 26  | 1336813   | 7  |
| 1424 | Solenopsis<br>invicta     | Red fire ant          | Unassigned | Venom or<br>Salivary | Solenopsis Sol i 1                                 | 346 | 51093373  | 7  |
| 1425 | Solenopsis<br>invicta     | Red fire ant          | Sol i 2    | Venom or<br>Salivary | Solenopsis Sol i<br>and Sol r Venom<br>allergen II | 138 | 549179    | 7  |
| 1426 | Solenopsis<br>richteri    | Black fire<br>ant     | Unassigned | Venom or<br>Salivary | Solenopsis Sol i<br>and Sol r Venom<br>allergen II | 119 | 6136162   | 7  |
| 1427 | Solenopsis<br>invicta     | Red fire ant          | Sol i 3    | Venom or<br>Salivary | Solenopsis Venom<br>allergen III                   | 234 | 14424466  | 7  |
| 1428 | Solenopsis<br>richteri    | Black fire<br>ant     | Unassigned | Venom or<br>Salivary | Solenopsis Venom<br>allergen III                   | 211 | 6136163   | 7  |
| 1429 | Solenopsis<br>geminata    | Tropical Fire<br>Ant  | Sol g 4    | Venom or<br>Salivary | Solenopsis Venom<br>allergen IV                    | 137 | 7638028   | 7  |
| 1430 | Solenopsis<br>geminata    | Tropical Fire<br>Ant  | Sol g 4    | Venom or<br>Salivary | Solenopsis Venom<br>allergen IV                    | 137 | 7638030   | 7  |
| 1431 | Solenopsis<br>invicta     | Red fire ant          | Sol i 4    | Venom or<br>Salivary | Solenopsis Venom<br>allergen IV                    | 137 | 4038411   | 7  |
| 1432 | Solenopsis<br>invicta     | Red fire ant          | Sol i 4    | Venom or<br>Salivary | Solenopsis Venom<br>allergen IV                    | 137 | 14424465  | 7  |
| 1433 | Solenopsis<br>saevissima  | Brazilian<br>fire ant | Unassigned | Venom or<br>Salivary | Solenopsis Venom<br>allergen IV                    | 137 | 291092710 | 12 |
| 1434 | Staphylococcus<br>laureus |                       | Unassigned | Bacteria<br>skin     | Staphylococcus<br>enterotoxin SEA                  | 233 | 1633233   | 9  |
| 1435 | Staphylococcus<br>laureus |                       | Unassigned | Bacteria<br>skin     | Staphylococcus<br>enterotoxin SEB                  | 254 | 83308249  | 9  |
| 1436 | Staphylococcus<br>laureus |                       | Unassigned | Bacteria<br>skin     | Staphylococcus<br>enterotoxin SEC                  | 266 | 462026    | 9  |

|      |                           |                       |              |                   |                                    |     |           |    |
|------|---------------------------|-----------------------|--------------|-------------------|------------------------------------|-----|-----------|----|
| 1437 | Staphylococcus aureus     |                       | Unassigned   | Bacteria skin     | Staphylococcus enterotoxin SED     | 258 | 119654    | 9  |
| 1438 | Staphylococcus aureus     |                       | Unassigned   | Bacteria skin     | Staphylococcus enterotoxin TSST 1  | 234 | 136457    | 9  |
| 1439 | Suidasia medanensis       |                       | Unassigned   | Aero Mite         | Suidasia putative Sui m 2          | 141 | 45738062  | 7  |
| 1440 | Sus scrofa                | Pig                   | Unassigned   | Aero Animal       | Sus Porcine Pepsin                 | 385 | 118572685 | 11 |
| 1441 | Syringa vulgaris          | Lilac                 | Syr v 1.0101 | Aero Plant        | Syringa Syr v I                    | 145 | 631911    | 7  |
| 1442 | Syringa vulgaris          | Lilac                 | Syr v 1.0102 | Aero Plant        | Syringa Syr v I                    | 145 | 631912    | 7  |
| 1443 | Syringa vulgaris          | Lilac                 | Syr v 1.0103 | Aero Plant        | Syringa Syr v I                    | 145 | 631913    | 7  |
| 1444 | Tabanus yao               | Horse Fly             | Tab y 1.0101 | Venom or Salivary | Tabanus Tab y 1 Apyrase            | 554 | 323473390 | 12 |
| 1445 | Tabanus yao               | Horse Fly             | Tab y 2.0101 | Venom or Salivary | Tabanus Tab y 2 Hyaluronidase      | 349 | 304273371 | 12 |
| 1446 | Tabanus yao               | Horse Fly             | Tab y 5.0101 | Venom or Salivary | Tabanus Tab y 5                    | 256 | 304273369 | 12 |
| 1447 | Thaumetopoea pityocampa   | Pine moth             | Unassigned   | Contact           | Thaumetopoea Tha p 1               | 126 | 301030229 | 12 |
| 1448 | Theragra chalcogramma     | Alaska pollock        | Unassigned   | Food Animal       | Theragra parvalbumin               | 109 | 14531020  | 7  |
| 1449 | Theragra chalcogramma     | Alaska pollock        | Unassigned   | Food Animal       | Theragra parvalbumin               | 109 | 14531018  | 7  |
| 1450 | Todarodes pacificus       | Japanese flying squid | Unassigned   | Food Animal       | Todarodes tropomyosin              | 284 | 83715932  | 7  |
| 1451 | Trachurus japonicus       |                       | Unassigned   | Food Animal       | Trachurus parvalbumin              | 107 | 77799800  | 7  |
| 1452 | Tresus keenae             |                       | Unassigned   | Food Animal       | Tresus tropomyosin                 | 284 | 219806600 | 10 |
| 1453 | Triatoma protracta        | Western conenose      | Tria p 1     | Venom or Salivary | Triatoma Tria p 1                  | 169 | 15426413  | 7  |
| 1454 | Arthroderma benhamiae     | Fungus                | Unassigned   | Contact           | Trichophyton (Arthroderma) Tri m 2 | 292 | 23894240  | 7  |
| 1455 | Arthroderma benhamiae     | Fungus                | Unassigned   | Contact           | Trichophyton (Arthroderma) Tri m 2 | 404 | 23894244  | 7  |
| 1456 | Trichophyton rubrum       | Fungus                | Tri r 2      | Contact           | Trichophyton (Arthroderma) Tri m 2 | 412 | 5813790   | 7  |
| 1457 | Trichophyton schoenleinii | Fungus                | Unassigned   | Contact           | Trichophyton (Arthroderma) Tri m 2 | 405 | 74663809  | 12 |
| 1458 | Arthroderma benhamiae     | Fungus                | Unassigned   | Contact           | Trichophyton (Arthroderma) Tri m 2 | 726 | 23894232  | 7  |

|      |                                      |        |            |            |   |     |           |    |
|------|--------------------------------------|--------|------------|------------|---|-----|-----------|----|
|      |                                      |        |            |            | 4   |     |           |    |
| 1459 | Arthroderma<br>vanbreuseghemii       | Fungus | Unassigned | Contact    | Trichophyton<br>(Arthroderma) Tri m<br>4        | 726 | 219687753 | 10 |
| 1460 | Trichophyton<br>rubrum               | Fungus | Tri r 4    | Contact    | Trichophyton tri 4<br>allergen<br>(Arthroderma) | 726 | 5813788   | 7  |
| 1461 | Trichophyton<br>schoenleinii         | Fungus | Unassigned | Contact    | Trichophyton tri 4<br>allergen<br>(Arthroderma) | 726 | 23894227  | 7  |
| 1462 | Triticum<br>aestivum                 | Wheat  | Unassigned | Aero Plant | Triticum Tri a 14<br>LTP_amylase<br>inhibitor   | 113 | 417370    | 11 |
| 1463 | Triticum<br>aestivum                 | Wheat  | Unassigned | Food Plant | Triticum 5a2<br>protein                         | 94  | 66840998  | 7  |
| 1464 | Triticum<br>aestivum                 | Wheat  | Unassigned | Aero Plant | Triticum aAI<br>CM16_17                         | 143 | 195957140 | 10 |
| 1465 | Triticum<br>aestivum                 | Wheat  | Unassigned | Food Plant | Triticum aAI<br>CM16_17                         | 143 | 21711     | 7  |
| 1466 | Triticum<br>turgidum                 | Wheat  | Unassigned | Aero Plant | Triticum aAI<br>CM16_17                         | 18  | 244610    | 7  |
| 1467 | Triticum<br>turgidum subsp.<br>durum | Wheat  | Unassigned | Food Plant | Triticum aAI<br>CM16_17                         | 143 | 21916     | 7  |
| 1468 | Triticum<br>aestivum                 | Wheat  | Unassigned | Food Plant | Triticum aAI CM3                                | 168 | 21713     | 7  |
| 1469 | Triticum<br>turgidum subsp.<br>durum | Wheat  | Unassigned | Food Plant | Triticum aAI CM3                                | 168 | 100834    | 7  |
| 1470 | Triticum<br>aestivum                 | Wheat  | Unassigned | Food Plant | Triticum Alpha/beta<br>gliadin IgE &<br>celiac  | 286 | 21755     | 7  |
| 1471 | Triticum<br>aestivum                 | Wheat  | Unassigned | Gliadin    | Triticum Alpha/beta<br>gliadin IgE &<br>celiac  | 307 | 21673     | 7  |
| 1472 | Triticum<br>aestivum                 | Wheat  | Unassigned | Gliadin    | Triticum Alpha/beta<br>gliadin IgE &<br>celiac  | 296 | 21757     | 7  |
| 1473 | Triticum<br>aestivum                 | Wheat  | Unassigned | Gliadin    | Triticum Alpha/beta<br>gliadin IgE &<br>celiac  | 286 | 21761     | 7  |
| 1474 | Triticum<br>aestivum                 | Wheat  | Unassigned | Gliadin    | Triticum Alpha/beta<br>gliadin IgE &<br>celiac  | 313 | 21765     | 7  |
| 1475 | Triticum<br>aestivum                 | Wheat  | Unassigned | Gliadin    | Triticum Alpha/beta<br>gliadin IgE &<br>celiac  | 318 | 170710    | 7  |
| 1476 | Triticum<br>aestivum                 | Wheat  | Unassigned | Gliadin    | Triticum Alpha/beta<br>gliadin IgE &<br>celiac  | 291 | 170712    | 7  |



|      |                   |       |            |            |  |     |         |   |
|------|-------------------|-------|------------|------------|--|-----|---------|---|
| 1477 | Triticum aestivum | Wheat | Unassigned | Gliadin    | Triticum Alpha/beta gliadin IgE & celiac | 313 | 170718  | 7 |
| 1478 | Triticum aestivum | Wheat | Unassigned | Gliadin    | Triticum Alpha/beta gliadin IgE & celiac | 286 | 170720  | 7 |
| 1479 | Triticum aestivum | Wheat | Unassigned | Gliadin    | Triticum Alpha/beta gliadin IgE & celiac | 262 | 170722  | 7 |
| 1480 | Triticum aestivum | Wheat | Unassigned | Gliadin    | Triticum Alpha/beta gliadin IgE & celiac | 297 | 170724  | 7 |
| 1481 | Triticum aestivum | Wheat | Unassigned | Gliadin    | Triticum Alpha/beta gliadin IgE & celiac | 282 | 170726  | 7 |
| 1482 | Triticum aestivum | Wheat | Unassigned | Gliadin    | Triticum Alpha/beta gliadin IgE & celiac | 186 | 170728  | 7 |
| 1483 | Triticum aestivum | Wheat | Unassigned | Gliadin    | Triticum Alpha/beta gliadin IgE & celiac | 287 | 473876  | 7 |
| 1484 | Triticum aestivum | Wheat | Unassigned | Gliadin    | Triticum Alpha/beta gliadin IgE & celiac | 259 | 1304264 | 7 |
| 1485 | Triticum urartu   | Wheat | Unassigned | Food Plant | Triticum Alpha/beta gliadin IgE & celiac | 296 | 170740  | 7 |
| 1486 | Triticum aestivum | Wheat | Unassigned | Aero Plant | Triticum Bakers asthma allergen #4       | 27  | 3913017 | 7 |
| 1487 | Triticum aestivum | Wheat | Unassigned | Gliadin    | Triticum gamma gliadin IgE & celiac      | 302 | 170702  | 7 |
| 1488 | Triticum aestivum | Wheat | Unassigned | Gliadin    | Triticum gamma gliadin IgE & celiac      | 291 | 170708  | 7 |
| 1489 | Triticum aestivum | Wheat | Unassigned | Gliadin    | Triticum gamma gliadin IgE & celiac      | 304 | 170730  | 7 |
| 1490 | Triticum aestivum | Wheat | Unassigned | Gliadin    | Triticum gamma gliadin IgE & celiac      | 323 | 170732  | 7 |
| 1491 | Triticum aestivum | Wheat | Unassigned | Gliadin    | Triticum gamma gliadin IgE & celiac      | 244 | 170734  | 7 |
| 1492 | Triticum aestivum | Wheat | Unassigned | Gliadin    | Triticum gamma gliadin IgE & celiac      | 251 | 170736  | 7 |
| 1493 | Triticum aestivum | Wheat | Unassigned | Gliadin    | Triticum gamma gliadin IgE & celiac      | 327 | 170738  | 7 |
| 1494 | Triticum aestivum | Wheat | Unassigned | Gliadin    | Triticum gamma gliadin IgE & celiac      | 279 | 1063270 | 7 |

|      |                                      |       |            |            |   |     |           |    |
|------|--------------------------------------|-------|------------|------------|---|-----|-----------|----|
|      |                                      |       |            |            | celiac                                    |     |           |    |
| 1495 | Triticum<br>aestivum                 | Wheat | Unassigned | Gliadin    | Triticum gamma<br>gliadin IgE &<br>celiac | 285 | 62484809  | 7  |
| 1496 | Triticum<br>aestivum                 | Wheat | Unassigned | Food Plant | Triticum HMW<br>glutenin                  | 830 | 21743     | 7  |
| 1497 | Triticum<br>aestivum                 | Wheat | Unassigned | Food Plant | Triticum HMW<br>glutenin                  | 648 | 21751     | 7  |
| 1498 | Triticum<br>aestivum                 | Wheat | Unassigned | Food Plant | Triticum HMW<br>glutenin                  | 660 | 21779     | 7  |
| 1499 | Triticum<br>aestivum                 | Wheat | Unassigned | Food Plant | Triticum HMW<br>glutenin                  | 39  | 21793     | 7  |
| 1500 | Triticum<br>aestivum                 | Wheat | Unassigned | Food Plant | Triticum HMW<br>glutenin                  | 705 | 22090     | 7  |
| 1501 | Triticum<br>aestivum                 | Wheat | Unassigned | Food Plant | Triticum HMW<br>glutenin                  | 815 | 170743    | 7  |
| 1502 | Triticum<br>aestivum                 | Wheat | Unassigned | Food Plant | Triticum HMW<br>glutenin                  | 838 | 736319    | 7  |
| 1503 | Triticum<br>aestivum                 | Wheat | Unassigned | Food Plant | Triticum HMW<br>glutenin                  | 101 | 897811    | 7  |
| 1504 | Triticum<br>aestivum                 | Wheat | Unassigned | Food Plant | Triticum LMW<br>glutenin                  | 307 | 21773     | 7  |
| 1505 | Triticum<br>aestivum                 | Wheat | Unassigned | Food Plant | Triticum LMW<br>glutenin                  | 356 | 21783     | 7  |
| 1506 | Triticum<br>aestivum                 | Wheat | Unassigned | Food Plant | Triticum LMW<br>glutenin                  | 373 | 75317968  | 7  |
| 1507 | Triticum<br>aestivum                 | Wheat | Unassigned | Food Plant | Triticum LMW<br>glutenin                  | 229 | 886963    | 7  |
| 1508 | Triticum<br>aestivum                 | Wheat | Unassigned | Food Plant | Triticum LMW<br>glutenin                  | 261 | 886965    | 7  |
| 1509 | Triticum<br>aestivum                 | Wheat | Unassigned | Food Plant | Triticum LMW<br>glutenin                  | 276 | 886967    | 7  |
| 1510 | Triticum<br>aestivum                 | Wheat | Unassigned | Food Plant | Triticum LMW<br>glutenin                  | 285 | 75219081  | 7  |
| 1511 | Triticum<br>aestivum                 | Wheat | Unassigned | Food Plant | Triticum LMW<br>glutenin                  | 326 | 62550933  | 7  |
| 1512 | Triticum<br>aestivum                 | Wheat | Unassigned | Food Plant | Triticum LMW<br>glutenin                  | 369 | 335331566 | 12 |
| 1513 | Triticum<br>turgidum subsp.<br>durum | Wheat | Unassigned | Food Plant | Triticum LMW<br>glutenin                  | 295 | 21926     | 7  |
| 1514 | Triticum<br>turgidum subsp.<br>durum | Wheat | Unassigned | Food Plant | Triticum LMW<br>glutenin                  | 285 | 21930     | 7  |
| 1515 | Triticum<br>aestivum                 | Wheat | Unassigned | Food Plant | Triticum omega-5<br>gliadin Tri a 19      | 439 | 73912496  | 7  |
| 1516 | Triticum                             | Wheat | Unassigned | Food Plant | Triticum omega-5                          | 359 | 208605344 | 10 |

|      |                       |       |            |            |   |     |           |    |
|------|-----------------------|-------|------------|------------|---|-----|-----------|----|
|      | aestivum              |       |            |            | gliadin Tri a 19  |     |           |    |
| 1517 | Triticum<br> aestivum | Wheat | Unassigned | Food Plant | Triticum omega-5<br> gliadin Tri a 19                     | 272 | 208605346 | 10 |
| 1518 | Triticum<br> aestivum | Wheat | Unassigned | Food Plant | Triticum omega-5<br> gliadin Tri a 19                     | 346 | 208605348 | 10 |
| 1519 | Triticum<br> aestivum | Wheat | Unassigned | Food Plant | Triticum Profilin   | 141 | 1008443   | 7  |
| 1520 | Triticum<br> aestivum | Wheat | Unassigned | Food Plant | Triticum Profilin   | 140 | 1008445   | 7  |
| 1521 | Triticum<br> aestivum | Wheat | Unassigned | Food Plant | Triticum Profilin   | 138 | 1052817   | 7  |
| 1522 | Triticum<br> aestivum | Wheat | Unassigned | Food Plant | Triticum Profilin   | 131 | 190684061 | 11 |
| 1523 | Triticum<br> aestivum | Wheat | Unassigned | Aero Plant | Triticum putative<br> flour allergens<br> Constantin 2010 | 118 | 190684055 | 11 |
| 1524 | Triticum<br> aestivum | Wheat | Unassigned | Aero Plant | Triticum putative<br> flour allergens<br> Constantin 2010 | 222 | 190684057 | 11 |
| 1525 | Triticum<br> aestivum | Wheat | Unassigned | Aero Plant | Triticum putative<br> flour allergens<br> Constantin 2010 | 218 | 190684059 | 11 |
| 1526 | Triticum<br> aestivum | Wheat | Unassigned | Aero Plant | Triticum putative<br> flour allergens<br> Constantin 2010 | 213 | 190684063 | 11 |
| 1527 | Triticum<br> aestivum | Wheat | Unassigned | Food Plant | Triticum putative<br> leucine-rich repeat<br> protein     | 137 | 66840996  | 7  |
| 1528 | Triticum<br> aestivum | Wheat | Unassigned | Food Plant | Triticum serine<br> carboxypeptidase II                   | 260 | 66840994  | 7  |
| 1529 | Triticum<br> aestivum | Wheat | Unassigned | Food Plant | Triticum serine<br> carboxypeptidase II                   | 444 | 125987805 | 10 |
| 1530 | Triticum<br> aestivum | Wheat | Unassigned | Food Plant | Triticum Serine<br> protease inhibitor                    | 399 | 1885350   | 7  |
| 1531 | Triticum<br> aestivum | Wheat | Unassigned | Aero Plant | Triticum serine<br> proteinase<br> inhibitor-like         | 84  | 154101366 | 10 |
| 1532 | Triticum<br> aestivum | Wheat | Unassigned | Aero Plant | Triticum serine<br> proteinase<br> inhibitor-like         | 84  | 122065237 | 11 |
| 1533 | Triticum<br> aestivum | Wheat | Unassigned | Food Plant | Triticum<br> Thaumatococcus-like                          | 173 | 135917    | 12 |
| 1534 | Triticum<br> aestivum | Wheat | Unassigned | Aero Plant | Triticum Tri a 29   | 120 | 253783731 | 11 |
| 1535 | Triticum<br> aestivum | Wheat | Unassigned | Aero Plant | Triticum Tri a 29   | 120 | 283465827 | 11 |
| 1536 | Triticum<br> aestivum | Wheat | Unassigned | Food Plant | Triticum Tri a 29   | 145 | 21701     | 7  |

|      |                                      |                    |            |                      |   |     |           |    |
|------|--------------------------------------|--------------------|------------|----------------------|---|-----|-----------|----|
| 1537 | Triticum<br>turgidum subsp.<br>durum | Wheat              | Unassigned | Food Plant           | Triticum Tri a 29                             | 145 | 21920     | 7  |
| 1538 | Triticum<br>aestivum                 | Wheat              | Unassigned | Food Plant           | Triticum<br>Triosephosphate<br>isomerase      | 253 | 11124572  | 7  |
| 1539 | Tyrophagus<br>putrescentiae          | Dust mite          | Unassigned | Aero Mite            | Tyrophagus Tyr p 10<br>tropomyosin            | 284 | 148615631 | 9  |
| 1540 | Tyrophagus<br>putrescentiae          | Dust mite          | Unassigned | Aero Mite            | Tyrophagus Tyr p 10<br>tropomyosin            | 201 | 156938915 | 9  |
| 1541 | Tyrophagus<br>putrescentiae          | Dust mite          | Unassigned | Aero Mite            | Tyrophagus Tyr p 10<br>tropomyosin            | 284 | 48249227  | 9  |
| 1542 | Tyrophagus<br>putrescentiae          | Dust mite          | Tyr p 13   | Aero Mite            | Tyrophagus Tyr p 13                           | 131 | 51860756  | 7  |
| 1543 | Tyrophagus<br>putrescentiae          | Dust mite          | Unassigned | Aero Mite            | Tyrophagus Tyr p 13                           | 130 | 121296500 | 9  |
| 1544 | Tyrophagus<br>putrescentiae          | Dust mite          | Unassigned | Aero Mite            | Tyrophagus Tyr p 13                           | 131 | 156938917 | 9  |
| 1545 | Tyrophagus<br>putrescentiae          | Dust mite          | Unassigned | Aero Mite            | Tyrophagus Tyr p 2                            | 141 | 3182907   | 9  |
| 1546 | Tyrophagus<br>putrescentiae          | Dust mite          | Unassigned | Aero Mite            | Tyrophagus Tyr p 24<br>Troponin C             | 153 | 219815476 | 11 |
| 1547 | Tyrophagus<br>putrescentiae          | Dust mite          | Unassigned | Aero Mite            | Tyrophagus Tyr p 3                            | 285 | 167540622 | 11 |
| 1548 | Vespa crabro                         | European<br>hornet | Vesp c 5   | Venom or<br>Salivary | Vespa Venom<br>allergen 5 hornets             | 202 | 549184    | 7  |
| 1549 | Vespa crabro                         | European<br>hornet | Vesp c 5   | Venom or<br>Salivary | Vespa Venom<br>allergen 5 hornets             | 202 | 549185    | 7  |
| 1550 | Vespa mandarinia                     | Wasp               | Vesp m 5   | Venom or<br>Salivary | Vespa Venom<br>allergen 5 hornets             | 202 | 6136165   | 7  |
| 1551 | Vespa crabro                         | European<br>hornet | Unassigned | Venom or<br>Salivary | Vespa Vesp c 1<br>phospholipase               | 301 | 313471397 | 12 |
| 1552 | Vespula<br>germanica                 | Wasp               | Unassigned | Venom or<br>Salivary | Vespula<br>Phospholipase A1-<br>Ves m/v 1     | 300 | 74035843  | 7  |
| 1553 | Vespula<br>maculifrons               | Wasp               | Ves m 1    | Venom or<br>Salivary | Vespula<br>Phospholipase A1-<br>Ves m/v 1     | 300 | 1709545   | 8  |
| 1554 | Vespula vulgaris                     | Wasp               | Ves v 1    | Venom or<br>Salivary | Vespula<br>Phospholipase A1-<br>Ves m/v 1     | 336 | 897647    | 7  |
| 1555 | Vespula<br>flavopilosa               | Wasp               | Ves f 5    | Venom or<br>Salivary | Vespula Venom<br>allergen 5 yellow<br>jackets | 204 | 549189    | 7  |
| 1556 | Vespula<br>germanica                 | Wasp               | Ves g 5    | Venom or<br>Salivary | Vespula Venom<br>allergen 5 yellow<br>jackets | 204 | 549190    | 7  |
| 1557 | Vespula<br>germanica                 | Wasp               | Unassigned | Venom or<br>Salivary | Vespula Venom<br>allergen 5 yellow            | 204 | 74035841  | 7  |

|      |                      |       |            |                   |   |     |           |    |
|------|----------------------|-------|------------|-------------------|---|-----|-----------|----|
|      |                      |       |            |                   | jackets                                 |     |           |    |
| 1558 | Vespula maculifrons  | Wasp  | Ves m 5    | Venom or Salivary | Vespula Venom allergen 5 yellow jackets | 204 | 549191    | 7  |
| 1559 | Vespula maculifrons  | Wasp  | Unassigned | Venom or Salivary | Vespula Venom allergen 5 yellow jackets | 227 | 85681830  | 7  |
| 1560 | Vespula pensylvanica | Wasp  | Ves p 5    | Venom or Salivary | Vespula Venom allergen 5 yellow jackets | 204 | 549192    | 7  |
| 1561 | Vespula squamosa     | Wasp  | Ves s 5    | Venom or Salivary | Vespula Venom allergen 5 yellow jackets | 205 | 549193    | 7  |
| 1562 | Vespula vidua        | Wasp  | Ves vi 5   | Venom or Salivary | Vespula Venom allergen 5 yellow jackets | 206 | 549194    | 7  |
| 1563 | Vespula vulgaris     | Wasp  | Ves v 5    | Venom or Salivary | Vespula Venom allergen 5 yellow jackets | 227 | 162551    | 7  |
| 1564 | Vespula vulgaris     | Wasp  | Ves v 5    | Venom or Salivary | Vespula Venom allergen 5 yellow jackets | 204 | 4826574   | 7  |
| 1565 | Vespula vulgaris     | Wasp  | Ves v 5    | Venom or Salivary | Vespula Venom allergen 5 yellow jackets | 209 | 11514279  | 7  |
| 1566 | Vespula maculifrons  | Wasp  | Unassigned | Venom or Salivary | Vespula Ves m 2 Hyaluronidase           | 31  | 313118253 | 12 |
| 1567 | Vespula squamosa     | Wasp  | Unassigned | Venom or Salivary | Vespula Ves s 1 phospholipase           | 298 | 313471398 | 12 |
| 1568 | Vespula germanica    | Wasp  | Unassigned | Venom or Salivary | Vespula Ves v 2                         | 331 | 116174180 | 8  |
| 1569 | Vespula germanica    | Wasp  | Unassigned | Venom or Salivary | Vespula Ves v 2                         | 323 | 116174182 | 8  |
| 1570 | Vespula vulgaris     | Wasp  | Ves v 2    | Venom or Salivary | Vespula Ves v 2                         | 331 | 1346323   | 7  |
| 1571 | Vespula vulgaris     | Wasp  | Unassigned | Venom or Salivary | Vespula Ves v 2                         | 340 | 62147665  | 7  |
| 1572 | Vespula vulgaris     | Wasp  | Unassigned | Venom or Salivary | Vespula Ves v 2                         | 331 | 109157163 | 8  |
| 1573 | Vespula vulgaris     | Wasp  | Unassigned | Venom or Salivary | Vespula Ves v 3 dipeptidylpeptidase IV  | 776 | 313471718 | 12 |
| 1574 | Vigna radiata        |       | Unassigned | Food Plant        | Vigna Vig r 1 PR 10                     | 155 | 60418924  | 7  |
| 1575 | Vitis sp.            | Grape | Unassigned | Food Plant        | Vitis Lipid transfer protein P3         | 91  | 145559502 | 8  |
| 1576 | Vitis sp.            | Grape | Vit v 1    | Food Plant        | Vitis Vit v 1 LTP                       | 37  | 462719    | 7  |
| 1577 | Vitis sp.            | Grape | Unassigned | Food Plant        | Vitis Vit v 1 LTP                       | 38  | 462717    | 7  |
| 1578 | Xiphias gladius      |       | Unassigned | Food              | Xiphias Xip g 1                         | 109 | 222352960 | 10 |

|      |                        |              |            | Animal     | beta-parvalbumin            |     |           |   |
|------|------------------------|--------------|------------|------------|-----------------------------|-----|-----------|---|
| 1579 | Zea mays               | Corn         | Unassigned | Aero Plant | Zea m 1 isoform             | 263 | 89892721  | 7 |
| 1580 | Zea mays               | Corn         | Unassigned | Aero Plant | Zea m 1 isoform             | 252 | 89892723  | 7 |
| 1581 | Zea mays               | Corn         | Unassigned | Aero Plant | Zea m 1 isoform             | 99  | 105969543 | 8 |
| 1582 | Zea mays               | Corn         | Unassigned | Aero Plant | Zea m 1 isoform             | 269 | 105969545 | 8 |
| 1583 | Zea mays               | Corn         | Unassigned | Aero Plant | Zea m 1 isoform             | 270 | 115502167 | 9 |
| 1584 | Zea mays               | Corn         | Unassigned | Aero Plant | Zea m 1 isoform             | 269 | 115502168 | 9 |
| 1585 | Zea mays               | Corn         | Unassigned | Food Plant | Zea profilin                | 131 | 2642324   | 7 |
| 1586 | Zea mays               | Corn         | Unassigned | Food Plant | Zea profilin                | 131 | 110644952 | 8 |
| 1587 | Zea mays               | Corn         | Unassigned | Food Plant | Zea profilin                | 131 | 110644954 | 8 |
| 1588 | Zea mays               | Corn         | Unassigned | Food Plant | Zea profilin                | 131 | 110644956 | 8 |
| 1589 | Zea mays               | Corn         | Unassigned | Food Plant | Zea profilin                | 131 | 110644958 | 8 |
| 1590 | Zea mays               | Corn         | Unassigned | Food Plant | Zea profilin                | 131 | 110644960 | 8 |
| 1591 | Zea mays               | Corn         | Unassigned | Food Plant | Zea profilin                | 131 | 110644962 | 8 |
| 1592 | Zea mays               | Corn         | Unassigned | Food Plant | Zea profilin                | 130 | 110644964 | 8 |
| 1593 | Zea mays               | Corn         | Unassigned | Aero Plant | Zea putative Zea m<br>13?   | 410 | 89892725  | 7 |
| 1594 | Zea mays               | Corn         | Unassigned | Aero Plant | Zea putative Zea m<br>13?   | 404 | 89892727  | 7 |
| 1595 | Zea mays               | Corn         | Unassigned | Aero Plant | Zea putative Zea m<br>13?   | 411 | 89892729  | 7 |
| 1596 | Zea mays               | Corn         | Unassigned | Aero Plant | Zea Zea m 13                | 170 | 1588669   | 7 |
| 1597 | Zea mays               | Corn         | Zea m 14   | Food Plant | Zea Zea m 14                | 120 | 128388    | 7 |
| 1598 | Zea mays               | Corn         | Unassigned | Aero Plant | Zea Zea m 25<br>thioredoxin | 128 | 66841002  | 7 |
| 1599 | Zea mays               | Corn         | Unassigned | Aero Plant | Zea Zea m1                  | 269 | 28630919  | 7 |
| 1600 | Zea mays               | Corn         | Unassigned | Aero Plant | Zea Zea m1                  | 269 | 28630923  | 7 |
| 1601 | Zea mays               | Corn         | Unassigned | Aero Plant | Zea Zea m1                  | 269 | 14193761  | 8 |
| 1602 | Zea mays               | Corn         | Unassigned | Aero Plant | Zea Zea m1                  | 245 | 114794319 | 8 |
| 1603 | Ziziphus<br>mauritiana | Chinese-date | Unassigned | Food Plant | Ziziphus Ziz m 1            | 330 | 61225281  | 7 |

## D.1 Omitted allergens from allergenonline

A few of the entries were omitted, due to wrong accession codes, unpublished sequences or other errors:

Blomia tropicalis Mite UnassignedAero MiteBlomia Blo t 1.02  
Brassica oleracea Cabbage UnassignedFood PlantBrassica Bra o 3 LTP manual entry

## E List of allergens from allergen.org

List of allergens that have been tested by the EFSA scientific opinion recommended allergen analysis described in section 2. The sequences were downloaded via <http://www.allergen.org>.

Aca s 13.0101 076821 *Acarus siro* (Storage mite)  
Act c 10.0101 P85204 *Actinidia chinensis* (Gold Kiwi fruit)  
Act c 5.0101 P85261 *Actinidia chinensis* (Gold Kiwi fruit)  
Act c 8.0101 D1YSM4 *Actinidia chinensis* (Gold Kiwi fruit)  
Act d 1.0101 P00785 *Actinidia deliciosa* (Kiwi fruit)  
Act d 10.0101 P85205 *Actinidia deliciosa* (Kiwi fruit)  
Act d 10.0201 P85206 *Actinidia deliciosa* (Kiwi fruit)  
Act d 11.0101 P85524 *Actinidia deliciosa* (Kiwi fruit)  
Act d 2.0101 P81370 *Actinidia deliciosa* (Kiwi fruit)  
Act d 3.0101 P85063 *Actinidia deliciosa* (Kiwi fruit)  
Act d 4.0101 Q6TPK4 *Actinidia deliciosa* (Kiwi fruit)  
Act d 5.0101 P84527 *Actinidia deliciosa* (Kiwi fruit)  
Act d 6.0101 P83326 *Actinidia deliciosa* (Kiwi fruit)  
Act d 7.0101 P85076 *Actinidia deliciosa* (Kiwi fruit)  
Act d 8.0101 D1YSM5 *Actinidia deliciosa* (Kiwi fruit)  
Aed a 1.0101 P50635 *Aedes aegypti* (Yellow fever mosquito)  
Aed a 2.0101 P18153 *Aedes aegypti* (Yellow fever mosquito)  
Aed a 3.0101 001949 *Aedes aegypti* (Yellow fever mosquito)  
Aln g 1.0101 P38948 *Alnus glutinosa* (Alder)  
Aln g 4.0101 081701 *Alnus glutinosa* (Alder)  
Alt a 1.0101 P79085 *Alternaria alternata* (Alternaria rot fungus)  
Alt a 1.0102 Q6Q128 *Alternaria alternata* (Alternaria rot fungus)  
Alt a 10.0101 P42041 *Alternaria alternata* (Alternaria rot fungus)  
Alt a 12.0101 P49148 *Alternaria alternata* (Alternaria rot fungus)  
Alt a 13.0101 Q6R4B4 *Alternaria alternata* (Alternaria rot fungus)  
Alt a 3.0101 P78983 *Alternaria alternata* (Alternaria rot fungus)  
Alt a 4.0101 Q00002 *Alternaria alternata* (Alternaria rot fungus)  
Alt a 5.0101 P42037 *Alternaria alternata* (Alternaria rot fungus)  
Alt a 6.0101 Q9HDT3 *Alternaria alternata* (Alternaria rot fungus)  
Alt a 7.0101 P42058 *Alternaria alternata* (Alternaria rot fungus)  
Alt a 8.0101 P0C0Y4 *Alternaria alternata* (Alternaria rot fungus)  
Ama r 2.0101 C3W2Q7 *Amaranthus retroflexus* (Redroot pigweed)  
Amb a 1.0101 P27759 *Ambrosia artemisiifolia* (Short ragweed)  
Amb a 1.0201 P27760 *Ambrosia artemisiifolia* (Short ragweed)  
Amb a 1.0202 E1XUL3 *Ambrosia artemisiifolia* (Short ragweed)  
Amb a 1.0301 P27761 *Ambrosia artemisiifolia* (Short ragweed)  
Amb a 1.0302 P27761 *Ambrosia artemisiifolia* (Short ragweed)  
Amb a 1.0304 E1XUL4 *Ambrosia artemisiifolia* (Short ragweed)  
Amb a 1.0305 E1XUL5 *Ambrosia artemisiifolia* (Short ragweed)  
Amb a 1.0401 P28744 *Ambrosia artemisiifolia* (Short ragweed)  
Amb a 1.0402 E1XUL9 *Ambrosia artemisiifolia* (Short ragweed)  
Amb a 1.0501 P27762 *Ambrosia artemisiifolia* (Short ragweed)  
Amb a 1.0502 E1XUM1 *Ambrosia artemisiifolia* (Short ragweed)  
Amb a 10.0101 Q2KN25 *Ambrosia artemisiifolia* (Short ragweed)  
Amb a 3.0101 P00304 *Ambrosia artemisiifolia* (Short ragweed)  
Amb a 5.0101 P02878 *Ambrosia artemisiifolia* (Short ragweed)  
Amb a 6.0101 004004 *Ambrosia artemisiifolia* (Short ragweed)  
Amb a 8.0101 Q2KN24 *Ambrosia artemisiifolia* (Short ragweed)  
Amb a 8.0102 Q2KN23 *Ambrosia artemisiifolia* (Short ragweed)  
Amb a 9.0101 Q2KN27 *Ambrosia artemisiifolia* (Short ragweed)  
Amb a 9.0102 Q2KN26 *Ambrosia artemisiifolia* (Short ragweed)  
Amb p 5.0101 P43174 *Ambrosia psilostachya* (Western ragweed)  
Amb p 5.0201 P43175 *Ambrosia psilostachya* (Western ragweed)  
Amb t 5.0101 P10414 *Ambrosia trifida* (Giant ragweed)  
Ana c 1.0101 Q94JN2 *Ananas comosus* (Pineapple)  
Ana c 2.0101 023791 *Ananas comosus* (Pineapple)  
Ana o 1.0101 Q8L5L5 *Anacardium occidentale* (Cashew)  
Ana o 1.0102 Q8L5L6 *Anacardium occidentale* (Cashew)  
Ana o 2.0101 Q8GZP6 *Anacardium occidentale* (Cashew)



Ana o 3.0101 Q8H2B8 Anacardium occidentale (Cashew)  
 Ani s 1.0101 Q7Z1K3 Anisakis simplex (Nematode)  
 Ani s 2.0101 Q9NJA9 Anisakis simplex (Nematode)  
 Ani s 3.0101 Q9NAS5 Anisakis simplex (Nematode)  
 Ani s 4.0101 Q14QT4 Anisakis simplex (Nematode)  
 Ani s 5.0101 A1IKL2 Anisakis simplex (Nematode)  
 Ani s 6.0101 A1IKL3 Anisakis simplex (Nematode)  
 Ani s 9.0101 B2XCP1 Anisakis simplex (Nematode)  
 Ant o 1.0101 Q7M1X6 Anthoxanthum odoratum (Sweet vernal grass)  
 Api c 1.0101 Q9BMK4 Apis cerana (Eastern hive bee)  
 Api d 1.0101 Q7M4I5 Apis dorsata (Giant honeybee)  
 Api g 1.0101 P49372 Apium graveolens (Celery)  
 Api g 1.0201 P92918 Apium graveolens (Celery)  
 Api g 3.0101 P92919 Apium graveolens (Celery)  
 Api g 4.0101 Q9XF37 Apium graveolens (Celery)  
 Api g 5.0101 P81943 Apium graveolens (Celery)  
 Api m 1.0101 P00630 Apis mellifera (Honey bee)  
 Api m 10.0101 Q1HHN7 Apis mellifera (Honey bee)  
 Api m 2.0101 Q08169 Apis mellifera (Honey bee)  
 Api m 3.0101 Q4TUB9 Apis mellifera (Honey bee)  
 Api m 4.0101 P01501 Apis mellifera (Honey bee)  
 Api m 5.0101 B2D0J4 Apis mellifera (Honey bee)  
 Api m 7.0101 Q8MQS8 Apis mellifera (Honey bee)  
 Api m 8.0101 B2D0J5 Apis mellifera (Honey bee)  
 Api m 9.0101 C9WMM5 Apis mellifera (Honey bee)  
 Ara h 1.0101 P43238 Arachis hypogaea (Peanut)  
 Ara h 10.0101 Q647G5 Arachis hypogaea (Peanut)  
 Ara h 10.0102 Q647G4 Arachis hypogaea (Peanut)  
 Ara h 11.0101 Q45W87 Arachis hypogaea (Peanut)  
 Ara h 2.0101 Q6PSU2 Arachis hypogaea (Peanut)  
 Ara h 2.0201 Q6PSU2 Arachis hypogaea (Peanut)  
 Ara h 3.0101 O82580 Arachis hypogaea (Peanut)  
 Ara h 3.0201 Q9SQH7 Arachis hypogaea (Peanut)  
 Ara h 5.0101 Q9SQI9 Arachis hypogaea (Peanut)  
 Ara h 6.0101 Q647G9 Arachis hypogaea (Peanut)  
 Ara h 7.0101 Q9SQH1 Arachis hypogaea (Peanut)  
 Ara h 7.0201 B4XID4 Arachis hypogaea (Peanut)  
 Ara h 8.0101 Q6VT83 Arachis hypogaea (Peanut)  
 Ara h 8.0201 BOYIU5 Arachis hypogaea (Peanut)  
 Ara h 9.0101 B6CEX8 Arachis hypogaea (Peanut)  
 Ara h 9.0201 B6CG41 Arachis hypogaea (Peanut)  
 Arc s 8.0101 Q8T5G9 Archaeopotamobius sibiricus (Crustacean species)  
 Arg r 1.0101 Q5GQ85 Argas reflexus (Pigeon tick)  
 Art fr 5.0101 A7L499 Artemia franciscana (Brine shrimp)  
 Art v 1.0101 Q84ZX5 Artemisia vulgaris (Mugwort)  
 Art v 2.0101 Q7M1G9 Artemisia vulgaris (Mugwort)  
 Art v 3.0101 P0C088 Artemisia vulgaris (Mugwort)  
 Art v 3.0201 C4MGG9 Artemisia vulgaris (Mugwort)  
 Art v 3.0202 C4MGH0 Artemisia vulgaris (Mugwort)  
 Art v 3.0301 C4MGH1 Artemisia vulgaris (Mugwort)  
 Art v 4.0101 Q8H2C9 Artemisia vulgaris (Mugwort)  
 Art v 4.0201 Q8H2C8 Artemisia vulgaris (Mugwort)  
 Art v 5.0101 A0PJ17 Artemisia vulgaris (Mugwort)  
 Art v 6.0101 A0PJ16 Artemisia vulgaris (Mugwort)  
 Asc l 3.0101 COL3K2 Ascaris lumbricoides (Common roundworm)  
 Asc s 1.0101 Q06811 Ascaris suum (Pig roundworm)  
 Asp f 1.0101 P67875 Aspergillus fumigatus (fungus)  
 Asp f 10.0101 Q12547 Aspergillus fumigatus (fungus)  
 Asp f 11.0101 Q9Y7F6 Aspergillus fumigatus (fungus)  
 Asp f 12.0101 P40292 Aspergillus fumigatus (fungus)  
 Asp f 13.0101 P28296 Aspergillus fumigatus (fungus)  
 Asp f 15.0101 O60022 Aspergillus fumigatus (fungus)  
 Asp f 16.0101 O74682 Aspergillus fumigatus (fungus)  
 Asp f 17.0101 O60025 Aspergillus fumigatus (fungus)  
 Asp f 18.0101 P87184 Aspergillus fumigatus (fungus)  
 Asp f 2.0101 P79017 Aspergillus fumigatus (fungus)  
 Asp f 22.0101 Q96X30 Aspergillus fumigatus (fungus)  
 Asp f 23.0101 Q8NKF4 Aspergillus fumigatus (fungus)  
 Asp f 27.0101 Q4WWX5 Aspergillus fumigatus (fungus)

Asp f 28.0101 Q1RQJ1 *Aspergillus fumigatus* (fungus)  
 Asp f 29.0101 Q4WV97 *Aspergillus fumigatus* (fungus)  
 Asp f 3.0101 Q43099 *Aspergillus fumigatus* (fungus)  
 Asp f 34.0101 A4FSH5 *Aspergillus fumigatus* (fungus)  
 Asp f 4.0101 Q60024 *Aspergillus fumigatus* (fungus)  
 Asp f 5.0101 P46075 *Aspergillus fumigatus* (fungus)  
 Asp f 6.0101 Q92450 *Aspergillus fumigatus* (fungus)  
 Asp f 7.0101 Q42799 *Aspergillus fumigatus* (fungus)  
 Asp f 8.0101 Q9UWZ6 *Aspergillus fumigatus* (fungus)  
 Asp f 9.0101 Q42800 *Aspergillus fumigatus* (fungus)  
 Asp n 14.0101 Q93933 *Aspergillus niger*  
 Asp n 25.0101 P34754 *Aspergillus niger*  
 Asp o 13.0101 P12547 *Aspergillus oryzae*  
 Asp o 21.0101 P10529 *Aspergillus oryzae*  
 Ber e 1.0101 P04403 *Bertholletia excelsa* (Brazil nut)  
 Ber e 2.0101 Q84ND2 *Bertholletia excelsa* (Brazil nut)  
 Bet v 1.0101 P15494 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 1.0201 P45431 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 1.0301 P43176 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 1.0401 P43177 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 1.0501 P43178 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 1.0601 P43179 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 1.0701 P43180 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 1.0801 P43183 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 1.0901 P43184 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 1.1001 P43185 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 1.1101 Q39417 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 1.1201 Q39420 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 1.1301 Q39415 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 1.1401 P43186 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 1.1501 Q42499 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 1.1601 Q39425 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 1.1701 Q39426 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 1.1801 Q39427 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 1.1901 Q39428 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 1.2001 Q39429 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 1.2101 Q39430 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 1.2201 Q39431 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 1.2301 Q23754 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 1.2401 Q96365 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 1.2501 Q96366 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 1.2601 Q96367 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 1.2701 Q96368 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 1.2801 P15494 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 1.2901 Q96370 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 1.3001 Q96371 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 2.0101 P25816 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 3.0101 P43187 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 4.0101 Q39419 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 6.0101 Q65002 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 6.0102 Q9FUW6 *Betula verrucosa* (European white birch [Betula pendula])  
 Bet v 7.0101 P81531 *Betula verrucosa* (European white birch [Betula pendula])  
 Beta v 1.0101 P85983 *Beta vulgaris* (Sugar beet)  
 Beta v 2.0101 P85984 *Beta vulgaris* (Sugar beet)  
 Bla g 1.0101 Q9UAM5 *Blattella germanica* (German cockroach)  
 Bla g 1.0201 Q96522 *Blattella germanica* (German cockroach)  
 Bla g 2.0101 P54958 *Blattella germanica* (German cockroach)  
 Bla g 4.0101 P54962 *Blattella germanica* (German cockroach)  
 Bla g 5.0101 Q18598 *Blattella germanica* (German cockroach)  
 Bla g 6.0101 Q1A7B3 *Blattella germanica* (German cockroach)  
 Bla g 6.0201 Q1A7B2 *Blattella germanica* (German cockroach)  
 Bla g 6.0301 Q1A7B1 *Blattella germanica* (German cockroach)  
 Bla g 7.0101 Q9NG56 *Blattella germanica* (German cockroach)  
 Bla g 8.0101 A0ERA8 *Blattella germanica* (German cockroach)  
 Blo t 1.0101 Q95PJ4 *Blomia tropicalis* (Mite)  
 Blo t 10.0101 A7XZI4 *Blomia tropicalis* (Mite)  
 Blo t 11.0101 Q8MUF6 *Blomia tropicalis* (Mite)  
 Blo t 12.0101 Q17282 *Blomia tropicalis* (Mite)  
 Blo t 13.0101 Q17284 *Blomia tropicalis* (Mite)

Blo t 2.0101 Q1M2P1 Blomia tropicalis (Mite)  
 Blo t 2.0102 Q1M2P2 Blomia tropicalis (Mite)  
 Blo t 2.0103 Q1M2P3 Blomia tropicalis (Mite)  
 Blo t 21.0101 A7IZE9 Blomia tropicalis (Mite)  
 Blo t 3.0101 Q8I916 Blomia tropicalis (Mite)  
 Blo t 5.0101 Q96870 Blomia tropicalis (Mite)  
 Bom p 1.0101 Q7M4I6 Bombus pennsylvanicus (Bumble bee)  
 Bom p 4.0101 Q7M4I3 Bombus pennsylvanicus (Bumble bee)  
 Bom t 1.0101 P82971 Bombus terrestris (Bumble bee)  
 Bos d 2.0101 Q28133 Bos domesticus (domestic cattle)  
 Bos d 2.0102 Q28133 Bos domesticus (domestic cattle)  
 Bos d 2.0103 Q28133 Bos domesticus (domestic cattle)  
 Bos d 3.0101 Q28050 Bos domesticus (domestic cattle)  
 Bos d 4.0101 P00711 Bos domesticus (domestic cattle)  
 Bos d 5.0101 P02754 Bos domesticus (domestic cattle)  
 Bos d 6.0101 P02769 Bos domesticus (domestic cattle)  
 Bra j 1.0101 P80207 Brassica juncea (Oriental mustard)  
 Bra n 1.0101 P80208 Brassica napus (Rapeseed)  
 Bra r 1.0101 Q42473 Brassica rapa (Turnip)  
 Bra r 2.0101 P81729 Brassica rapa (Turnip)  
 Can f 1.0101 Q18873 Canis familiaris (dog)  
 Can f 2.0101 Q18874 Canis familiaris (dog)  
 Can f 3.0101 P49822 Canis familiaris (dog)  
 Can f 5.0101 P09582 Canis familiaris (dog)  
 Cand a 1.0101 P43067 Candida albicans (Yeast)  
 Cand a 3.0101 Q6YK78 Candida albicans (Yeast)  
 Cand b 2.0101 P14292 Candida boidinii (Yeast)  
 Cap a 1w.0101 Q9ARG0 Capsicum annuum (Bell pepper)  
 Cap a 2.0101 Q93YI9 Capsicum annuum (Bell pepper)  
 Car b 1.0101 P38949 Carpinus betulus (Hornbeam)  
 Car b 1.0102 P38949 Carpinus betulus (Hornbeam)  
 Car b 1.0103 Q96377 Carpinus betulus (Hornbeam)  
 Car b 1.0104 Q96378 Carpinus betulus (Hornbeam)  
 Car b 1.0105 Q96379 Carpinus betulus (Hornbeam)  
 Car b 1.0106 Q96503 Carpinus betulus (Hornbeam)  
 Car b 1.0107 Q96501 Carpinus betulus (Hornbeam)  
 Car b 1.0108 Q96380 Carpinus betulus (Hornbeam)  
 Car b 1.0109 B6RQR6 Carpinus betulus (Hornbeam)  
 Car b 1.0110 B6RQR7 Carpinus betulus (Hornbeam)  
 Car b 1.0111 B6RQR8 Carpinus betulus (Hornbeam)  
 Car b 1.0112 B6RQR9 Carpinus betulus (Hornbeam)  
 Car b 1.0113 B6RQS0 Carpinus betulus (Hornbeam)  
 Car b 1.0201 P38950 Carpinus betulus (Hornbeam)  
 Car b 1.0301 Q96381 Carpinus betulus (Hornbeam)  
 Car b 1.0302 Q96382 Carpinus betulus (Hornbeam)  
 Car i 1.0101 Q84XA9 Carya illinoensis (Pecan)  
 Car i 4.0101 B5KVH4 Carya illinoensis (Pecan)  
 Cas s 1.0101 B7TWE3 Castanea sativa (Chestnut)  
 Cat r 1.0101 Q39613 Catharanthus roseus (Rosy periwinkle)  
 Cav p 1.0101 P83507 Cavia porcellus (guinea pig)  
 Cav p 2.0101 F0UZ11 Cavia porcellus (guinea pig)  
 Cav p 3.0101 F0UZ12 Cavia porcellus (guinea pig)  
 Cha f 1.0101 Q9N2R3 Charybdis feriatus (Crab)  
 Cha o 1.0101 Q96385 Chamaecyparis obtusa (Japanese cypress)  
 Cha o 2.0101 Q7M1E7 Chamaecyparis obtusa (Japanese cypress)  
 Che a 1.0101 Q8LGR0 Chenopodium album (Pigweed)  
 Che a 2.0101 Q84V37 Chenopodium album (Pigweed)  
 Che a 3.0101 Q84V36 Chenopodium album (Pigweed)  
 Chi k 10.0101 Q96764 Chironomus kiiensis (Midge)  
 Chi t 1.0101 P02229 Chironomus thummi thummi (Midge)  
 Chi t 1.0201 P02230 Chironomus thummi thummi (Midge)  
 Chi t 2.0101 P02221 Chironomus thummi thummi (Midge)  
 Chi t 2.0102 P02221 Chironomus thummi thummi (Midge)  
 Chi t 3.0101 P02222 Chironomus thummi thummi (Midge)  
 Chi t 3.0201 P02224 Chironomus thummi thummi (Midge)  
 Chi t 3.0301 P02226 Chironomus thummi thummi (Midge)  
 Chi t 3.0401 P02223 Chironomus thummi thummi (Midge)  
 Chi t 3.0501 P12548 Chironomus thummi thummi (Midge)  
 Chi t 3.0601 P84296 Chironomus thummi thummi (Midge)

Chi t 3.0701 P84298 Chironomus thummi thummi (Midge)  
 Chi t 3.0702 P12549 Chironomus thummi thummi (Midge)  
 Chi t 3.0801 P12550 Chironomus thummi thummi (Midge)  
 Chi t 3.0901 P02227 Chironomus thummi thummi (Midge)  
 Chi t 4.0101 P02231 Chironomus thummi thummi (Midge)  
 Chi t 9.0101 P02228 Chironomus thummi thummi (Midge)  
 Cit l 3.0101 P84160 Citrus limon (Lemon)  
 Cit s 1.0101 P84159 Citrus sinensis (Sweet orange)  
 Cit s 2.0101 P84177 Citrus sinensis (Sweet orange)  
 Cit s 3.0102 Q6EV47 Citrus sinensis (Sweet orange)  
 Cla h 10.0101 P40108 Cladosporium herbarum  
 Cla h 12.0101 P50344 Cladosporium herbarum  
 Cla h 5.0101 P42039 Cladosporium herbarum  
 Cla h 6.0101 P42040 Cladosporium herbarum  
 Cla h 7.0101 P42059 Cladosporium herbarum  
 Cla h 8.0101 P0C0Y5 Cladosporium herbarum  
 Clu h 1.0101 C6GKU6 Clupea harengus (Atlantic herring)  
 Clu h 1.0201 C6GKU7 Clupea harengus (Atlantic herring)  
 Clu h 1.0301 C6GKU8 Clupea harengus (Atlantic herring)  
 Cop c 1.0101 Q9Y7G3 Coprinus comatus (Shaggy mane)  
 Cop c 2.0101 Q9UW02 Coprinus comatus (Shaggy mane)  
 Cop c 3.0101 Q9UW01 Coprinus comatus (Shaggy mane)  
 Cop c 5.0101 Q9UW00 Coprinus comatus (Shaggy mane)  
 Cop c 7.0101 Q9UVZ9 Coprinus comatus (Shaggy mane)  
 Cor a 1.0101 Q08407 Corylus avellana (Hazel)  
 Cor a 1.0102 Q08407 Corylus avellana (Hazel)  
 Cor a 1.0103 Q08407 Corylus avellana (Hazel)  
 Cor a 1.0104 Q08407 Corylus avellana (Hazel)  
 Cor a 1.0201 Q39453 Corylus avellana (Hazel)  
 Cor a 1.0301 Q39454 Corylus avellana (Hazel)  
 Cor a 1.0401 Q9SWR4 Corylus avellana (Hazel)  
 Cor a 1.0402 Q9FPK4 Corylus avellana (Hazel)  
 Cor a 1.0403 Q9FPK3 Corylus avellana (Hazel)  
 Cor a 1.0404 Q9FPK2 Corylus avellana (Hazel)  
 Cor a 10.0101 Q9FSY7 Corylus avellana (Hazel)  
 Cor a 11.0101 Q8S4P9 Corylus avellana (Hazel)  
 Cor a 12.0101 Q84T21 Corylus avellana (Hazel)  
 Cor a 13.0101 Q84T91 Corylus avellana (Hazel)  
 Cor a 14.0101 D0PWG2 Corylus avellana (Hazel)  
 Cor a 2.0101 Q9AXH5 Corylus avellana (Hazel)  
 Cor a 2.0102 Q9AXH4 Corylus avellana (Hazel)  
 Cor a 8.0101 Q9ATH2 Corylus avellana (Hazel)  
 Cor a 9.0101 Q8W1C2 Corylus avellana (Hazel)  
 Cra c 1.0101 D7F1J4 Crangon crangon (North Sea shrimp)  
 Cra c 2.0101 D7F1J5 Crangon crangon (North Sea shrimp)  
 Cra c 4.0101 D7F1P9 Crangon crangon (North Sea shrimp)  
 Cra c 5.0101 D7F1Q1 Crangon crangon (North Sea shrimp)  
 Cra c 6.0101 D7F1Q2 Crangon crangon (North Sea shrimp)  
 Cra c 8.0101 D7F1Q0 Crangon crangon (North Sea shrimp)  
 Cry j 1.0101 P18632 Cryptomeria japonica (Sugi)  
 Cry j 1.0102 P18632 Cryptomeria japonica (Sugi)  
 Cry j 1.0103 P18632 Cryptomeria japonica (Sugi)  
 Cry j 1.0103 Q8RUR1 Cryptomeria japonica (Sugi)  
 Cry j 1.0103 Q8RUR1 Cryptomeria japonica (Sugi)  
 Cry j 2.0101 P43212 Cryptomeria japonica (Sugi)  
 Cte f 1.0101 Q94424 Ctenocephalides felis felis (Cat flea)  
 Cte f 2.0101 Q9NH66 Ctenocephalides felis felis (Cat flea)  
 Cuc m 1.0101 Q39547 Cucumis melo (Muskmelon)  
 Cuc m 2.0101 Q5FX67 Cucumis melo (Muskmelon)  
 Cuc m 3.0101 P83834 Cucumis melo (Muskmelon)  
 Cup a 1.0101 Q9SCG9 Cupressus arizonica (Cypress)  
 Cup s 1.0101 Q9M4S6 Cupressus sempervirens (Common cypress)  
 Cup s 1.0102 Q9M4S5 Cupressus sempervirens (Common cypress)  
 Cup s 1.0103 Q9M4S4 Cupressus sempervirens (Common cypress)  
 Cup s 1.0104 Q9M4S3 Cupressus sempervirens (Common cypress)  
 Cup s 1.0105 Q9M4S2 Cupressus sempervirens (Common cypress)  
 Cup s 3.0101 Q69CS2 Cupressus sempervirens (Common cypress)  
 Cup s 3.0102 Q69CS3 Cupressus sempervirens (Common cypress)  
 Cup s 3.0103 Q69CS2 Cupressus sempervirens (Common cypress)

Cur l 2.0101 Q96VP4 *Curvularia lunata* (Synonym: *Cochliobolus lunatus*)  
 Cur l 3.0101 Q96VP3 *Curvularia lunata* (Synonym: *Cochliobolus lunatus*)  
 Cyn d 1.0101 004701 *Cynodon dactylon* (Bermuda grass)  
 Cyn d 1.0201 Q947S7 *Cynodon dactylon* (Bermuda grass)  
 Cyn d 1.0202 Q947S6 *Cynodon dactylon* (Bermuda grass)  
 Cyn d 1.0203 Q947S4 *Cynodon dactylon* (Bermuda grass)  
 Cyn d 1.0204 Q9FVM0 *Cynodon dactylon* (Bermuda grass)  
 Cyn d 12.0101 004725 *Cynodon dactylon* (Bermuda grass)  
 Cyn d 15.0101 Q7XYF2 *Cynodon dactylon* (Bermuda grass)  
 Cyn d 23.0101 Q7XYF3 *Cynodon dactylon* (Bermuda grass)  
 Cyn d 24.0101 Q647J6 *Cynodon dactylon* (Bermuda grass)  
 Cyn d 7.0101 P94092 *Cynodon dactylon* (Bermuda grass)  
 Dac g 1.0101 Q7M1X8 *Dactylis glomerata* (Orchard grass)  
 Dac g 2.0101 Q41183 *Dactylis glomerata* (Orchard grass)  
 Dac g 3.0101 P93124 *Dactylis glomerata* (Orchard grass)  
 Dac g 4.0101 P82946 *Dactylis glomerata* (Orchard grass)  
 Dau c 1.0101 004298 *Daucus carota* (Carrot)  
 Dau c 1.0102 004298 *Daucus carota* (Carrot)  
 Dau c 1.0103 004298 *Daucus carota* (Carrot)  
 Dau c 1.0104 004298 *Daucus carota* (Carrot)  
 Dau c 1.0105 004298 *Daucus carota* (Carrot)  
 Dau c 1.0201 Q8SAE7 *Daucus carota* (Carrot)  
 Dau c 4.0101 Q8SAE6 *Daucus carota* (Carrot)  
 Der f 1.0101 Q58A71 *Dermatophagoides farinae* (American house dust mite)  
 Der f 1.0102 Q3HWZ4 *Dermatophagoides farinae* (American house dust mite)  
 Der f 1.0103 Q3HWZ4 *Dermatophagoides farinae* (American house dust mite)  
 Der f 1.0104 Q3HWZ4 *Dermatophagoides farinae* (American house dust mite)  
 Der f 1.0105 Q3HWZ4 *Dermatophagoides farinae* (American house dust mite)  
 Der f 1.0106 P16311 *Dermatophagoides farinae* (American house dust mite)  
 Der f 1.0108 A1YW11 *Dermatophagoides farinae* (American house dust mite)  
 Der f 1.0109 A1YW12 *Dermatophagoides farinae* (American house dust mite)  
 Der f 1.0110 A1YW13 *Dermatophagoides farinae* (American house dust mite)  
 Der f 10.0101 Q23939 *Dermatophagoides farinae* (American house dust mite)  
 Der f 11.0101 Q967Z0 *Dermatophagoides farinae* (American house dust mite)  
 Der f 13.0101 Q1MZP5 *Dermatophagoides farinae* (American house dust mite)  
 Der f 14.0101 Q94507 *Dermatophagoides farinae* (American house dust mite)  
 Der f 15.0101 Q9U6R7 *Dermatophagoides farinae* (American house dust mite)  
 Der f 16.0101 Q8MVU3 *Dermatophagoides farinae* (American house dust mite)  
 Der f 18.0101 Q86R84 *Dermatophagoides farinae* (American house dust mite)  
 Der f 2.0101 Q00855 *Dermatophagoides farinae* (American house dust mite)  
 Der f 2.0102 Q00855 *Dermatophagoides farinae* (American house dust mite)  
 Der f 2.0103 Q00855 *Dermatophagoides farinae* (American house dust mite)  
 Der f 2.0104 Q8WQK5 *Dermatophagoides farinae* (American house dust mite)  
 Der f 2.0105 Q8WQK5 *Dermatophagoides farinae* (American house dust mite)  
 Der f 2.0109 Q3HWZ2 *Dermatophagoides farinae* (American house dust mite)  
 Der f 2.0110 Q3HWZ2 *Dermatophagoides farinae* (American house dust mite)  
 Der f 2.0111 Q3HWZ2 *Dermatophagoides farinae* (American house dust mite)  
 Der f 2.0112 Q3HWZ2 *Dermatophagoides farinae* (American house dust mite)  
 Der f 2.0113 Q3HWZ2 *Dermatophagoides farinae* (American house dust mite)  
 Der f 2.0114 Q3HWZ2 *Dermatophagoides farinae* (American house dust mite)  
 Der f 2.0115 Q3HWZ2 *Dermatophagoides farinae* (American house dust mite)  
 Der f 2.0116 Q3HWZ2 *Dermatophagoides farinae* (American house dust mite)  
 Der f 2.0117 Q3HWZ2 *Dermatophagoides farinae* (American house dust mite)  
 Der f 3.0101 P49275 *Dermatophagoides farinae* (American house dust mite)  
 Der f 6.0101 P49276 *Dermatophagoides farinae* (American house dust mite)  
 Der f 7.0101 Q26456 *Dermatophagoides farinae* (American house dust mite)  
 Der m 1.0101 P16312 *Dermatophagoides microceras* (House dust mite)  
 Der p 1.0101 P08176 *Dermatophagoides pteronyssinus* (European house dust mite)  
 Der p 1.0102 P08176 *Dermatophagoides pteronyssinus* (European house dust mite)  
 Der p 1.0103 P08176 *Dermatophagoides pteronyssinus* (European house dust mite)  
 Der p 1.0104 P08176 *Dermatophagoides pteronyssinus* (European house dust mite)  
 Der p 1.0105 P08176 *Dermatophagoides pteronyssinus* (European house dust mite)  
 Der p 1.0106 P08176 *Dermatophagoides pteronyssinus* (European house dust mite)  
 Der p 1.0107 P08176 *Dermatophagoides pteronyssinus* (European house dust mite)  
 Der p 1.0108 P08176 *Dermatophagoides pteronyssinus* (European house dust mite)  
 Der p 1.0109 P08176 *Dermatophagoides pteronyssinus* (European house dust mite)  
 Der p 1.0110 P08176 *Dermatophagoides pteronyssinus* (European house dust mite)  
 Der p 1.0111 P08176 *Dermatophagoides pteronyssinus* (European house dust mite)  
 Der p 1.0112 P08176 *Dermatophagoides pteronyssinus* (European house dust mite)

Der p 1.0113 Q3HWZ5 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 1.0114 Q3HWZ5 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 1.0115 Q3HWZ5 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 1.0116 Q3HWZ5 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 1.0117 Q3HWZ5 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 1.0118 Q3HWZ5 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 1.0119 Q3HWZ5 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 1.0120 Q3HWZ5 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 1.0121 Q3HWZ5 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 1.0122 Q3HWZ5 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 1.0123 Q3HWZ5 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 1.0124 C7T6L6 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 10.0101 018416 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 11.0101 Q6YZF9 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 14.0101 Q8NONO Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 2.0101 P49278 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 2.0102 P49278 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 2.0103 P49278 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 2.0104 P49278 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 2.0105 P49278 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 2.0106 P49278 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 2.0107 P49278 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 2.0108 P49278 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 2.0109 Q3HWZ3 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 2.0110 Q3HWZ3 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 2.0111 Q3HWZ3 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 2.0112 Q3HWZ3 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 2.0113 Q3HWZ3 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 2.0114 Q1H8P8 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 2.0115 C7T6L5 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 21.0101 Q2L7C5 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 3.0101 P39675 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 4.0101 Q9Y197 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 5.0101 P14004 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 5.0102 P14004 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 6.0101 P49277 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 7.0101 P49273 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 8.0101 P46419 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 9.0101 Q7Z163 Dermatophagoides pteronyssinus (European house dust mite)  
 Der p 9.0102 Q8MWR4 Dermatophagoides pteronyssinus (European house dust mite)  
 Dol a 5.0101 Q05108 Dolichovespula arenaria (Yellow hornet)  
 Dol m 1.0101 Q06478 Dolichovespula maculata (White face hornet)  
 Dol m 1.02 P53357 Dolichovespula maculata (White face hornet)  
 Dol m 2.0101 P49371 Dolichovespula maculata (White face hornet)  
 Dol m 5.0101 P10736 Dolichovespula maculata (White face hornet)  
 Dol m 5.02 P10737 Dolichovespula maculata (White face hornet)  
 Epi p 1.0101 P83340 Epicoccum purpurascens (Soil fungus)  
 Equ c 1.0101 Q95182 Equus caballus (domestic horse)  
 Equ c 2.0101 P81216 Equus caballus (domestic horse)  
 Equ c 2.0102 P81217 Equus caballus (domestic horse)  
 Equ c 3.0101 P35747 Equus caballus (domestic horse)  
 Equ c 4.0101 P82615 Equus caballus (domestic horse)  
 Eur m 1.0101 P25780 Euroglyphus maynei (House dust mite)  
 Eur m 1.0102 P25780 Euroglyphus maynei (House dust mite)  
 Eur m 14.0101 Q9U785 Euroglyphus maynei (House dust mite)  
 Eur m 2.0101 Q9TZ22 Euroglyphus maynei (House dust mite)  
 Eur m 2.0102 Q9TZ22 Euroglyphus maynei (House dust mite)  
 Eur m 3.0101 Q97370 Euroglyphus maynei (House dust mite)  
 Eur m 4.0101 Q9Y196 Euroglyphus maynei (House dust mite)  
 Fel d 1.0101 P30438 Felis domesticus (cat)  
 Fel d 2.0101 P49064 Felis domesticus (cat)  
 Fel d 3.0101 Q8WNR9 Felis domesticus (cat)  
 Fel d 4.0101 Q5VFH6 Felis domesticus (cat)  
 For t 1.0101 B2ZPG6 Forcipomyia taiwana (Biting midge)  
 For t 2.0101 B2ZPG7 Forcipomyia taiwana (Biting midge)  
 Fra a 1.0101 Q5ULZ4 Fragaria ananassa (Strawberry)  
 Fra a 3.0101 Q8VX12 Fragaria ananassa (Strawberry)  
 Fra e 1.0101 Q7XAV4 Fraxinus excelsior (Ash)  
 Fra e 1.0102 Q5EXJ6 Fraxinus excelsior (Ash)

Fra e 1.0201 Q6U740 Fraxinus excelsior (Ash)  
 Fus c 1.0101 Q8TFM9 Fusarium culmorum (N.A.)  
 Fus c 2.0101 Q8TFM8 Fusarium culmorum (N.A.)  
 Gad c 1.0101 P02622 Gadus callarias (Baltic cod)  
 Gal d 1.0101 P01005 Gallus domesticus (chicken)  
 Gal d 2.0101 P01012 Gallus domesticus (chicken)  
 Gal d 3.0101 P02789 Gallus domesticus (chicken)  
 Gal d 4.0101 P00698 Gallus domesticus (chicken)  
 Gal d 5.0101 P19121 Gallus domesticus (chicken)  
 Gal d 6.0101 P87498 Gallus domesticus (chicken)  
 Gly d 2.0101 Q9U5P7 Glycyphagus domesticus (Storage mite)  
 Gly d 2.0201 Q9NFK4 Glycyphagus domesticus (Storage mite)  
 Gly m 1.0101 Q9S8F3 Glycine max (Soybean)  
 Gly m 1.0102 Q9S8F2 Glycine max (Soybean)  
 Gly m 3.0101 065809 Glycine max (Soybean)  
 Gly m 3.0102 065810 Glycine max (Soybean)  
 Gly m 4.0101 P26987 Glycine max (Soybean)  
 Gly m 5.0101 022120 Glycine max (Soybean)  
 Gly m 5.0201 Q9FZP9 Glycine max (Soybean)  
 Gly m 5.0301 P25974 Glycine max (Soybean)  
 Gly m 5.0302 P25974 Glycine max (Soybean)  
 Gly m 6.0101 P04776 Glycine max (Soybean)  
 Gly m 6.0201 P04405 Glycine max (Soybean)  
 Gly m 6.0301 P11828 Glycine max (Soybean)  
 Gly m 6.0401 Q9SB11 Glycine max (Soybean)  
 Gly m 6.0501 Q7GC77 Glycine max (Soybean)  
 Hel a 2.0101 081982 Helianthus annuus (Sunflower)  
 Hel a 3.0101 Q7X9Q5 Helianthus annuus (Sunflower)  
 Hel as 1.0101 097192 Helix aspersa (Brown garden snail)  
 Hev b 1.0101 P15252 Hevea brasiliensis (Para rubber tree (latex))  
 Hev b 10.0101 P35017 Hevea brasiliensis (Para rubber tree (latex))  
 Hev b 10.0102 Q9STB5 Hevea brasiliensis (Para rubber tree (latex))  
 Hev b 10.0103 Q9FSJ2 Hevea brasiliensis (Para rubber tree (latex))  
 Hev b 11.0101 Q949H3 Hevea brasiliensis (Para rubber tree (latex))  
 Hev b 11.0102 Q8GUD7 Hevea brasiliensis (Para rubber tree (latex))  
 Hev b 12.0101 Q8RYA8 Hevea brasiliensis (Para rubber tree (latex))  
 Hev b 13.0101 Q7Y1X1 Hevea brasiliensis (Para rubber tree (latex))  
 Hev b 2.0101 P52407 Hevea brasiliensis (Para rubber tree (latex))  
 Hev b 3.0101 082803 Hevea brasiliensis (Para rubber tree (latex))  
 Hev b 4.0101 Q6T4P0 Hevea brasiliensis (Para rubber tree (latex))  
 Hev b 5.0101 Q39967 Hevea brasiliensis (Para rubber tree (latex))  
 Hev b 6.01 P02877 Hevea brasiliensis (Para rubber tree (latex))  
 Hev b 6.02 P02877 Hevea brasiliensis (Para rubber tree (latex))  
 Hev b 6.03 P02877 Hevea brasiliensis (Para rubber tree (latex))  
 Hev b 7.01 004008 Hevea brasiliensis (Para rubber tree (latex))  
 Hev b 7.02 065811 Hevea brasiliensis (Para rubber tree (latex))  
 Hev b 8.0101 065812 Hevea brasiliensis (Para rubber tree (latex))  
 Hev b 8.0102 Q9STB6 Hevea brasiliensis (Para rubber tree (latex))  
 Hev b 8.0201 Q9M7N0 Hevea brasiliensis (Para rubber tree (latex))  
 Hev b 8.0202 Q9M7M9 Hevea brasiliensis (Para rubber tree (latex))  
 Hev b 8.0203 Q9M7M8 Hevea brasiliensis (Para rubber tree (latex))  
 Hev b 8.0204 Q9LEI8 Hevea brasiliensis (Para rubber tree (latex))  
 Hev b 9.0101 Q9LEJ0 Hevea brasiliensis (Para rubber tree (latex))  
 Hol l 1.0101 P43216 Holcus lanatus (Velvet grass)  
 Hol l 1.0102 P43216 Holcus lanatus (Velvet grass)  
 Hol l 5.0101 023972 Holcus lanatus (Velvet grass)  
 Hol l 5.0201 023971 Holcus lanatus (Velvet grass)  
 Hom a 1.0101 044119 Homarus americanus (American lobster)  
 Hom a 1.0102 044119 Homarus americanus (American lobster)  
 Hom a 6.0101 P29291 Homarus americanus (American lobster)  
 Hom s 1.0101 043290 Homo sapiens (human autoallergens)  
 Hom s 2.0101 Q13765 Homo sapiens (human autoallergens)  
 Hom s 3.0101 Q13845 Homo sapiens (human autoallergens)  
 Hom s 4.0101 075785 Homo sapiens (human autoallergens)  
 Hom s 5.0101 P02538 Homo sapiens (human autoallergens)  
 Hor v 12.0101 P52184 Hordeum vulgare (Barley)  
 Hor v 15.0101 P16968 Hordeum vulgare (Barley)  
 Hor v 20.0101 P80198 Hordeum vulgare (Barley)  
 Hor v 5.0101 004828 Hordeum vulgare (Barley)

Hum j 1.0101 Q7XBE3 *Humulus japonicus* (Japanese hop)  
 Jug n 1.0101 Q7Y1C2 *Juglans nigra* (Black walnut)  
 Jug n 2.0101 Q7Y1C1 *Juglans nigra* (Black walnut)  
 Jug r 1.0101 P93198 *Juglans regia* (English walnut)  
 Jug r 2.0101 Q9SEW4 *Juglans regia* (English walnut)  
 Jug r 4.0101 Q2TPW5 *Juglans regia* (English walnut)  
 Jun a 1.010101 P81294 *Juniperus ashei* (Mountain cedar)  
 Jun a 1.010102 P81294 *Juniperus ashei* (Mountain cedar)  
 Jun a 2.0101 Q9FY19 *Juniperus ashei* (Mountain cedar)  
 Jun a 3.0101 P81295 *Juniperus ashei* (Mountain cedar)  
 Jun o 4.0101 O64943 *Juniperus oxycedrus* (Prickly juniper)  
 Jun v 1.0101 Q9LLT2 *Juniperus virginiana* (Eastern red cedar)  
 Jun v 1.0102 Q9LLT1 *Juniperus virginiana* (Eastern red cedar)  
 Jun v 3.010101 Q9LD79 *Juniperus virginiana* (Eastern red cedar)  
 Jun v 3.010102 Q9LD79 *Juniperus virginiana* (Eastern red cedar)  
 Len c 1.0101 Q84UI1 *Lens culinaris* (Lentil)  
 Len c 1.0102 Q84UI0 *Lens culinaris* (Lentil)  
 Lep d 10.0101 Q9NFZ4 *Lepidoglyphus destructor* (Storage mite)  
 Lep d 13.0101 Q9U5P1 *Lepidoglyphus destructor* (Storage mite)  
 Lep d 2.0101 P80384 *Lepidoglyphus destructor* (Storage mite)  
 Lep d 2.0102 P80384 *Lepidoglyphus destructor* (Storage mite)  
 Lep d 2.0201 P80384 *Lepidoglyphus destructor* (Storage mite)  
 Lep d 2.0202 P80384 *Lepidoglyphus destructor* (Storage mite)  
 Lep d 5.0101 Q9U5P2 *Lepidoglyphus destructor* (Storage mite)  
 Lep d 5.0102 Q1M2N1 *Lepidoglyphus destructor* (Storage mite)  
 Lep d 5.0103 Q1M2N0 *Lepidoglyphus destructor* (Storage mite)  
 Lep d 7.0101 Q9U1G2 *Lepidoglyphus destructor* (Storage mite)  
 Lep s 1.0101 Q8T380 *Lepisma saccharina* (Silverfish)  
 Lep w 1.0101 B5WX08 *Lepidorrhombus whiffiaegonis* (Megrim, Whiff, Gallo)  
 Lig v 1.0101 O82015 *Ligustrum vulgare* (Privet)  
 Lig v 1.0102 O82015 *Ligustrum vulgare* (Privet)  
 Lit c 1.0101 Q941H7 *Litchi chinensis* (Litchi)  
 Lit v 2.0101 Q004B5 *Litopenaeus vannamei* (White shrimp)  
 Lol p 1.0101 P14946 *Lolium perenne* (Rye grass)  
 Lol p 1.0102 P14946 *Lolium perenne* (Rye grass)  
 Lol p 1.0103 Q9SC98 *Lolium perenne* (Rye grass)  
 Lol p 11.0101 Q7M1X5 *Lolium perenne* (Rye grass)  
 Lol p 2.0101 P14947 *Lolium perenne* (Rye grass)  
 Lol p 3.0101 P14948 *Lolium perenne* (Rye grass)  
 Lol p 4.0101 Q5TIW3 *Lolium perenne* (Rye grass)  
 Lol p 5.0101 Q40237 *Lolium perenne* (Rye grass)  
 Lol p 5.0102 Q40240 *Lolium perenne* (Rye grass)  
 Lup an 1.0101 B8Q5G0 *Lupinus angustifolius* (Narrow-leaved blue lupin)  
 Lyc e 1.0101 Q93YG7 *Lycopersicon esculentum* (Tomato)  
 Lyc e 2.0101 Q547Q0 *Lycopersicon esculentum* (Tomato)  
 Lyc e 2.0201 Q8RVW4 *Lycopersicon esculentum* (Tomato)  
 Lyc e 3.0101 P93224 *Lycopersicon esculentum* (Tomato)  
 Mal d 1.0101 P43211 *Malus domestica* (Apple)  
 Mal d 1.0102 P43211 *Malus domestica* (Apple)  
 Mal d 1.0103 Q9SYV2 *Malus domestica* (Apple)  
 Mal d 1.0104 Q9SYV5 *Malus domestica* (Apple)  
 Mal d 1.0105 Q9SYV6 *Malus domestica* (Apple)  
 Mal d 1.0106 Q9SYV7 *Malus domestica* (Apple)  
 Mal d 1.0107 Q9SYV8 *Malus domestica* (Apple)  
 Mal d 1.0108 Q9SYW3 *Malus domestica* (Apple)  
 Mal d 1.0109 Q941P6 *Malus domestica* (Apple)  
 Mal d 1.0201 Q40280 *Malus domestica* (Apple)  
 Mal d 1.0202 Q9S7M5 *Malus domestica* (Apple)  
 Mal d 1.0203 Q9SYV3 *Malus domestica* (Apple)  
 Mal d 1.0204 Q9SYV4 *Malus domestica* (Apple)  
 Mal d 1.0205 Q9SYV9 *Malus domestica* (Apple)  
 Mal d 1.0206 Q40280 *Malus domestica* (Apple)  
 Mal d 1.0207 Q941P5 *Malus domestica* (Apple)  
 Mal d 1.0208 Q8L6K9 *Malus domestica* (Apple)  
 Mal d 1.0301 Q43549 *Malus domestica* (Apple)  
 Mal d 1.0302 Q941P8 *Malus domestica* (Apple)  
 Mal d 1.0303 Q941P7 *Malus domestica* (Apple)  
 Mal d 1.0304 Q84LA7 *Malus domestica* (Apple)  
 Mal d 1.0401 Q43550 *Malus domestica* (Apple)



Mal d 1.0402 Q43551 *Malus domestica* (Apple)  
 Mal d 1.0403 Q43552 *Malus domestica* (Apple)  
 Mal d 2.0101 Q9FSG7 *Malus domestica* (Apple)  
 Mal d 4.0101 Q9XF42 *Malus domestica* (Apple)  
 Mal d 4.0102 Q84RR5 *Malus domestica* (Apple)  
 Mal d 4.0201 Q9XF41 *Malus domestica* (Apple)  
 Mal d 4.0202 Q84RR6 *Malus domestica* (Apple)  
 Mal d 4.0301 Q9XF40 *Malus domestica* (Apple)  
 Mal d 4.0302 Q84RR7 *Malus domestica* (Apple)  
 Mala f 2.0101 P56577 *Malassezia furfur* (Pityriasis versicolor infect. agent)  
 Mala f 3.0101 P56578 *Malassezia furfur* (Pityriasis versicolor infect. agent)  
 Mala f 4.0101 Q9Y750 *Malassezia furfur* (Pityriasis versicolor infect. agent)  
 Mala s 1.0101 Q01940 *Malassezia sympodialis*  
 Mala s 10.0101 Q8TGH3 *Malassezia sympodialis*  
 Mala s 11.0101 Q873M4 *Malassezia sympodialis*  
 Mala s 12.0101 Q5GMY3 *Malassezia sympodialis*  
 Mala s 13.0101 Q1RQI9 *Malassezia sympodialis*  
 Mala s 5.0101 Q93969 *Malassezia sympodialis*  
 Mala s 6.0101 Q93970 *Malassezia sympodialis*  
 Mala s 7.0101 Q93971 *Malassezia sympodialis*  
 Mala s 8.0101 Q93972 *Malassezia sympodialis*  
 Mala s 9.0101 Q93973 *Malassezia sympodialis*  
 Met e 1.0101 Q25456 *Metapenaeus ensis* (Shrimp)  
 Mor n 3.0101 P85894 *Morus nigra* (Mulberry)  
 Mus a 1.0101 Q94JN3 *Musa acuminata* (Banana)  
 Mus a 2.0101 Q8VXF1 *Musa acuminata* (Banana)  
 Mus a 3.0101 P86333 *Musa acuminata* (Banana)  
 Mus m 1.0101 P02762 *Mus musculus* (mouse)  
 Mus m 1.0102 P11589 *Mus musculus* (mouse)  
 Myr p 1.0101 Q07932 *Myrmecia pilosula* (Australian jumper ant)  
 Myr p 2.0101 Q26464 *Myrmecia pilosula* (Australian jumper ant)  
 Myr p 2.0102 Q26464 *Myrmecia pilosula* (Australian jumper ant)  
 Myr p 3.0101 Q68Y22 *Myrmecia pilosula* (Australian jumper ant)  
 Ole e 1.0101 P19963 *Olea europea* (Olive)  
 Ole e 1.0105 P19963 *Olea europea* (Olive)  
 Ole e 1.0106 P19963 *Olea europea* (Olive)  
 Ole e 1.0107 P19963 *Olea europea* (Olive)  
 Ole e 10.0101 Q84V39 *Olea europea* (Olive)  
 Ole e 2.0101 Q24169 *Olea europea* (Olive)  
 Ole e 3.0101 Q81092 *Olea europea* (Olive)  
 Ole e 4.0101 P80741 *Olea europea* (Olive)  
 Ole e 5.0101 P80740 *Olea europea* (Olive)  
 Ole e 6.0101 Q24172 *Olea europea* (Olive)  
 Ole e 7.0101 P81430 *Olea europea* (Olive)  
 Ole e 8.0101 Q9M7R0 *Olea europea* (Olive)  
 Ole e 9.0101 Q94G86 *Olea europea* (Olive)  
 Ory s 1.0101 Q40638 *Oryza sativa* (Rice)  
 Ory s 12.0101 Q9FUD1 *Oryza sativa* (Rice)  
 Pan s 1.0101 Q61379 *Panulirus stimpsoni* (Spiny lobster)  
 Par j 1.0101 P43217 *Parietaria judaica* (Pellitory-of-the-Wall)  
 Par j 1.0102 Q04404 *Parietaria judaica* (Pellitory-of-the-Wall)  
 Par j 1.0103 Q1JTN5 *Parietaria judaica* (Pellitory-of-the-Wall)  
 Par j 1.0201 Q40905 *Parietaria judaica* (Pellitory-of-the-Wall)  
 Par j 2.0101 P55958 *Parietaria judaica* (Pellitory-of-the-Wall)  
 Par j 2.0102 Q04403 *Parietaria judaica* (Pellitory-of-the-Wall)  
 Par j 3.0101 Q9XG85 *Parietaria judaica* (Pellitory-of-the-Wall)  
 Par j 3.0102 Q9TOM8 *Parietaria judaica* (Pellitory-of-the-Wall)  
 Par j 4.0101 B5QST3 *Parietaria judaica* (Pellitory-of-the-Wall)  
 Pen b 26.0101 Q49KL9 *Penicillium brevicompactum*  
 Pen c 13.0101 Q9URH1 *Penicillium citrinum*  
 Pen c 19.0101 Q92260 *Penicillium citrinum*  
 Pen c 22.0101 Q96X46 *Penicillium citrinum*  
 Pen c 24.0101 Q69BZ7 *Penicillium citrinum*  
 Pen c 3.0101 Q9Y8B8 *Penicillium citrinum*  
 Pen c 30.0101 Q2V6Q5 *Penicillium citrinum*  
 Pen ch 13.0101 Q9URR2 *Penicillium chrysogenum*  
 Pen ch 18.0101 Q9P8G3 *Penicillium chrysogenum*  
 Pen ch 20.0101 Q02352 *Penicillium chrysogenum*  
 Pen ch 31.0101 Q2TL59 *Penicillium chrysogenum*

Pen m 1.0101 A1KYZ2 *Penaeus monodon* (Black tiger shrimp)  
 Pen m 2.0101 Q8I9P7 *Penaeus monodon* (Black tiger shrimp)  
 Pen o 18.0101 Q9HF12 *Penicillium oxalicum*  
 Per a 1.0101 Q9TZR6 *Periplaneta americana* (American cockroach)  
 Per a 1.0102 018535 *Periplaneta americana* (American cockroach)  
 Per a 1.0103 018530 *Periplaneta americana* (American cockroach)  
 Per a 1.0104 018528 *Periplaneta americana* (American cockroach)  
 Per a 1.0201 018527 *Periplaneta americana* (American cockroach)  
 Per a 3.0101 Q25641 *Periplaneta americana* (American cockroach)  
 Per a 3.0201 Q94643 *Periplaneta americana* (American cockroach)  
 Per a 3.0202 Q25640 *Periplaneta americana* (American cockroach)  
 Per a 3.0203 Q25639 *Periplaneta americana* (American cockroach)  
 Per a 6.0101 Q1M0Y3 *Periplaneta americana* (American cockroach)  
 Per a 7.0101 Q9UB83 *Periplaneta americana* (American cockroach)  
 Per a 7.0102 Q9UB83 *Periplaneta americana* (American cockroach)  
 Pers a 1.0101 P93680 *Persea americana* (Avocado)  
 Pha a 1.0101 Q41260 *Phalaris aquatica* (Canary grass)  
 Pha a 5.0101 P56164 *Phalaris aquatica* (Canary grass)  
 Phl p 1.0101 Q40967 *Phleum pratense* (Timothy)  
 Phl p 1.0102 P43213 *Phleum pratense* (Timothy)  
 Phl p 11.0101 Q8H6L7 *Phleum pratense* (Timothy)  
 Phl p 12.0101 P35079 *Phleum pratense* (Timothy)  
 Phl p 12.0102 024650 *Phleum pratense* (Timothy)  
 Phl p 12.0103 024282 *Phleum pratense* (Timothy)  
 Phl p 13.0101 Q9XG86 *Phleum pratense* (Timothy)  
 Phl p 2.0101 P43214 *Phleum pratense* (Timothy)  
 Phl p 4.0101 Q5ZQK5 *Phleum pratense* (Timothy)  
 Phl p 4.0201 Q5ZQK4 *Phleum pratense* (Timothy)  
 Phl p 5.0101 Q40960 *Phleum pratense* (Timothy)  
 Phl p 5.0102 Q40962 *Phleum pratense* (Timothy)  
 Phl p 5.0103 081341 *Phleum pratense* (Timothy)  
 Phl p 5.0104 P93467 *Phleum pratense* (Timothy)  
 Phl p 5.0105 065318 *Phleum pratense* (Timothy)  
 Phl p 5.0106 065319 *Phleum pratense* (Timothy)  
 Phl p 5.0107 065320 *Phleum pratense* (Timothy)  
 Phl p 5.0108 065321 *Phleum pratense* (Timothy)  
 Phl p 5.0109 Q84UI2 *Phleum pratense* (Timothy)  
 Phl p 5.0201 Q40963 *Phleum pratense* (Timothy)  
 Phl p 5.0202 P93466 *Phleum pratense* (Timothy)  
 Phl p 5.0203 081342 *Phleum pratense* (Timothy)  
 Phl p 5.0206 081343 *Phleum pratense* (Timothy)  
 <tr id='817'><td nowrap>Phl p 5.0207</td><td><a href='http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?CMD=search&DB=nucleotide&term=AF069474' t  
 Phl p 6.0101 P43215 *Phleum pratense* (Timothy)  
 Phl p 6.0102 065868 *Phleum pratense* (Timothy)  
 Phl p 7.0101 082040 *Phleum pratense* (Timothy)  
 Pho d 2.0101 Q8L5D8 *Phoenix dactylifera* (Date palm)  
 Pis s 1.0101 Q702P1 *Pisum sativum* (Pea)  
 Pis s 1.0102 Q702P0 *Pisum sativum* (Pea)  
 Pis v 1.0101 B7P072 *Pistacia vera* (Pistachio)  
 Pis v 2.0101 B7P073 *Pistacia vera* (Pistachio)  
 Pis v 2.0201 B7P074 *Pistacia vera* (Pistachio)  
 Pis v 3.0101 B4X640 *Pistacia vera* (Pistachio)  
 Pis v 5.0101 B7SLJ1 *Pistacia vera* (Pistachio)  
 Pla a 1.0101 Q8GT41 *Platanus acerifolia* (London plane tree)  
 Pla a 2.0101 Q6H9K0 *Platanus acerifolia* (London plane tree)  
 Pla l 1.0101 P82242 *Plantago lanceolata* (English plantain)  
 Pla l 1.0102 P82242 *Plantago lanceolata* (English plantain)  
 Pla l 1.0103 P82242 *Plantago lanceolata* (English plantain)  
 Pla or 1.0101 A9YUH4 *Platanus orientalis* (Oriental plane)  
 Pla or 2.0101 A9YUH5 *Platanus orientalis* (Oriental plane)  
 Pla or 3.0101 A9YUH6 *Platanus orientalis* (Oriental plane)  
 Plo i 1.0101 Q95PM9 *Plodia interpunctella* (Indianmeal moth)  
 Poa p 1.0101 Q9ZP03 *Poa pratensis* (Kentucky blue grass)  
 Poa p 5.0101 Q9FPRO *Poa pratensis* (Kentucky blue grass)  
 Pol a 1.0101 Q9U6W0 *Polistes annularis* (Wasp)  
 Pol a 2.0101 Q9U6V9 *Polistes annularis* (Wasp)  
 Pol a 5.0101 Q05109 *Polistes annularis* (Wasp)  
 Pol d 1.0101 Q6Q252 *Polistes dominulus* (Mediterranean paper wasp)  
 Pol d 1.0102 Q6Q251 *Polistes dominulus* (Mediterranean paper wasp)

Pol d 1.0103 Q6Q250 *Polistes dominulus* (Mediterranean paper wasp)  
 Pol d 1.0104 Q6Q249 *Polistes dominulus* (Mediterranean paper wasp)  
 Pol d 4.0101 Q7Z269 *Polistes dominulus* (Mediterranean paper wasp)  
 Pol d 5.0101 Q68KJ8 *Polistes dominulus* (Mediterranean paper wasp)  
 Pol e 5.0101 Q68KJ9 *Polistes exclamans* (Wasp)  
 Pol f 5.0101 P35780 *Polistes fuscatus* (Wasp)  
 Pol g 1.0101 P83542 *Polistes gallicus* (Wasp)  
 Pol g 5.0101 P83377 *Polistes gallicus* (Wasp)  
 Pon l 4.0101 P05946 *Pontastacus leptodactylus* (Narrow-clawed crayfish)  
 Pru ar 1.0101 050001 *Prunus armeniaca* (Apricot)  
 Pru ar 3.0101 P81651 *Prunus armeniaca* (Apricot)  
 Pru av 1.0101 024248 *Prunus avium* (Sweet cherry)  
 Pru av 1.0201 Q6QHU3 *Prunus avium* (Sweet cherry)  
 Pru av 1.0202 Q6QHU2 *Prunus avium* (Sweet cherry)  
 Pru av 1.0203 Q6QHU1 *Prunus avium* (Sweet cherry)  
 Pru av 2.0101 P50694 *Prunus avium* (Sweet cherry)  
 Pru av 3.0101 Q9M5X8 *Prunus avium* (Sweet cherry)  
 Pru av 4.0101 Q9XF39 *Prunus avium* (Sweet cherry)  
 Pru d 3.0101 P82534 *Prunus domestica* (European plum)  
 Pru du 3.0101 C0LOI5 *Prunus dulcis* (Almond)  
 Pru du 4.0101 Q8GSL5 *Prunus dulcis* (Almond)  
 Pru du 4.0102 Q8GSL5 *Prunus dulcis* (Almond)  
 Pru du 5.0101 Q8H2B9 *Prunus dulcis* (Almond)  
 Pru p 1.0101 Q2I6V8 *Prunus persica* (Peach)  
 Pru p 3.0101 P81402 *Prunus persica* (Peach)  
 Pru p 4.0101 Q8GT40 *Prunus persica* (Peach)  
 Pru p 4.0201 Q8GT39 *Prunus persica* (Peach)  
 Pyr c 1.0101 065200 *Pyrus communis* (Pear)  
 Pyr c 3.0101 Q9M5X6 *Pyrus communis* (Pear)  
 Pyr c 4.0101 Q9XF38 *Pyrus communis* (Pear)  
 Pyr c 5.0101 081355 *Pyrus communis* (Pear)  
 Que a 1.0201 B6RQS1 *Quercus alba* (White oak)  
 Que a 1.0301 B6RQS2 *Quercus alba* (White oak)  
 Que a 1.0401 B6RQS3 *Quercus alba* (White oak)  
 Ran e 1.0101 Q8JIU2 *Rana esculenta* (edible frog)  
 Ran e 2.0101 Q8JIU1 *Rana esculenta* (edible frog)  
 Rat n 1.0101 P02761 *Rattus norvegicus* (Rat)  
 Rho m 1.0101 Q870B9 *Rhodotorula mucilaginosa* (Yeast)  
 Rho m 2.0101 Q32ZM1 *Rhodotorula mucilaginosa* (Yeast)  
 Ric c 1.0101 P01089 *Ricinus communis* (Castor bean)  
 Rub i 1.0101 Q0Z8U9 *Rubus idaeus* (Red raspberry)  
 Rub i 3.0101 Q0Z8V0 *Rubus idaeus* (Red raspberry)  
 Sal k 1.0101 P83181 *Salsola kali* (Russian thistle)  
 Sal k 1.0301 Q17ST3 *Salsola kali* (Russian thistle)  
 Sal k 1.0302 Q17ST4 *Salsola kali* (Russian thistle)  
 Sal k 2.0101 Q8L5K9 *Salsola kali* (Russian thistle)  
 Sal k 3.0101 C1KEU0 *Salsola kali* (Russian thistle)  
 Sal k 4.0101 C6JWH0 *Salsola kali* (Russian thistle)  
 Sal s 1.0101 Q91482 *Salmo salar* (Atlantic salmon)  
 Sar sa 1.0101 B3WFF7 *Sardinops sagax* (Pacific pilchard)  
 Seb m 1.0101 C6GKU4 *Sebastes marinus* (Ocean perch, redfish, snapper)  
 Seb m 1.0201 C6GKU5 *Sebastes marinus* (Ocean perch, redfish, snapper)  
 Sec c 38.0101 Q9S8H2 *Secale cereale* (Rye)  
 Sec c 20.0101 Q9S8B0 *Secale cereale* (Rye)  
 Sec c 20.0201 Q9S8A7 *Secale cereale* (Rye)  
 Ses i 1.0101 Q9AUD1 *Sesamum indicum* (Sesame)  
 Ses i 2.0101 Q9XHP1 *Sesamum indicum* (Sesame)  
 Ses i 3.0101 Q9AUD0 *Sesamum indicum* (Sesame)  
 Ses i 4.0101 Q9FUJ9 *Sesamum indicum* (Sesame)  
 Ses i 5.0101 Q9XHP2 *Sesamum indicum* (Sesame)  
 Ses i 6.0101 Q9XHP0 *Sesamum indicum* (Sesame)  
 Ses i 7.0101 Q9AUD2 *Sesamum indicum* (Sesame)  
 Sin a 1.0101 P15322 *Sinapis alba* (Yellow mustard)  
 Sin a 2.0101 Q2TLW0 *Sinapis alba* (Yellow mustard)  
 Sol g 4.0101 Q9NH75 *Solenopsis geminata* (Tropical fire ant)  
 Sol g 4.0201 Q9NH75 *Solenopsis geminata* (Tropical fire ant)  
 Sol i 1.0101 Q68KK0 *Solenopsis invicta* (Red imported fire ant)  
 Sol i 2.0101 P35775 *Solenopsis invicta* (Red imported fire ant)  
 Sol i 3.0101 P35778 *Solenopsis invicta* (Red imported fire ant)

Sol i 4.0101 P35777 *Solenopsis invicta* (Red imported fire ant)  
 Sol r 2.0101 P35776 *Solenopsis richteri* (Black fire ant)  
 Sol r 3.0101 P35779 *Solenopsis richteri* (Black fire ant)  
 Sola t 1.0101 P15476 *Solanum tuberosum* (Potato)  
 Sola t 2.0101 P16348 *Solanum tuberosum* (Potato)  
 Sola t 3.0101 024383 *Solanum tuberosum* (Potato)  
 Sola t 3.0102 P20347 *Solanum tuberosum* (Potato)  
 Sola t 4.0101 P30941 *Solanum tuberosum* (Potato)  
 Syr v 3.0101 P58171 *Syringa vulgaris* (Lilac)  
 Tha p 1.0101 Q7M4K8 *Thaumetopoea pityocampa* (Pine processionary moth)  
 Thu a 1.0101 C6GKU3 *Thunnus albacares* (Yellowfin tuna)  
 Tri a 12.0101 P49232 *Triticum aestivum* (Wheat)  
 Tri a 12.0102 P49233 *Triticum aestivum* (Wheat)  
 Tri a 12.0103 P49234 *Triticum aestivum* (Wheat)  
 Tri a 14.0201 D2T2K2 *Triticum aestivum* (Wheat)  
 Tri a 18.0101 P10968 *Triticum aestivum* (Wheat)  
 Tri a 19.0101 P08453 *Triticum aestivum* (Wheat)  
 Tri a 25.0101 Q9LX4 *Triticum aestivum* (Wheat)  
 Tri a 26.0101 P10388 *Triticum aestivum* (Wheat)  
 Tri a 27.0101 Q7Y1Z2 *Triticum aestivum* (Wheat)  
 Tri a 28.0101 Q4W0V7 *Triticum aestivum* (Wheat)  
 Tri a 29.0101 C7C4X0 *Triticum aestivum* (Wheat)  
 Tri a 29.0201 D2TGC2 *Triticum aestivum* (Wheat)  
 Tri a 30.0101 P17314 *Triticum aestivum* (Wheat)  
 Tri r 2.0101 Q9UW97 *Trichophyton rubrum*  
 Tri r 4.0101 Q9UW98 *Trichophyton rubrum*  
 Tri t 4.0101 P80514 *Trichophyton tonsurans*  
 Tria p 1.0101 Q9U6R6 *Triatoma protracta* (California kissing bug)  
 Tyr p 13.0101 Q66RP5 *Tyrophagus putrescentiae* (Storage mite)  
 Tyr p 2.0101 002380 *Tyrophagus putrescentiae* (Storage mite)  
 Ves f 5.0101 P35783 *Vespula flavopilosa* (Yellow jacket)  
 Ves g 5.0101 P35784 *Vespula germanica* (Yellow jacket)  
 Ves m 1.0101 P51528 *Vespula maculifrons* (Yellow jacket)  
 Ves m 5.0101 P35760 *Vespula maculifrons* (Yellow jacket)  
 Ves p 5.0101 P35785 *Vespula pensylvanica* (Yellow jacket)  
 Ves s 5.0101 P35786 *Vespula squamosa* (Yellow jacket)  
 Ves v 1.0101 P49369 *Vespula vulgaris* (Yellow jacket)  
 Ves v 2.0101 P49370 *Vespula vulgaris* (Yellow jacket)  
 Ves v 2.0201 Q5D7H4 *Vespula vulgaris* (Yellow jacket)  
 Ves v 3.0101 B1A4F7 *Vespula vulgaris* (Yellow jacket)  
 Ves v 5.0101 Q05110 *Vespula vulgaris* (Yellow jacket)  
 Ves vi 5.0101 P35787 *Vespula vidua* (Wasp)  
 Vesp c 5.0101 P35781 *Vespa crabro* (European hornet)  
 Vesp c 5.0102 P35782 *Vespa crabro* (European hornet)  
 Vesp m 5.0101 P81657 *Vespa mandarinia* (Giant asian hornet)  
 Vig r 1.0101 Q2VU97 *Vigna radiata* (Mung bean)  
 Vit v 1.0101 P80274 *Vitis vinifera* (Grape)  
 Zea m 1.0101 Q07154 *Zea mays* (Maize)  
 Zea m 12.0101 P35081 *Zea mays* (Maize)  
 Zea m 12.0102 P35082 *Zea mays* (Maize)  
 Zea m 12.0103 P35083 *Zea mays* (Maize)  
 Zea m 12.0104 022655 *Zea mays* (Maize)  
 Zea m 12.0105 Q9FR39 *Zea mays* (Maize)  
 Zea m 14.0101 P19656 *Zea mays* (Maize)  
 Zea m 14.0102 P19656 *Zea mays* (Maize)  
 Zea m 25.0101 Q4W1F7 *Zea mays* (Maize)  
 Ziz m 1.0101 Q2VST0 *Ziziphus mauritiana* (Chinese-date)  
 Cur l 4.0101 B3VOK8 *Curvularia lunata* (Synonym: *Cochliobolus lunatus*)  
 Pru du 6.0101 E3SH28 *Prunus dulcis* (Almond)  
 Pru du 6.0201 E3SH29 *Prunus dulcis* (Almond)  
 Pru p 2.0101 B6CQT7 *Prunus persica* (Peach)  
 Pru p 2.0201 B6CQT5 *Prunus persica* (Peach)  
 Pru p 2.0301 B6CQT3 *Prunus persica* (Peach)  
 Cas s 9.0101 Q9ZS24 *Castanea sativa* (Chestnut)  
 Tha p 2.0101 P86360 *Thaumetopoea pityocampa* (Pine processionary moth)  
 Glo m 5.0101 Q9NBA6 *Glossina morsitans* (Savannah Tsetse Fly)  
 Bomb m 1.0101 Q2F5T5 *Bombyx mori* (Silk moth)  
 Fag e 2.0101 Q2PS07 *Fagopyrum esculentum* (Common buckwheat)  
 Len c 3.0101 A0AT29 *Lens culinaris* (Lentil)

Ole e 11.0101 ACZ57582 *Olea europea* (Olive)  
 Hev b 14.0101 E7BQV3 *Hevea brasiliensis* (Para rubber tree (latex))  
 Pen m 3.0101 E1A683 *Penaeus monodon* (Black tiger shrimp)  
 Lyc e 4.0101 049881 *Lycopersicon esculentum* (Tomato)  
 Fag s 1.0101 B7TWE6 *Fagus sylvatica* (European beech)  
 Lip b 1.0101 P86712 *Liposcelis bostrichophila* (Booklouse)  
 Gad m 1.0101 Q90YL0 *Gadus morhua* (Atlantic cod)  
 Gad m 1.0102 A5I873 *Gadus morhua* (Atlantic cod)  
 Gad m 1.0201 Q90YK9 *Gadus morhua* (Atlantic cod)  
 Gad m 1.0202 A5I874 *Gadus morhua* (Atlantic cod)  
 Can f 6.0101 H2B3G5 *Canis familiaris* (dog)  
 Plo i 2.0101 E1XUQ3 *Plodia interpunctella* (Indianmeal moth)  
 Tyr p 3.0101 C6ZDB5 *Tyrophagus putrescentiae* (Storage mite)  
 Pan b 1.0101 E5BBS3 *Pandalus borealis* (Northern shrimp)  
 Tri a 15.0101 D2TGC3 *Triticum aestivum* (Wheat)  
 Tri a 21.0101 D2T2K3 *Triticum aestivum* (Wheat)  
 Tri a 31.0101 Q9FS79 *Triticum aestivum* (Wheat)  
 Tri a 32.0101 Q6W8Q2 *Triticum aestivum* (Wheat)  
 Tri a 33.0101 Q9ST57 *Triticum aestivum* (Wheat)  
 Tri a 34.0101 C7C4X1 *Triticum aestivum* (Wheat)  
 Tri a 35.0101 D2TE72 *Triticum aestivum* (Wheat)  
 Asp v 13.0101 ADE74975 *Aspergillus versicolor*  
 Sta c 3.0101 C7E9W0 *Stachybotrys chartarum*  
 Cof a 1.0101 D7REL9 *Coffea arabica* (Arabian coffee)  
 Fag t 2.0101 E9NX73 *Fagopyrum tataricum* (Tartarian buckwheat)  
 Api g 6.0101 P86809 *Apium graveolens* (Celery)  
 Onc m 1.0101 P86431 *Oncorhynchus mykiss* (Rainbow trout)  
 Onc m 1.0201 P86432 *Oncorhynchus mykiss* (Rainbow trout)  
 Api m 11.0101 B3GM11 *Apis mellifera* (Honey bee)  
 Api m 11.0201 Q4ZJX1 *Apis mellifera* (Honey bee)  
 Sal s 2.0101 B5DGQ7 *Salmo salar* (Atlantic salmon)  
 Tri a 37.0101 Q9TOP1 *Triticum aestivum* (Wheat)  
 Api m 12.0101 Q868N5 *Apis mellifera* (Honey bee)  
 Ves v 6.0101 G8IIT0 *Vespula vulgaris* (Yellow jacket)  
 Dau c 5.0101 H2DF86 *Daucus carota* (Carrot)  
 Fag e 3.0101 A5HIX6 *Fagopyrum esculentum* (Common buckwheat)  
 Vig r 2.0101 Q198W3 *Vigna radiata* (Mung bean)  
 Vig r 2.0201 B1NPN8 *Vigna radiata* (Mung bean)  
 Vig r 4.0101 Q43680 *Vigna radiata* (Mung bean)  
 Vig r 6.0101 Q9ZWP8 *Vigna radiata* (Mung bean)  
 Bra r 5.0101 P69197 *Brassica rapa* (Turnip)  
 Sch c 1.0101 D8Q9M3 *Schizophyllum commune*  
 Gad m 2.0101 B3AOL6 *Gadus morhua* (Atlantic cod)  
 Gad m 3.0101 P86980 *Gadus morhua* (Atlantic cod)  
 Sal s 3.0101 B5DGM7 *Salmo salar* (Atlantic salmon)  
 Thu a 2.0101 P86978 *Thunnus albacares* (Yellowfin tuna)  
 Thu a 3.0101 P86979 *Thunnus albacares* (Yellowfin tuna)  
 Bos d 9.0101 P02662 *Bos domesticus* (domestic cattle)  
 Bos d 10.0101 P02663 *Bos domesticus* (domestic cattle)  
 Bos d 11.0101 P02666 *Bos domesticus* (domestic cattle)  
 Bos d 12.0101 P02668 *Bos domesticus* (domestic cattle)  
 Pru p 7.0101 P86888 *Prunus persica* (Peach)  
 Bla g 3.0101 D0VNY7 *Blattella germanica* (German cockroach)  
 Gly m 7.0101 C6K8D1 *Glycine max* (Soybean)  
 Onc k 5.0101 D5MU14 *Oncorhynchus* (Chum salmon)  
 Cav p 4.0101 Q6WDN9 *Cavia porcellus* (guinea pig)  
 Ory c 3. Q9GK63 *Oryctolagus cuniculus* (rabbit)  
 Ory c 3. Q9GK67 *Oryctolagus cuniculus* (rabbit)  
 Tri a 39.0101 J7QW61 *Triticum aestivum* (Wheat)  
 Der p 15.0101 Q4JK69 *Dermatophagoides pteronyssinus* (European house dust mite)  
 Der p 15.0102 Q4JK70 *Dermatophagoides pteronyssinus* (European house dust mite)  
 Der p 18.0101 Q4JK71 *Dermatophagoides pteronyssinus* (European house dust mite)

## E.1 Omitted allergens from allergen.org

A few of the entries were omitted, due to wrong accession codes, unpublished sequences or other errors:

```
Pen c 13.0101 Q9URH1 Penicillium citrinum
Ole e 11.0101 ACZ57582 Olea europea (Olive)
Asp v 13.0101 ADE74975 Aspergillus versicolor
Api g 6.0101 P86809 Apium graveolens (Celery)
Gad m 2.0101 B3A0L6 Gadus morhua (Atlantic cod)
Gad m 3.0101 P86980 Gadus morhua (Atlantic cod)
Thu a 2.0101 P86978 Thunnus albacares (Yellowfin tuna)
Thu a 3.0101 P86979 Thunnus albacares (Yellowfin tuna)
```

## F Results from the EFSA scientific opinion recommended allergen analysis of Asparaginase from MOL2940 using allergenonline database

### F.1 35% or larger identity over any 80 amino acid window

(No hits found)

(blank=No matches found) Count of significant hits described in text based on identity > 35%.

### F.2 35% or larger identity over any 80 amino acid window (with scaling)

(No hits found)

(blank=No matches found) Count of significant hits described in text based on identity > 35%.

### F.3 Identities calculated from Needleman-Wuncsh alignment

Matches  $\geq$  10% are shown

|  |        |         |
|--|--------|---------|
| gi_3243234_gb_AAC24001.1__isoflavone_reductase_related_protein_[Pyrus_communis]  | 76/370 | = 20.5% |
| gi_66840994_emb_CAI64396.1__serine_carboxypeptidase_II_[Triticum_aestivum]       | 71/363 | = 19.6% |
| gi_84029333_sp_Q948T6.2_LGUL_ORYSJ_RecName__Full=Lactoylglutathione_lyase__AltNa | 73/393 | = 18.6% |
| gi_16580747_dbj_BAB71741.1__glyoxalase_I_[Oryza_sativa_Japonica_Group]           | 73/393 | = 18.6% |
| gi_1582250_prf__2118271A_allergen_PhI_p_I  | 69/374 | = 18.4% |
| gi_41581137_emb_CAE85467.1__putative_latex_allergen_hev_b_7_02_[Hevea_brasiliens | 76/417 | = 18.2% |
| gi_3288200_emb_CAA11042.1__latex_allergen_[Hevea_brasiliensis]                   | 76/418 | = 18.2% |
| gi_6707018_gb_AAF25553.1_AF113546_1_latex_protein_allergen_Hev_b_7_[Hevea_brasil | 75/418 | = 17.9% |
| gi_3901094_emb_CAA81613.1__pollen_allergen_PhI_pI_[Phleum_pratense]              | 67/374 | = 17.9% |
| gi_3087805_emb_CAA11041.1__latex_allergen_[Hevea_brasiliensis]                   | 75/418 | = 17.9% |
| gi_1916805_gb_AAC27724.1__latex_patatin_homolog_[Hevea_brasiliensis]             | 75/418 | = 17.9% |
| gi_12005501_gb_AAG44480.1_AF245168_1_vacuolar_serine_protease_[Penicillium_citri | 76/425 | = 17.9% |
| gi_219806600_dbj_BAH10155.1__tropomyosin_[Tresus_keenae]                         | 69/388 | = 17.8% |
| gi_83300389_sp_042799.2_ALL7_ASPFU_RecName__Full=Allergen_Asp_f_7__AltName__Alle | 64/365 | = 17.5% |
| gi_118216_sp_P18153.1_D7_AEDAE_D7_protein_precursor_(Allergen_Aed_a_2)           | 71/406 | = 17.5% |
| gi_83715934_dbj_BAE54432.1__tropomyosin_[Ommastrephes_bartramii]                 | 65/373 | = 17.4% |
| gi_218203828_gb_ACK76297.1__Der_f_6_allergen_[Dermatophagoides_farinae]          | 66/384 | = 17.2% |
| gi_83715928_dbj_BAE54429.1__tropomyosin_[Sepia_esculenta]                        | 64/375 | = 17.1% |
| gi_323575365_dbj_BAJ78222.1__Ani_s_11-like_protein_2_precursor_[Anisakis_simplex | 66/387 | = 17.1% |
| gi_21514_emb_CAA27588.1__patatin_[Solanum_tuberosum]                             | 76/445 | = 17.1% |
| gi_136457_sp_P06886.1_TSST_STAAU_RecName__Full=Toxic_shock_syndrome_toxin-1__Sho | 60/351 | = 17.1% |

|   |        |         |
|---|--------|---------|
| gi_21725616_emb_CAD38389.1__unnamed_protein_product_[Phleum_pratense]             | 63/370 | = 17.0% |
| gi_18772_emb_CAA45778.1__trypsin_inhibitor_subtype_B_[Glycine_max]                | 61/359 | = 17.0% |
| gi_14423687_sp_Q9LEI9.1_ENO2_HEVBR_RecName__Full=Enolase_2__AltName__Full=2-phos  | 85/507 | = 16.8% |
| gi_2266623_emb_CAB10766.1__group_V_grass_pollen_allergen_[Holcus_lanatus]         | 59/354 | = 16.7% |
| gi_45823012_emb_CAG24374.1__unnamed_protein_product_[Phleum_pratense]             | 61/371 | = 16.4% |
| gi_2498576_sp_Q41260.1_MPAP1_PHAHQ_RecName__Full=Major_pollen_allergen_Pha_a_1__  | 63/385 | = 16.4% |
| gi_219806602_dbj_BAH10156.1__tropomyosin_[Solen_strictus]                         | 63/383 | = 16.4% |
| gi_219806598_dbj_BAH10154.1__tropomyosin_[Pseudocardium_sachalinensis]            | 63/385 | = 16.4% |
| gi_145105726_gb_ABP35603.1__Bla_g_2_allergen_variant_[Blattella_germanica]        | 70/428 | = 16.4% |
| gi_169500_gb_AAA33819.1__patatin_[Solanum_tuberosum]                              | 73/447 | = 16.3% |
| gi_85701160_sp_Q00002.2_PDI_ALTAL_RecName__Full=Protein_disulfide-isomerase__Sho  | 79/489 | = 16.2% |
| gi_1703445_sp_P54958.1_ASP2_BLAG_RecName__Full=Aspartic_protease_Bla_g_2__AltNa   | 69/426 | = 16.2% |
| gi_109913547_sp_Q40638.2_EXPB1_ORYSJ_RecName__Full=Expansin-B1__AltName__Full=Be  | 60/373 | = 16.1% |
| gi_1225905_dbj_BAA05540.1__prepro_AprM_[Bacillus_sp.]                             | 67/418 | = 16.0% |
| gi_74611808_sp_Q6R4B4.1_GST_ALTAL_RecName__Full=Glutathione-S-transferase__AltNa  | 57/359 | = 15.9% |
| gi_10764491_gb_AAG22740.1_AF282850_1_allergenic_isoflavone_reductase-like_protei  | 63/395 | = 15.9% |
| gi_61225281_gb_AAX40948.1__allergen_Ziz_m_1_[Ziziphus_mauritiana]                 | 69/437 | = 15.8% |
| gi_37078092_sp_Q870B9.1_ENO_RHOMI_RecName__Full=Enolase__AltName__Full=2-phospho  | 77/486 | = 15.8% |
| gi_315113421_pdb_3LIZ_A.Chain_A,_Crystal_Structure_Of_Bla_G_2_Complexed_With_Fab  | 67/425 | = 15.8% |
| gi_21512_emb_CAA27571.1__patatin_[Solanum_tuberosum]                              | 72/459 | = 15.7% |
| gi_62738637_pdb_1YG9_A.Chain_A,_The_Structure_Of_Mutant_(N93q)_Of_Bla_G_2         | 65/423 | = 15.4% |
| gi_219806596_dbj_BAH10153.1__tropomyosin_[Fulvia_mutica]                          | 59/382 | = 15.4% |
| gi_14423688_sp_Q9LEJ0.1_ENO1_HEVBR_RecName__Full=Enolase_1__AltName__Full=2-phos  | 78/506 | = 15.4% |
| gi_289172_gb_AAA32702.1__serine_protease_[Aspergillus_niger]                      | 87/569 | = 15.3% |
| gi_13959403_sp_Q01940.1_MALF1_MALFU_RecName__Full=Major_allergen_Mal_f_1__AltNam  | 64/419 | = 15.3% |
| gi_125659386_dbj_BAF46896.1__tropomyosin_[Balanus_rostratus]                      | 60/391 | = 15.3% |
| gi_2143220_emb_CAA73782.1__cellular_serine_proteinase_[Aspergillus_fumigatus]     | 83/547 | = 15.2% |
| gi_85701146_sp_POC0V5.1_MTDH_DAVTA_RecName__Full=Probable_NADP-dependent_mannito  | 61/403 | = 15.1% |
| gi_21069093_gb_AAM33821.1__alkaline_serine_protease_[Penicillium_chrysogenum]     | 73/483 | = 15.1% |
| gi_14285796_sp_Q44119.1_TPM_HOMAM_RecName__Full=Tropomyosin__AltName__Allergen=H  | 61/406 | = 15.0% |
| gi_23894240_emb_CAD23613.1__tri_m_2_allergen_[Arthroderma_benhamiae]              | 61/409 | = 14.9% |
| gi_190684059_gb_ACE82290.1__peroxiredoxin_[Triticum_aestivum]                     | 55/368 | = 14.9% |
| gi_156480837_gb_ABU68318.1__Der_f_2_allergen_[Dermatophagoides_farinae]           | 52/349 | = 14.9% |
| gi_238477265_gb_ACR43474.1__arginine_kinase_[Crangon_crangon]                     | 67/454 | = 14.8% |
| gi_511476_gb_AAA19973.1__Der_p_3_allergen_[Dermatophagoides_pteronyssinus]        | 56/382 | = 14.7% |
| gi_13430402_gb_AAK25823.1__group_V_allergen_Phl_p_5_precursor_[Phleum_pratense]   | 62/423 | = 14.7% |
| gi_6684758_gb_AAF23726.1_AF193420_1_allergen_Pen_n_13_[Penicillium_chrysogenum]   | 68/467 | = 14.6% |
| gi_4587983_gb_AAD25926.1_AF084546.1_Pen_c_1_[Penicillium_citrinum]                | 68/467 | = 14.6% |
| gi_19570315_dbj_BAB86286.1__Cry_j_1_precursor_[Cryptomeria_japonica]              | 69/472 | = 14.6% |
| gi_1173557_gb_AAA86533.1__Ory_s_1_[Oryza_sativa]                                  | 57/390 | = 14.6% |
| gi_1173367_sp_P18632.2_SBP_CRYJA_RecName__Full=Sugi_basic_protein__Short=SBP__Al  | 69/472 | = 14.6% |
| gi_14285800_sp_Q9N2R3.1_TPM_CHAFE_RecName__Full=Tropomyosin__AltName__Full=Aller  | 54/373 | = 14.5% |
| gi_1352240_sp_P49273.1_ALL7_DERPT_RecName__Full=Mite_allergen_Der_p_7__AltName__  | 53/365 | = 14.5% |
| gi_11991227_gb_AAG42254.1_AF306707_1_pollen_allergen_Poa_p_5_[Poa_pratensis]      | 59/408 | = 14.5% |
| gi_10189811_emb_CAC09234.1__unnamed_protein_product_[Dermatophagoides_pteronyssi  | 53/365 | = 14.5% |
| gi_493634_dbj_BAA05543.1__Cry_j_IB_precursor_[Cryptomeria_japonica]               | 68/472 | = 14.4% |
| gi_317383198_gb_ADV17343.1__sarcoplasmic_calcium_binding_protein_[Penaeus_monodo  | 50/347 | = 14.4% |
| gi_223403273_gb_ACM89179.1__sarcoplasmic_calcium-binding_protein_[Litopenaeus_va  | 50/347 | = 14.4% |
| gi_27550039_gb_AAM19082.1__60_kDa_allergen_Der_f_18p_[Dermatophagoides_farinae]   | 76/533 | = 14.3% |
| gi_256631558_dbj_BAD74060.2__group_2_allergen_[Dermatophagoides_farinae]          | 48/335 | = 14.3% |
| gi_20141714_sp_P30941.2_SPI7_SOLTU_RecName__Full=Serine_protease_inhibitor_7__Al  | 54/378 | = 14.3% |
| gi_125995165_dbj_BAF47266.1__tropomyosin_slow-tonic_isoform_[Paralithodes_camtsco | 56/393 | = 14.2% |
| gi_11991229_gb_AAG42255.1_AF306708_1_pollen_allergen_Hol_1_5b_[Holcus_lanatus]    | 58/409 | = 14.2% |
| gi_55859468_emb_CAI05849.1__Der_f_2_[Dermatophagoides_farinae]                    | 48/340 | = 14.1% |
| gi_546852_gb_AAB30829.1__Der_f_II_[Dermatophagoides_farinae]                      | 47/333 | = 14.1% |
| gi_42559558_sp_Q97192.1_TPM_HELAS_RecName__Full=Tropomyosin__AltName__Allergen=H  | 57/403 | = 14.1% |
| gi_302127810_emb_CBW30986.1__putative_pectate_lyase_precursor_[Ambrosia_artemisi  | 69/491 | = 14.1% |
| gi_29539111_emb_CAD87731.1__allergen_Len_c_1.0102_[Lens_culinaris]                | 66/467 | = 14.1% |



|   |        |         |
|---|--------|---------|
| gi_218203818_gb_ACK76292.1__Der_f_3_allergen_[Dermatophagoides_farinae]           | 54/383 | = 14.1% |
| gi_19847822_gb_AAK27264.1__isoflavone_reductase-like_protein_CJP-6_[Cryptomeria]  | 58/411 | = 14.1% |
| gi_127533_sp_P02761.1_MUP_RAT_RecName__Full=Major_urinary_protein__Short=MUP__Al  | 49/347 | = 14.1% |
| gi_76666767_emb_CAA55071.2__aldehyde_dehydrogenase_(NAD+)_[Alternaria_alternata]  | 80/570 | = 14.0% |
| gi_308191588_sp_A2V735.1_TPM_CHIOP_RecName__Full=Tropomyosin__AltName__Full=Trop  | 55/393 | = 14.0% |
| gi_27462848_gb_AAO15613.1_AF462196_1_major_allergen_1_[Sarcoptes_scabiei_type_ho  | 63/449 | = 14.0% |
| gi_218203834_gb_ACK76300.1__Der_f_2_allergen_[Dermatophagoides_farinae]           | 47/335 | = 14.0% |
| gi_14423933_sp_082803.1_SRPP_HEVBR_RecName__Full=Small_rubber_particle_protein__  | 48/343 | = 14.0% |
| gi_68270856_gb_AAY88919.1__Ole_e_11.0102_allergen_precursor_[Olea_europaea]       | 65/468 | = 13.9% |
| gi_21725632_emb_CAD38397.1__unnamed_protein_product_[Phleum_pratense]             | 59/423 | = 13.9% |
| gi_21413_emb_CAA45723.1__aspartic_proteinase_inhibitor_[Solanum_tuberosum]        | 52/375 | = 13.9% |
| gi_86450747_gb_ABC96702.1__Der_s_2_a_allergen_[Dermatophagoides_siboney]          | 47/340 | = 13.8% |
| gi_33149333_gb_AAP96759.1__group_1_allergen_Dac_g_1.01_precursor_[Dactylis_glome  | 55/399 | = 13.8% |
| gi_3121746_sp_018874.1_ALL2_CANFA_RecName__Full=Minor_allergen_Can_f_2__AltName_  | 49/355 | = 13.8% |
| gi_269996495_gb_ACZ57582.1__Ole_e_11.0101_allergen_precursor_[Olea_europaea]      | 66/479 | = 13.8% |
| gi_2498579_sp_P56166.1_MPA53_PHAHQ_RecName__Full=Major_pollen_allergen_Pha_a_5.3  | 59/427 | = 13.8% |
| gi_21591547_gb_AAM64112.1__gelsoin-like_allergen_Der_f_16_[Dermatophagoides_far   | 76/551 | = 13.8% |
| gi_161137518_gb_ABX57814.1__delta_class_glutathione_S-transferase_[Blattella_ger  | 52/376 | = 13.8% |
| gi_148361511_gb_ABQ59329.1__vacuolar_serine_protease_[Cladosporium_cladosporioid  | 68/492 | = 13.8% |
| gi_125995171_dbj_BAF47269.1__tropomyosin_slow-tonic_isoform_[Erimacrus_isenbecki  | 54/393 | = 13.7% |
| gi_115492980_gb_ABI98020.1__arginine_kinase_[Litopenaeus_vannamei]                | 63/461 | = 13.7% |
| gi_83308249_emb_CAJ43561.1__staphylococcal_enterotoxin_B_precursor_(SEB)_[Staphy  | 54/396 | = 13.6% |
| gi_42414629_emb_CAF25233.1__Vicilin_[Pisum_sativum]                               | 67/498 | = 13.5% |
| gi_313471397_sp_POCH87.1_PA1_VESCR_RecName__Full=Venom_phospholipase_A1__AltName  | 59/438 | = 13.5% |
| gi_9954253_gb_AAG08989.1_AF216520_1_tropomyosin_[Mimachlamys_nobilis]             | 56/419 | = 13.4% |
| gi_162794_gb_AAA30429.1__alpha-S1-casein_[Bos_taurus]                             | 50/372 | = 13.4% |
| gi_156001070_gb_ABU42022.1__11S_globulin_[Pistacia_vera]                          | 71/529 | = 13.4% |
| gi_75277440_sp_023791.1_BROM1_ANACO_RecName__Full=Fruit_bromelain__AltName__Alle  | 67/505 | = 13.3% |
| gi_187766751_gb_ACD36976.1__Gly_m_Bd_28K_allergen_[Glycine_max]                   | 63/474 | = 13.3% |
| gi_46406012_gb_AAS93674.1__Sar_s_1_allergen_SMIPP-C_Yv4028C12_[Sarcoptes_scabiei  | 63/479 | = 13.2% |
| gi_2507248_sp_P49275.2_DERF3_DERFA_RecName__Full=Mite_allergen_Der_f_3__AltName_  | 52/393 | = 13.2% |
| gi_218203816_gb_ACK76291.1__Der_f_3_allergen_[Dermatophagoides_farinae]           | 52/393 | = 13.2% |
| gi_18542113_gb_AAL75449.1_AF465612_1_minor_allergen_beta-fructofuranosidase_prec  | 80/608 | = 13.2% |
| gi_55859464_emb_CAH92637.1__pollen_allergen_Lol_p_4_[Lolium_perenne]              | 69/525 | = 13.1% |
| gi_308154236_sp_C7E3T4.1_KARG_PENMO_RecName__Full=Arginine_kinase__Short=AK__Alt  | 61/464 | = 13.1% |
| gi_27463265_gb_AAO15713.1_AF479772_1_allergen_Pen_m_2_[Penaeus_monodon]           | 61/464 | = 13.1% |
| gi_187766749_gb_ACD36975.1__Gly_m_Bd_28K_allergen_[Glycine_max]                   | 62/474 | = 13.1% |
| gi_187766747_gb_ACD36974.1__Gly_m_Bd_28K_allergen_[Glycine_max]                   | 62/474 | = 13.1% |
| gi_163638970_gb_ABY28115.1__Der_f_3_allergen_precursor_[Dermatophagoides_farinae] | 51/388 | = 13.1% |
| gi_125987805_sp_P08819.2_CBP2_WHEAT_RecName__Full=Serine_carboxypeptidase_2__Alt  | 72/549 | = 13.1% |
| gi_113475_sp_P27759.1_MPA11_AMBAR_RecName__Full=Pollen_allergen_Amb_a_1.1__AltNa  | 64/491 | = 13.0% |
| gi_58371884_emb_CAG26895.1__Arg_r_1_precursor_[Argas_reflexus]                    | 44/342 | = 12.9% |
| gi_55859470_emb_CAI05850.1__mite_allergen_Der_f_2_[Dermatophagoides_farinae]      | 43/334 | = 12.9% |
| gi_534910_emb_CAA54694.1__1-Sc1_[Betula_pendula]                                  | 46/356 | = 12.9% |
| gi_38326693_gb_AAR17475.1__unknown_[Penicillium_citrinum]                         | 50/389 | = 12.9% |
| gi_302127820_emb_CBW30991.1__putative_pectate_lyase_precursor_[Ambrosia_artemisi  | 62/479 | = 12.9% |
| gi_302127818_emb_CBW30990.1__putative_pectate_lyase_precursor_[Ambrosia_artemisi  | 62/479 | = 12.9% |
| gi_302127814_emb_CBW30988.1__putative_pectate_lyase_precursor_[Ambrosia_artemisi  | 62/479 | = 12.9% |
| gi_28630923_gb_AAO45608.1__beta-expansin_1_protein_[Zea_mays]                     | 51/394 | = 12.9% |
| gi_166443_gb_AAA32669.1__antigen_E_[Ambrosia_artemisiifolia]                      | 62/479 | = 12.9% |
| gi_119654_sp_P20723.1_ETXD_STAAU_RecName__Full=Enterotoxin_type_D__AltName__Full  | 53/411 | = 12.9% |
| gi_113560_sp_P22284.1_MPA91_POAPR_RecName__Full=Pollen_allergen_KBG_31__AltName_  | 63/488 | = 12.9% |
| gi_113477_sp_P27761.1_MPA13_AMBAR_RecName__Full=Pollen_allergen_Amb_a_1.3__AltNa  | 62/479 | = 12.9% |
| gi_4590366_gb_AAD26547.1_AF124824_1_major_allergen_mal_d_1_[Malus_x_domestica]    | 43/337 | = 12.8% |
| gi_37958157_gb_AAP35073.1__Der_f_2_allergen_[Dermatophagoides_farinae]            | 43/335 | = 12.8% |
| gi_37958161_gb_AAP35075.1__Der_f_1_allergen_[Dermatophagoides_farinae]            | 53/416 | = 12.7% |
| gi_302127822_emb_CBW30992.1__putative_pectate_lyase_precursor_[Ambrosia_artemisi  | 61/479 | = 12.7% |
| gi_2506461_sp_PO2224.2_GLB6_CHITH_RecName__Full=Globin_CTT-VI__Flags__Precursor   | 45/354 | = 12.7% |

|   |        |         |
|---|--------|---------|
| gi_322812205_pdb_2X45_A_Chain_A_Crystal_Structure_Of_Arg_R_1_In_Complex_With_Hi   | 42/334 | = 12.6% |
| gi_1314736_gb_AAA99805.1__Der_f_3_mite_allergen,_partial_[Dermatophagoides_farin  | 47/373 | = 12.6% |
| gi_55859456_emb_CAH92630.1__pollen_allergen_Sec_c_4_[Secale_cereale]              | 73/582 | = 12.5% |
| gi_549186_sp_P10737.3_VA53_DOLMA_RecName__Full=Venom_allergen_5.02__AltName__Ful  | 49/392 | = 12.5% |
| gi_166317_gb_AAA32629.1__actinidin_[Actinidia_deliciosa]                          | 61/489 | = 12.5% |
| gi_1168696_sp_P43187.1_ALLB3_BETPN_RecName__Full=Calcium-binding_allergen_Bet_v_  | 47/376 | = 12.5% |
| gi_113478_sp_P28744.1_MPA14_AMBAR_RecName__Full=Pollen_allergen_Amb_a_1.4__AltNa  | 64/512 | = 12.5% |
| gi_94471622_gb_ABF21077.1__icarapin_variant_1_precursor_[Apis_mellifera]          | 47/380 | = 12.4% |
| gi_238477327_gb_ACR43475.1__sarcoplasmic_calcium-binding_protein_[Crangon_crango  | 43/346 | = 12.4% |
| gi_204324083_gb_ACI01048.1__arginine_kinase_[Bombyx_mori]                         | 59/476 | = 12.4% |
| gi_114794319_pdb_2HCZ_X_Chain_X_Crystal_Structure_Of_Expb1_(Zea_M_1),_A_Beta-Ex   | 48/386 | = 12.4% |
| gi_585279_sp_Q08169.1_HUGA_APIME_RecName__Full=Hyaluronidase__Short=Hya__AltName  | 62/504 | = 12.3% |
| gi_55859466_emb_CAI05848.1__mite_allergen_Der_f_2_[Dermatophagoides_farinae]      | 41/333 | = 12.3% |
| gi_37958165_gb_AAP35077.1__Der_f_7_allergen_[Dermatophagoides_farinae]            | 46/373 | = 12.3% |
| gi_2498299_sp_Q26456.1_ALL7_DERFA_RecName__Full=Mite_allergen_Der_f_7__AltName__  | 46/373 | = 12.3% |
| gi_218203832_gb_ACK76299.1__Der_f_7_allergen_[Dermatophagoides_farinae]           | 46/373 | = 12.3% |
| gi_133711974_gb_ABO36677.1__vicilin_[Pistacia_vera]                               | 74/604 | = 12.3% |
| gi_60280829_gb_AAX18307.1__major_allergen_Mal_d_1.07_[Malus_x_domestica]          | 42/343 | = 12.2% |
| gi_34495288_gb_AAQ73491.1__type_2_allergen_Lep_d_2.039_[Lepidoglyphus_destructor  | 42/345 | = 12.2% |
| gi_34495286_gb_AAQ73490.1__type_2_allergen_Lep_d_2.035_[Lepidoglyphus_destructor  | 42/345 | = 12.2% |
| gi_34495282_gb_AAQ73488.1__type_2_allergen_Lep_d_2.025_[Lepidoglyphus_destructor  | 42/345 | = 12.2% |
| gi_34495278_gb_AAQ73486.1__type_2_allergen_Lep_d_2.023_[Lepidoglyphus_destructor  | 42/345 | = 12.2% |
| gi_34495274_gb_AAQ73484.1__type_2_allergen_Lep_d_2.013_[Lepidoglyphus_destructor  | 42/345 | = 12.2% |
| gi_33772588_gb_AAQ54603.1__Gly_d_2.03_[Glycyphagus_domesticus]                    | 42/345 | = 12.2% |
| gi_14193761_gb_AAK56124.1_AF332174_1_beta-expansin_1_[Zea_mays]                   | 49/400 | = 12.2% |
| gi_76097511_gb_ABA39438.1__Der_f_2_allergen_precursor_[Dermatophagoides_farinae]  | 41/338 | = 12.1% |
| gi_3121745_sp_O18873.1_ALL1_CANFA_RecName__Full=Major_allergen_Can_f_1__AltName__ | 43/354 | = 12.1% |
| gi_30909091_gb_AAP37412.1__venom_serine_protease_precursor_[Polistes_dominulus]   | 47/387 | = 12.1% |
| gi_293329689_dbj_BAJ04354.1__pollen_allergen_CPA63_[Cryptomeria_japonica]         | 67/552 | = 12.1% |
| gi_261407_gb_AAB24432.1__Aln_g_I_[Alnus_glutinosa]                                | 43/356 | = 12.1% |
| gi_205525919_sp_P18153.2_ALL2_AEDAE_RecName__Full=37_kDa_salivary_gland_allergen  | 56/463 | = 12.1% |
| gi_19338630_gb_AAL86739.1_AF441864_1_48-kDa_glycoprotein_precursor_[Corylus_avel  | 64/527 | = 12.1% |
| gi_51093377_gb_AAT95010.1__allergen_Pol_d_5_precursor_[Polistes_dominulus]        | 46/384 | = 12.0% |
| gi_171464770_gb_ACB45874.1__pathogen-related_protein_1_[Cucumis_melo_var._inodor  | 41/341 | = 12.0% |
| gi_1168402_sp_P42058.1_ALTA7_ALTAL_RecName__Full=Minor_allergen_Alt_a_7__AltName  | 45/375 | = 12.0% |
| gi_729979_sp_P39673.1_MAG_DERFA_RecName__Full=Allergen_Mag__AltName__Allergen=De  | 55/462 | = 11.9% |
| gi_56405054_sp_P84298.1_GLB75_CHITH_RecName__Full=Globin_CTT-VIIB-5/CTT-VIIB-9__  | 41/345 | = 11.9% |
| gi_33667928_gb_AAQ24541.1__Blo_t_1_allergen_[Blomia_tropicalis]                   | 54/455 | = 11.9% |
| gi_232054_sp_P30575.1_ENO1_CANAL_RecName__Full=Enolase_1__AltName__Full=2-phosph  | 66/555 | = 11.9% |
| gi_149208401_gb_ABR21771.1__conglutin_beta_[Lupinus_angustifolius]                | 68/572 | = 11.9% |
| gi_121248_sp_P12549.1_GLB76_CHITH_RecName__Full=Globin_CTT-VIIB-6__Flags__Precur  | 41/345 | = 11.9% |
| gi_30313867_gb_AAO38859.1__11S_globulin_[Bertholletia_excelsa]                    | 68/577 | = 11.8% |
| gi_302127812_emb_CBW30987.1__putative_pectate_lyase_precursor_[Ambrosia_artemisi  | 59/499 | = 11.8% |
| gi_1321714_emb_CAA96546.1__major_allergen_Bet_v_1_[Betula_pendula]                | 42/356 | = 11.8% |
| gi_124365249_gb_ABN09653.1__beta-1,3-glucanase_[Hevea_brasiliensis]               | 59/501 | = 11.8% |
| gi_113476_sp_P27760.1_MPA12_AMBAR_RecName__Full=Pollen_allergen_Amb_a_1.2__AltNa  | 59/499 | = 11.8% |
| gi_534898_emb_CAA54696.1__1_Sc-3_[Betula_pendula]                                 | 41/350 | = 11.7% |
| gi_42414627_emb_CAF25232.1__Vicilin_[Pisum_sativum]                               | 63/538 | = 11.7% |
| gi_325910590_emb_CAX62129.1__allergen_lipocalin_Cav_p_2.0101_precursor_[Cavia_po  | 42/358 | = 11.7% |
| gi_28798085_emb_CAD69036.1__unnamed_protein_product_[Dermatophagoides_pteronyssi  | 40/342 | = 11.7% |
| gi_2154734_emb_CAB03716.1__major_allergen_[Daucus_carota]                         | 41/351 | = 11.7% |
| gi_167472847_gb_ABZ81045.1__pollen_allergen_Que_a_1_isoform_[Quercus_alba]        | 41/350 | = 11.7% |
| gi_152031631_sp_P82615.3_LATH_HORSE_RecName__Full=Latherin__AltName__Full=Dander  | 41/351 | = 11.7% |
| gi_14423650_sp_Q9U1G2.1_ALL7_LEPDS_RecName__Full=Mite_allergen_Lep_d_7__AltName__ | 41/350 | = 11.7% |
| gi_12697782_dbj_BAB21619.1__allergen_Gly_m_Bd_28K_[Glycine_max]                   | 66/563 | = 11.7% |
| gi_44409496_gb_AAS47037.1__major_cherry_allergen_Pru_av_1.0203_[Prunus_avium]     | 40/344 | = 11.6% |
| gi_4006961_emb_CAA07327.1__pollen_allergen_Betv1,_isoform_at59_[Betula_pendula]   | 40/344 | = 11.6% |
| gi_219687753_dbj_BAH09387.1__allergen_[Trichophyton_interdigitale]                | 89/766 | = 11.6% |

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| gi_162929_gb_AAA30479.1__alpha-s2-like_casein_precursor_[Bos_taurus]              | 43/371 | = 11.6% |
| gi_162797_gb_AAA30430.1__beta-casein_precursor_[Bos_taurus]                       | 46/397 | = 11.6% |
| gi_124365251_gb_ABNO9654.1__beta-1,3-glucanase_[Hevea_brasiliensis]               | 58/501 | = 11.6% |
| gi_5777414_emb_CAB53458.1__MnSOD_[Hevea_brasiliensis]                             | 45/391 | = 11.5% |
| gi_45108973_emb_CAF32567.2__unnamed_protein_product_[Phleum_pratense]             | 69/599 | = 11.5% |
| gi_338930686_emb_CBM42667.1__group_13_grass_pollen_allergen_[Paspalum_notatum]    | 41/357 | = 11.5% |
| gi_338930684_emb_CBM42666.1__group_13_grass_pollen_allergen_[Paspalum_notatum]    | 41/357 | = 11.5% |
| gi_256429_gb_AAB23464.1__Kunitz_trypsin_inhibitor_[Glycine_max]                   | 44/384 | = 11.5% |
| gi_162792_gb_AAA30428.1__alpha-s1-casein_precursor_[Bos_taurus]                   | 44/383 | = 11.5% |
| gi_1321733_emb_CAA96549.1__major_allergen_Cor_a_1_[Corylus_avellana]              | 41/355 | = 11.5% |
| gi_1321726_emb_CAA96544.1__major_allergen_Bet_v_1_[Betula_pendula]                | 41/356 | = 11.5% |
| gi_10862818_emb_CAC13961.1__IgE-binding_protein_MnSOD_[Hevea_brasiliensis]        | 45/391 | = 11.5% |
| gi_913285_gb_AAB32842.1__Der_p_V_allergen_[Dermatophagoides_pteronyssinus]        | 39/342 | = 11.4% |
| gi_60280851_gb_AAX18318.1__major_allergen_Mal_d_1.03D_[Malus_x_domestica]         | 39/342 | = 11.4% |
| gi_54144332_emb_CAD54670.2__pollen_allergen_Ph1_p_4_[Phleum_pratense]             | 69/607 | = 11.4% |
| gi_459292_gb_AAB29137.1__beta-casein_A3_[Bos_taurus]                              | 45/396 | = 11.4% |
| gi_45108967_emb_CAF32566.2__unnamed_protein_product_[Phleum_pratense]             | 68/599 | = 11.4% |
| gi_4376216_emb_CAA04823.1__pollen_allergen_Betv1_[Betula_pendula]                 | 40/352 | = 11.4% |
| gi_4006945_emb_CAA07319.1__pollen_allergen_Betv1_isoform_at10_[Betula_pendula]    | 40/352 | = 11.4% |
| gi_38492423_pdb_1LLT_A_Chain_A_Birch_Pollen_Allergen_Bet_V_1_Mutant_E45s          | 40/352 | = 11.4% |
| gi_281552898_emb_CAM31909.1__bet_v_1_related_allergen_[Actinidia_deliciosa]       | 40/351 | = 11.4% |
| gi_27922941_gb_AAO25113.1__major_allergen_Mal_d_1_[Malus_x_domestica]             | 39/342 | = 11.4% |
| gi_2564228_emb_CAA05190.1__pollen_allergen_Betv1_[Betula_pendula]                 | 40/352 | = 11.4% |
| gi_2564224_emb_CAA05188.1__pollen_allergen_Betv1_[Betula_pendula]                 | 40/352 | = 11.4% |
| gi_2564220_emb_CAA05186.1__pollen_allergen_Betv1_[Betula_pendula]                 | 40/352 | = 11.4% |
| gi_217308_dbj_BAA01241.1__mite_allergen_Der_f_II_precursor_[Dermatophagoides_far  | 38/334 | = 11.4% |
| gi_190358935_sp_P00785.4_ACTN_ACTCH_RecName__Full=Actinidain__Short=Actinidin__A  | 58/511 | = 11.4% |
| gi_189014266_emb_CAQ55938.1__pollen_allergen_Ph1_p_4.0102_[Phleum_pratense]       | 68/599 | = 11.4% |
| gi_18770_emb_CAA45777.1__trypsin_inhibitor_subtype_A_[Glycine_max]                | 44/385 | = 11.4% |
| gi_1648970_gb_AAB60779.1__manganese_superoxide_dismutase_partial_[Aspergillus_f   | 45/394 | = 11.4% |
| gi_162931_gb_AAA30480.1__beta-casein_precursor_[Bos_taurus]                       | 45/396 | = 11.4% |
| gi_162805_gb_AAA30431.1__beta-casein_[Bos_taurus]                                 | 45/396 | = 11.4% |
| gi_1542871_emb_CAB02160.1__pollen_allergen_Bet_v_1_[Betula_pendula]               | 40/352 | = 11.4% |
| gi_1542869_emb_CAB02159.1__pollen_allergen_Bet_v_1_[Betula_pendula]               | 40/352 | = 11.4% |
| gi_1542867_emb_CAB02158.1__pollen_allergen_Bet_v_1_[Betula_pendula]               | 40/352 | = 11.4% |
| gi_1352238_sp_P14004.2__ALL5_DERPT_RecName__Full=Mite_allergen_Der_p_5__AltName__ | 39/342 | = 11.4% |
| gi_1321728_emb_CAA96547.1__major_allergen_Bet_v_1_[Betula_pendula]                | 40/352 | = 11.4% |
| gi_124294783_gb_ABNO3965.1__beta-1,3-glucanase_[Hevea_brasiliensis]               | 58/509 | = 11.4% |
| gi_121244_sp_P12548.1_GLB73_CHITH_RecName__Full=Globin_CTT-VIIB-3__Flags__Precur  | 39/343 | = 11.4% |
| gi_1184668_gb_AAA87456.1__beta-1,3-glucanase_[Hevea_brasiliensis]                 | 57/501 | = 11.4% |
| gi_1168970_sp_P42059.1_CLAH7_DAVTA_RecName__Full=Minor_allergen_Cla_h_7__AltName  | 44/387 | = 11.4% |
| gi_1168703_sp_P43177.2_BEV1D_BETPN_RecName__Full=Major_pollen_allergen_Bet_v_1-D  | 40/352 | = 11.4% |
| gi_11514622_pdb_1QMR_A_Chain_A_Birch_Pollen_Allergen_Bet_V_1_Mutant_N28t_K32q     | 40/352 | = 11.4% |
| gi_45738062_gb_AAS75831.1__group_2_allergen_Sui_m_2_[Suidasia_medanensis]         | 37/328 | = 11.3% |
| gi_4006967_emb_CAA07330.1__pollen_allergen_Betv1_isoform_at7_[Betula_pendula]     | 39/344 | = 11.3% |
| gi_4006959_emb_CAA07326.1__pollen_allergen_Betv1_isoform_at50_[Betula_pendula]    | 39/344 | = 11.3% |
| gi_23894232_emb_CAD23611.1__tri_m_4_allergen_[Arthroderma_benhamiae]              | 87/769 | = 11.3% |
| gi_23894227_emb_CAD23374.1__tri_s_4_allergen_[Trichophyton_schoenleinii]          | 87/769 | = 11.3% |
| gi_18542115_gb_AAL75450.1_AF465613_1_minor_allergen_beta-fructofuranosidase_prec  | 78/690 | = 11.3% |
| gi_162811_gb_AAA30433.1__kappa-casein_precursor_[Bos_taurus]                      | 41/364 | = 11.3% |
| gi_14424466_sp_P35778.2_VA3_SOLIN_RecName__Full=Venom_allergen_3__AltName__Full=  | 43/380 | = 11.3% |
| gi_5813788_gb_AAD52012.1_AF082514_1_Tri_r_4_allergen_[Trichophyton_rubrum]        | 86/766 | = 11.2% |
| gi_5726304_gb_AAD48405.1_AF136945_1_major_allergen_Cor_a_1.0401_[Corylus_avellan  | 39/347 | = 11.2% |
| gi_520_emb_CAA32835.1__beta-lactoglobulin_[Bos_taurus]                            | 39/347 | = 11.2% |
| gi_32765543_gb_AAP87281.1__beta-1,3-glucanase_[Hevea_brasiliensis]                | 57/509 | = 11.2% |
| gi_302127824_emb_CBW30993.1__putative_pectate_lyase_precursor_[Ambrosia_artemisi  | 57/507 | = 11.2% |
| gi_2897849_gb_AAC34312.1__allergen_[Periplaneta_americana]                        | 42/375 | = 11.2% |
| gi_193806686_sp_A5HII1.1_ACTN_ACTDE_RecName__Full=Actinidain__Short=Actinidin__A  | 57/509 | = 11.2% |

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| gi_15984_emb_CAA34486.1__unnamed_protein_product_[Actinidia_deliciosa]            | 57/509 | = 11.2% |
| gi_6065738_emb_CAB58171.1__troponin-like_protein_[Anisakis_simplex]               | 38/342 | = 11.1% |
| gi_549179_sp_P35775.1_VA2_SOLIN_RecName__Full=Venom_allergen_2__AltName__Full=Al  | 37/332 | = 11.1% |
| gi_534900_emb_CAA54695.1__1_Sc2_[Betula_pendula]                                  | 40/359 | = 11.1% |
| gi_4590394_gb_AAD26561.1_AF124838.1_isoallergen_Bet_v_1_b2_[Betula_pendula]       | 39/352 | = 11.1% |
| gi_4590392_gb_AAD26560.1_AF124837.1_isoallergen_bet_v_1_b1_[Betula_pendula]       | 39/352 | = 11.1% |
| gi_4376221_emb_CAA04828.1__pollen_allergen_Betv1_[Betula_pendula]                 | 39/352 | = 11.1% |
| gi_4376219_emb_CAA04826.1__pollen_allergen_Betv1_[Betula_pendula]                 | 39/352 | = 11.1% |
| gi_4240399_gb_AAD13533.1__major_allergen_Per_a_1.0101_[Periplaneta_americana]     | 42/378 | = 11.1% |
| gi_4006957_emb_CAA07325.1__pollen_allergen_Betv1__isoform_at45_[Betula_pendula]   | 39/352 | = 11.1% |
| gi_4006953_emb_CAA07323.1__pollen_allergen_Betv1__isoform_at37_[Betula_pendula]   | 39/352 | = 11.1% |
| gi_4006928_emb_CAA07318.1__pollen_allergen_Betv1__isoform_at8_[Betula_pendula]    | 39/352 | = 11.1% |
| gi_3914387_sp_P56578.1_MALF3_MALFU_RecName__Full=Putative_peroxiredoxin__AltName  | 39/351 | = 11.1% |
| gi_323575363_dbj_BA78221.1__Ani_s_11-like_protein_precursor_[Anisakis_simplex]    | 40/361 | = 11.1% |
| gi_2564222_emb_CAA05187.1__pollen_allergen_Betv1_[Betula_pendula]                 | 39/352 | = 11.1% |
| gi_21666498_gb_AAM73729.1_AF395893.1_vicilin-like_protein_[Anacardium_occident    | 71/637 | = 11.1% |
| gi_1709545_sp_P51528.1_PA1_VESMC_RecName__Full=Phospholipase_A1__AltName__Full=A  | 50/451 | = 11.1% |
| gi_159162097_pdb_1B6F_A_Chain_A_Birch_Pollen_Allergen_Bet_V_1                     | 39/352 | = 11.1% |
| gi_1542865_emb_CAB02157.1__pollen_allergen_Bet_v_1_[Betula_pendula]               | 39/352 | = 11.1% |
| gi_1542863_emb_CAB02156.1__pollen_allergen_Bet_v_1_[Betula_pendula]               | 39/352 | = 11.1% |
| gi_1542861_emb_CAB02155.1__pollen_allergen_Bet_v_1_[Betula_pendula]               | 39/352 | = 11.1% |
| gi_1321716_emb_CAA96539.1__major_allergen_Bet_v_1_[Betula_pendula]                | 39/352 | = 11.1% |
| gi_12583683_dbj_BAB21490.1__Bet_vI_jap2_[Betula_platyphylla_var._japonica]        | 39/352 | = 11.1% |
| gi_1168701_sp_P45431.2_BEV1B_BETPN_RecName__Full=Major_pollen_allergen_Bet_v_1-B  | 38/341 | = 11.1% |
| gi_114922_sp_P15494.2_BEV1A_BETPN_RecName__Full=Major_pollen_allergen_Bet_v_1-A   | 39/352 | = 11.1% |
| gi_75306007_sp_Q941P5_Q941P5_MALDO_Ribonuclease-like_PR-10a                       | 39/353 | = 11.0% |
| gi_74035843_emb_CAJ28931.1__Ves_g_1_allergen_precursor_[Vespula_germanica]        | 49/446 | = 11.0% |
| gi_4590388_gb_AAD26558.1_AF124835.1_major_allergen_mal_d_1_[Malus_x_domestica]    | 39/353 | = 11.0% |
| gi_4590382_gb_AAD26555.1_AF124832.1_major_allergen_mal_d_1_[Malus_x_domestica]    | 39/353 | = 11.0% |
| gi_4590368_gb_AAD26548.1_AF124825.1_major_allergen_mal_d_1_[Malus_x_domestica]    | 39/355 | = 11.0% |
| gi_4590364_gb_AAD26546.1_AF124823.1_major_allergen_mal_d_1_[Malus_x_domestica]    | 39/353 | = 11.0% |
| gi_4588118_gb_AAD25995.1_AF098517.1_alkaline_serine_protease_Pen_c2_[Penicillium  | 63/571 | = 11.0% |
| gi_4587985_gb_AAD25927.1_AF084828.1_major_allergenic_protein_Mal_f4_[Malassezia   | 54/493 | = 11.0% |
| gi_42558971_sp_Q40280.3_MAL12_MALDO_RecName__Full=Major_allergen_Mal_d_1__AltNam  | 39/353 | = 11.0% |
| gi_21914823_gb_AAM73730.2_AF395894.1_vicilin-like_protein_[Anacardium_occident    | 71/644 | = 11.0% |
| gi_1513216_gb_AAC02632.1__cherry_allergen_PRUA1_[Prunus_avium]                    | 39/354 | = 11.0% |
| gi_134194_sp_P26987.1_SAM22_SOYBN_RecName__Full=Stress-induced_protein_SAM22__Al  | 39/354 | = 11.0% |
| gi_121259_sp_P02228.1_GLB10_CHITH_RecName__Full=Globin_CTT-X                      | 38/345 | = 11.0% |
| gi_11762106_gb_AAG40331.1_AF323975.1_major_allergen_variant_Cor_a_1.0404_[Corylu  | 38/347 | = 11.0% |
| gi_54039254_sp_P67875.1_RNMG_AS PFU_RecName__Full=Ribonuclease_mitogillin__AltNam | 38/348 | = 10.9% |
| gi_51315784_sp_Q7Y1X1.1_EST_HEVBR_RecName__Full=Esterase__AltName__Full=Early_no  | 54/497 | = 10.9% |
| gi_3121758_sp_Q95182.1_ALL1_HORSE_RecName__Full=Major_allergen_Equ_c_1__AltName_  | 41/377 | = 10.9% |
| gi_187766755_gb_ACD36978.1__Gly_m_Bd_28K_allergen_[Glycine_max]                   | 60/552 | = 10.9% |
| gi_1633233_pdb_1ESF_B_Chain_B_Staphylococcal_Enterotoxin_A                        | 46/422 | = 10.9% |
| gi_1545875_emb_CAB02206.1__pollen_allergen_Car_b_1_[Carpinus_betulus]             | 39/359 | = 10.9% |
| gi_1321724_emb_CAA96543.1__major_allergen_Bet_v_1_[Betula_pendula]                | 38/349 | = 10.9% |
| gi_1321722_emb_CAA96542.1__major_allergen_Bet_v_1_[Betula_pendula]                | 38/349 | = 10.9% |
| gi_13183177_gb_AAK15089.1_AF240006.1_7S_globulin_[Sesamum_indicum]                | 69/635 | = 10.9% |
| gi_1092249_prf__2023228A_major_allergen_Phl_p_Va                                  | 51/470 | = 10.9% |
| gi_56405052_sp_P84296.1_GLB74_CHITH_RecName__Full=Globin_CTT-VIIB-4__AltName__Fu  | 38/352 | = 10.8% |
| gi_4590396_gb_AAD26562.1_AF124839.1_isoallergen_bet_v_1_b3_[Betula_pendula]       | 38/352 | = 10.8% |
| gi_4006955_emb_CAA07324.1__pollen_allergen_Betv1__isoform_at42_[Betula_pendula]   | 38/352 | = 10.8% |
| gi_2398757_emb_CAA50281.1__Major_Pollen_Allergen_Phl_p_Va_[Phleum_pratense]       | 51/471 | = 10.8% |
| gi_21886603_emb_CAC84116.1__peptidylprolyl_isomerase_(cyclophilin)_[Betula_pendu  | 40/372 | = 10.8% |
| gi_218193_dbj_BAA01998.1__allergenic_protein_[Oryza_sativa_Japonica_Group]        | 38/353 | = 10.8% |
| gi_17978844_gb_AAL47677.1__major_Der_f_2_isoform_partial_[Dermatophagoides_fari   | 36/332 | = 10.8% |
| gi_1663522_dbj_BAA13604.1__cr16_[Daucus_carota]                                   | 37/342 | = 10.8% |
| gi_1580794_gb_AAB62731.1__allergen_partial_[Periplaneta_americana]                | 60/557 | = 10.8% |

|   |        |         |
|---|--------|---------|
| gi_12583685_dbj_BAB21491.1__Bet_vI_jap3_[Betula_platyphylla_var._japonica]          | 38/352 | = 10.8% |
| gi_12583681_dbj_BAB21489.1__Bet_vI_jap1_[Betula_platyphylla_var._japonica]          | 38/352 | = 10.8% |
| gi_1168709_sp_P43185.2_BEV1L_BETPN_RecName__Full=Major_pollen_allergen_Bet_v_1-L    | 38/352 | = 10.8% |
| gi_1168706_sp_P43180.2_BEV1G_BETPN_RecName__Full=Major_pollen_allergen_Bet_v_1-G    | 38/352 | = 10.8% |
| gi_1168704_sp_P43178.2_BEV1E_BETPN_RecName__Full=Major_pollen_allergen_Bet_v_1-E    | 38/352 | = 10.8% |
| gi_60678787_gb_AAX33728.1__Per_a_4_allergen_[Periplaneta_americana]                 | 40/374 | = 10.7% |
| gi_338930682_emb_CBM42665.1__group_13_grass_pollen_allergen_[Paspalum_notatum]      | 38/356 | = 10.7% |
| gi_270315180_gb_ACZ74626.1__beta-1,3-glucanase_form_RRII_Gln_3_[Hevea_brasiliensis] | 55/514 | = 10.7% |
| gi_268037674_gb_ACY91851.1__beta-1,3-glucanase_form_RRII_Gln_2_[Hevea_brasiliensis] | 55/512 | = 10.7% |
| gi_212675308_gb_ACJ37389.1__Bla_g_4_allergen,_partial_[Blattella_germanica]         | 39/366 | = 10.7% |
| gi_14423646_sp_P92918.1_ALL2_APIGR_RecName__Full=Major_allergen_Api_g_2__AltName    | 38/356 | = 10.7% |
| gi_137395_sp_P10736.1_VA52_DOLMA_RecName__Full=Venom_allergen_5_01__AltName__Ful    | 43/402 | = 10.7% |
| gi_124365253_gb_ABNO9655.1__beta-1,3-glucanase_[Hevea_brasiliensis]                 | 55/512 | = 10.7% |
| gi_124294785_gb_ABNO3966.1__beta-1,3-glucanase_[Hevea_brasiliensis]                 | 55/512 | = 10.7% |
| gi_6136165_sp_P81657.1_VA5_VESMA_RecName__Full=Venom_allergen_5__AltName__Full=A    | 41/385 | = 10.6% |
| gi_4376222_emb_CAA04829.1__pollen_allergen,_Betv1_[Betula_pendula]                  | 38/357 | = 10.6% |
| gi_4138171_emb_CAA09883.1__allergen_[Malassezia_symphodialis]                       | 38/360 | = 10.6% |
| gi_4006965_emb_CAA07329.1__pollen_allergen_Betv1,_isoform_at5_[Betula_pendula]      | 37/349 | = 10.6% |
| gi_267048_sp_P29600.1_SUBS_BACLE_RecName__Full=Subtilisin_Savinase__AltName__Ful    | 47/444 | = 10.6% |
| gi_261824817_pdb_3F55_D_Chain_D,_Crystal_Structure_Of_The_Native_Endo_Beta-1,3-G    | 50/472 | = 10.6% |
| gi_21725624_emb_CAD38393.1__unnamed_protein_product_[Phleum_pratense]               | 50/472 | = 10.6% |
| gi_20141344_sp_P20347.3_CPI1_SOLTU_RecName__Full=Cysteine_protease_inhibitor_1__    | 42/395 | = 10.6% |
| gi_190684057_gb_ACE82289.1__glutathione_transferase_[Triticum_aestivum]             | 44/416 | = 10.6% |
| gi_18652047_gb_AAL76932.1_AF456481.1_major_allergen_isoform_Dau_c_1_0201_[Daucus]   | 37/349 | = 10.6% |
| gi_1709542_sp_P53357.1_PA12_DOLMA_RecName__Full=Phospholipase_A1_2__AltName__Ful    | 48/451 | = 10.6% |
| gi_167472849_gb_ABZ81046.1__pollen_allergen_Que_a_1_isoform_[Quercus_alba]          | 39/367 | = 10.6% |
| gi_13925873_gb_AAK49451.1_AF284645.1_enolase_[Aspergillus_fumigatus]                | 61/575 | = 10.6% |
| gi_1321718_emb_CAA96540.1__major_allergen_Bet_v_1_[Betula_pendula]                  | 37/349 | = 10.6% |
| gi_1168710_sp_P43186.2_BEV1M_BETPN_RecName__Full=Major_pollen_allergen_Bet_v_1-M    | 37/349 | = 10.6% |
| gi_1168708_sp_P43184.2_BEV1K_BETPN_RecName__Full=Major_pollen_allergen_Bet_v_1-K    | 37/349 | = 10.6% |
| gi_1168705_sp_P43179.2_BEV1F_BETPN_RecName__Full=Major_pollen_allergen_Bet_v_1-F    | 38/357 | = 10.6% |
| gi_1168702_sp_P43176.2_BEV1C_BETPN_RecName__Full=Major_pollen_allergen_Bet_v_1-C    | 37/349 | = 10.6% |
| gi_90185688_emb_CAJ85644.1__Major_strawberry_allergen_Fra_a_1-C_[Fragaria_x_anan]   | 38/363 | = 10.5% |
| gi_90185682_emb_CAJ85641.1__Major_strawberry_allergen_Fra_a_1-B_[Fragaria_x_anan]   | 38/363 | = 10.5% |
| gi_8928058_sp_004298.1_DAU1_DAUCA_RecName__Full=Major_allergen_Dau_c_1__AltName     | 36/342 | = 10.5% |
| gi_886683_emb_CAA88833.1__major_allergen_[Malus_x_domestica]                        | 37/353 | = 10.5% |
| gi_88082485_gb_ABD39049.1__Fra_a_1-A_allergen_[Fragaria_x_ananassa]                 | 38/363 | = 10.5% |
| gi_82492265_gb_ABB78006.1__major_allergen_Pru_p_1_[Prunus_persica]                  | 37/354 | = 10.5% |
| gi_74664773_sp_Q96X46.3_ENO_PENCI_RecName__Full=Enolase__AltName__Full=2-phospho    | 60/572 | = 10.5% |
| gi_5059162_gb_AAD38942.1_AF144060.1_alpha-amylase_[Dermatophagoides_apteronyssinu]  | 62/593 | = 10.5% |
| gi_4007655_emb_CAA10348.1__pollen_allergen_(group_II)_[Poa_pratensis]               | 35/333 | = 10.5% |
| gi_4007040_emb_CAA10345.1__pollen_allergen_(group_II)_[Dactylis_glomerata]          | 35/333 | = 10.5% |
| gi_38258932_sp_P82615_LATH_HORSE_Latherin_precursor_(Dander_allergen_Equ_c_4/Equ    | 42/400 | = 10.5% |
| gi_29465666_gb_AAL92870.1__pollen_allergen_Che_a_2_[Chenopodium_album]              | 35/334 | = 10.5% |
| gi_145904610_gb_ABP97433.1__Ara_h_8_allergen_isoform_[Arachis_hypogaea]             | 39/373 | = 10.5% |
| gi_1321720_emb_CAA96541.1__major_allergen_Bet_v_1_[Betula_pendula]                  | 37/352 | = 10.5% |
| gi_1171009_sp_P43214.1_MPAP2_PHLPR_RecName__Full=Pollen_allergen_Phl_p_2__AltNam    | 35/333 | = 10.5% |
| gi_1168707_sp_P43183.2_BEV1J_BETPN_RecName__Full=Major_pollen_allergen_Bet_v_1-J    | 37/352 | = 10.5% |
| gi_94471624_gb_ABF21078.1__icarapin_variant_2_precursor_[Apis_mellifera]            | 38/367 | = 10.4% |
| gi_75062228_sp_Q5VFH6.1_ALL4_FELCA_RecName__Full=Allergen_Fel_d_4__AltName__Alle    | 39/376 | = 10.4% |
| gi_6901654_gb_AAF31152.1_AF078680.1_calcium-binding_protein_[Olea_europaea]         | 40/384 | = 10.4% |
| gi_4376220_emb_CAA04827.1__pollen_allergen,_Betv1_[Betula_pendula]                  | 37/357 | = 10.4% |
| gi_34851174_gb_AAP15199.1__profilin-like_protein_[Humulus_scandens]                 | 36/347 | = 10.4% |
| gi_29500897_emb_CAD87529.1__phl_p5a_allergen_precursor_[Phleum_pratense]            | 49/472 | = 10.4% |
| gi_2414158_emb_CAA96545.1__major_allergen_Bet_v_1_[Betula_pendula]                  | 37/357 | = 10.4% |
| gi_14423648_sp_Q9M7R0.1_ALL8_OLEEU_RecName__Full=Calcium-binding_allergen_Ole_e     | 40/384 | = 10.4% |
| gi_73913442_gb_AAZ91659.1__polygalacturonase_[Lilium_longiflorum]                   | 54/522 | = 10.3% |
| gi_6015094_sp_P42040.2_ENO_DAVTA_RecName__Full=Enolase__AltName__Full=2-phospho-    | 60/580 | = 10.3% |

|   |        |         |
|---|--------|---------|
| gi_467660_emb_CAA55070.1__enolase__allergen_Cla_h_6_[Davidiella_tassiana]         | 60/580 | = 10.3% |
| gi_313870530_gb_ADR82196.1__hevamine_[Hevea_brasiliensis]                         | 42/409 | = 10.3% |
| gi_225810599_gb_AC034814.1__Sal_k_3_pollen_allergen_[Salsola_kali]                | 84/819 | = 10.3% |
| gi_21725612_emb_CAD38387.1__unnamed_protein_product_[Phleum_pratense]             | 48/464 | = 10.3% |
| gi_18536_emb_CAA35691.1__unnamed_protein_product_[Glycine_max]                    | 67/652 | = 10.3% |
| gi_1582222_prf__2118249A_allergen_Lep_d_1.01                                      | 37/360 | = 10.3% |
| gi_1542873_emb_CAB02161.1__pollen_allergen_Bet_v_1_[Betula_pendula]               | 36/349 | = 10.3% |
| gi_1313966_emb_CAA96534.1__major_allergen_Mal_d_1_[Malus_x_domestica]             | 36/350 | = 10.3% |
| gi_118638268_gb_ABL09307.1__allergen_Aca_s_13_[Acarus_siro]                       | 34/331 | = 10.3% |
| gi_5326864_gb_AAD42074.1_AF144753.1_peroxisomal_membrane_protein_[Penicillium_ci] | 37/361 | = 10.2% |
| gi_4138173_emb_CAA09884.1__allergen_[Malassezia_symphodialis]                     | 37/364 | = 10.2% |
| gi_3309039_gb_AAC25994.1__group_V_allergen_Phl_p_5.0103_precursor_[Phleum_praten] | 50/491 | = 10.2% |
| gi_3182907_sp_002380.1_ALL2_TYRPU_RecName__Full=Mite_group_2_allergen_Tyr_p_2__A  | 35/343 | = 10.2% |
| gi_238477329_gb_ACR43476.1__triosephosphate_isomerase_[Crangon_crangon]           | 45/441 | = 10.2% |
| gi_2154732_emb_CAB03715.1__major_allergen_[Daucus_carota]                         | 35/342 | = 10.2% |
| gi_194350817_gb_ACF53837.1__Bla_g_4_isoallergen_2_[Blattella_germanica]           | 37/363 | = 10.2% |
| gi_190684063_gb_ACE82292.1__dehydrin_[Triticum_aestivum]                          | 42/413 | = 10.2% |
| gi_160962597_gb_ABX54869.1__Ole_e_5_olive_pollen_allergen_[Olea_europaea]         | 37/364 | = 10.2% |
| gi_14585753_gb_AAK67491.1__enolase_[Cochliobolus_lunatus]                         | 58/569 | = 10.2% |
| gi_83288046_sp_Q96X30.3_ENO_ASPFU_RecName__Full=Enolase__AltName__Full=2-phospho  | 58/576 | = 10.1% |
| gi_8101719_gb_AAF72629.1_AF257495.1_Cup_s_1_pollen_allergen_precursor_[Cupressus] | 51/506 | = 10.1% |
| gi_8101717_gb_AAF72628.1_AF257494.1_Cup_s_1_pollen_allergen_precursor_[Cupressus] | 51/505 | = 10.1% |
| gi_51242679_gb_AAT99258.1__pectin-methyltransferase_precursor_[Salsola_kali]      | 51/506 | = 10.1% |
| gi_40807635_gb_AAR92223.1__phytocytoxin_[Actinidia_deliciosa]                     | 34/337 | = 10.1% |
| gi_25091511_sp_P83377.1_VA5_POLGA_RecName__Full=Venom_allergen_5__AltName__Full=  | 40/397 | = 10.1% |
| gi_21725622_emb_CAD38392.1__unnamed_protein_product_[Phleum_pratense]             | 48/474 | = 10.1% |
| gi_21725608_emb_CAD38385.1__unnamed_protein_product_[Phleum_pratense]             | 48/474 | = 10.1% |
| gi_212675312_gb_ACJ37391.1__Per_a_4_allergen_variant_1__partial_[Periplaneta_ame] | 37/368 | = 10.1% |
| gi_14423876_sp_Q9XG85.1_PROF1_PARJU_RecName__Full=Profilin-1__AltName__Full=Poll  | 36/357 | = 10.1% |
| gi_11762104_gb_AAG40330.1_AF323974.1_major_allergen_variant_Cor_a_1.0403_[Corylu] | 35/346 | = 10.1% |
| gi_11762102_gb_AAG40329.1_AF323973.1_major_allergen_variant_Cor_a_1.0402_[Corylu] | 35/346 | = 10.1% |
| gi_34851182_gb_AAP15203.1__profilin-like_protein_[Ambrosia_artemisiifolia]        | 36/361 | = 10.0% |
| gi_212291472_gb_ACJ23865.1__Fag_s_1_pollen_allergen_[Fagus_sylvatica]             | 37/370 | = 10.0% |
| gi_21213898_emb_CAD32313.1__Lep_D_2_precursor_[Lepidoglyphus_destructor]          | 36/360 | = 10.0% |
| gi_1708793_sp_P80384.2_ALL2_LEPDS_RecName__Full=Mite_group_2_allergen_Lep_d_2__A  | 36/360 | = 10.0% |
| gi_169929_gb_AAB01374.1__beta-conglycinin_storage_protein_[Glycine_max]           | 68/681 | = 10.0% |
| gi_1582223_prf__2118249B_allergen_Lep_d_1.02                                      | 36/359 | = 10.0% |
| gi_14423698_sp_Q17284.1_FABP_BLOTA_RecName__Full=Fatty_acid-binding_protein__Alt  | 34/341 | = 10.0% |
| gi_1321731_emb_CAA96548.1__major_allergen_Cor_a_1_[Corylus_avellana]              | 35/349 | = 10.0% |

## G Results from the EFSA scientific opinion recommended allergen analysis of Asparaginase from MOL2940 using allergen.org database

### G.1 35% or larger identity over any 80 amino acid window

(No hits found)

(blank=No matches found) Count of significant hits described in text based on identity > 35%.

### G.2 35% or larger identity over any 80 amino acid window (with scaling)

(No hits found)

(blank=No matches found) Count of significant hits described in text based on scaled identity > 35%.

### G.3 Identities calculated from Needleman-Wuncsh alignment

Matches  $\geq 10\%$  are shown

|  |        |         |
|--|--------|---------|
| 065002_Isoflavone_reductase_homolog_Bet_v_6_0101                 | 80/387 | = 20.7% |
| 081355_Isoflavone_reductase_related_protein                      | 76/370 | = 20.5% |
| H2DF86_Isoflavone_reductase_like_protein                         | 66/362 | = 18.2% |
| Q40967_Pollen_allergen_Phl_pI                                    | 67/374 | = 17.9% |
| 065811_Latex_allergen  | 75/418 | = 17.9% |
| 004008_Latex_patatin_homolog                                     | 75/418 | = 17.9% |
| 042799_Allergen_Asp_f_7  | 64/365 | = 17.5% |
| B5DGQ7_Enolase_3_2   | 85/506 | = 16.8% |
| 023971_Group_V_grass_pollen_allergen                             | 59/354 | = 16.7% |
| Q41260_Major_pollen_allergen_Pha_a_1                             | 63/385 | = 16.4% |
| Q00002_Protein_disulfide_isomerase                               | 79/489 | = 16.2% |
| P54958_Aspartic_protease_Bla_g_2                                 | 69/426 | = 16.2% |
| Q40638_Expansin_B1   | 60/373 | = 16.1% |
| Q9FUW6_Allergenic_isoflavone_reductase_like_protein_Bet_v_6_0102 | 63/395 | = 15.9% |
| Q6R4B4_Glutathione_S_transferase                                 | 57/359 | = 15.9% |
| Q870B9_Enolase   | 77/486 | = 15.8% |
| Q2VST0_Allergen_Ziz_m_1  | 69/437 | = 15.8% |
| Q9LEJ0_Enolase_1   | 78/506 | = 15.4% |
| Q01940_Major_allergen_Mal_f_1                                    | 64/419 | = 15.3% |
| Q9BQE9_B_cell_CLL_lymphoma_7_protein_family_member_B             | 51/336 | = 15.2% |

|   |        |         |
|---|--------|---------|
| Q9BPX6_Calcium_uptake_protein_1__mitochondrial              | 79/520 | = 15.2% |
| P87184_Alkaline_protease_2                                  | 83/547 | = 15.2% |
| P0C0Y5_Probable_NADP_dependent_mannitol_dehydrogenase       | 61/403 | = 15.1% |
| P43067_Alcohol_dehydrogenase_1                              | 67/446 | = 15.0% |
| O44119_Tropomyosin  | 61/406 | = 15.0% |
| O44119_Tropomyosin  | 61/406 | = 15.0% |
| D7F1J5_Arginine_kinase                                      | 67/454 | = 14.8% |
| P39675_Mite_allergen_Der_p_3                                | 56/382 | = 14.7% |
| Q9URR2_Allergen_Pen_n_13                                    | 68/467 | = 14.6% |
| Q8RUR1_Cry_j_1  | 69/472 | = 14.6% |
| Q8RUR1_Cry_j_1  | 69/472 | = 14.6% |
| P18632_Sugi_basic_protein                                   | 69/472 | = 14.6% |
| P18632_Sugi_basic_protein                                   | 69/472 | = 14.6% |
| P18632_Sugi_basic_protein                                   | 69/472 | = 14.6% |
| Q9N2R3_Tropomyosin  | 54/373 | = 14.5% |
| Q9FPRO_Pollen_allergen_Poa_p_5                              | 59/408 | = 14.5% |
| Q13765_Nascent_polypeptide_associated_complex_subunit_alpha | 51/351 | = 14.5% |
| P49273_Mite_allergen_Der_p_7                                | 53/365 | = 14.5% |
| Q86R84_60_kDa_allergen_Der_f_18p                            | 76/533 | = 14.3% |
| Q198W3_8S_globulin_beta_isoform                             | 71/496 | = 14.3% |
| P30941_Serine_protease_inhibitor_7                          | 54/378 | = 14.3% |
| Q84UI0_Allergen_Len_c_1_0102                                | 66/467 | = 14.1% |
| P02761_Major_urinary_protein                                | 49/347 | = 14.1% |
| O97192_Tropomyosin  | 57/403 | = 14.1% |
| Q00855_Mite_group_2_allergen_Der_f_2                        | 47/335 | = 14.0% |
| Q00855_Mite_group_2_allergen_Der_f_2                        | 47/335 | = 14.0% |
| Q00855_Mite_group_2_allergen_Der_f_2                        | 47/335 | = 14.0% |
| P42041_Aldehyde_dehydrogenase                               | 80/570 | = 14.0% |
| O82803_Small_rubber_particle_protein                        | 48/343 | = 14.0% |
| P83326_Pectinesterase_inhibitor                             | 49/353 | = 13.9% |
| Q9NH66_Salivary_allergen_2                                  | 54/392 | = 13.8% |
| Q8MVU3_Gelsolin_like_allergen_Der_f_16                      | 76/551 | = 13.8% |
| O18874_Minor_allergen_Can_f_2                               | 49/355 | = 13.8% |
| Q004B5_Arginine_kinase                                      | 63/461 | = 13.7% |
| Q702P0_Vicilin  | 67/498 | = 13.5% |
| O97370_Mite_allergen_Eur_m_3                                | 54/404 | = 13.4% |
| Q6W8Q2_1_Cys_peroxiredoxin_PER1                             | 50/375 | = 13.3% |
| O23791_Fruit_bromelain                                      | 67/505 | = 13.3% |
| Q547Q0_Minor_allergen_beta_fructofuranosidase               | 80/608 | = 13.2% |
| P49275_Mite_allergen_Der_f_3                                | 52/393 | = 13.2% |
| Q5TIW3_Pollen_allergen_Lol_p_4                              | 69/525 | = 13.1% |
| C7E3T4_Arginine_kinase                                      | 61/464 | = 13.1% |
| P92919_Chlorophyll_a_b_binding_protein__chloroplastic       | 53/407 | = 13.0% |
| P27759_Pollen_allergen_Amb_a_1_1                            | 64/491 | = 13.0% |
| Q69BZ7_Putative_uncharacterized_protein                     | 50/389 | = 12.9% |
| Q5GQ85_Allergen_Arg_r_1                                     | 44/342 | = 12.9% |
| Q39417_1_Sc1_protein  | 46/356 | = 12.9% |
| P27761_Pollen_allergen_Amb_a_1_3                            | 62/479 | = 12.9% |
| P27761_Pollen_allergen_Amb_a_1_3                            | 62/479 | = 12.9% |
| E1XUL4_Putative_pectate_lyase                               | 62/479 | = 12.9% |
| Q9SYV3_Major_allergen_mal_d_1                               | 43/337 | = 12.8% |
| Q8L6K9_Major_allergen_d_1                                   | 43/337 | = 12.8% |
| P05946_Sarcoplasmic_calcium_binding_protein_1               | 44/346 | = 12.7% |
| P02224_Globin_CTT_VI  | 45/354 | = 12.7% |
| O60025_IgE_binding_protein                                  | 45/355 | = 12.7% |
| Q4JK69_Group_15_allergen_protein_short_isoform              | 75/601 | = 12.5% |
| P43187_Calcium_binding_allergen_Bet_v_3                     | 47/376 | = 12.5% |
| P28744_Pollen_allergen_Amb_a_1_4                            | 64/512 | = 12.5% |



|   |        |         |
|---|--------|---------|
| P10737_Venom_allergen_5_02                                      | 49/392 | = 12.5% |
| Q5EF78_Icarapin   | 47/380 | = 12.4% |
| Q2F5T5_Arginine_kinase  | 59/476 | = 12.4% |
| D7F1P9_Sarcoplasmic_calcium_binding_protein                     | 43/346 | = 12.4% |
| Q9ST57_Serpin_Z2A   | 63/512 | = 12.3% |
| Q8MQS8_Venom_serine_protease_34                                 | 62/505 | = 12.3% |
| Q26456_Mite_allergen_Der_f_7                                    | 46/373 | = 12.3% |
| Q08169_Hyaluronidase  | 62/504 | = 12.3% |
| B4X640_Vicilin  | 74/604 | = 12.3% |
| B3GM11_Major_royal_jelly_protein_8                              | 64/519 | = 12.3% |
| Q941P7_Major_allergen_Mal_d_1_07                                | 42/343 | = 12.2% |
| Q8S4P9_48_kDa_glycoprotein                                      | 64/527 | = 12.1% |
| Q7Z269_Venom_serine_protease                                    | 47/387 | = 12.1% |
| Q3HWZ2_Der_f_2_allergen   | 41/338 | = 12.1% |
| Q3HWZ2_Der_f_2_allergen   | 41/338 | = 12.1% |
| Q3HWZ2_Der_f_2_allergen   | 41/338 | = 12.1% |
| Q3HWZ2_Der_f_2_allergen   | 41/338 | = 12.1% |
| Q3HWZ2_Der_f_2_allergen   | 41/338 | = 12.1% |
| Q3HWZ2_Der_f_2_allergen   | 41/338 | = 12.1% |
| Q3HWZ2_Der_f_2_allergen   | 41/338 | = 12.1% |
| Q3HWZ2_Der_f_2_allergen   | 41/338 | = 12.1% |
| P38948_Major_pollen_allergen_Aln_g_1                            | 43/356 | = 12.1% |
| P18153_37_kDa_salivary_gland_allergen_Aed_a_2                   | 56/463 | = 12.1% |
| O18873_Major_allergen_Can_f_1                                   | 43/354 | = 12.1% |
| Q4JK70_Group_15_allergen_protein                                | 75/627 | = 12.0% |
| P81656_Venom_allergen_5   | 46/384 | = 12.0% |
| P42058_Minor_allergen_Alt_a_7                                   | 45/375 | = 12.0% |
| P34754_3_phytase_B  | 68/568 | = 12.0% |
| P02668_Kappa_casein   | 45/374 | = 12.0% |
| P84298_Globin_CTT_VIIB_5_CTT_VIIB_9                             | 41/345 | = 11.9% |
| P12549_Globin_CTT_VIIB_6  | 41/345 | = 11.9% |
| Q84ND2_11S_globulin   | 68/577 | = 11.8% |
| Q39425_Major_allergen_Bet_v_1                                   | 42/356 | = 11.8% |
| P27760_Pollen_allergen_Amb_a_1_2                                | 59/499 | = 11.8% |
| E1XUL3_Putative_pectate_lyase                                   | 59/499 | = 11.8% |
| Q9U6R7_98kDa_HDM_allergen                                       | 73/625 | = 11.7% |
| Q9U1G2_Mite_allergen_Lep_d_7                                    | 41/350 | = 11.7% |
| Q702P1_Vicilin  | 63/538 | = 11.7% |
| Q39415_1_Sc_3_protein   | 41/350 | = 11.7% |
| P82615_Latherin   | 41/351 | = 11.7% |
| F0UZ11_Allergen_lipocalin_Cav_p_2_0101                          | 42/358 | = 11.7% |
| B6RQS1_Pollen_allergen_Que_a_1_isoform                          | 41/350 | = 11.7% |
| Q6QHU1_Major_cherry_allergen_Pru_av_1_0203                      | 40/344 | = 11.6% |
| P52407_Glucan_endo_1_3_beta_glucosidase__basic_vacuolar_isoform | 58/501 | = 11.6% |
| P02663_Alpha_S2_casein  | 43/371 | = 11.6% |
| Q9STB5_Superoxide_dismutase                                     | 45/391 | = 11.5% |
| Q9FSJ2_Superoxide_dismutase                                     | 45/391 | = 11.5% |
| Q39454_Major_allergen_Cor_a_1                                   | 41/355 | = 11.5% |
| Q39430_Major_allergen_Bet_v_1                                   | 41/356 | = 11.5% |
| P02662_Alpha_S1_casein  | 44/383 | = 11.5% |
| Q96370_Pollen_allergen_Bet_v_1                                  | 40/352 | = 11.4% |
| Q96368_Pollen_allergen_Bet_v_1                                  | 40/352 | = 11.4% |
| Q941P8_Major_allergen_Mal_d_1_03D                               | 39/342 | = 11.4% |
| Q84LA7_Major_allergen_Mal_d_1                                   | 39/342 | = 11.4% |
| Q5ZQK5_Pollen_allergen_Phl_p_4                                  | 69/607 | = 11.4% |
| Q39431_Major_allergen_Bet_v_1                                   | 40/352 | = 11.4% |
| P43177_Major_pollen_allergen_Bet_v_1_D_H                        | 40/352 | = 11.4% |

|   |        |         |
|---|--------|---------|
| P42059_Minor_allergen_Cla_h_7                             | 44/387 | = 11.4% |
| P14004_Mite_allergen_Der_p_5                              | 39/342 | = 11.4% |
| P14004_Mite_allergen_Der_p_5                              | 39/342 | = 11.4% |
| P12548_Globin_CTT_VIIB_3                                  | 39/343 | = 11.4% |
| P02666_Beta_casein  | 45/396 | = 11.4% |
| P00785_Actinidain   | 58/511 | = 11.4% |
| O22120_Alpha_subunit_of_beta_conglycinin                  | 67/590 | = 11.4% |
| O04828_Pollen_allergen                                    | 53/463 | = 11.4% |
| D1YSM5_Bet_v_1_related_allergen                           | 40/351 | = 11.4% |
| Q9ZS24_Cytosolic_class_I_small_heat_shock_protein_HSP17_5 | 40/354 | = 11.3% |
| Q8RVW4_Minor_allergen_beta_fructofuranosidase             | 78/690 | = 11.3% |
| P35778_Venom_allergen_3                                   | 43/380 | = 11.3% |
| Q9UW98_Dipeptidyl_peptidase_5                             | 86/766 | = 11.2% |
| Q9SWR4_Major_allergen_Cor_a_1_0401                        | 39/347 | = 11.2% |
| O18535_Cr_PII_protein                                     | 42/375 | = 11.2% |
| E1XUL9_Putative_pectate_lyase                             | 57/507 | = 11.2% |
| C7C4X1_Glyceraldehyde_3_phosphate_dehydrogenase           | 55/493 | = 11.2% |
| Q9TZR6_Major_allergen_Per_a_1_0101                        | 42/378 | = 11.1% |
| Q9FZP9_Alpha__subunit_of_beta_conglycinin                 | 67/603 | = 11.1% |
| Q96367_Pollen_allergen_Bet_v_1                            | 39/352 | = 11.1% |
| Q96366_Pollen_allergen_Bet_v_1                            | 39/352 | = 11.1% |
| Q96365_Pollen_allergen_Bet_v_1                            | 39/352 | = 11.1% |
| Q8L5L6_Vicilin_like_protein                               | 71/637 | = 11.1% |
| Q39426_Major_allergen_Bet_v_1                             | 39/352 | = 11.1% |
| Q39420_1_Sc2_protein                                      | 40/359 | = 11.1% |
| P56578_Putative_peroxiredoxin                             | 39/351 | = 11.1% |
| P51528_Phospholipase_A1                                   | 50/451 | = 11.1% |
| P45431_Major_pollen_allergen_Bet_v_1_B                    | 38/341 | = 11.1% |
| P35775_Venom_allergen_2                                   | 37/332 | = 11.1% |
| P15494_Major_pollen_allergen_Bet_v_1_A                    | 39/352 | = 11.1% |
| P15494_Major_pollen_allergen_Bet_v_1_A                    | 39/352 | = 11.1% |
| C7E9W0_SchS21_protein                                     | 38/341 | = 11.1% |
| Q9Y750_Malate_dehydrogenase                               | 54/493 | = 11.0% |
| Q9SYV9_Major_allergen_mal_d_1                             | 39/353 | = 11.0% |
| Q9SYV8_Major_allergen_mal_d_1                             | 39/353 | = 11.0% |
| Q9SYV4_Major_allergen_mal_d_1                             | 39/355 | = 11.0% |
| Q9SYV2_Major_allergen_mal_d_1                             | 39/353 | = 11.0% |
| Q9S7M5_Allergen_Mal_d_1_02                                | 39/353 | = 11.0% |
| Q9FPK2_Major_allergen_variant_Cor_a_1_0404                | 38/347 | = 11.0% |
| Q941P5_Ribonuclease_like_PR_10a                           | 39/353 | = 11.0% |
| Q8L5L5_Vicilin_like_protein                               | 71/644 | = 11.0% |
| Q40280_Major_allergen_Mal_d_1                             | 39/353 | = 11.0% |
| Q40280_Major_allergen_Mal_d_1                             | 39/353 | = 11.0% |
| P26987_Stress_induced_protein_SAM22                       | 39/354 | = 11.0% |
| P02228_Globin_CTT_X                                       | 38/345 | = 11.0% |
| O24248_Major_allergen_Pru_av_1                            | 39/354 | = 11.0% |
| Q9AUD0_7S_globulin  | 69/635 | = 10.9% |
| Q96377_Pollen_allergen_Car_b_1                            | 39/359 | = 10.9% |
| Q95182_Major_allergen_Equ_c_1                             | 41/377 | = 10.9% |
| Q7Y1X1_Esterase   | 54/497 | = 10.9% |
| Q39429_Major_allergen_Bet_v_1                             | 38/349 | = 10.9% |
| Q39428_Major_allergen_Bet_v_1                             | 38/349 | = 10.9% |
| P67875_Ribonuclease_mitogillin                            | 38/348 | = 10.9% |
| O50001_Major_allergen_Pru_ar_1                            | 37/338 | = 10.9% |
| B2D0J5_Venom_carboxylesterase_6                           | 69/634 | = 10.9% |
| Q8WQK5_Major_Der_f_2_isoform                              | 36/332 | = 10.8% |
| Q8WQK5_Major_Der_f_2_isoform                              | 36/332 | = 10.8% |
| Q40962_Pollen_allergen_Ph1_p_5a                           | 51/471 | = 10.8% |

|  |        |         |
|--|--------|---------|
| Q25640_Allergen                            | 60/557 | = 10.8% |
| P84296_Globin_CTT_VIIB_4                   | 38/352 | = 10.8% |
| P43185_Major_pollen_allergen_Bet_v_1_L     | 38/352 | = 10.8% |
| P43180_Major_pollen_allergen_Bet_v_1_G     | 38/352 | = 10.8% |
| P43178_Major_pollen_allergen_Bet_v_1_E     | 38/352 | = 10.8% |
| P92918_Major_allergen_Api_g_2              | 38/356 | = 10.7% |
| P10736_Venom_allergen_5_01                 | 43/402 | = 10.7% |
| Q8SAE7_Major_allergen_isoform_Dau_c_1_0201 | 37/349 | = 10.6% |
| Q39427_Major_allergen_Bet_v_1              | 37/349 | = 10.6% |
| P81657_Venom_allergen_5                    | 41/385 | = 10.6% |
| P53357_Phospholipase_A1_2                  | 48/451 | = 10.6% |
| P43186_Major_pollen_allergen_Bet_v_1_M_N   | 37/349 | = 10.6% |
| P43184_Major_pollen_allergen_Bet_v_1_K     | 37/349 | = 10.6% |
| P43179_Major_pollen_allergen_Bet_v_1_F_I   | 38/357 | = 10.6% |
| P43176_Major_pollen_allergen_Bet_v_1_C     | 37/349 | = 10.6% |
| P29291_Troponin_C_isoform_2B               | 35/329 | = 10.6% |
| P20347_Cysteine_protease_inhibitor_1       | 42/395 | = 10.6% |
| O93969_Allergen                            | 38/360 | = 10.6% |
| O60022_Allergen_Asp_f_15                   | 38/357 | = 10.6% |
| D5MU14_Vitellogenin                        | 37/350 | = 10.6% |
| B6RQS2_Pollen_allergen_Que_a_1_isoform     | 39/367 | = 10.6% |
| Q9Y197_Alpha_amylase                       | 62/593 | = 10.5% |
| Q96X46_Enolase                             | 60/572 | = 10.5% |
| Q84V37_Profilin                            | 35/334 | = 10.5% |
| Q42499_Major_allergen_Bet_v_1              | 37/352 | = 10.5% |
| Q2TL59_Calreticulin                        | 67/636 | = 10.5% |
| Q2I6V8_Major_allergen_Pru_p_1              | 37/354 | = 10.5% |
| P43214_Pollen_allergen_Phl_p_2             | 35/333 | = 10.5% |
| P43183_Major_pollen_allergen_Bet_v_1_J     | 37/352 | = 10.5% |
| O04298_Major_allergen_Dau_c_1              | 36/342 | = 10.5% |
| O04298_Major_allergen_Dau_c_1              | 36/342 | = 10.5% |
| O04298_Major_allergen_Dau_c_1              | 36/342 | = 10.5% |
| O04298_Major_allergen_Dau_c_1              | 36/342 | = 10.5% |
| O04298_Major_allergen_Dau_c_1              | 36/342 | = 10.5% |
| B0YIU5_Ara_h_8_allergen_isoform            | 39/373 | = 10.5% |
| Q9M7R0_Calcium_binding_allergen_Ole_e_8    | 40/384 | = 10.4% |
| Q84UI2_Phl_p5a_allergen                    | 49/472 | = 10.4% |
| Q5VFH6_Allergen_Fel_d_4                    | 39/376 | = 10.4% |
| O23754_Major_allergen_Bet_v_1              | 37/357 | = 10.4% |
| Q96371_Pollen_allergen_Bet_v_1             | 36/349 | = 10.3% |
| Q43549_Major_allergen_Mal_d_1              | 36/350 | = 10.3% |
| P42040_Enolase                             | 60/580 | = 10.3% |
| E7BQV3_Hevamine                            | 42/409 | = 10.3% |
| C1KEU0_Sal_k_3_pollen_allergen             | 84/819 | = 10.3% |
| Q9Y8B8_Peroxisomal_membrane_protein        | 37/361 | = 10.2% |
| Q96VP4_Enolase                             | 58/569 | = 10.2% |
| Q43552_Major_allergen_Mal_d1               | 35/342 | = 10.2% |
| Q43550_Major_allergen_Mal_d_1              | 35/342 | = 10.2% |
| O93970_Peptidyl_prolyl_cis_trans_isomerase | 37/364 | = 10.2% |
| O81341_Group_V_allergen_Phl_p_5_0103       | 50/491 | = 10.2% |
| O02380_Mite_group_2_allergen_Tyr_p_2       | 35/343 | = 10.2% |
| D7F1Q0_Triosephosphate_isomerase           | 45/441 | = 10.2% |
| Q9XG85_Profilin_1                          | 36/357 | = 10.1% |
| Q9M4S3_Cup_s_1_pollen_allergen             | 51/505 | = 10.1% |
| Q9M4S2_Cup_s_1_pollen_allergen             | 51/506 | = 10.1% |
| Q9FPK4_Major_allergen_variant_Cor_a_1_0402 | 35/346 | = 10.1% |
| Q9FPK3_Major_allergen_variant_Cor_a_1_0403 | 35/346 | = 10.1% |
| Q96X30_Enolase                             | 58/576 | = 10.1% |

|  |        |   |       |
|--|--------|---|-------|
| Q6TPK4_Cysteine_proteinase_inhibitor_1 | 34/337 | = | 10.1% |
| Q43680_Mung_bean_seed_albumin          | 42/414 | = | 10.1% |
| P83377_Venom_allergen_5                | 40/397 | = | 10.1% |
| P28296_Alkaline_protease_1             | 55/543 | = | 10.1% |
| Q8T5G9_Triosephosphate_isomerase       | 41/412 | = | 10.0% |
| Q43551_Major_allergen_Mal_d1           | 34/341 | = | 10.0% |
| Q39453_Major_allergen_Cor_a_1          | 35/349 | = | 10.0% |
| Q17284_Fatty_acid_binding_protein      | 34/341 | = | 10.0% |
| P80384_Mite_group_2_allergen_Lep_d_2   | 36/360 | = | 10.0% |
| P80384_Mite_group_2_allergen_Lep_d_2   | 36/360 | = | 10.0% |
| P80384_Mite_group_2_allergen_Lep_d_2   | 36/360 | = | 10.0% |
| P80384_Mite_group_2_allergen_Lep_d_2   | 36/360 | = | 10.0% |

—

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**Toxicology**

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## **SUMMARY OF TOXICITY DATA**

### **Asparaginase PPV33595**

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## 1. SUMMARY

The below series of toxicological tests were undertaken to evaluate the toxicological profile of Asparaginase PPV33595.

All studies were carried out in accordance with current OECD guidelines and in compliance with the OECD principles of Good Laboratory Practice (GLP). The studies were carried out and finalised at CiTox/Scantox, DK, Huntingdon Life Sciences or in-house at Novozymes A/S during the period March 2012 to January 2013.

The main conclusions of the safety studies can be summarized as below:

- Asparaginase PPV33595 was considered non-cytotoxic *in vitro* in a Neutral Red Uptake assay applying the BALB/c 3T3 cells as test system.
- The Ames test showed no mutagenic activity of Asparaginase PPV33595, neither in the absence or presence of S9.
- Asparaginase PPV33595 did not cause an increase in the induction of micronuclei in cultured human lymphocytes in this *in vitro* test using human lymphocytes either in the presence or in the absence of S-9 mix.
- In a 13 weeks oral toxicity study in rats Asparaginase PPV33595 was well tolerated and did not cause any toxicologically significant changes at any dose level.

Based on the present toxicity data it can be concluded that Asparaginase PPV33595 exhibits no toxicological effects under the experimental conditions described.

## 2. TEST SUBSTANCE

### 2.1 Production organism

The production organism is a non-pathogenic *Bacillus subtilis* microorganism carrying the genes coding for asparaginase. Three genes of *asnP23MHU* (coding for the asparaginase) was introduced into the chromosome of the recipient *B. subtilis*. The host strain is derived from strain A164 by modifying several chromosomal loci to introduce deletion of genes encoding a number of proteases. Also a gene essential for sporulation was deleted, eliminating the ability to sporulate, together with a gene essential for formation of surfactin. The lack of these peptides and proteins represents improvements in product safety and stability.

### 2.2 Characterization

The test substances were the 3 sub-batches (HQFR9, HQFR10 and HQFR11) and the toxbatch PPV33595 mixed from the three sub-batches of Asparaginase. The toxbatch PPV33595 was used for the conduct of all the toxicological studies. The characterisation of the toxbatch is presented in table 1.

Table 1. The composition of the Asparaginase toxbatch used during the studies reviewed.

| Batch number                             | PPV33595     |
|--|--------------|
| Activity                                 | 55200 TASU/g |
| Water (KF) (% w/w)                       | 86.9         |
| Dry matter (% w/w)                       | 13.1         |
| Ash (% w/w)                              | 1.7          |
| Total Organic Solids (TOS <sup>1</sup> ) | 11.4         |
| Specific gravity (g/mL)                  | 1.059        |

<sup>1</sup> % TOS is calculated as 100% - % water - % ash - % diluents.

## 3. CYTOTOXICITY

### 3.1 *In Vitro* Cytotoxicity Test: Neutral Red Uptake in BALB/c 3T3 cell culture.

Asparaginase, batch PPV33595, was examined for cytotoxic potential in an *in vitro* bioassay, the Neutral Red Uptake assay using BALB/c 3T3 cells in 96-well microplates.

The time of exposure for the test substance and positive control was 48 hours in total. The concentration of the test substance required to reduce the viability of the treated test system to 50% of that of the untreated control test system was determined as the endpoint (NRU50). The NRU50 value for Asparaginase, batch PPV33595 was calculated from the linear part of the curve (10 to 1 mg Asparaginase/mL) and determined to be 5.72 mg/mL.

Conclusion: The NRU50 value for Asparaginase, batch PPV33595 is 5.72 mg/mL in the present *in vitro* Neutral Red Uptake assay applying the BALB/c 3T3 cell line as test system.

## 4. MUTAGENICITY

### 4.1 Test for Mutagenic Activity with Strains of *Salmonella typhimurium* and *Escherichia coli*

Asparaginase was examined for mutagenic activity in four histidine-dependent strains of *Salmonella typhimurium*, strain TA98, TA100, TA1535 and TA1537 and the tryptophan-dependent strain *Escherichia coli* WP2uvrApKM101 using a "treat and plate" procedure.



The study was carried out with and without the metabolic activation system S9 - a liver preparation from male rats, pre-treated with Aroclor 1254, and the co-factors required for mixed function oxidase activity (S9 mix). Each test with each strain was conducted on two separate occasions. In all experiments bacteria were exposed to 6 doses separated with bi-sections. The highest dose level applied was 5 mg (dry matter) per ml as the highest concentration.

No toxicity of the test substance to the bacteria was observed.

No treatment of any of the Salmonella and E.coli strains with Asparaginase PPV33595 resulted in any increases in revertant numbers that meet the criteria for a positive or equivocal response.

It was concluded that Asparaginase PPV33595 did not induce gene mutations in bacteria in either the absence or presence of S9, when tested under the conditions employed in this study.

## **4.2 *In vitro* Micronucleus Test In Cultured Human Lymphocytes**

Asparaginase, PPV33595 was tested in an *in vitro* cytogenetics assay using cultured human lymphocytes stimulated to divide by addition of phytohaemagglutinin (PHA) 48 hours prior to treatment. The lymphocytes were treated for 3 hours in both absence and presence of metabolic activation (S9 mix) and for 20 hours in the absence of S9 mix. In this study, blood taken from healthy male non-smoking donors was pooled and diluted with tissue culture medium. Five test concentrations were assessed for determination of induction of micronuclei. The highest Asparaginase, PPV33595 concentration selected (2.5 % v/v) was that which did not alter the osmolality of the medium by more than 50 mOsm/kg relative to the vehicle controls. Concentrations of Asparaginase, PPV33595 selected for micronucleus analysis were 0.16, 0.31, 0.63, 1.25 and 2.5% v/v.

In both the absence and presence of S9 mix following 3-hour treatment, and in the absence of S9 mix following 20 hour treatment, Asparaginase, PPV33595 did not cause any statistically significant increases in the number of binucleate cells containing micronuclei when compared with the vehicle controls.

The positive control compounds (mitomycin C, colchicine and cyclophosphamide) caused significant increases in the number of binucleate cells containing micronuclei demonstrating the efficacy of the test system.

It is concluded that Asparaginase, PPV33595 administered for 3 hours at concentrations of up to 2.5% v/v, in both the absence and presence of S9 mix, and for 20 hours in the absence of S9 mix only, did not show evidence of causing an increase in the induction of micronuclei in cultured human lymphocytes.

## **5. IN VIVO TOXICITY**

### **5.1 13 Weeks Oral Toxicity Study in Rats**

The objective of this study was to assess the systemic toxic potential of Asparaginase PPV33595 when administered daily by oral treatment (gavage) to rats for 13 weeks.

Three groups, each comprising ten males and ten females, received Asparaginase, PPV33595 at doses of 1.0, 3.3 or 10.0 mL/kg/day corresponding to 0.121 g TOS/kg bw or 58457 TASU/kg in Group 2, 0.398 g TOS/kg bw or 192907 TASU/kg in Group 3 and 1.207g TOS/kg bw or 584568 TASU/kg in Group 4. A similarly constituted Control group received the vehicle (purified water obtained by reverse osmosis) at the same volume-dosage.

During the study, clinical condition, detailed physical and arena observations, sensory reactivity, grip strength, motor activity, bodyweight, food and water consumption, ophthalmic examination, haematology, blood chemistry, organ weight, macropathology and histopathology investigations were undertaken.

No treatment related signs were recorded at the clinical examination (clinical observations,

open field and stimuli tests and ophthalmoscopy), on body weight gain, on food or water consumption or on clinical pathology parameters. At necropsy, no microscopic or macroscopic treatment related findings were observed.

In conclusion, 90 days of oral (gavage) treatment of rats with Asparaginase, PPV33595, at dose levels of up to 1.207g TOS/kg bw or 584568 TASU/kg administered at a dose volume of 10 ml/kg did not cause any treatment related changes. The NOAEL (No Observed Adverse Effect Level) for both female and male animals for Asparaginase, PPV33595, is 1.207g TOS/kg bw corresponding to 584568 TASU/kg bw.

## 6. REFERENCES

Asparaginase, batch PPV33595, In Vitro Cytotoxicity Test: Neutral Red Uptake in BALB/c 3T3 cell culture. Novozymes references number: 20128030. File No.: 2012-07837-01. 12 April 2012.

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**Toxicology**

Date: 23. January 2013  
Project: DEV00851  
File: 2013-01259-01  
Ref.: PBjP/PScK

## **R E P O R T**

***Asparaginase, batch PPV33595:  
Test for Mutagenic Activity with Strains of  
Salmonella typhimurium and Escherichia coli.***

**Study No. 20128071**

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## GLP - Compliance Statement

**REPORT:** Asparaginase, Batch PPV33595: Test for Mutagenic Activity with Strains of *Salmonella typhimurium* and *Escherichia coli* .

**STUDY No.:** 20128071

A sample of Asparaginase, Batch PPV33595 was received from Recovery Pilot Plant, Novozymes A/S.

This study was conducted at the department of Toxicology, Novozymes A/S in compliance with the following current Good Laboratory Practice Regulations:

OECD, ENV/MC/CHEM(98)17, 1998

Date:

23 Jan. 2013



Study Director

## QUALITY ASSURANCE STATEMENT

REPORT: Asparaginase, PPV33595  
Test for Mutagenic Activity with Strains of Salmonella  
typhimurium and Escherichia coli

STUDY NUMBER 20128071

The conduct of this study has been subject to appropriate inspections and the report has been reviewed according to the relevant Standard Operation Procedures of Novozymes A/S Quality Assurance.

| Inspection/Audit | Dates of inspection | Inspection results reported to Study Director and Study Management |
|------------------|---------------------|--|
| Protocol         | 24 AUG 2012         | 24 AUG 2012  |
| Genotype control | 4 SEP 2012          | 4 SEP 2012   |
| Report           | 7 DEC 2012          | 7 DEC 2012   |

I hereby confirm that the report reflects the raw data.

23 JAN 2013

Date

Quality Assurance

## 1. General Information

**STUDY** Asparaginase, Batch PPV33595: Test for Mutagenic Activity with Strains of *Salmonella typhimurium* and *Escherichia coli*.  
Study No. 20128071

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**ARCHIVE** QM Central Archive  
Novozymes A/S  
Krogshøjvej 36  
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**DATES OF STUDY**  
Study initiation date: 23.August 2012  
Experimental start date: 27.August 2012  
Experimental termination: 29.October 2012

**PERSONNEL INVOLVED IN THE STUDY**  
[REDACTED] Toxicology  
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### DATE OF FINAL REPORT

Date: 23 Jan. 2013

[REDACTED]  
Toxicology



## 2. Summary

Asparaginase (Batch Number: PPV33595) was examined for mutagenic activity in the bacterial reverse mutation assay using *Salmonella typhimurium* strain TA1535, TA100, TA1537, TA98 and *Escherichia coli* WP2uvrApKM101.

Crude enzyme preparations, like the present batch of Asparaginase contain the free amino acid histidine and tryptophan, most often in an amount, which exceeds the critical concentration for incorporation in the direct standard assay.

To overcome this problem all strains were exposed to Asparaginase in liquid culture ("treat and plate assay"). Bacteria were exposed to 6 doses of the test substance in a phosphate buffered nutrient broth for 3 hours with 5 mg (dry matter) per ml as highest concentration. After incubation the test substance was removed by centrifugation prior to plating.

The study was conducted with and without the metabolic activation system S9 - a liver preparation from male rats, pre-treated with Aroclor 1254, and the co-factors required for mixed function oxidase activity (S9 mix). All results were confirmed by conducting two complete and independent experiments.

Asparaginase contains an abundance of various nutrients, and composes a rich growth medium to the test bacteria. These circumstances are only reflected to a minor extent in the present study.

No toxicity of the test substance to the bacteria is observed.

Growth stimulation ("feeding effect") is present in a few test series especially with especially in the *E.coli* strain as demonstrated by increases in the viable count of exposed cultures compared to the solvent control. These conditions have no obvious influence on the revertant colony count

No treatments of any of the *Salmonella* and *E.coli* strains with Asparaginase resulted in any increases in revertant numbers that meet the criteria for a positive or equivocal response.

### 3. Introduction

Bacterial reverse mutation assays have been recognized and used for more than three decades as a rapid, sensitive and reliable method of evaluating the mutagenic potential of chemicals. Bacterial systems offer several advantages to other test systems. They can be grown in large numbers in a short time, enabling the detection of very rare mutational events. Further, extensive knowledge of bacterial genetics has allowed the construction of special strains, which are more sensitive than wild-type strains are to a variety of agents. The reversion of bacteria from growth-dependence on a particular amino acid to growth in the absence of that amino acid is the most widely used marker in reverse-mutation assays. The genetic target is small, specific and selective, and the phenotypic effect of the reverse mutation is easily detected.

A wide range of strains within the species *Salmonella typhimurium* (Ames strains) and *Escherichia coli* have been constructed in order to make the test system more sensitive and selective to different classes of chemical mutagens.

By incorporation of the post-mitochondrial supernatant (S9) from the livers of rats pretreated with an enzyme inducer Aroclor 1254, the metabolising systems present in mammalian cells are mimicked to facilitate the detection of a wide range of pro-mutagens.

This report describes experiments performed to assess the activity of Asparaginase (Batch Number: PPV33595) in amino acid dependent strains of *Salmonella typhimurium* and *Escherichia coli* capable of detecting both induced frame-shift (TA1537 and TA98) and base-pair substitution mutations (TA1535, TA100, and *E. coli* WP2uvrA pKM101). Asparaginase (Batch Number: PPV33595) is a microbial enzyme preparation derived from submerged pure culture fermentation of a non-pathogenic and non-toxicogenic strain. It contains a variety of unspent medium residues, including low concentrations of free amino acids like histidine and tryptophan.

This complexity poses several problems during mutagenicity testing in vitro. In the Ames test it composes a rich growth medium to the test bacteria, resulting in completely different and poorly defined environments of exposed cultures compared to control cultures. The main problem is the content of utilizable histidine and tryptophan in the test material, since the principle of the Ames test is the histidine auxotrophy of the *Salmonella* strains and tryptophan auxotrophy of the *E. coli* strains.

As a result, the density of the bacterial background lawn increase with increasing doses ("feeding effect") followed by dose related increases in the number of spontaneous revertant. These increases are obviously artificial.

To overcome this problem all strains applied in the present study were treated with Asparaginase in liquid culture ("treat and plate assay").

The study was conducted in accordance with the general recommendations in OECD Guideline for testing of chemicals, No. 471: Bacterial Reverse Mutation Assay" (July 1997 concerning the general specifications of the test. However the exposure of test bacteria in liquid culture ("treat and plate") is not specifically described in any guidelines.

### 4. Materials

#### 4.1 Test substance

Asparaginase (Batch Number: PPV33595, TKS number 223/2012 029) was received from RPP, 19 March 2012, and immediately stored in a freezer. The substance was a brown liquid with a declared content of 13.1 % (w/w) dry matter.

A standard solution of 5% (w/v) dry matter was prepared in deionised water and sterilised by filtration. The sterility was confirmed by plate counting. Solution was stored refrigerated and used as test substance.



## 4.2 Positive control substances

| Chemical                                   | Source         | Lot.No.     |
|--|----------------|-------------|
| 2-Nitrofluorene (2-NF)                     | Aldrich-Chemie | S 43858 V   |
| Acridine mutagen (ICR-191)                 | Sigma          | 031M 1947 V |
| 1-Methyl-3-Nitro-N-NitrosoGuanidine (MNNG) | Aldrich-Chemie | 15427 LO    |
| 2-Aminoanthracene (2-AA)                   | Aldrich-Chemie | STBB1901    |

All positive control substances were dissolved in dimethyl sulphoxide (spectrophotometric grade).

## 4.3 Liver homogenate – S9

A commercial preparation of S9 from Aroclor 1254 induced Sprague Dawley rats was obtained from Cappel/MP Biomedicals, LLC, 29525 Fountain Parkway, Solon, Ohio 44139. Specifications of the preparation, the enzymatic properties and metabolic activation from the supplier are archived as raw data.

The tubes with S9 were received frozen in dry ice and were immediately stored in a  $-80^{\circ}\text{C}$  ultra low freezer at Toxicology, Novozymes.

## 4.4 Plates

As selective substrate for reverted bacteria Vogel-Bonner medium E agar plates with 2% glucose was prepared in-house as described in Appendix 3.

All plates were stored refrigerated in closed plastic bags and examined for contamination and dryness before use.

## 4.5 Bacteria

### *Salmonella typhimurium*

Four strains of *Salmonella typhimurium* were used:

*S. typhimurium* TA1535

*S. typhimurium* TA100

*S. typhimurium* TA1537

*S. typhimurium* TA98

All these strains contain mutations in the histidine operon, thereby imposing a requirement for histidine in the growth medium. They all contain GC base-pairs at the site of the histidine mutation, and are therefore selective for agents which react predominantly with these bases. Three mutations in the histidine operon are involved: his G 46 (TA1535 and TA100) is a missense mutation which is reverted to prototrophy by a variety of mutagens that cause base-pair substitutions.

his C 3076 (TA1537) contains a frame-shift which appears to have added a GC base-pair. This mutation is reverted for example by ICR-191 and epoxides of polycyclic hydrocarbon. his D 3052 (TA98) also contains a frame-shift mutation with a sequence of repeated GC, which is reverted with the deletion of 2 of these base-pairs. It is readily reverted by aromatic amines and derivatives.

All four strains contain the deep rough (*rfa*) mutation, which deletes the polysaccharide side chain of the polysaccharide coat of the bacterial cell surface. This deletion increases cell permeability to more hydrophobic substances and, furthermore, greatly decreases the pathogenicity of these organisms.

The *uvrB* deletion renders the strains incapable of excision repair, making them more sensitive both to the mutagenic and lethal effects of a wide variety of mutagens (e.g. poly-aromatic hydrocarbons), since the strains cannot excise DNA adducts.

These two deletions include the nitrate reductase (*chl*) and biotin (*bio*) genes also.

Strain TA98 and TA100 are derived from strain TA1538 and TA1535 respectively by the addition of a plasmid, pKM101, which confers resistance to ampicillin. This plasmid also carries a gene (*muc<sup>+</sup>*), which in some strains (*recA<sup>+</sup>/lexA<sup>+</sup>*) have proven to participate in "SOS" DNA-repair. This repair pathway is induced by DNA damage and confers resistance to the lethal effects of many mutagens at the expense of increased mutability. Bacteria carrying pKM101 have therefore a higher spontaneous mutation rate.

### **Escherichia coli**

One strain was used:

*Escherichia coli* WP2uvrApKM101

This strain contain an ochre mutation in the *trpE* locus and can be mutated to tryptophan independence either by a base-pair reversion of an A-T base-pair in the *trpE* locus, or more likely, by a base-pair substitution within a number of transfer RNA loci elsewhere in the chromosome. The latter causes the original defect to be suppressed (ochre suppression) and involves only base-pair substitution transitions at G-C base-pairs.

Like the *uvrB* mutation in the *Salmonella* strains, the *uvrA* mutation causes the bacteria to be deficient in the excision of bulky lesions from the DNA, so, it is more readily mutated by certain agents (ultraviolet radiation, polycyclic hydrocarbons). Further the strain contains the pKM101 plasmid as described above for the *Salmonella* strains.

## **4.6 Bacterial cultures**

The test strains of *Salmonella typhimurium* LT2 were obtained from Prof. B.N. Ames, Biochemistry Department, University of California, Berkeley, CA 94720, U.S.A.

*Escherichia coli* WP2uvrApKM101 was obtained from Covance Laboratories Ltd, Otley road, Harrogate, North Yorkshire HG3 1PY, England.

New batches of culture stocks frozen in 8% dimethyl sulphoxide are prepared at intervals from a central stock held in a  $-150^{\circ}\text{C}$  freezer. They are regularly checked for appropriate amino acid requirement, spontaneous reversion rate, genetic characters and response to diagnostic mutagens.

Samples of each strain were grown up overnight in Nutrient broth in a  $37 \pm 1^{\circ}\text{C}$  water bath with shaking. Fresh cultures were prepared before each test.

## **4.7 S9 mix**

Composition of a 10% V/V S9 mix (final concentrations):

Co-factors:

|  |             |
|--|-------------|
| -phosphate buffer (0.2M, pH 7.4) .....             | 100 mM      |
| -salts (1.65M KCl, 0.4 M MgCl <sub>2</sub> ) ..... | 33 and 8 mM |
| -glucose-6-phosphate, mono-Na salt (0.2M) .....    | 5 mM        |
| -NADP, di-Na salt (0.1M) .....                     | 4 mM        |
| S9 preparation .....                               | 10% V/V     |

A freshly prepared solution of the co-factors was filter-sterilised by passage through a 0.2  $\mu\text{m}$  membrane filter and mixed 9:1 (v/v) with freshly thawed still cold S9 preparation. This S9 mix was prepared freshly each day, and immediately used. Unused reagent was discarded.

## **4.8 Test material**

Serial dilutions of a sterile standard solution of 5% (w/v dry matter) Asparaginase, Batch number PPV33595, were prepared in sterile deionised water corresponding to the final dose levels:

5000  $\mu\text{g}$  - 2500  $\mu\text{g}$  - 1250  $\mu\text{g}$  - 625  $\mu\text{g}$  - 313  $\mu\text{g}$  - 156  $\mu\text{g}$  dry matter per mL.



The dilutions were prepared freshly each day just before use.  
This range of doses was applied in experiments with respectively without S9.

#### 4.9 Top agar

0.6 % soft agar was sterilised by autoclaving.  
Bottles with 200 ml melted soft agar were kept at about 55°C and added 20 ml 0.5 mM L-histidine/biotin solution for strains of *Salmonella* or 20 ml 0.5 mM tryptophan solution for *Escherichia coli*. This molten agar was divided into 2 ml aliquots in sterile glass tubes and placed in a heat-block at  $45 \pm 1^\circ\text{C}$ .

### 5. Methods

#### 5.1. Treat and plate assay

This procedure was applied with all strains.

For each assay sterile tubes were added:

- 4 ml Nutrient broth
- 4 ml S9 mix or 0.2M phosphate buffer (pH 7.4)
- 1 ml bacterial culture
- 1 ml test substance solution (6 doses) or diagnostic mutagen solution (positive control) or sterile deionised water (solvent control).

These incubation mixtures were incubated with shaking at  $37 \pm 1^\circ\text{C}$  for 3 hours.

After incubation all bacterial suspensions were washed two times by centrifugation for 10 minutes at 1272 X g. After the first washing the bacterial pellets were resuspended in 5 ml phosphate buffer (pH 7.4, 0.2M) and finally they were re-suspended in 1 ml phosphate buffer.

Tubes with top agar were added 0.1 ml of all washed bacterial suspensions.

#### 5.2 Selective incubation

For each dose of the test substance and the standard mutagens three similar tubes with top agar were prepared and five tubes were prepared for the solvent control.

These tubes were poured on to minimal glucose agar plates. When the soft agar set, the plates were inverted and incubated at  $37 \pm 2^\circ\text{C}$  for about 72 hours as described in the standard operating procedures.

After incubation the numbers of revertant colonies were counted automatically (Perceptive Instruments). Plates with less than about 20 colonies were counted manually.

#### 5.3 Viable cell count

0.1 ml aliquots of a  $10^{-6}$  dilution of each bacterial suspension were poured on to minimal glucose agar plates (added the required amino acids in excess) in duplicates.

#### 5.4 Controls

The following controls were run with each experiment:

##### Genotype checking:

Sensitivity for crystal violet (rfa-character), (all *Salmonella* strains)

Sensitivity for Mitomycin C uvrB (*Salmonella*) and uvrA pKM101 (*E.coli*).

Resistance to ampicillin TA98 & TA100 (*Salmonella*) and uvrA pKM101 (*E.coli*).

0.1 ml bacterial culture was spread on to nutrient agar medium. To the surface of the dried plate was added a disc of ampicillin/(Rosco Neo-Sensitabs) and two 9 mm  $\phi$  sterile filter discs, one with 10 $\mu$ l 0.1% crystal violet and the other with 10 $\mu$ l 0.01% Mitomycin C. The plate was incubated for 48-72 hours at  $37 \pm 2^\circ\text{C}$ .

##### Sterility of Asparaginase standard solution and S9 mix:

0.1 ml of standard solution or S9 mix was plated on to complete medium and incubated for 48-72 hours at  $37 \pm 2^\circ\text{C}$ .

**Diagnostic mutagens** were used for each strain with and without S9 mix, as follows:

| Mutagen | S9 | Strain        | µg/ml |
|---------|----|---------------|-------|
| MNNG    | -  | TA 1535       | 1.0   |
| MNNG    | -  | TA 100        | 1.0   |
| 2-NF    | -  | TA 98         | 20.0  |
| ICR-191 | -  | TA 1537       | 0.01  |
| MNNG    | -  | WP2uvrApKM101 | 7.5   |
| 2-AA    | +  | TA 98         | 5.0   |
| 2-AA    | +  | TA 1537       | 5.0   |
| 2-AA    | +  | TA 1535       | 5.0   |
| 2-AA    | +  | TA 100        | 5.0   |
| 2-AA    | +  | WP2uvrApKM101 | 20.0  |

**Deviation from protocol:** During the experimental period of this study the standard operating procedures TOX-SP-1023 and 1024 were updated twice from version 4 to version 5 and 6, successively.

## 6. Results and discussion

### Genetic characters

All *Salmonella* strains used in these experiments were sensitive to crystal violet and Mitomycin C. TA98 and TA100 were both resistant to ampicillin. *E.coli* WP2uvrApKM101 was sensitive to Mitomycin C and resistant to ampicillin. These results are as expected.

### Solvent and positive controls

The solvent control values presented in this report are within the normal ranges experienced in our laboratory (Appendix 1) and/or the ranges reported in the literature with the *Salmonella* strains.

All positive control chemicals induced significant increases in revertant colony numbers which fulfilled our criteria for an acceptable response and thereby confirmed the sensitivity of the test system.

Therefore all data were considered as valid.

### Asparaginase (Batch Number: PPV33595)

The results are represented in Table 1-10.

We consider a test substance as positive when it has induced at least a doubling in the mean number of revertant colonies per plate compared to the appropriate solvent control in one or more of the strains, in the presence or absence of S9 mix, if this response is dose related (at least 3 doses) and reproducible.

In case of a dose related and reproducible numerical increase, which is below a doubling but at least 50% higher than the solvent control, the result is considered as equivocal and needs further clarification.

*Asparaginase* is a fluid enzyme preparation. It contains an abundance of various nutrients, and composes a rich growth medium to the test bacteria. This means, that comparison of

viable counts between exposed cultures and control culture in a "treat and plate" assay reflects growth stimulation/inhibition as well as cell killing. Variation in the viable counts may cause some variation in the number of spontaneous revertant colonies.

These circumstances are to a minor extent reflected in the present study. No toxicity of the test substance to the bacteria is observed. Growth stimulation is present in a few test series especially with especially in the *E.coli* strain as demonstrated by increases in the viable count of exposed cultures compared to the solvent control. These conditions have no obvious influence on the revertant colony count.

No treatments of any of the *Salmonella* and *E.coli* strains with Asparaginase resulted in any increases in revertant numbers that meet the criteria for a positive or equivocal response.

## **7. Conclusion**

The results of the bacterial mutagenicity tests described in this report give no indication of the presence of mutagenic components in this preparation of Asparaginase (Batch No. PPV33595), when tested under the conditions applied in this study.



**Table 1-10****Table 1.**

Number of revertant colonies per plate obtained with *Salmonella typhimurium TA100* following exposure to Asparaginase, Batch No. PPV33595 in the absence and presence of metabolic activation in the Treat and plate assay.

**20128071 exp.1**

| Test<br>Substance<br>Concentration<br>µg per mL | Number of revertants (number of colonies/plate)<br>Base-pair substitution type |      |                 |      |                             |      |                 |      |
|---|--|------|-----------------|------|-----------------------------|------|-----------------|------|
|   | Without S9   |      |                 |      | With S9                     |      |                 |      |
|   | Revertants   |      | Viable cells *) |      | Revertants                  |      | Viable cells *) |      |
|   | Single plates  | Mean | Single plates   | Mean | Single plates               | Mean | Single plates   | Mean |
| 5000  | 106<br>115<br>96   | 106  | 83<br>96        | 90   | 128<br>121<br>79            | 109  | 112<br>133      | 123  |
| 2500  | 109<br>120<br>101  | 110  | 104<br>89       | 97   | 85<br>117<br>128            | 110  | 125<br>161      | 143  |
| 1250  | 101<br>96<br>100   | 99   | 68<br>62        | 65   | 133<br>141<br>107           | 127  | 101<br>91       | 96   |
| 625   | 114<br>79<br>85  | 93   | 103<br>98       | 101  | 135<br>78<br>86             | 100  | 80<br>82        | 81   |
| 313   | 104<br>107<br>126  | 112  | 93<br>94        | 94   | 112<br>84<br>106            | 101  | 106<br>104      | 105  |
| 156   | 91<br>128<br>126   | 115  | 63<br>83        | 73   | 131<br>125<br>131           | 129  | 59<br>53        | 56   |
| Solvent control                                 | 114<br>96<br>79<br>79<br>85  | 91   | 98<br>96        | 97   | 84<br>75<br>91<br>136<br>86 | 94   | 63<br>65        | 64   |
| 2AA<br>5.0                                      | -  | -    | -               | -    | 1507<br>1468<br>1429        | 1468 | 41<br>46        | 44   |
| MNNG<br>1.0                                     | 3635<br>3690<br>3656   | 3660 | 42<br>53        | 48   | -                           | -    | -               | -    |

\*) Corresponding to no. of viable cells x10<sup>6</sup> on revertant plates..

## Abbreviations:

1-Methyl-3-Nitro-N-NitrosoGuanidine (MNNG)

2AA - 2-Aminoanthracene



**Table 2.**

Number of revertant colonies per plate obtained with *Salmonella typhimurium TA1535* following exposure to Asparaginase, Batch No. PPV33595 in the absence and presence of metabolic activation in the treat and plate assay.

**20128071 exp.1**

| Test<br>Substance<br>Concentration<br>µg per mL | Number of revertants (number of colonies/plate)<br>Base-pair substitution type |      |                 |      |                         |      |                 |      |
|---|--|------|-----------------|------|-------------------------|------|-----------------|------|
|   | Without S9   |      |                 |      | With S9                 |      |                 |      |
|   | Revertants   |      | Viable cells *) |      | Revertants              |      | Viable cells *) |      |
|   | Single plates  | Mean | Single plates   | Mean | Single plates           | Mean | Single plates   | Mean |
| 5000  | 7<br>10<br>9   | 9    | 82<br>95        | 89   | 13<br>19<br>6           | 13   | 157<br>169      | 163  |
| 2500  | 14<br>11<br>8  | 11   | 99<br>73        | 86   | 12<br>12<br>11          | 12   | 116<br>158      | 137  |
| 1250  | 6<br>12<br>14  | 11   | 135<br>128      | 132  | 13<br>8<br>13           | 11   | 125<br>125      | 125  |
| 625   | 7<br>15<br>6   | 9    | 100<br>74       | 87   | 8<br>8<br>17            | 11   | 101<br>114      | 108  |
| 313   | 7<br>6<br>13   | 9    | 106<br>109      | 108  | 11<br>10<br>11          | 11   | 137<br>145      | 141  |
| 156   | 9<br>8<br>10   | 9    | 121<br>107      | 114  | 9<br>9<br>10            | 9    | 93<br>116       | 105  |
| Solvent control                                 | 8<br>12<br>7<br>4<br>11  | 8    | 96<br>82        | 89   | 8<br>8<br>10<br>11<br>7 | 9    | 145<br>120      | 133  |
| 2AA<br>5.0                                      | -  | -    | -               | -    | 96<br>124<br>125        | 115  | 64<br>58        | 61   |
| MNNG<br>1.0                                     | 3936<br>4073<br>4061   | 4023 | 70<br>63        | 67   | -                       | -    | -               | -    |

\*) Corresponding to no. of viable cells x10<sup>6</sup> on revertant plates..

Abbreviations:

MMNG - 1-Methyl-3-Nitro-N-NitrosoGuanidine

2AA - 2-Aminoanthracene

**Table 3.**

Number of revertant colonies per plate obtained with *Salmonella typhimurium* TA98 following exposure to Asparaginase, Batch No. PPV33595 in the absence and presence of metabolic activation in the Treat and plate assay.

**20128071 exp. 1**

| Test Substance<br>Concentration<br>µg per mL | Number of revertants (number of colonies/plate)<br>Frame-shift mutation type |      |                 |      |                            |      |                 |      |
|--|--|------|-----------------|------|----------------------------|------|-----------------|------|
|  | Without S9   |      |                 |      | With S9                    |      |                 |      |
|  | Revertants   |      | Viable cells *) |      | Revertants                 |      | Viable cells *) |      |
|  | Single plates  | Mean | Single plates   | Mean | Single plates              | Mean | Single plates   | Mean |
| 5000   | 19<br>28<br>40   | 29   | 167<br>180      | 174  | 43<br>33<br>33             | 36   | 220<br>241      | 231  |
| 2500   | 22<br>19<br>33   | 25   | 162<br>169      | 166  | 27<br>32<br>27             | 29   | 142<br>149      | 146  |
| 1250   | 27<br>40<br>36   | 34   | 136<br>146      | 141  | 41<br>27<br>36             | 35   | 149<br>149      | 149  |
| 625  | 21<br>21<br>22   | 21   | 133<br>159      | 146  | 31<br>28<br>44             | 34   | 167<br>126      | 147  |
| 313  | 36<br>17<br>35   | 29   | 149<br>145      | 147  | 37<br>27<br>31             | 32   | 105<br>128      | 117  |
| 156  | 21<br>20<br>27   | 23   | 151<br>135      | 143  | 35<br>42<br>31             | 36   | 184<br>126      | 155  |
| Solvent control                              | 23<br>23<br>25<br>20<br>21   | 22   | 110<br>126      | 118  | 37<br>28<br>25<br>30<br>36 | 31   | 210<br>221      | 216  |
| 2-NF<br>20.0                                 | 1035<br>1050<br>1177   | 1087 | 136<br>122      | 129  | -                          | -    | -               | -    |
| 2AA<br>5.0                                   | -  | -    | -               | -    | 1425<br>1467<br>1417       | 1436 | 100<br>124      | 112  |

\*) Corresponding to no. of viable cells x10<sup>6</sup> on revertant plates..

Abbreviations:

2-NF - 2-Nitrofluorene

2AA - 2-Aminoanthracene

**Table 4.**

Number of revertant colonies per plate obtained with *Salmonella typhimurium TA1537* following exposure to Asparaginase, Batch No. PPV33595 in the absence and presence of metabolic activation in the Treat and plate assay.

**20128071 exp.1**

| Test<br>Substance<br>Concentration<br>µg per mL | Number of revertants (number of colonies/plate)<br>Frame-shift mutation type |      |                 |      |                          |      |                 |      |
|---|--|------|-----------------|------|--------------------------|------|-----------------|------|
|   | Without S9   |      |                 |      | With S9                  |      |                 |      |
|   | Revertants   |      | Viable cells *) |      | Revertants               |      | Viable cells *) |      |
|   | Single plates  | Mean | Single plates   | Mean | Single plates            | Mean | Single plates   | Mean |
| 5000  | 13<br>11<br>7  | 10   | 86<br>116       | 101  | 14<br>21<br>11           | 15   | 37<br>28        | 33   |
| 2500  | 12<br>14<br>12   | 13   | 114<br>112      | 113  | 15<br>13<br>12           | 13   | 46<br>42        | 44   |
| 1250  | 13<br>14<br>10   | 12   | 91<br>96        | 94   | 18<br>15<br>17           | 17   | 62<br>64        | 63   |
| 625   | 9<br>6<br>8  | 8    | 107<br>89       | 98   | 12<br>12<br>11           | 12   | 44<br>56        | 50   |
| 313   | 12<br>6<br>11  | 10   | 105<br>115      | 110  | 14<br>9<br>17            | 13   | 54<br>61        | 58   |
| 156   | 15<br>12<br>8  | 12   | 80<br>106       | 93   | 12<br>17<br>11           | 13   | 22<br>21        | 22   |
| Solvent control                                 | 13<br>16<br>8<br>13<br>12  | 12   | 82<br>115       | 99   | 13<br>14<br>9<br>9<br>11 | 11   | 32<br>22        | 27   |
| 2AA<br>5.0                                      | -  | -    | -               | -    | 68<br>110<br>93          | 90   | 7<br>10         | 9    |
| ICR-191<br>0.01                                 | 2905<br>2760<br>2516   | 2727 | 106<br>94       | 100  | -                        | -    | -               | -    |

\*) Corresponding to no. of viable cells x10<sup>6</sup> on revertant plates..

## Abbreviations:

ICR-191 - Acridine Mutagen

2AA - 2-Aminoanthracene



**Table 5.**

Number of revertant colonies per plate obtained with *E.coli* **WP2uvrApKM101** following exposure to Asparaginase, Batch No. PPV33595 in the absence and presence of metabolic activation in the Treat and plate assay.

**20128071 E.coli exp.1**

| Test<br>Substance<br>Concentration<br>µg per mL | Number of revertants (number of colonies/plate)<br>Base-pair substitution type |      |                 |      |                                 |      |                 |      |
|---|--|------|-----------------|------|---------------------------------|------|-----------------|------|
|   | Without S9   |      |                 |      | With S9                         |      |                 |      |
|   | Revertants   |      | Viable cells *) |      | Revertants                      |      | Viable cells *) |      |
|   | Single plates  | Mean | Single plates   | Mean | Single plates                   | Mean | Single plates   | Mean |
| 5000  | 243<br>240<br>188  | 224  | 414<br>461      | 438  | 248<br>237<br>237               | 241  | 425<br>437      | 431  |
| 2500  | 216<br>203<br>216  | 212  | 242<br>350      | 296  | 271<br>290<br>289               | 283  | 301<br>352      | 327  |
| 1250  | 255<br>208<br>211  | 225  | 362<br>352      | 357  | 279<br>279<br>280               | 279  | 358<br>416      | 387  |
| 625   | 216<br>194<br>196  | 202  | 273<br>231      | 252  | 258<br>224<br>256               | 246  | 242<br>271      | 257  |
| 313   | 247<br>263<br>252  | 254  | 319<br>337      | 328  | 269<br>298<br>282               | 283  | 285<br>408      | 347  |
| 156   | 192<br>235<br>251  | 226  | 184<br>216      | 200  | 305<br>278<br>294               | 292  | 384<br>297      | 341  |
| Solvent control                                 | 172<br>188<br>168<br>171<br>193  | 178  | 297<br>408      | 353  | 219<br>248<br>269<br>252<br>232 | 244  | 232<br>215      | 224  |
| 2AA<br>20.0                                     | -  | -    | -               | -    | 1838<br>1838<br>1878            | 1851 | 154<br>231      | 193  |
| MNNG<br>7.5                                     | 1647<br>1810<br>1832   | 1763 | 145<br>166      | 156  | -                               | -    | -               | -    |

\*) Corresponding to no. of viable cells x10<sup>6</sup> on revertant plates..

## Abbreviations:

MMNG - 1-Methyl-3-Nitro-N-NitrosoGuanidine

2AA - 2-Aminoanthracene

**Table 6.**

Number of revertant colonies per plate obtained with *Salmonella typhimurium* TA100 following exposure to Asparaginase, Batch No. PPV33595 in the absence and presence of metabolic activation in the Treat and plate assay.

**20128071 exp.2**

| Test<br>Substance<br>Concentration<br>µg per mL | Number of revertants (number of colonies/plate)<br>Base-pair substitution type |      |                 |      |                                |      |                 |      |
|---|--|------|-----------------|------|--------------------------------|------|-----------------|------|
|   | Without S9   |      |                 |      | With S9                        |      |                 |      |
|   | Revertants   |      | Viable cells *) |      | Revertants                     |      | Viable cells *) |      |
|   | Single plates  | Mean | Single plates   | Mean | Single plates                  | Mean | Single plates   | Mean |
| 5000  | 124<br>117<br>99   | 113  | 99<br>104       | 102  | 117<br>117<br>136              | 123  | 161<br>84       | 123  |
| 2500  | 127<br>117<br>107  | 117  | 190<br>157      | 174  | 104<br>138<br>128              | 123  | 135<br>128      | 132  |
| 1250  | 110<br>85<br>133   | 109  | 116<br>120      | 118  | 101<br>105<br>115              | 107  | 203<br>220      | 212  |
| 625   | 114<br>85<br>121   | 107  | 124<br>111      | 118  | 141<br>120<br>137              | 133  | 127<br>149      | 138  |
| 313   | 116<br>107<br>104  | 109  | 120<br>128      | 124  | 148<br>95<br>133               | 125  | 227<br>215      | 221  |
| 156   | 114<br>105<br>103  | 107  | 100<br>104      | 102  | 128<br>103<br>136              | 122  | 132<br>141      | 137  |
| Solvent control                                 | 110<br>86<br>88<br>106<br>80   | 94   | 116<br>78       | 97   | 99<br>111<br>104<br>100<br>116 | 106  | 213<br>190      | 202  |
| 2AA<br>5.0                                      | -  | -    | -               | -    | 2551<br>2544<br>2721           | 2605 | 62<br>68        | 65   |
| MNNG<br>1.0                                     | 4854<br>4704<br>4475   | 4678 | 80<br>106       | 93   | -                              | -    | -               | -    |

\*) Corresponding to no. of viable cells x10<sup>6</sup> on revertant plates..

## Abbreviations:

MMNG - 1-Methyl-3-Nitro-N-NitrosoGuanidine

2AA - 2-Aminoanthracene

**Table 7.**

Number of revertant colonies per plate obtained with *Salmonella typhimurium* TA1535 following exposure to Asparaginase, Batch No. PPV33595 in the absence and presence of metabolic activation in the treat and plate assay.

**20128071 exp.2**

| Test<br>Substance<br>Concentration<br>µg per mL | Number of revertants (number of colonies/plate)<br>Base-pair substitution type |      |                 |      |                           |      |                 |      |
|---|--|------|-----------------|------|---------------------------|------|-----------------|------|
|   | Without S9   |      |                 |      | With S9                   |      |                 |      |
|   | Revertants   |      | Viable cells *) |      | Revertants                |      | Viable cells *) |      |
|   | Single plates  | Mean | Single plates   | Mean | Single plates             | Mean | Single plates   | Mean |
| 5000  | 18<br>12<br>9  | 13   | 146<br>99       | 123  | 10<br>7<br>9              | 9    | 236<br>217      | 227  |
| 2500  | 10<br>13<br>11   | 11   | 154<br>124      | 139  | 10<br>9<br>10             | 10   | 143<br>153      | 148  |
| 1250  | 15<br>18<br>9  | 14   | 110<br>138      | 124  | 15<br>4<br>15             | 11   | 224<br>128      | 176  |
| 625   | 13<br>6<br>6   | 8    | 161<br>180      | 171  | 10<br>16<br>8             | 11   | 141<br>193      | 167  |
| 313   | 11<br>10<br>10   | 10   | 140<br>114      | 127  | 8<br>12<br>9              | 10   | 179<br>187      | 183  |
| 156   | 6<br>14<br>8   | 9    | 101<br>106      | 104  | 7<br>12<br>12             | 10   | 273<br>208      | 241  |
| Solvent control                                 | 8<br>8<br>8<br>12<br>8   | 9    | 161<br>121      | 141  | 10<br>8<br>11<br>11<br>10 | 10   | 238<br>261      | 250  |
| 2AA<br>5.0                                      | -  | -    | -               | -    | 192<br>200<br>203         | 198  | 70<br>85        | 78   |
| MNNG<br>1.0                                     | 4620<br>4440<br>4676   | 4579 | 105<br>79       | 92   | -                         | -    | -               | -    |

\*) Corresponding to no. of viable cells x10<sup>6</sup> on revertant plates..

## Abbreviations:

MNNG - 1-Methyl-3-Nitro-N-NitrosoGuanidine

2AA - 2-Aminoanthracene



**Table 8.**

Number of revertant colonies per plate obtained with *Salmonella typhimurium* TA98 following exposure to Asparaginase, Batch No. PPV33595 in the absence and presence of metabolic activation in the Treat and plate assay.

**20128071 exp.2**

| Test Substance Concentration<br>µg per mL | Number of revertants (number of colonies/plate)<br>Frame-shift mutation type |      |                 |      |                            |      |                 |      |
|---|--|------|-----------------|------|----------------------------|------|-----------------|------|
|   | Without S9   |      |                 |      | With S9                    |      |                 |      |
|   | Revertants   |      | Viable cells *) |      | Revertants                 |      | Viable cells *) |      |
|   | Single plates  | Mean | Single plates   | Mean | Single plates              | Mean | Single plates   | Mean |
| 5000                                      | 10<br>18<br>19   | 16   | 289<br>294      | 292  | 28<br>22<br>30             | 27   | 171<br>131      | 151  |
| 2500                                      | 20<br>14<br>15   | 16   | 247<br>247      | 247  | 22<br>28<br>17             | 22   | 163<br>101      | 132  |
| 1250                                      | 18<br>15<br>21   | 18   | 262<br>263      | 263  | 27<br>22<br>27             | 25   | 221<br>127      | 174  |
| 625                                       | 15<br>14<br>14   | 14   | 226<br>252      | 239  | 26<br>25<br>27             | 26   | 116<br>120      | 118  |
| 313                                       | 21<br>14<br>18   | 18   | 267<br>226      | 247  | 25<br>16<br>26             | 22   | 243<br>248      | 246  |
| 156                                       | 13<br>14<br>16   | 14   | 278<br>300      | 289  | 19<br>20<br>16             | 18   | 168<br>127      | 148  |
| Solvent control                           | 6<br>19<br>19<br>9<br>20   | 15   | 246<br>264      | 255  | 16<br>35<br>32<br>32<br>25 | 28   | 213<br>95       | 154  |
| 2-NF<br>20.0                              | 1914<br>2235<br>1916   | 2022 | 225<br>196      | 211  | -                          | -    | -               | -    |
| 2AA<br>5.0                                | -  | -    | -               | -    | 2221<br>2026<br>2260       | 2169 | 148<br>135      | 142  |

\*) Corresponding to no. of viable cells x10<sup>6</sup> on revertant plates..

Abbreviations:

2-NF - 2-Nitrofluorene

2AA - 2-Aminoanthracene

**Table 9.**

Number of revertant colonies per plate obtained with *Salmonella typhimurium TA1537* following exposure to Asparaginase, Batch No. PPV33595 in the absence and presence of metabolic activation in the Treat and plate assay.

**20128071 exp.2**

| Test<br>Substance<br>Concentration<br>µg per mL | Number of revertants (number of colonies/plate)<br>Frame-shift mutation type |      |                 |      |                          |      |                 |      |
|---|--|------|-----------------|------|--------------------------|------|-----------------|------|
|   | Without S9   |      |                 |      | With S9                  |      |                 |      |
|   | Revertants   |      | Viable cells *) |      | Revertants               |      | Viable cells *) |      |
|   | Single plates  | Mean | Single plates   | Mean | Single plates            | Mean | Single plates   | Mean |
| 5000  | 8<br>9<br>10   | 9    | 204<br>204      | 204  | 16<br>13<br>15           | 15   | 64<br>98        | 81   |
| 2500  | 13<br>13<br>4  | 10   | 194<br>222      | 208  | 27<br>16<br>11           | 18   | 74<br>64        | 69   |
| 1250  | 8<br>5<br>9  | 7    | 225<br>246      | 236  | 11<br>12<br>11           | 11   | 101<br>100      | 101  |
| 625   | 5<br>6<br>5  | 5    | 183<br>183      | 183  | 8<br>12<br>10            | 10   | 84<br>91        | 88   |
| 313   | 10<br>6<br>9   | 8    | 229<br>205      | 217  | 20<br>6<br>11            | 12   | 127<br>107      | 117  |
| 156   | 15<br>8<br>12  | 12   | 189<br>175      | 182  | 26<br>10<br>11           | 16   | 91<br>114       | 103  |
| Solvent control                                 | 5<br>3<br>7<br>9<br>8  | 6    | 192<br>192      | 192  | 11<br>8<br>6<br>17<br>10 | 10   | 106<br>106      | 106  |
| 2AA<br>5.0                                      | -  | -    | -               | -    | 188<br>199<br>188        | 192  | 95<br>63        | 79   |
| ICR-191<br>0.01                                 | 1610<br>1512<br>1530   | 1551 | 198<br>172      | 185  | -                        | -    | -               | -    |

\*) Corresponding to no. of viable cells x10<sup>6</sup> on revertant plates..

Abbreviations:

ICR-191 - Acridine Mutagen

2AA - 2-Aminoanthracene



**Table 10.**

Number of revertant colonies per plate obtained with *E.coli* WP2uvrApKM101 following exposure to Asparaginase, Batch No. PPV33595 in the absence and presence of metabolic activation in the Treat and plate assay.

**20128071 exp.2**

| Test Substance Concentration<br>µg per mL | Number of revertants (number of colonies/plate)<br>Base-pair substitution type |      |                 |      |                                 |      |                 |      |
|---|--|------|-----------------|------|---------------------------------|------|-----------------|------|
|   | Without S9   |      |                 |      | With S9                         |      |                 |      |
|   | Revertants   |      | Viable cells *) |      | Revertants                      |      | Viable cells *) |      |
|   | Single plates  | Mean | Single plates   | Mean | Single plates                   | Mean | Single plates   | Mean |
| 5000                                      | 211<br>217<br>208  | 212  | 242<br>211      | 227  | 238<br>225<br>216               | 226  | 621<br>740      | 681  |
| 2500                                      | 255<br>247<br>237  | 246  | 172<br>177      | 175  | 256<br>257<br>240               | 251  | 424<br>471      | 448  |
| 1250                                      | 199<br>221<br>213  | 211  | 136<br>141      | 139  | 276<br>238<br>235               | 250  | 366<br>309      | 338  |
| 625                                       | 203<br>205<br>227  | 212  | 138<br>122      | 130  | 247<br>205<br>193               | 215  | 429<br>468      | 449  |
| 313                                       | 264<br>232<br>231  | 242  | 135<br>124      | 130  | 231<br>203<br>245               | 226  | 436<br>395      | 416  |
| 156                                       | 245<br>247<br>272  | 255  | 114<br>119      | 117  | 262<br>274<br>241               | 259  | 297<br>345      | 321  |
| Solvent control                           | 178<br>215<br>215<br>188<br>196  | 198  | 147<br>103      | 125  | 282<br>209<br>198<br>226<br>213 | 226  | 418<br>321      | 370  |
| 2AA<br>20.0                               | -  | -    | -               | -    | 1616<br>1625<br>1726            | 1656 | 230<br>238      | 234  |
| MNNG<br>7.5                               | 1306<br>1195<br>1169   | 1223 | 117<br>138      | 128  | -                               | -    | -               | -    |

\*) Corresponding to no. of viable cells x10<sup>6</sup> on revertant plates..

## Abbreviations:

MNNG - 1-Methyl-3-Nitro-N-NitrosoGuanidine

2AA - 2-Aminoanthracene

## Appendix 1

### Historical control data

**Negative control** (purified water) for *S. typhimurium* strains and *E.coli* WP2uvrA pKM101 in the treat and plate assay. (SOP: TOX-SM-1006 and TOX-SM-1007)

| Strain          | S9 | Number of determinations | Mean number of revertants per plate | SD | Range *) |       |
|-----------------|----|--------------------------|-------------------------------------|----|----------|-------|
|                 |    |                          |                                     |    | lower    | upper |
| TA1535          | ÷  | 15                       | 10                                  | 3  | 6        | 19    |
|                 | +  | 15                       | 11                                  | 4  | 7        | 22    |
| TA100           | ÷  | 17                       | 96                                  | 17 | 70       | 125   |
|                 | +  | 17                       | 109                                 | 17 | 87       | 151   |
| TA1537          | ÷  | 16                       | 9                                   | 4  | 5        | 18    |
|                 | +  | 16                       | 12                                  | 3  | 8        | 22    |
| TA98            | ÷  | 15                       | 22                                  | 6  | 11       | 33    |
|                 | +  | 16                       | 29                                  | 6  | 22       | 40    |
| WP2 uvrA pKM101 | ÷  | 18                       | 193                                 | 30 | 122      | 251   |
|                 | +  | 18                       | 226                                 | 37 | 175      | 303   |

The above are pooled data from a number of independent determinations selected from studies conducted over the period August 2011 to June 2012. Only determinations, which were obviously vitiated by errors, have been omitted.

\*) Ranges stated are the maximum and minimum mean revertant colony counts from the data sets sampled.

## Appendix 2

### Historical control data

**Positive control ranges** for *S. typhimurium* strains and *E.coli* WP2uvrA pKM101 in the treat and plate assay. (SOP: TOX-SM-1006 and TOX-SM-1007).

| Strain             | S9 | Number of determinations | Chemical             | Mean number of revertants per plate | SD  | Range *) |       |
|--------------------|----|--------------------------|----------------------|-------------------------------------|-----|----------|-------|
|                    |    |                          |                      |                                     |     | lower    | upper |
| TA1535             | ÷  | 15                       | MNNG<br>1 µg/ml      | 3648                                | 846 | 2267     | 5623  |
|                    | +  | 15                       | 2-AA<br>5 µg/ml      | 179                                 | 28  | 121      | 218   |
| TA100              | ÷  | 17                       | MNNG<br>1 µg/ml      | 3577                                | 758 | 1792     | 5121  |
|                    | +  | 16                       | 2-AA<br>5 µg/ml      | 2194                                | 271 | 1624     | 2617  |
| TA1537             | ÷  | 16                       | ICR-191<br>0.01µg/ml | 1704                                | 832 | 1032     | 4611  |
|                    | +  | 16                       | 2-AA<br>5 µg/ml      | 166                                 | 51  | 92       | 250   |
| TA98               | ÷  | 15                       | 2-NF<br>20 µg/ml     | 1102                                | 347 | 646      | 1865  |
|                    | +  | 16                       | 2-AA<br>5 µg/ml      | 2106                                | 489 | 1205     | 2972  |
| WP2 uvrA<br>pKM101 | ÷  | 18                       | MNNG<br>7.5 µg/ml    | 1269                                | 442 | 639      | 2442  |
|                    | +  | 18                       | 2-AA<br>20 µg/ml     | 1425                                | 228 | 878      | 1878  |

The above are pooled data from a number of independent determinations selected from studies conducted over the period August 2011 to June 2012. Only determinations, which were obviously vitiated by errors, have been omitted.

\*) Ranges stated are the maximum and minimum mean revertant colony counts from the data sets sampled.

## Appendix 3

### PREPARATION OF MEDIA

#### 1. Top-agar - histidine-deficient soft agar

|                    |        |
|--------------------|--------|
| Agar, Merck        | 0.6 g  |
| NaCl               | 0.5 g  |
| Distilled water to | 100 ml |

The medium was autoclaved for 15 minutes at 121°C. After cooling to about 60°C, 10 ml of a sterile aqueous solution of 0.5 mM biotin - 0.5 mM histidine was added aseptically.

#### 2. Nutrient broth - histidine-rich broth

|                      |         |
|----------------------|---------|
| Difco nutrient broth | 8 g     |
| NaCl                 | 5 g     |
| Distilled water to   | 1 litre |

The medium was autoclaved for 15 minutes at 121°C.

#### 3. Nutrient agar - histidine-rich agar medium

|                            |         |
|----------------------------|---------|
| Agar, Merck                | 15 g    |
| Oxoid nutrient broth No. 2 | 25 g    |
| Distilled water to         | 1 litre |

The medium was autoclaved for 15 minutes at 121°C.

#### 4. Minimal medium

This was Vogel-Bonner minimal "E" medium with 2% glucose, prepared as follows:

##### Solution A (Vogel-Bonner medium E, 20X)

|  |         |
|--|---------|
| MgSO <sub>4</sub> 7H <sub>2</sub> O                | 4 g     |
| Citric acid, monohydrate                           | 40 g    |
| K <sub>2</sub> HPO <sub>4</sub>                    | 200 g   |
| NaH <sub>2</sub> NH <sub>4</sub> 4H <sub>2</sub> O | 70 g    |
| Distilled water to                                 | 1000 ml |

The solution was sterilized by filtration.

##### Solution B (40% glucose)

|                    |        |
|--------------------|--------|
| Glucose            | 40 g   |
| Distilled water to | 100 ml |

This solution was sterilized by filtration.

##### Solution C (Agar base)

|                    |         |
|--------------------|---------|
| Agar, Merck        | 16.7 g  |
| Distilled water to | 1000 ml |

Solution C was autoclaved for 15 minutes at 121°C. After cooling to 60°C, 450 ml of solution C was aseptically added 25 ml solution A and 25 ml solution B.

## **REPORT**

### **Asparaginase, PPV33595**

#### ***In Vitro* Micronucleus Test In Cultured Human Lymphocytes**

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|                                  |                |
|----------------------------------|----------------|
| <b>HLS study number:</b>         | LKG0062        |
| <b>Sponsor reference number:</b> | 20126013       |
| <b>Version ID:</b>               | Final report   |
| <b>Issue date:</b>               | 20 August 2012 |

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## Sponsor and Test Facility Details

|  |   |
|--|---|
| <b>Sponsor</b>                                 | Novozymes A/S<br>Krogshoejvej 36<br>2880 Bagsvaerd<br>DENMARK   |
| <b>Test facility</b>                           | Huntingdon Life Sciences<br>Eye Research Centre<br>Eye<br>Suffolk<br>IP23 7PX<br>UK   |
| <b>Test facility</b><br>(Statistical analysis) | Huntingdon Life Sciences<br>Huntingdon Research Centre<br>Woolley Road<br>Alconbury<br>Huntingdon<br>Cambridgeshire<br>PE28 4HS<br>UK |

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## Compliance with Good Laboratory Practice standards

### Asparaginase, PPV33595: *In Vitro* Micronucleus Test in Cultured Human Lymphocytes

The study described in this report was conducted in compliance with the following Good Laboratory Practice standards, with the exception stated below, and I consider the data generated to be valid.

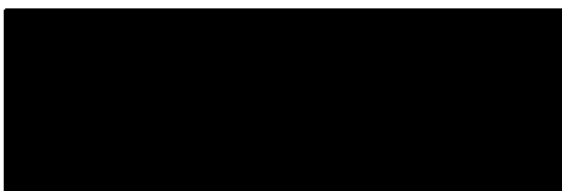
The UK Good Laboratory Practice Regulations (Statutory Instrument 1999 No. 3106, as amended by Statutory Instrument 2004 No. 994).

OECD Principles of Good Laboratory Practice (as revised in 1997), ENV/MC/CHEM (98) 17.

EC Commission Directive 2004/10/EC of 11 February 2004 (Official Journal No. L 50/44).

These principles of Good Laboratory Practice are accepted by the regulatory authorities of the United States of America and Japan on the basis of intergovernmental agreements.

In line with normal practice in this type of short-term study, the protocol did not require analysis of the dose form.

  
Study Director  
Huntingdon Life Sciences

20 August 2012  
Date

## Quality Assurance Statement

### Asparaginase, PPV33595: *In Vitro* Micronucleus Test in Cultured Human Lymphocytes

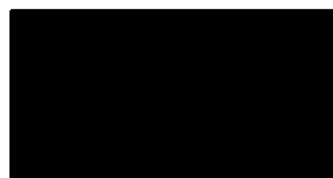
The following inspections and audits have been carried out in relation to this study:

| Study Phase             | Date(s) of Inspection | Date of Reporting to Study Director and Management |
|-------------------------|-----------------------|--|
| Protocol Audit          | 30 Apr 2012           | 30 Apr 2012  |
| Protocol Amendment No.1 | 27 Jul 2012           | 27 Jul 2012  |
| Report Audit            | 06 Aug 2012           | 06 Aug 2012  |

**Process based inspections:** At or about the time this study was in progress inspections of procedures employed on this type of study were carried out. These were conducted and reported to appropriate Company Management as indicated below:

| Process Based Inspections                                 | Date(s) of Inspection    | Date of Reporting to Management |
|---|--------------------------|---------------------------------|
| Culture establishment, Osmolality and pH (In Vitro)       | 31 Jan 2012-01 Feb 2012  | 01 Feb 2012                     |
| Harvesting (In Vitro)                                     | 03 Feb 2012              | 03 Feb 2012                     |
| Slide preparation, staining and slide reading (In Vitro)  | 06 Feb 2012              | 07 Feb 2012                     |
| Formulation procedures, sampling and treatment (In Vitro) | 28 Feb 2012, 16 Mar 2012 | 16 Mar 2012                     |
| Study management and conduct (In Vitro)                   | 04 May 2012              | 04 May 2012                     |

In addition, an inspection of the facility where this study was conducted was carried out on an annual basis. These inspections were reported to Company Management.



Group Manager  
Department of Quality Assurance  
Huntingdon Life Sciences

20 August 2012  
Date

## **Contributing Scientists**

**Asparaginase, PPV33595: *In Vitro* Micronucleus Test in Cultured Human Lymphocytes**

### **Study Management**

[REDACTED]

Study Director

[REDACTED]

Study Supervisor

### **Statistics**

[REDACTED]

Head of Statistics and Data Management

## Summary

This study was designed to assess the potential of Asparaginase, PPV33595 to cause an increase in the induction of micronuclei in cultured human lymphocytes *in vitro*.

Human lymphocytes in whole blood culture, stimulated to divide by addition of phytohaemagglutinin (PHA) 48 hours prior to treatment, were exposed to Asparaginase, PPV33595 for 3 hours in both the absence and presence of exogenous metabolic activation (S9 mix) and for 20 hours in the absence of S9 mix. Vehicle (water) and positive control cultures were included in all test conditions.

Cytokinesis was blocked following mitosis using Cytochalasin B, the cells harvested and slides prepared, so that binucleate cells could be examined for micronucleus induction. In order to assess the toxicity of Asparaginase, PPV33595 to cultured human lymphocytes, the cytokinesis-block proliferative index (CBPI) was calculated for cultures treated with the test substance, the vehicle and positive controls. Five test concentrations were assessed for determination of induction of micronuclei. The highest Asparaginase, PPV33595 concentration selected (2.5 % v/v) was that which did not alter the osmolality of the medium by more than 50 mOsm/kg relative to the vehicle controls. Following 3-hour treatment, reductions in CBPI equivalent to 12.3% and 15.1% cytotoxicity were obtained with Asparaginase, PPV33595 at 2.5% v/v, in the absence and presence of S9 mix respectively. Concentrations of Asparaginase, PPV33595 selected for micronucleus analysis were 0.16, 0.31, 0.63, 1.25 and 2.5% v/v, in both the absence and presence of S9 mix. In the absence of S9 mix following 20 hour treatment, a reduction in CBPI equivalent to 25.8% cytotoxicity was obtained with Asparaginase, PPV33595 at 2.5% v/v. Concentrations of Asparaginase, PPV33595 selected for micronucleus analysis were 0.16, 0.31, 0.63, 1.25 and 2.5% v/v.

In both the absence and presence of S9 mix following 3-hour treatment, and in the absence of S9 mix following 20 hour treatment, Asparaginase, PPV33595 did not cause any statistically significant increases in the number of binucleate cells containing micronuclei when compared with the vehicle controls.

The positive control compounds (mitomycin C, colchicine and cyclophosphamide) caused significant increases in the number of binucleate cells containing micronuclei under appropriate conditions, demonstrating the efficacy of the S9 mix and the sensitivity of the test system.

It is concluded that Asparaginase, PPV33595 administered for 3 hours at concentrations of up to 2.5% v/v, in both the absence and presence of S9 mix, and for 20 hours in the absence of S9 mix only, did not show evidence of causing an increase in the induction of micronuclei in cultured human lymphocytes, in this *in vitro* test system under the experimental conditions described.

## 1. Introduction

### 1.1 Objective

The purpose of this study was to assess the potential of Asparaginase, PPV33595 to induce an increase in the induction of micronuclei in cultured human lymphocytes *in vitro*.

### 1.2 Regulatory Compliance

This study was performed in compliance with the following guideline:

OECD Guideline for the Testing of Chemicals (2010): In vitro mammalian Cell Micronucleus Test, Guideline 487.

### 1.3 Test System

In mitotic cells in which chromosomal breakage has been caused by the test substance or its metabolites, acentric fragments of the chromosomes do not separate at the anaphase stage of cell division. After telophase these fragments may not be included in the nuclei of the daughter cells and hence will form single or multiple micronuclei in the cytoplasm of these cells.

Substances which interfere with the mitotic spindle cause non-disjunction or lagging chromosomes at anaphase which may not be incorporated into the daughter nuclei. These lagging chromosomes are not excluded from the cell with the main nucleus and hence form single or multiple micronuclei in the cytoplasm of these cells.

Human lymphocytes are cultured *in vitro* and are stimulated to divide by adding phytohaemagglutinin (PHA) to the culture, resulting in a high mitotic yield (Nowell 1960).

In this study, blood taken from healthy male non-smoking donors was pooled and diluted with tissue culture medium. The cultures were incubated in the presence of PHA before being treated with the test substance. Following treatment (3 hour exposure) or during treatment (20 hour exposure) cytokinesis was blocked at metaphase using the inhibitor, Cytochalasin B. Binucleate cells were then examined for the presence of micronuclei.

Some substances do not exert a mutagenic effect until they have been metabolised by enzyme systems that are not found in cultured cells. Therefore the cultures and test substance were incubated in both the absence and presence of a supplemented liver fraction (S9 mix).

The study comprised two tests, a 3-hour treatment time in both the absence and the presence of S9 mix and a 20-hour treatment time in the absence of S9 mix only.

Any toxic effects of the test substance on the cells may lead either to a reduction in cell replication or to cell death. Cytokinesis-block proliferative index (CBPI) values significantly less than the concurrent vehicle control values are indicative of toxicity.

The following criteria for selection of analysable cells were used: cells are included in the analysis provided that the cytoplasm has remained essentially intact and any micronuclei present are separate in the cytoplasm or only just touching the main nucleus (not connected to

the nucleus by a nucleoplasmic bridge). The micronuclei should lie in the same focal plane as the cell, with no micronucleus debris in the surrounding area. The main nuclei of the binucleate cells scored for micronuclei should be of approximately equal size. The diameter of the micronucleus should be between 1/16 and 1/3 that of the main nucleus with a generally rounded shape with a clearly defined outline. The colour of the micronuclei should be the same or lighter than the main nucleus.

The protocol was approved by Huntingdon Life Sciences Management and by the Study Director on 24 April 2012 and by the Sponsor on 26 April 2012.

Experimental start date: 8 May 2012.

Experimental completion date: 24 July 2012.

## 2. Experimental Procedure

### 2.1 Test substance

|                          |                            |
|--------------------------|----------------------------|
| Identity:                | Asparaginase, PPV33595     |
| Activity:                | 55200 TASU/g               |
| Molecular weight:        | 35.76 kDa                  |
| Batch number:            | PPV33595                   |
| Expiry:                  | 6 March 2022               |
| Appearance               | Liquid                     |
| Storage conditions:      | <i>ca</i> -20°C            |
| Total Organic Solids:    | 11.4% w/w                  |
| Vehicle:                 | Water                      |
| Date received:           | 13 April 2012              |
| Certificate of Analysis: | <a href="#">Appendix 2</a> |

### 2.2 Culture of lymphocytes

Blood was taken from 2 healthy non-smoking male donors into Lithium Heparin tubes and diluted with tissue culture medium (RPMI 1640 containing 10% foetal calf serum, heparin and antibiotics). Prior to the culture establishment, the blood was pooled using equal volumes from each donor. Lymphocytes, which do not normally undergo cell division, were stimulated to do so by the addition of the naturally occurring mitogen, phytohaemagglutinin (PHA), ([Evans and O'Riordan 1975](#), [Nowell 1960](#)). The cultures were prepared as 5 mL aliquots (0.4 mL blood: 4.5 mL medium: 0.1 mL PHA solution) in sterile universal containers and incubated at 37°C. The cultures were shaken occasionally to re-suspend the cells.

### 2.3 Positive controls

In the absence of S9 mix

|                          |  |
|--------------------------|--|
| Identity:                | Mitomycin C  |
| Solvent:                 | Sterile purified (reverse osmosis) water                                       |
| CAS No.:                 | 50-07-7  |
| Exposure concentrations: | 0.2 and 0.3 µg/mL (3 hour treatment)<br>0.05 and 0.1 µg/mL (20 hour treatment) |
| Identity:                | Colchicine   |
| Solvent:                 | Sterile purified (reverse osmosis) water                                       |
| CAS No.:                 | 64-86-8  |
| Exposure concentrations: | 0.02, 0.03, 0.04 µg/mL (3 hour treatment)                                      |

In the presence of S9 mix

|                         |  |
|-------------------------|--|
| Identity:               | Cyclophosphamide                         |
| Solvent:                | Sterile purified (reverse osmosis) water |
| CAS No.:                | 6055-19-2                                |
| Exposure concentration: | 5 and 10 µg/mL                           |

## 2.4 S9 metabolising system

S9 fraction, prepared from male Sprague-Dawley derived rats, dosed with phenobarbital and 5,6-benzoflavone to stimulate mixed-function oxidases in the liver, was purchased from a commercial source and stored at ca -80°C. The quality control statement relating to each batch of S9 preparation used is included in the raw data and a copy is included in this report as [Appendix 4](#).

Lot No.: 2779 (Date of preparation: 7 July 2011)

## 2.5 Preparation of S9 mix

S9 mix contains: S9 fraction (10% v/v), MgCl<sub>2</sub> (8 mM), KCl (33 mM), sodium phosphate buffer pH 7.4 (100 mM), glucose-6-phosphate (5 mM), NADP (4 mM). The cofactors were filter-sterilised with a 0.2 µm non-pyrogenic sterile filter prior to use.

## 2.6 Selection of solvent and formulation of test substance

The sponsor indicated that Asparaginase, PPV33595 was soluble in water. Water (purified by reverse osmosis) was, therefore, used as the vehicle for this study.

The pH and osmolality of Asparaginase, PPV33595 in medium were tested at concentrations of 10, 5 and 2.5% v/v. No fluctuations in pH of the medium of more than 1 unit were observed compared with the vehicle control. No fluctuations in osmolality of the medium of more than 50 mOsm/kg were observed compared with the vehicle control at 2.5% v/v. Higher concentrations altered the osmolality in the medium by more than 50 mOsm/kg relative to the vehicle control.

The highest concentration of Asparaginase, PPV33595 tested in this study was, therefore, 25% in the chosen vehicle, which provided a final concentration of 2.5% v/v, when dosed at 10% v/v, in order to test up to a concentration that did not alter the osmolality of the medium by more than 50 mOsm/kg relative to the vehicle controls. The highest concentration in each test was diluted with water to produce a series of lower concentrations.

All concentrations cited in this report are expressed in terms of Asparaginase, PPV33595 as received.



## **2.7 Stability, homogeneity and formulation analysis**

The stability of Asparaginase, PPV33595 and the stability and homogeneity of Asparaginase, PPV33595 in the solvent were not determined as part of this study. Analysis of achieved concentration was not performed as part of this study.

## **2.8 *In vitro* micronucleus test**

### **2.8.1 3-hour treatment in the absence and presence of S9 mix**

Lymphocyte cultures were incubated for approximately 48 hours following stimulation with PHA, before addition of the test substance. The test substance was prepared in the vehicle and dilutions made for both sets of cultures. Duplicate cultures were prepared for each treatment level and positive control cultures, quadruplicate cultures were prepared for vehicle controls. S9 homogenate was present in appropriate cultures at a final concentration of 2% v/v. All cultures were identified using unique number/colour codes.

Before treatment in the absence and presence of S9 mix all cultures were re-suspended in fresh media. For cultures in the presence of S9 mix, 1 mL of medium was removed from the final volume. This was replaced with 1 mL of S9 mix immediately prior to treatment.

Test substance preparations were added to cultures at 10% v/v. Cultures were incubated at 37°C for 3 hours.

The cells were centrifuged and the medium was replaced with fresh medium. Cytochalasin B, at a final concentration of 6 µg/mL, was then added to all cultures. The cultures were incubated for a further 17 hours until the scheduled harvest time.

### **2.8.2 20-hour treatment in the absence of S9 mix**

Human lymphocyte cultures were set up as previously described. A 20-hour continuous treatment (1.5 to 2 normal cell cycles) at 37°C was used in the absence of S9 mix. Test substance preparations were added to cultures at 10% v/v in the presence of Cytochalasin B (6 µg/mL).

### **2.8.3 Harvesting and fixation**

The cells were harvested by centrifugation at 500 g for 5 minutes. The supernatant was removed and the cell pellet re-suspended and treated with a 4 mL hypotonic solution (0.075M KCl) at 37°C, cultures were then incubated for 3 minutes at 37°C to cause swelling. Cultures were agitated, 4 mL of ice-cold fixative (3:1 v/v methanol: acetic acid) was added slowly onto the culture surface and the cultures were slowly inverted to mix.

The cultures were centrifuged at 500 g for five minutes. The supernatant was removed, and the cell pellet re-suspended. A further 4 mL of fresh fixative was then added and the cells stored at 4°C until slide preparation.

### **2.8.4 Slide preparation**

The cultures were centrifuged at 500 g for 5 minutes and the supernatant removed. A homogeneous cell suspension was prepared. Microscope slides (pre-cleaned in methanol for

ten minutes and left to air dry) were prepared for each culture by aliquoting the re-suspended cells onto the slides, and allowing the slides to air-dry. Two slides were prepared per culture. The remaining cell cultures were stored at approximately 4°C until slide analysis was complete.

### 2.8.5 Slide staining

- 1 Rinsed in purified water
- 2 Stained in acridine orange solution (0.0125 mg/mL using purified water) for 4 minutes
- 3 Washed in purified water for 5 minutes
- 4 Rinsed in cold tap water for 2 minutes
- 5 Stored at room temperature protected from light until required
- 6 Immediately prior to scoring, slides are wet mounted with glass coverslips using purified water

### 2.8.6 Microscopic examination

The prepared slides were examined by fluorescence microscopy. The incidence of mononucleate, binucleate and polynucleate cells per 500 cells was assessed per culture. The presence of an unusual number of, for example, cells undergoing mitosis, polyploid cells, necrotic cells and debris was also noted.

From these results, concentrations were selected for micronucleus analysis. The highest concentration was intended to be that which caused a depression in the cytokinesis-block proliferative index (CBPI) equivalent to  $55 \pm 5\%$  cytotoxicity (approximately) when compared with the concurrent vehicle control.

Prior to micronucleus analysis, all slides were randomly coded. Interphase cells were examined by fluorescence microscopy and the incidence of micronucleated cells per 1000 binucleate cells per culture were scored where possible.

Positive control micronucleus counts are reported for the following treatments only:

Cyclophosphamide: 10 µg/mL (3h, +S9 mix)

Mitomycin C: 0.3 µg/mL (3h, -S9 mix); 0.1 µg/mL (20h, -S9 mix)

Colchicine: 0.04 µg/mL (3h, -S9 mix)

The analysis for micronucleated cells was based on the following criteria ([Fenech & Morley 1985](#), [Fenech 1993](#), [Fenech \*et al\* 2003](#) and [Albertini \*et al\* 1997](#)):

- Only cells where the cytoplasm has remained essentially intact are analysed.
- Any micronuclei present should be separate in the cytoplasm or just touching the main nucleus (not connected via a cytoplasmic bridge).

- The main nuclei of the binucleate cells scored for micronuclei should be of approximately equal size.
- Micronuclei should lie in the same focal plane as the cell.
- The diameter of the micronucleus should be between 1/16 and 1/3 that of the main nucleus.
- Micronuclei should possess a generally rounded shape with a clearly defined outline.
- The colour of the micronuclei should be the same or lighter than the main nucleus.
- There should be no micronucleus like debris in the surrounding area.

## **2.9 Assessment of results**

### **2.9.1 Acceptance criteria**

The following criteria were applied for assessment of assay acceptability:

Positive controls must show clear unequivocal positive responses.

The negative control (solvent, vehicle control or untreated cultures) must show reproducible low and consistent micronucleus frequencies.

Tests that did not fulfil the required criteria were rejected and therefore are not reported.

### **2.9.2 Analysis of data**

#### **Cytotoxicity**

$$\text{Cytotoxicity} = 100 - 100 \{ (\text{CBPI}_T - 1) / (\text{CBPI}_C - 1) \}$$

Where  $\text{CBPI} = \frac{N^{\circ} \text{ mononucleate cells} + 2 \times N^{\circ} \text{ binucleate cells} + 3 \times N^{\circ} \text{ multinucleate cells}}{\text{Total number of cells}}$

T = test chemical treatment culture

C = solvent control culture

Thus, a CBPI of 1 (all cells are mononucleate) is equivalent to 100% cytotoxicity.

#### **Genotoxicity**

The analysis assumed that the replicate was the experimental unit. An arcsine transformation was used to transform the data. Asparaginase, PPV33595 treated groups were then compared to control using Williams' tests (Williams 1971, 1972). Positive controls were compared to control using *t*-tests. Trend tests have also been carried out using linear contrasts by group number. These were repeated, removing the top dose group, until there were only 3 groups.

Statistical significance was declared at the 5% level for all tests.

### **2.9.3 Criteria for assessing genotoxic potential**

Although statistical methods were used as an aid in evaluating the micronucleus test results, biological relevance of the results were considered first. Statistical significance should not be the only determining factor for a positive response. A test substance is considered to be positive if the following conditions are met:

Statistically significant increases in the frequency of micronucleated cells are observed at one or more test concentrations compared to the solvent control.

The increases are reproducible between replicate cultures.

The increases are not associated with large changes in pH, osmolality of the treatment medium or extreme toxicity.

There is evidence of a concentration-response relationship.

A negative response is claimed if no statistically significant increases in the number of micronucleated cells above concurrent solvent control frequencies are observed at any concentration, and there is no evidence of a concentration-response relationship.

### 3. Results

#### 3.1 3-hour treatment in the absence and presence of S9 mix

The results and statistical analysis of the *in vitro* micronucleus test, 3-hour treatment in the absence and presence of S9 mix, are presented in [Table 1](#) and [Table 2](#) respectively.

##### 3.1.1 Cytotoxicity

Following 3-hour treatment, reductions in CBPI compared with vehicle control values equivalent to 12.3% and 15.1% cytotoxicity were obtained with Asparaginase, PPV33595 at 2.5% v/v in the absence and presence of S9 mix respectively. Concentrations of Asparaginase, PPV33595 selected for micronucleus analysis were 0.16, 0.31, 0.63, 1.25 and 2.5% v/v, in both the absence and presence of S9 mix. The maximum concentration was limited by osmolality of the test substance in medium.

On the basis of the results obtained following CBPI analysis, the concentrations of mitomycin C, colchicine and cyclophosphamide analysed for micronucleus induction were 0.3, 0.04 and 10 µg/mL respectively.

##### 3.1.2 Micronucleus Analysis

In both the absence and presence of S9 mix following 3-hour treatment, Asparaginase, PPV33595 did not cause any statistically significant increases in the number of binucleate cells containing micronuclei when compared with the vehicle controls.

In both the absence and presence of S9 mix, mean micronucleus induction in the vehicle control and in the Asparaginase, PPV33595 treated cultures was within or close to the historical control range.

The positive control compounds (mitomycin C, colchicine and cyclophosphamide) caused significant increases in the number of binucleate cells containing micronuclei, demonstrating the efficacy of the S9 mix and the sensitivity of the test system.

#### 3.2 20-hour treatment in the absence of S9 mix

The results and statistical analysis of the *in vitro* micronucleus test, 20-hour treatment, are presented in [Table 3](#).

##### 3.2.1 Cytotoxicity

In the absence of S9 mix following 20-hour treatment, a reduction in CBPI, compared with vehicle control values, equivalent to 25.8% cytotoxicity, was obtained with Asparaginase, PPV33595 at 2.5% v/v. Concentrations of Asparaginase, PPV33595 selected for micronucleus analysis were 0.16, 0.31, 0.63, 1.25 and 2.5% v/v. The maximum concentration was limited by osmolality of the test substance in medium.

On the basis of the results obtained following CBPI analysis, the concentration of mitomycin C analysed for micronucleus induction was 0.1 µg/mL.

### **3.2.2 Micronucleus Analysis**

In the absence of S9 mix following 20-hour treatment, Asparaginase, PPV33595 did not cause any statistically significant increases in the number of binucleate cells containing micronuclei when compared to the vehicle controls.

Mean micronucleus induction in the vehicle control was within the historical control range.

The positive control compound (mitomycin C) caused a significant increase in the number of binucleate cells containing micronuclei, demonstrating the sensitivity of the test system.

[Appendix 1](#) summarises the current historical control data.

#### **4. Deviations from Protocol**

There were no deviations from the protocol.

## **5. Maintenance of records**

Following completion of this study all raw data, specimens and samples, except those generated or used during any Sponsor's or supplier's analysis, were stored in the archives of Huntingdon Life Sciences. Types of sample and specimen which are unsuitable, by reason of instability, for long term retention and archiving may be disposed of after the periods stated in Huntingdon Life Sciences Standard Operating Procedures.

A copy of the final report will be retained indefinitely and all Quality Assurance inspection records for a period of 20 years. All other appropriate specimens and records will be retained for a minimum period of 1 year from the date of issue of the final report. At the end of this retention period the Sponsor will be contacted and advice sought on future archiving requirements. Under no circumstances will any item be discarded without the Sponsor's knowledge.



## 6. Conclusion

It is concluded that Asparaginase, PPV33595 administered for 3 hours in both the absence and presence of S9 mix and for 20 hours in the absence of S9 mix only, at concentrations of up to 2.5% v/v, did not show any evidence of causing an increase in the induction of micronuclei in cultured human lymphocytes, in this *in vitro* test system under the experimental conditions described.

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**Table 1 Results and statistical analysis: 3-hour treatment in the absence of S9 mix**

| Treatment / Concentration              | Replicate ID | CBPI | Mean CBPI | Mean Cytotoxicity (%) | Binucleate Micronuclei |         |                                       |   |
|--|--------------|------|-----------|-----------------------|------------------------|---------|---------------------------------------|---|
|  |              |      |           |                       | per 1000 cells         | Mean    | Pairwise <i>p</i> -value <sup>b</sup> | Trend test <i>p</i> -value <sup>c</sup> |
| Vehicle <sup>a</sup>                   | a            | 1.88 | 1.82      | 0                     | 7                      | 4.5     |                                       |   |
|  | b            | 1.78 |           |                       | 2                      |         |                                       |   |
|  | c            | 1.83 |           |                       | 2                      |         |                                       |   |
|  | d            | 1.79 |           |                       | 7                      |         |                                       |   |
| Asparaginase, PPV33595<br>0.16 (% v/v) | a            | 1.75 | 1.80      | 2.6                   | 4                      | 3.5     | 1.000                                 |   |
|  | b            | 1.84 |           |                       | 3                      |         |                                       |   |
| Asparaginase, PPV33595<br>0.31 (% v/v) | a            | 1.83 | 1.79      | 3.6                   | 4                      | 7.5     | 1.000                                 | 0.264                                   |
|  | b            | 1.75 |           |                       | 11                     |         |                                       |   |
| Asparaginase, PPV33595<br>0.63 (% v/v) | a            | 1.80 | 1.76      | 7.1                   | 1                      | 2.5     | 1.000                                 | 0.651                                   |
|  | b            | 1.72 |           |                       | 4                      |         |                                       |   |
| Asparaginase, PPV33595<br>1.25 (% v/v) | a            | 1.76 | 1.74      | 9.9                   | 6                      | 5.0     | 0.946                                 | 0.985                                   |
|  | b            | 1.71 |           |                       | 4                      |         |                                       |   |
| Asparaginase, PPV33595<br>2.5 (% v/v)  | a            | 1.71 | 1.72      | 12.2                  | 11                     | 9.0     | 0.129                                 | 0.186                                   |
|  | b            | 1.73 |           |                       | 7                      |         |                                       |   |
| MMC<br>0.3 (µg/mL)                     | a            | 1.55 | 1.58      | 29.3                  | 30                     | 25.5*** | <0.001                                |   |
|  | b            | 1.60 |           |                       | 21                     |         |                                       |   |
| COL<br>0.04 (µg/mL)                    | a            | 1.81 | 1.80      | 1.8                   | 16                     | 18.0**  | 0.002                                 |   |
|  | b            | 1.80 |           |                       | 20                     |         |                                       |   |

a. Vehicle control = Water (10% v/v)

b. Pairwise *p*-values are for comparisons to control using Williams' test for Asparaginase, PPV33595 and the *t*-test otherwise

c. Trend test *p*-values are for the linear contrast including the control group and lower concentrations of the same compound

\*\*\* *p* < 0.01

\*\* *p* < 0.001

CBPI: Cytokinesis block proliferative index

MMC: Mitomycin C

COL: Colchicine

**Table 2 Results and statistical analysis: 3-hour treatment in the presence of S9 mix**

| Treatment / Concentration              | Replicate ID | CBPI | Mean CBPI | Mean Cytotoxicity (%) | Binucleate Micronuclei |        |                                       |   |
|--|--------------|------|-----------|-----------------------|------------------------|--------|---------------------------------------|---|
|  |              |      |           |                       | per 1000 cells         | mean   | Pairwise <i>p</i> -value <sup>b</sup> | Trend test <i>p</i> -value <sup>c</sup> |
| Vehicle <sup>a</sup>                   | a            | 1.86 | 1.80      | 0                     | 5                      | 3.5    |                                       |   |
|  | b            | 1.80 |           |                       | 1                      |        |                                       |   |
|  | c            | 1.74 |           |                       | 3                      |        |                                       |   |
|  | d            | 1.80 |           |                       | 5                      |        |                                       |   |
| Asparaginase, PPV33595<br>0.16 (% v/v) | a            | 1.79 | 1.80      | 0.3                   | 7                      | 4.0    | 1.000                                 |   |
|  | b            | 1.81 |           |                       | 1                      |        |                                       |   |
| Asparaginase, PPV33595<br>0.31 (% v/v) | a            | 1.76 | 1.78      | 2.2                   | 1                      | 1.0    | 1.000                                 | 0.156                                   |
|  | b            | 1.81 |           |                       | 1                      |        |                                       |   |
| Asparaginase, PPV33595<br>0.63 (% v/v) | a            | 1.78 | 1.81      | -0.5                  | 4                      | 4.0    | 0.989                                 | 0.895                                   |
|  | b            | 1.83 |           |                       | 4                      |        |                                       |   |
| Asparaginase, PPV33595<br>1.25 (% v/v) | a            | 1.82 | 1.81      | -0.8                  | 2                      | 4.0    | 0.989                                 | 0.722                                   |
|  | b            | 1.80 |           |                       | 6                      |        |                                       |   |
| Asparaginase, PPV33595<br>2.5 (% v/v)  | a            | 1.67 | 1.68      | 15.1                  | 8                      | 6.5    | 0.253                                 | 0.154                                   |
|  | b            | 1.69 |           |                       | 5                      |        |                                       |   |
| CPA<br>10 (µg/mL)                      | a            | 1.37 | 1.39      | 51.1                  | 15                     | 17.0** | 0.002                                 |   |
|  | b            | 1.41 |           |                       | 19                     |        |                                       |   |

a. Vehicle control = Water (10% v/v)

b. Pairwise *p*-values are for comparisons to control using Williams' test for Asparaginase, PPV33595 and the *t*-test otherwise

c. Trend test *p*-values are for the linear contrast including the control group and lower concentrations of the same compound

\*\* *p* < 0.01

CBPI: Cytokinesis block proliferative index

CPA: Cyclophosphamide

**Table 3 Results and statistical analysis: 20-hour treatment in the absence of S9 mix**

| Treatment / Concentration              | Replicate ID | CBPI | Mean CBPI | Mean Cytotoxicity (%) | Binucleate Micronuclei |        |                                       |   |
|--|--------------|------|-----------|-----------------------|------------------------|--------|---------------------------------------|---|
|  |              |      |           |                       | per 1000 cells         | mean   | Pairwise <i>p</i> -value <sup>b</sup> | Trend test <i>p</i> -value <sup>c</sup> |
| Vehicle <sup>a</sup>                   | a            | 1.93 | 1.93      | 0                     | 7                      | 8.0    |                                       |   |
|  | b            | 1.92 |           |                       | 9                      |        |                                       |   |
|  | c            | 1.94 |           |                       | 7                      |        |                                       |   |
|  | d            | 1.92 |           |                       | 9                      |        |                                       |   |
| Asparaginase, PPV33595<br>0.16 (% v/v) | a            | 1.93 | 1.97      | -4.9                  | 4                      | 3.0    | 0.047                                 |   |
|  | b            | 2.01 |           |                       | 2                      |        |                                       |   |
| Asparaginase, PPV33595<br>0.31 (% v/v) | a            | 1.90 | 1.92      | 0.6                   | 6                      | 4.0    | 0.047                                 | 0.021                                   |
|  | b            | 1.94 |           |                       | 2                      |        |                                       |   |
| Asparaginase, PPV33595<br>0.63 (% v/v) | a            | 1.95 | 1.96      | -3.7                  | 6                      | 6.5    | 0.047                                 | 0.571                                   |
|  | b            | 1.97 |           |                       | 7                      |        |                                       |   |
| Asparaginase, PPV33595<br>1.25 (% v/v) | a            | 1.85 | 1.85      | 8.0                   | 2                      | 2.5    | 0.015                                 | 0.051                                   |
|  | b            | 1.85 |           |                       | 3                      |        |                                       |   |
| Asparaginase, PPV33595<br>2.5 (% v/v)  | a            | 1.64 | 1.69      | 25.8                  | 4                      | 4.5    | 0.015                                 | 0.127                                   |
|  | b            | 1.74 |           |                       | 5                      |        |                                       |   |
| MMC<br>0.1 µg/mL                       | a            | 1.89 | 1.83      | 9.9                   | 13                     | 16.0** | 0.005                                 |   |
|  | b            | 1.77 |           |                       | 19                     |        |                                       |   |

a. Vehicle control = Water (10%v/v)

b. Pairwise *p*-values are for comparisons to control using Williams' test for Asparaginase, PPV33595 and the *t*-test otherwise

c. Trend test *p*-values are for the linear contrast including the control group and lower concentrations of the same compound

\*\* *p*<0.01

CBPI: Cytokinesis block proliferative index

MMC: Mitomycin C

## Appendix 1 Historical control data

### Historical control values 3hr -S9

|                  |                    | Mononucleate Individual MN | Mononucleate Group MN | Binucleate Individual MN | Binucleate Group MN |
|------------------|--------------------|----------------------------|-----------------------|--------------------------|---------------------|
| Vehicle Control  | Min                | 0.00                       | 0.50                  | 0.00                     | 1.75                |
|                  | Max                | 7.00                       | 3.50                  | 14.00                    | 11.50               |
|                  | Mean               | 2.37                       | 2.29                  | 4.83                     | 4.61                |
|                  | Standard Deviation | 1.82                       | 1.08                  | 1.08                     | 3.21                |
|                  | No. of cultures:   | 42                         |                       |                          |                     |
|                  |                    | Colchicine                 |                       | Mitomycin C              |                     |
| Positive Control | Min                | 10.00                      | 10.50                 | 9.00                     | 13.50               |
|                  | Max                | 52.00                      | 51.00                 | 36.00                    | 31.50               |
|                  | Mean               | 27.41                      | 25.85                 | 21.09                    | 20.98               |
|                  | Standard Deviation | 13.95                      | 12.94                 | 7.47                     | 6.66                |
|                  | No. of cultures:   | 22                         |                       | 22                       |                     |

Data collection period: 03-Feb-09 11-May-12

### Historical control values 3hr +S9

|                                     |                    | Binucleate Individual MN | Binucleate Group MN |
|-------------------------------------|--------------------|--------------------------|---------------------|
| Vehicle Control                     | Min                | 1.00                     | 2.00                |
|                                     | Max                | 12.00                    | 11.50               |
|                                     | Mean               | 4.00                     | 4.16                |
|                                     | Standard Deviation | 2.80                     | 2.74                |
|                                     | No. of cultures:   | 50                       |                     |
| Positive Control (Cyclophosphamide) | Min                | 9.00                     | 12.50               |
|                                     | Max                | 50.00                    | 48.00               |
|                                     | Mean               | 25.42                    | 25.67               |
|                                     | Standard Deviation | 9.82                     | 10.01               |
|                                     | No. of cultures:   | 26                       |                     |

Data collection period: 03-Feb-09 23-May-12

### Historical control values 20hr -S9

|                  |                    | Mononucleate Individual MN | Mononucleate Group MN | Binucleate Individual MN | Binucleate Group MN |
|------------------|--------------------|----------------------------|-----------------------|--------------------------|---------------------|
| Vehicle Control  | Min                | 0.00                       | 0.50                  | 1.00                     | 2.50                |
|                  | Max                | 7.00                       | 5.50                  | 14.00                    | 11.25               |
|                  | Mean               | 2.23                       | 2.20                  | 4.83                     | 4.83                |
|                  | Standard Deviation | 1.79                       | 1.35                  | 2.84                     | 2.21                |
|                  | No. of cultures:   | 48                         |                       |                          |                     |
|                  |                    | Colchicine                 |                       | Mitomycin C              |                     |
| Positive Control | Min                | 12.00                      | 18.00                 | 8.00                     | 9.00                |
|                  | Max                | 61.00                      | 50.50                 | 53.00                    | 45.00               |
|                  | Mean               | 27.40                      | 32.40                 | 25.24                    | 24.80               |
|                  | Standard Deviation | 11.37                      | 11.87                 | 12.20                    | 11.44               |
|                  | No. of cultures:   | 25                         |                       | 25                       |                     |

Data collection period: 03-Feb-09 11-May-12

## Appendix 2 Certificate of Analysis



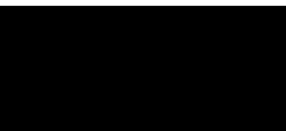
### Toxicology

Date: 16. April, 2012  
Project no.: DEV00851  
Luna: 2012-03841-01  
Ref.: SuH

## Documentation of Test Material

Product: TOX BATCH  
Batch: PPV33595  
Type of enzyme: Asparaginase  
Host organism: *Bacillus subtilis*  
Physical form / Colour: Brownish liquid at room temperature  
E.C.: 3.5.1.1

|                             |              |
|-----------------------------|--------------|
| Activity:                   | 55200 TASU/g |
| Water (KF):                 | 86.9 % w/w   |
| Dry matter:                 | 13.1 % w/w   |
| Ash (600°C):                | 1.7 % w/w    |
| Total Organic Solids (TOS): | 11.4 % w/w   |
| Specific gravity (g/ml):    | 1.059 g/ml   |
| pH:                         | 7.4          |
| Total viable counts/g:      | <100         |



Study Director

## Appendix 3 GLP Compliance Statements



### THE DEPARTMENT OF HEALTH OF THE GOVERNMENT OF THE UNITED KINGDOM

#### GOOD LABORATORY PRACTICE

##### STATEMENT OF COMPLIANCE IN ACCORDANCE WITH DIRECTIVE 2004/9/EC

###### TEST FACILITY

Huntingdon Life Sciences  
Eye Research Centre  
Occold  
Eye  
Suffolk  
IP23 7PX

###### TEST TYPE

Analytical/Clinical Chemistry  
Environmental Fate  
Environmental Toxicity  
Ecosystems  
Phys.Chem. Testing  
Residue studies  
Mutagenicity  
Toxicology

###### DATE OF INSPECTION

**28<sup>th</sup> - 30<sup>th</sup> June 2011**

A general inspection for compliance with the Principles of Good Laboratory Practice was carried out at the above test facility as part of the UK GLP Compliance Programme.

At the time of inspection no deviations were found of sufficient magnitude to affect the validity of non-clinical studies performed at these facilities.



Head, UK GLP Monitoring Authority







**THE DEPARTMENT OF HEALTH OF THE GOVERNMENT  
OF THE UNITED KINGDOM**

**GOOD LABORATORY PRACTICE**

**STATEMENT OF COMPLIANCE  
IN ACCORDANCE WITH DIRECTIVE 2004/9/EC**

**TEST FACILITY**

Huntingdon Life Sciences  
Woolley Road  
Alconbury  
Huntingdon  
Cambridgeshire  
PE28 4HS

**TEST TYPE(S)**

Analytical/Clinical Chemistry  
Environmental Fate  
Environmental Toxicity  
Ecosystems  
Toxicology

**DATE OF INSPECTION**

23 August 2011

An inspection for compliance with the Principles of Good Laboratory Practice was carried out at the above test facility as part of the UK Good Laboratory Practice Compliance Monitoring Programme.

This statement confirms that, on the date of issue, the UK Good Laboratory Practice Monitoring Authority were satisfied that the above test facility was operating in compliance with the OECD Principles of Good Laboratory Practice.

This statement constitutes a Good Laboratory Practice Instrument (as defined in the UK Good Laboratory Practice Regulations 1999).

[Redacted]  
12/12/11  
[Redacted]  
Head, UK GLP Monitoring Authority

**MHRA**

## Appendix 4 S9 Quality Control Certificate



**TRINOVA**  
**Biochem**  
GmbH

### MOLTOX POST MITOCHONDRIAL SUPERNATANT (S-9) PRODUCTION & QUALITY CONTROL CERTIFICATE

|                  |                        |  |
|------------------|------------------------|--|
| LOT NO.: 2779    | SPECIES: Rat           | PREPARATION DATE: July 07, 2011                        |
| PART NO.: J1-105 | STRAIN: Sprague Dawley | EXPIRATION DATE: July 07, 2013                         |
| VOLUME: 1 mL     | SEX: Male              | BUFFER: 0.154 M KCl                                    |
|                  | TISSUE: Liver          | INDUCING AGENT(s): Phenobarbital -<br>5,6-Benzoflavone |

REFERENCE: Matsushima, et al., In: In Vitro Metabolic  
Activation in Mutagenesis Testing (F.J. de Serres, Ed.), Elsevier, 1976, p. 85.  
STORAGE: At or below - 70°C

#### BIOCHEMISTRY:

- PROTEIN  
44.0 mg/ml

Assayed according to the method of Lowry et al., JBC  
193:265, 1951 using bovine serum albumin as the standard.

#### - ALKOXYRESORUFIN-0-DEALKYLASE ACTIVITIES

| Activity | P450     | Fold -<br>Induction |
|----------|----------|---------------------|
| EROD     | 1A1, 1A2 | 131.8               |
| PROD     | 2B1      | 31.2                |
| BROD     | 2B1      | 48.1                |
| MROD     | 1A2      | 32.2                |

Assays for ethoxyresorufin-0-deethylase (EROD), pentoxy-, benzyl- and methoxyresorufin-0-dealkylases (PROD, BROD, & MROD) were conducted using a modification of the methods of Burke, et al., *Biochem Pharm* 34:3337, 1985. Fold-inductions were calculated as the ratio of the sample vs. uninduced specific activities (SA's). Control SA's (pmoles/min/mg protein) were 40.1, 29.6, 95.3, & 16.7 for EROD, PROD, BROD and MROD, respectively.

#### BIOASSAY:

##### - TEST FOR THE PRESENCE OF ADVENTITIOUS AGENTS

Samples of S-9 were assayed for the presence of contaminating microflora by plating 1.0 ml volumes on Nutrient Agar and Minimal Glucose (Vogel-Bonner E. supplemented with 0.05 mM L-histidine and D-biotin) media. Triplicate plates were read after 24 - 48 h incubation at 35°C. The tested samples met acceptance criteria.

##### - PROMUTAGEN ACTIVATION

| No. his <sup>+</sup> Revertants | EtBr/ CPA/ |
|---------------------------------|------------|
| TA98                            | TA1535     |
| 186.4                           | 1284       |

The ability of the sample to activate ethidium bromide (EtBr) and cyclophosphamide (CPA) to intermediates mutagenic to TA98 and TA1535, respectively, was determined according to Lesca, et al., *Mutation Res* 129:299, 1984. Data were expressed as revertants per µg EtBr or per mg CPA.

Dilutions of the sample S9, ranging from 0.2 - 10% in S9 mix, were tested for their ability to activate benzo(a)pyrene (BP) and 2-aminoanthracene (2-AA) to intermediates mutagenic to TA100. Assays were conducted using duplicate plates as described by Maron & Ames (*Mutat. Res.* 113:173, 1983).

#### µl S9 per plate/number his<sup>+</sup> revertants per plate

| Promutagen    | 0   | 1   | 5   | 10   | 20   | 50   |
|---------------|-----|-----|-----|------|------|------|
| BP (5 µg)     | 126 | 211 | 290 | 418  | 523  | 893  |
| 2-AA (2.5 µg) | 147 | 168 | 920 | 2051 | 2380 | 1737 |

#### MOLECULAR TOXICOLOGY, INC.

157 Industrial Park Dr.  
Boone, NC 28604  
(828) 264-9099  
www.moltox.com

Approved:

07/14/11

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## TEST REPORT

**Asparaginase PPV33595**

**90-Days Oral Gavage Toxicity Study in Rats**

|                         |  |
|-------------------------|--|
| <b>Study No:</b>        | 74826  |
| <b>Sponsor Ref:</b>     | 20126001   |
| <b>Date:</b>            | 17 October 2012  |
| <b>Author:</b>          | <div></div>  |
| <b>Number of pages:</b> | 304  |
| <b>Sponsor:</b>         | Novozymes A/S<br>Krogshøjvej 36<br>DK-2880 Bagsværd<br>Denmark |

Study No: 74826  
Sponsor Ref: 20126001

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Status:  
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## Good Laboratory Practice Compliance Statement

The study described in this report "Asparaginase PPV33595 - 90-Days Oral Gavage Toxicity Study in Rats" was conducted under my supervision and responsibility and is in compliance with the OECD Principles of Good Laboratory Practice (as revised in 1997), which are in conformity with other international GLP regulations.

The report is a complete and accurate account of the methods employed and the data obtained.



Study Director  
CiToxLAB Scantox A/S

17 October 2012

Date

## Quality Assurance Statement

Study No: 74826

Study Title: Asparaginase PPV33595 - 90-Days Oral Gavage Toxicity Study in Rats

An audit of the study plan has been performed and reported to the Study Director (SD) and Test Facility Management (TFM).

| Audit            | Date of audit | Date of reporting to SD and TFM |
|------------------|---------------|---------------------------------|
| Final study plan | 30 March 2012 | 30 March 2012                   |
| Amendment 1      | 19 April 2012 | 19 April 2012                   |
| Amendment 2      | 13 July 2012  | 13 July 2012                    |
| Amendment 3      | 31 July 2012  | 31 July 2012                    |

This study performed by CiToxLAB Scantox A/S has been inspected by the Quality Assurance Unit at CitoxLAB Scantox A/S in compliance with OECD Principles of Good Laboratory Practice. Inspection reports have been provided to the Study Director and to Test Facility Management according to the table below. Process and facility inspections are performed on a regular basis in accordance with CiToxLAB Scantox A/S procedures. Study-based and the most recent process based inspection dates are stated in the table below.

| Inspection type | Inspection item(s)                           | Inspection date(s)            | Date of reporting to SD and TFM |
|-----------------|--|-------------------------------|---------------------------------|
| Study based     | Preparation and sampling of dose formulation | 18 April 2012                 | 18 April 2012                   |
|                 | Registration and storage of dose formulation | 18 April 2012                 | 18 April 2012                   |
|                 | Housing of animals                           | 18 April 2012                 | 18 April 2012                   |
|                 | Observation of animals, documentation        | 18 April 2012<br>01 June 2012 | 18 April 2012<br>01 June 2012   |
|                 | Observation of animals                       | 08 May 2012                   | 08 May 2012                     |
|                 | Detailed clinical observation                | 17 April 2012<br>08 May 2012  | 18 April 2012<br>08 May 2012    |
|                 | Observation after re-allocation              | 17 April 2012                 | 18 April 2012                   |
|                 | Dosing                                       | 18 April 2012<br>01 June 2012 | 18 April 2012<br>01 June 2012   |
|                 | Re-allocation                                | 17 April 2012                 | 18 April 2012                   |

|                      |   |                                 |                                 |
|----------------------|---|---------------------------------|---------------------------------|
| <b>Study based</b>   | Stimuli-induced tests                             | 11 July 2012                    | 12 July 2012                    |
|                      | Open field  | 11 July 2012                    | 12 July 2012                    |
|                      | Blood sampling                                    | 17 July 2012                    | 17 July 2012                    |
|                      | Necropsy  | 17 July 2012                    | 17 July 2012                    |
|                      | Raw data  | 18 April 2012                   | 18 April 2012                   |
| <b>Process-based</b> | Arrival and allocation of animals                 | 12 January 2012                 | 12 January 2012                 |
|                      | Re-allocation, weighing of animal, diet and water | 21 February 2012<br>08 May 2012 | 22 February 2012<br>08 May 2012 |
|                      | Reception or sample dispatch                      | 15 May 2012                     | 16 May 2012                     |
|                      | Clinical chemistry analysis                       | 15 June 2012                    | 15 June 2012                    |
|                      | Haematology analysis                              | 15 June 2012                    | 15 June 2012                    |
|                      | Histology and pathology                           | 21 and 22 May 2012              | 22 May 2012                     |
|                      | Ophthalmoscopy                                    | 27 March 2012<br>07 June 2012   | 28 March 2012<br>07 June 2012   |

The study report has been audited. The methods, procedures and observations as outlined in the study plan and in CiToxLAB Scantox A/S Standard Operating Procedures have been accurately described. The results and data presented in the study report accurately reflect the raw data generated during the study.

|                                      |   |
|--------------------------------------|---|
| <b>Date of audit of draft Report</b> | <b>Date(s) of reporting to SD and TFM</b> |
| 11,14,17-21,25,27,28 September 2012  | 28 September 2012                         |
| <b>Date of audit of Final Report</b> | <b>Date of reporting to SD and TFM</b>    |
| 10, 15 and 17 October 2012           | 17 October 2012                           |

The Analysis of dose formulation of the study performed by Novozymes A/S has been inspected and the results audited by their Quality Assurance Unit and a test site QA statement have been issued.

QA Auditor  
CiToxLAB Scantox A/S

17 October 2012

Date

## Personnel involved in the study

Study Director from 01 August 2012:

[REDACTED]

Study Director until 31 July 2012:

[REDACTED]

Analysis of dose formulation:

[REDACTED], Novozymes A/S

Sponsor Monitor:

[REDACTED], Novozymes A/S

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## 1 Summary

The objective of this study conducted at CiToxLAB Scantox A/S, was to assess the systemic toxic potential of Asparaginase PPV33595 when administered daily by oral treatment (gavage) to rats for 90/91 days.

The study was conducted in 40 male and 40 female SPF Sprague Dawley rats of the Ntac:SD strain, approximately 5 weeks old. The animals were randomly allocated to four groups: Group 1 (tap water, 0 g TOS/kg bw and TASU/kg bw), Group 2 (0.121 g TOS/kg bw or 58457 TASU/kg bw), Group 3 (0.398 g TOS/kg bw or 192907 TASU/kg bw) and Group 4 (1.207g TOS/kg bw or 584568 TASU/kg bw). Treatment was performed by oral treatment (gavage) once daily for 90 days with a dose volume of 10 ml/kg.

Clinical signs were recorded daily and once weekly detailed clinical observations outside the cage were performed. Body weight and food consumption were recorded once weekly, while water consumption was recorded twice weekly. Before termination, the animals were examined with respect to motor activity (open field test) and reactivity to different types of stimuli. Clinical pathology was performed before termination of treatment. At termination of the study, the animals were euthanised and subjected to a full macroscopic examination and selected organs were weighed, fixed and examined histopathologically.

No treatment related signs were recorded at the clinical examination (clinical observations, open field and stimuli tests and ophthalmoscopy), on body weight gain, on food or water consumption or on clinical pathology parameters. At necropsy, no microscopic or macroscopic treatment related findings were observed.

**In conclusion,** 90 days of oral (gavage) treatment of rats with Asparaginase, PPV33595, at dose levels of up to 1.207g TOS/kg bw or 584568 TASU/kg bw administered at a dose volume of 10 ml/kg did not cause any treatment related changes. The NOAEL (No Observed Adverse Effect Level) for both female and male animals for Asparaginase, PPV33595, is 1.207g TOS/kg bw corresponding to 584568 TASU/kg bw.

## 2 Introduction

### 2.1 Background

The name of the enzyme is Asparaginase PPV33595 (batch No is PPV33595). The host organism is *Bacillus subtilis*. This asparaginase is thermostable and has been developed with the purpose of reducing acrylamide formation in food products that are processed at high temperatures (80-100 °C). These include breakfast cereals, potato flakes and decaffeinated coffee. The existing asparaginase (Acrylaway) has a temperature optimum around 55-60 °C, and is not stable above 60 °C.

### 2.2 Objective

The objective of this study was to assess the systemic toxic potential of Asparaginase PPV33595 when administered daily orally, by gavage, to rats for 90/91 days.

### 2.3 Rationale for study design

The rat was selected as the rat was one of the standard species for toxicological investigations. Oral treatment (gavage) has been chosen in order to comply with the intended human route of administration. The doses were selected by the Sponsor.

### 2.4 Study conduct

The present study has been conducted in accordance with the OECD Guideline 408, adopted on 21 September 1998.

This study was conducted at CiToxLAB Scantox A/S, Hestehavevej 36A, Ejby, DK-4623 Lille Skensved, Denmark according to:

|                |       |               |
|----------------|-------|---------------|
| Study plan     | Dated | 30 March 2012 |
| Amendment No 1 | Dated | 12 April 2012 |
| Amendment No 2 | Dated | 11 July 2012  |
| Amendment No 3 | Dated | 27 July 2012  |

The animals arrived on 04 April 2012. Treatment started on 18 April 2012. The in-life phase ended on 18 July 2012.

This report describes the procedures used and the results obtained.

## 3 Materials and methods

### 3.1 Test item and vehicle

The test item, Asparaginase PPV33595 (batch No PPV33595, expiry date 06 March 2022), was supplied by the Sponsor.

Test item characterisation for the batch is listed below.

|                       |                                     |
|-----------------------|-------------------------------------|
| Batch No:             | PPV33595                            |
| Host organism:        | <i>Bacillus subtilis</i>            |
| Physical form/colour: | Brownish liquid at room temperature |
| E.C.:                 | 3.5.1.1                             |

|                             |              |
|-----------------------------|--------------|
| Activity:                   | 55200 TASU/g |
| Water (KF):                 | 86.9 % w/w   |
| Dry matter:                 | 13.1 % w/w   |
| Ash (600°C):                | 1.7 % w/w    |
| Total Organic Solids (TOS): | 11.4 % w/w   |
| Specific gravity (g/ml):    | 1.059 g/ml   |
| pH:                         | 7.4          |
| Total viable counts/g:      | <100         |

The test item was stored in a freezer (-18°C) protected from light.

Remaining test item was discarded after finalisation of the dose formulation report.

The vehicle for the preparation was tap water.

### 3.2 Animals

The study was performed in 40 male and 40 female SPF Sprague Dawley rats of the Ntac:SD strain from Taconic Europe A/S, Ejby, Denmark. At the start of the acclimatisation period, the rats were approximately 5 weeks old and their body weight was within a range of 123-165 grams for males and 108-153 grams for females. This was a deviation from the study plan, as the study plan specified that the body weight would be within a range of  $\pm 20$  for each sex. However, this deviation was considered to have no impact on the outcome of the study. Ten (10) extra animals (5 of each sex) were available for replacement purposes.

An acclimatisation period of 14 days was allowed in order to reject animals in poor condition or at the extremes of the weight range.

### **3.3 Housing**

The study took place in animal room No 104 provided with filtered air at a temperature of  $21^{\circ}\text{C} \pm 3^{\circ}\text{C}$  and relative humidity of  $55\% \pm 15\%$ . The temperature and relative humidity in the animal room were recorded hourly during the study and the records have been retained.

The ventilation system has been designed to give 10 air changes per hour. The room was illuminated to give a cycle of 12 hours light and 12 hours darkness. Light was on from 06:00 h to 18:00 h.

The rats were kept in transparent polycarbonate cages (floor area:  $1500\text{ cm}^2$  - height 21 cm) with 2-3 animals in each cage, males and females separated. The cages were cleaned and the bedding changed at least once per week.

Before arrival of the animals, the animal room was cleaned and disinfected. During the study, the animal room was cleaned regularly and rinsed with water.

### **3.4 Bedding**

The bedding was softwood sawdust "Jeluxyl" from Jelu Werk GmbH, Josef Ehrler GmbH & Co KG, Ludwigsmühle, D-73494 Rosenberg, Germany. Analyses for relevant possible contaminants were performed regularly. Certificates of analysis have been retained.

### **3.5 Environmental enrichment**

For environmental enrichment, the animals were offered a supply of Aspen Wood Wool from Tapvei Estonia OÜ, Estonia, at each change of bedding. Analyses for relevant possible contaminants were performed regularly. Certificates of analysis have been retained.

Furthermore, an autoclaved brick of wood from Tapvei Estonia OÜ, Estonia, was provided to each cage. Analyses for relevant possible contaminants were performed regularly. Certificates of analysis have been retained.

Each cage also contained a red transparent Rat House (Noryl, Tecniplast) from Tecniplast Gazzada S.a.r.l., 21020 Buguggiate -Va, Italy. The house allows the animals to show a wide range of natural behaviour.

### **3.6 Diet**

A complete pelleted rodent diet "Altromin 1314 Fortified" (for growing animals) was available *ad libitum* until Day 48 of the dosing period. On Day 49 and throughout the study, the animals were offered *ad libitum* "Altromin 1324 Fortified" (for adult animals). Altromin was supplied by Altromin Gesellschaft für Tierernährung mbH, D-32791 Lage, Germany. Analyses for major nutritive components and relevant possible contaminants were performed regularly. Certificates of analysis have been retained.

### **3.7 Drinking water**

The animals had free access to bottles with domestic quality drinking water acidified with hydrochloric acid to pH 2.5 in order to prevent microbial growth. Analyses for relevant possible contaminants were performed regularly on the drinking water prior to acidification. Certificates of analysis have been retained.

### **3.8 Animal randomisation and allocation**

On the day of arrival, the animals were allocated randomly to 4 groups and a group of extra animals, using a randomisation scheme.

Prior to commencement of treatment, the animals may be re-allocated in order to reduce possible inter-group mean body weight differences. Data available from pre-treatment observations, clinical signs and laboratory investigations were taken into account when re-allocating animals.

On Day 3 of the study, the extra animals were allocated to CiToxLAB Scantox A/S stock, after which they were no longer part of this study.

### **3.9 Animal and cage identification**

Each animal was identified by punched ear marks.

Each cage was identified by a colour coded card containing study number, group number, sex and animal number.

### 3.10 Treatment

The groups, dose levels, animal numbers and colour codes were as follows:

**Table 1 Treatment schedule**

| Group | Dose concentration* | Dose          | Dose       | Animal Nos |        | Colour code |
|-------|---------------------|---------------|------------|------------|--------|-------------|
|       | (v/v)               | (g TOS/kg bw) | TASU/kg bw | Male       | Female |             |
| 1     | 0 %                 | 0             | 0          | 1-10       | 11-20  | White       |
| 2     | 10 %                | 0.121         | 58457      | 21-30      | 31-40  | Blue        |
| 3     | 33 %                | 0.398         | 192907     | 41-50      | 51-60  | Green       |
| 4     | 100 %               | 1.207         | 584568     | 61-70      | 71-80  | Red         |

\* Corresponding to: 0 ml PPV33595/kg/day (Group 1), 1.0 ml PPV33595/kg/day (Group 2), 3.3 ml PPV33595/kg/day (Group 3) and 10 ml PPV33595/kg/day (Group 4). TOS = Total organic solids. TASU= Thermo-stable Asparaginase Unit.

- The daily dose was given by oral treatment (gavage) according to the most recent body weight data.
- Treatment was performed daily for at least 90 days and until the day before necropsy.
- Dose volume was 10 mL/kg body weight.
- Dose formulations for Groups 2-4 was kept on a magnetic stirrer (gentle stirring) at least 10 minutes before start of treatment and during treatment.
- The first day of treatment was designated Day 1.
- The tubes for gavage was wiped with a wetted cloth between each dosing.

On Day 87, animal No 61 Group 4, bid through the oral tube while being dosed. Therefore, the total amount of test item given was not known. The incident was considered to have no impact on the outcome of the study.

### 3.11 Dose formulation preparation

The stock bottles with test item were kept frozen at approximately -18°C (and protected from light) until use. Each stock bottle was thawed overnight in a refrigerator, and the contents were divided into aliquots suitable for daily preparation of dose formulations. Before dividing the contents of the stock bottles, the test item in the stock bottles was stirred gently for at least 10 minutes on a magnetic stirrer at room temperature. The aliquots were frozen and any



remaining test item in the thawed stock bottle was discarded (in order to avoid thawing the stock bottles more than once).

On one occasion (from Day 50 to 51), the stock bottles from Groups 2, 3 and 4 were thawed overnight at room temperature and not in a refrigerator. The incident is considered not to have impact on the study, due to the fact that all bottles were used within 24 hours after they were taken out from the freezer and therefore used before expiry, and stability data from Sponsor shows high stability of the enzyme activity at room temperature for at least 24 hours.

Prior to each dosing, a suitable number of aliquots were thawed overnight in a refrigerator. The thawed aliquots were stirred gently for at least 10 minutes on a magnetic stirrer at room temperature. Dose formulations were prepared as follows:

Group 1: Vehicle (tap water)

Group 2: 1 portion of test item diluted in 9 portions of vehicle (tap water).

Group 3: 1 portion of test item diluted in 2.03 portions of vehicle (tap water).

Group 4: Undiluted test item.

The prepared dose formulations were stored at room temperature (protected from light) until usage and during usage. The treatment of the animals was completed within 24 hours after preparation of the dose formulations. According to the Sponsor Monitor, the dose formulations were stable for use in this time period.

Prior to commencement of treatment, a trial formulation (high dose group in expected volume) was prepared. The preparation of this trial formulation was documented in the raw data of this study, but not reported.

### **3.12 Control of dose preparations and usage**

Before preparation of dose formulation, the dose calculations were double checked.

Each step of the dose formulation preparation was documented. The weight of dose formulation for each group before and after dosing was documented.

After dosing, the amount of dose formulation used for each group was compared with the predicted daily usage.

### 3.13 Analysis of dose formulations

During Weeks 1, 6 and 13, two (2) sets of triplicate (3) samples (6 samples in total) each of 10 ml of the 4 dose formulations were collected in Nunc plastic tubes and stored frozen at approximately  $-18^{\circ}\text{C}$ . One (1) set of triplicate samples (Nos 1-3) was sent on dry ice to the PI at Novozymes A/S for analysis. The other set of triplicate samples (Nos 4-6) was stored at CiToxLAB Scantox A/S until the PI report was finalised, whereafter the samples were discarded.

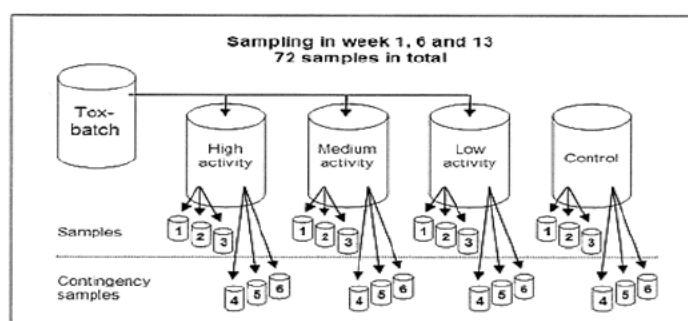
**Table 2 Samples of dose formulations**

| Sampling occasion | Sampling volume | Sample container | Nominal concentration (%) | Number of samples*    | Shipping date    |
|-------------------|-----------------|------------------|---------------------------|-----------------------|------------------|
| Week 1            | 10 mL           | Cryotube         | 0                         | 2 sets of 3 (total 6) | Nos 1-3: Week 32 |
|                   |                 |                  | 10                        | 2 sets of 3 (total 6) |                  |
|                   |                 |                  | 33                        | 2 sets of 3 (total 6) |                  |
|                   |                 |                  | 100                       | 2 sets of 3 (total 6) |                  |
| Week 6            | 10 mL           | Cryotube         | 0                         | 2 sets of 3 (total 6) | Nos 1-3: Week 32 |
|                   |                 |                  | 10                        | 2 sets of 3 (total 6) |                  |
|                   |                 |                  | 33                        | 2 sets of 3 (total 6) |                  |
|                   |                 |                  | 100                       | 2 sets of 3 (total 6) |                  |
| Week 13           | 10 mL           | Cryotube         | 0                         | 2 sets of 3 (total 6) | Nos 1-3: Week 32 |
|                   |                 |                  | 10                        | 2 sets of 3 (total 6) |                  |
|                   |                 |                  | 33                        | 2 sets of 3 (total 6) |                  |
|                   |                 |                  | 100                       | 2 sets of 3 (total 6) |                  |
| Total             |                 |                  |                           | 3x24 samples          |                  |

\* For each sampling occasion the cryotubes were labelled 1-6.

Total number of samples from each week: 2 sets of 12, totally 24.

Total number of samples from whole study: 2 sets of 36, total 72.



The draft results of the analysis (a non-audited draft) were sent to the Study Director at CiToxLAB Scantox A/S for commenting. The final results were sent to the Study Director at CiToxLAB Scantox A/S, as a QA-audited PI-report for inclusion in the final study report ([Appendix I](#)).

### **3.14 Clinical signs**

#### **3.14.1 Daily observations**

All visible signs of ill health and any behavioural changes were recorded daily. Any deviation from normal was recorded with respect to time of onset, duration and intensity.

Clinical signs observed during the pre-treatment period were only reported if considered relevant for the study. However, all findings were listed in the raw data.

#### **3.14.2 Weekly observations**

Beginning prior to start of treatment, detailed clinical observations were performed outside the home cage once per week at similar times. Signs to be recorded included, but were not limited to: changes in skin/fur, eyes, mucous membranes, occurrence of secretions and excretions and autonomic activity (*e.g.*, lacrimation, piloerection, pupil size, and unusual respiratory pattern). Changes in gait, posture and response to handling as well as the presence of clonic or tonic movements, stereotypies (*e.g.* excessive grooming, repetitive circling) or bizarre behaviour (*e.g.* self-mutilation, walking backwards) were also recorded.

#### **3.14.3 Open field**

During the last two weeks of the study, all animals were examined with respect to motor activity (open field test).

The rat was placed in the ActiMot arena for open-field-testing for 5 minutes, and the parameters given in [Table 3](#) were recorded and described. When the 5 minutes had passed, the rat was removed and placed in its own cage again. The arena was cleaned after each tested animal.

**Table 3 Open-field observations**

| Parameters               | Recorded as   | Description  |
|--------------------------|---|--|
| Abnormal behaviour       | 0 = Not observed<br>1 = Observed                    | Observation e.g. stereotypes   |
| Level of activity*)      | ActiMot   | Time moving<br>Total distance<br>Numbers of rearings<br>Time in centre<br>Time in periphery<br>Total corner visits<br>Moves/Counts |
| Ataxia                   | 0 = None<br>1 = Slightly increased<br>2 = Increased |  |
| Number of faecal pellets | Count   | Actual number  |
| Urination during test    | 0 = Not observed<br>1 = Observed                    | Observation  |

\*) Level of activity when placed in the ActiMot arena.

#### **3.14.4 Stimuli-induced tests**

During the last two weeks of the study, all animals were examined with respect to reactivity to different types of stimuli (*e.g.* auditory, visual, tactile) and grip strength, as described in the internal SOP/1.1.1/13, version 2.

#### **3.15 Mortality**

No animal died or was killed for ethical reasons after start of treatment.

#### **3.16 Body weight**

Starting on arrival, the animals were weighed once weekly, including Day –1 which was the body weight used for re-allocation. During the dosing period, the animals were weighed on the last day of each study week (Days 7, 14, etc) and this weight was used for calculation of the doses for the following study weeks. Moreover, the animals were weighed on Day 1 and at necropsy.

Body weight gain was calculated.

### 3.17 Food consumption

From Day -1, the food consumption was recorded weekly for each cage with a 7-day interval.

Accumulated food consumption was calculated.

### 3.18 Water consumption

From Day -1, the water consumption was recorded twice weekly for each cage.

### 3.19 Ophthalmoscopy

Before start of treatment, ophthalmoscopy was performed on all animals. Before termination of treatment, all animals in Groups 1 and 4 were re-examined. The animals in Groups 2 and 3 were not re-examined as no treatment related findings were observed.

After application of tropicamide 1% solution (Mydriacyl, Alcon Universal Ltd., USA), both eyes were examined with an indirect ophthalmoscope and a portable slit-lamp microscope.

### 3.20 Clinical pathology

Before termination of treatment, blood was taken from all animals. Blood samples were drawn using the sublingual venous plexus during CO<sub>2</sub>/O<sub>2</sub> anaesthesia.

For haematology, at least 300 µl K3 EDTA stabilised blood was taken. From this sample, a smear was prepared and stained with May-Grünwald and Giemsa. These smears were read manually as the direct measurement by Pentra was too different (>10%) compared to manual count. The smears have been archived.

For the coagulation tests, 500 µl citrate stabilised blood was taken.

Approximately 750 µl blood was taken for clinical chemistry in plain glass tubes for serum.

At necropsy, a bone marrow smear was taken from the femur of all animals (see the table under the heading [Organs and tissues](#)). The smears were fixed and stained with May-Grünwald and Giemsa stain. These smears were not analysed as no test item related effect was observed and the smears have been discarded upon finalisation of the study.

The parameters, methods and units for the laboratory investigations were stated below:

**Table 4 Haematology and coagulation parameters**

| Parameter  | Method/Equipment                       | Unit              |
|--|--|-------------------|
| Haemoglobin (Hb)   | Direct measurement/ABX Pentra DX120SPS | mmol/l            |
| Red blood cell count (RBC)                                     | Direct measurement/ABX Pentra DX120SPS | $10^{12}/l$       |
| Reticulocyte count (RETIC)                                     | Direct measurement/ABX Pentra DX120SPS | % and $10^{12}/l$ |
| Haematocrit (HT)   | Direct measurement/ABX Pentra DX120SPS | ml/100 ml         |
| Mean cell volume (MCV)   | Calculated/ABX Pentra DX120SPS         | fl                |
| Mean cell haemoglobin (MCH)                                    | Calculated/ABX Pentra DX120SPS         | fmol              |
| Mean cell haemoglobin concentration (MCHC)                     | Calculated/ABX Pentra DX120SPS         | mmol/l            |
| White blood cell count (WBC)                                   | Direct measurement/ABX Pentra DX120SPS | $10^9/l$          |
| Differential leucocyte count (NEUTRO, LYMPHO, EOS, BASO, MONO) | Direct measurement/ABX Pentra DX120SPS | % and $10^9/l$    |
| Platelet count (Plt)   | Direct measurement/ABX Pentra DX120SPS | $10^9/l$          |
| Activated partial thromboplastin time (APTT)                   | IL Test™/ACL™ (*)                      | sec.              |
| Prothrombin time (Pt)  | IL Test™/ACL™(*)                       | sec.              |
| Fibrinogen (Fib)   | IL Test™/ACL™(*)                       | g/l               |

(\* Instrumentation Laboratories, Automated Coagulation Laboratory)

**Table 5 Clinical chemistry**

| Parameter                         | Method                              | Unit    |
|-----------------------------------|-------------------------------------|---------|
| Alanine aminotransferase (ALAT)   | Hitachi 917                         | μkat/l  |
| Aspartate aminotransferase (ASAT) | Hitachi 917                         | μkat/l  |
| Alkaline phosphatase (ALKPH)      | Hitachi 917                         | μkat/l  |
| Bilirubin (total) (TBILI)         | Hitachi 917                         | μmol/l  |
| Gamma-glutamyl transferase (GGT)  | Hitachi 917                         | μkat/l  |
| Cholesterol (CHOL)                | Hitachi 917                         | mmol/l  |
| Triglycerides (TRIG)              | Hitachi 917                         | mmol/l  |
| Carbamide (UREA)                  | Hitachi 917                         | mmol/l  |
| Creatinine (CREAT)                | Hitachi 917                         | μmol/l  |
| Glucose (GLUC)                    | Hitachi 917                         | mmol/l  |
| Sodium (Na)                       | Ion selective electrode/Hitachi 917 | mmol/l  |
| Potassium (K)                     | Ion selective electrode/Hitachi 917 | mmol/l  |
| Calcium (Ca)                      | Hitachi 917                         | mmol/l  |
| Magnesium (Mg)                    | Hitachi 917                         | mmol/l  |
| Inorganic phosphorus (P)          | Hitachi 917                         | mmol/l  |
| Chloride (Cl)                     | Ion selective electrode/Hitachi 917 | mmol/l  |
| Protein (total) (PROTEIN)         | Hitachi 917                         | g/l     |
| Albumin (ALB)                     | Hitachi 917                         | g/l     |
| Globulin                          | Calculated                          | g/l     |
| Albumin/Globulin (ALB/G) ratio    | Calculated                          | No unit |

### 3.21 Terminal observations

On the day of necropsy, the animals were weighed, examined externally and placed in a chamber with atmospheric air upon which a mixture of 70% CO<sub>2</sub> and 30% O<sub>2</sub> was applied at a steadily increasing concentration for euthanasia. The animals were monitored closely while in the chamber. Death was confirmed and the animals were bled before proceeding. The animals were necropsied in the sequence of one or two animals/group.

### 3.21.1 Necropsy

A macroscopic examination was performed after opening the cranial, thoracic and abdominal cavities and by observing the appearance of the organs and tissues *in situ*. Any macroscopic change was recorded with details of the location, colour, shape and size in the PathData©System V6.2a2 computer system.

### 3.21.2 Organs and tissues

Either whole organs or selected samples of the indicated organs and tissues were subjected to the procedures itemised in the list given in [Table 6](#) below. Weights were recorded in the PathData©System V6.2a2 computer system.

Paired organs were weighed together. The relative organ weights, i.e. the organ weight as a percentage of the body weight and organ weight as a percentage of the brain weight, were calculated for each animal.

All tissues were initially fixed in phosphate buffered neutral 4% formaldehyde with the exception of the eyes and testes (Modified Davidsons's fixative). The fixative for long term preservation was phosphate buffered neutral 4% formaldehyde for all tissues. The lungs were infused with fixative at necropsy.



**Table 6 Organs and tissues**

| Organs and tissues                            | W<br>e<br>i<br>g<br>h | F<br>i<br>x | M<br>i<br>c<br>r<br>o | Organs and tissues  | W<br>e<br>i<br>g<br>h | F<br>i<br>x | M<br>i<br>c<br>r<br>o |
|---|-----------------------|-------------|-----------------------|---|-----------------------|-------------|-----------------------|
| Abnormalities (gross lesions)                 |                       | x           | x                     | Pituitary   | x                     | x           | x                     |
| Adrenals                                      | x                     | x           | x                     | Prostate  | x                     | x           | x                     |
| Aorta (thoracic)                              |                       | x           | x                     | Salivary glands (right parotid, sublingual and submandibular) |                       | x           | x                     |
| Brain   | x                     | x           | x                     | Sciatic nerve   |                       | x           | x                     |
| Bone marrow smear                             |                       | x           |                       | Seminal vesicles  |                       | x           | x                     |
| Bones (right femur)                           |                       | x           | x                     | Skeletal muscle   |                       | x           | x                     |
| Epididymides                                  | x                     | x           | x                     | Skin  |                       | x           | x                     |
| Eyes with lens/optic nerve*                   |                       | x           | x                     | Spinal cord (cervical, thoracic, lumbar)                      |                       | x           | x                     |
| Heart   | x                     | x           | x                     | Spleen  | x                     | x           | x                     |
| Intestine small (duodenum, jejunum, ileum)    |                       | x           | x                     | Sternum (for bone marrow)                                     |                       | x           | x                     |
| Intestine large (caecum, colon, rectum)       |                       | x           | x                     | Stomach (glandular, non glandular)                            |                       | x           | x                     |
| Joint (knee)                                  |                       | x           | x                     | Testes  | x                     | x           | x                     |
| Kidneys                                       | x                     | x           | x                     | Thymus  | x                     | x           | x                     |
| Larynx  |                       | x           | x                     | Thyroids (incl. parathyroid)                                  |                       | x           | x                     |
| Liver   | x                     | x           | x                     | Tongue  |                       | x           | x                     |
| Lungs   |                       | x           | x                     | Trachea   |                       | x           | x                     |
| Lymph nodes (mesenteric and right mandibular) |                       | x           | x                     | Ureters   |                       | x           | x                     |
| Mammary gland                                 |                       | x           | x                     | Urinary bladder   |                       | x           | x                     |
| Oesophagus                                    |                       | x           | x                     | Uterus (horn, cervix and oviducts)                            | x                     | x           | x                     |
| Ovaries                                       | x                     | x           | x                     | Vagina  |                       | x           | x                     |
| Pancreas                                      |                       | x           | x                     |   |                       |             |                       |

\* Both eyes were fixed, but only one eye was examined microscopically.

### 3.21.3 Processing and microscopic examination

After fixation, the organs and tissues sampled for microscopic examination was trimmed and representative specimens were taken for histological processing. The specimens were embedded in paraffin and cut at a nominal thickness of approximately 5 µm, stained with haematoxylin and eosin and examined under a light microscope. Paired organs were processed together.

All pathological findings were entered directly onto the PathData©System V6.2a2 computer system.

Histological alterations were graded on a 5-grade system:

- Grade 1 - Minimal/Very few/Very small
- Grade 2 - Slight/Few/Small
- Grade 3 - Moderate/Moderate number/Moderate size
- Grade 4 - Marked/Many/Large
- Grade 5 - Massive/Extensive number/Extensive size
- Present - Finding present/Severity not scored

The following organs and tissues were examined microscopically:

- All organs and tissues from all control (Group 1) and high dose animals (Group 4).
- From all animals, the organs and tissues where treatment-related changes were observed in the high dose group.
- All gross lesions from all animals.

Mandibular lymph nodes with macroscopically visible signs of accumulation of blood due to blood sampling using submandibular method was fixed but not processed histologically.

Tissues not examined microscopically were stored at CiToxLAB Scantox A/S held in fixative.

#### **3.21.4 Peer review**

A peer review by CiToxLAB Scantox A/S peer reviewing pathologist was performed on selected slides. Diagnostic discrepancies were resolved by discussion.

#### **3.22 Data capture**

The following computerised data capture systems were during the conduct of this study.

Instem Provantis (version 7.0.3.3) used for in-life recordings e.g. clinical signs, body weights, food consumption, water consumption, haematology and blood chemistry.

PathData (version 6.2a2) used for necropsy and pathology data.

Cirkom iFix (version 4.0) used for collection of temperature and humidity data.

SAS (version 8.2) used for statistical processing of data.

ActiMot Motility Measuring System (version 4.29) used for collection of motility data.

In the event of a computerised system technical failure, manual recording (in-life data collection) in accordance with the standard operating procedures were used to ensure data capture.

### **3.23 Statistics**

Data was processed to give group mean values and standard deviations where appropriate.

Thereafter each continuous variable was tested for homogeneity of variance with Levene's test. If the variance was homogeneous, analysis of variance was carried out for the variable. If any significant differences were detected, possible inter-group differences were assessed with Dunnett's test. If the variance was heterogeneous, each variable was tested for normality by the Shapiro-Wilk method. In case of normal distribution, possible inter-group differences were identified with Student's t-test. Otherwise the possible inter-group differences were assessed by Kruskal-Wallis's test. If any significant inter-group differences were detected, the subsequent identification of the groups was carried out with Wilcoxon Rank-Sum test.

For all tests, the level of significance was defined as  $p < 0.05$ .

The statistical analyses were made with SAS<sup>®</sup> procedures (version 8.2) described in "SAS/STAT<sup>®</sup> User's Guide, SAS OnlineDoc<sup>®</sup>, 1999, SAS Institute Inc., Cary, North Carolina 27513, USA".

### **3.24 Archives**

#### **3.24.1 CiToxLAB Scantox A/S**

For a period of 10 years, CiToxLAB Scantox A/S will be responsible for the archiving of the following materials relating to the study:

Study plan, study plan amendments and correspondence, test material receipts, sample of test item, animal records, all original paper and/or electronic data, wet tissues, blocks and slides and final report.

After end of the archiving period, the original report will be transferred to external archiving.

At the end of the storage period, CiToxLAB will contact Novozymes A/S for instructions whether the material should be transferred, retained or destroyed.

#### **3.24.2 Novozymes A/S (Analysis of dose formulation)**

For a period of 10 years, the raw data pertaining to formulation analysis, shipping documents, correspondence and the analytical report will be archived at Novozymes A/S. It is the responsibility of the Principal Investigator (PI) to notify the Study Director when the PI Report will be archived. At the end of the storage period, Novozymes A/S will contact the Study Director for instructions whether the material should be transferred, retained or destroyed.

## 4 Results

### 4.1 Analysis of dose formulations

#### [Appendix I](#)

The Asparaginase activity (TASU/g) in the three groups was found not to differ significantly for Weeks 1, 6 and 13.

The following mean activities (TASU/g) per group and week were determined:

| Group 2 | Group 3 | Group 4 |
|---------|---------|---------|
| 5710    | 19100   | 55600   |

There was no significant difference between the Asparaginase activity (TASU/g) of Group 4 (100 % dose solution) and the tox-batch.

Absence of activity in the control samples was shown.

### 4.2 Clinical signs

#### *Individual findings* [Table 15](#)

No test item related adverse clinical signs were observed.

Some animals were observed with hair loss, small wounds and slight discharge from the eyes. These are common observations in untreated Sprague Dawley rats and therefore considered to be incidental.

### 4.3 Open field observations

*Group mean values - Before start of treatment* [Table 7](#)

*Group mean values - At termination of treatment* [Table 8](#)

*Individual values - Before start of treatment* [Table 16](#)

*Individual values - At termination of treatment* [Table 17](#)

No test item related adverse effects on the behaviour of the animals were observed.

### 4.4 Stimuli-induced clinical observations

*Individual values - Before start of treatment* [Table 18](#)

*Individual values – At termination of treatment* [Table 19](#)

No test item related adverse effects at the stimuli-induced clinical observations were seen.

### 4.5 Body weight

[Figure 1](#)

*Group mean values* [Table 9](#)

*Individual values* [Table 20](#)

No test item related effect was observed on the body weight or body weight gain.

### 4.6 Food consumption

*Group mean values* [Table 10](#)

*Individual values* [Table 21](#)

The male animals from Group 4 had significantly lower food consumption in Week 6, compared to the animals in Group 1. Further, the female animals in Group 2 had significantly higher food consumption in Week 8 compared to the females in Group 1. These findings were considered to be incidental and not test item related, since no continued effect in the food consumption was observed throughout the entire study.

#### **4.7 Water consumption**

*Group mean values* [Table 11](#)

*Individual values* [Table 22](#)

No test item related effects were observed on the water consumption.

#### **4.8 Ophthalmoscopy**

*Individual findings* [Table 23](#)

No test item related adverse findings were observed at the ophthalmoscopic examination.

#### **4.9 Haematology**

*Group mean values* [Table 12](#)

*Individual values* [Table 24](#)

*Historical data* [Appendix III](#)

No test item related findings were recorded in the investigated parameters of haematology and coagulation.

After 13 weeks of treatment, the haematocrit level was statistically significantly lower in the males in Group 3 compared to Group 1. The low level for the group was due to a very low level for animal No 43 and was considered an incidental finding.

The prothrombin time of the high-dose males (Group 4) was significantly higher when compared to the control animals (Group 1), however, no dose-response relationship was observed as well as no similar increase in high-dose females was observed. Therefore, this increase in the prothrombin time of the high-dose males was considered incidental.

The % basophils for females in Group 4 was significantly lower compared to Group 1. The amount was within historical control data (see [Appendix III](#)) and as no change was seen in the other leucocyte counts it was considered not to be treatment related.

#### **4.10 Clinical chemistry**

*Group mean values* [Table 13](#)

*Individual values* [Table 25](#)

*Historical data* [Appendix IV](#)

For the males in Groups 3 and 4, the albumin/globulin ratios were significantly higher compared to Group 1. No significant changes were seen in the albumin or the globulin levels and no similar increases were found in the females in any of the groups. These findings were therefore considered not to be test item related.

The females in Group 4 showed a significant decrease in the cholesterol level when compared to Group 1. Moreover, a similar decrease in cholesterol, although not statistically significant, was found in the female mid- and low dose groups (Groups 3 and 2). A similar pattern, although not statistically significant, was observed in male animals. The findings appeared to be dose dependent, and a treatment-related effect could not be disregarded, however, these minor changes were all within the historical control data (see [Appendix IV](#)) and considered of no toxicological importance.

#### **4.11 Absolute and relative organ weights**

*Group mean values* [Table 14](#)

*Individual values* [Table 26](#)

For the males in Group 3, the liver (% of the body weight) was found to be significantly higher compared to Group 1. Since no increase in neither Group 4 nor in any of the treated females was found, the finding was considered to be incidental and with no relation to the treatment.

The males in Group 2 were found to have a significantly higher prostate absolute and relative level when compared to Group 1. The findings were due to a very low level in animal No 45, and therefore considered an incidental finding.

#### **4.12 Macroscopic findings.**

[Appendix II](#)

Only few, incidental findings were reported at necropsy.



In animal No 22, a diaphragmatic hernia with herniation of the right medial liver lobe was observed. In addition, the seminal vesicles were reported diminished in size in two males (Nos 4 and 22), an ovarian cyst was reported in two females (Nos 12 and 71) and thymic red discoloration was observed in three animals.

#### **4.13 Microscopic findings**

##### **Appendix II**

Neither the ovarian cysts observed in female Nos 12 and 71 nor the diminished seminal vesicles of male Nos 4 and 22 could be confirmed by microscopy.

Except for a small fibrotic area, no findings were observed in the herniated liver lobe.

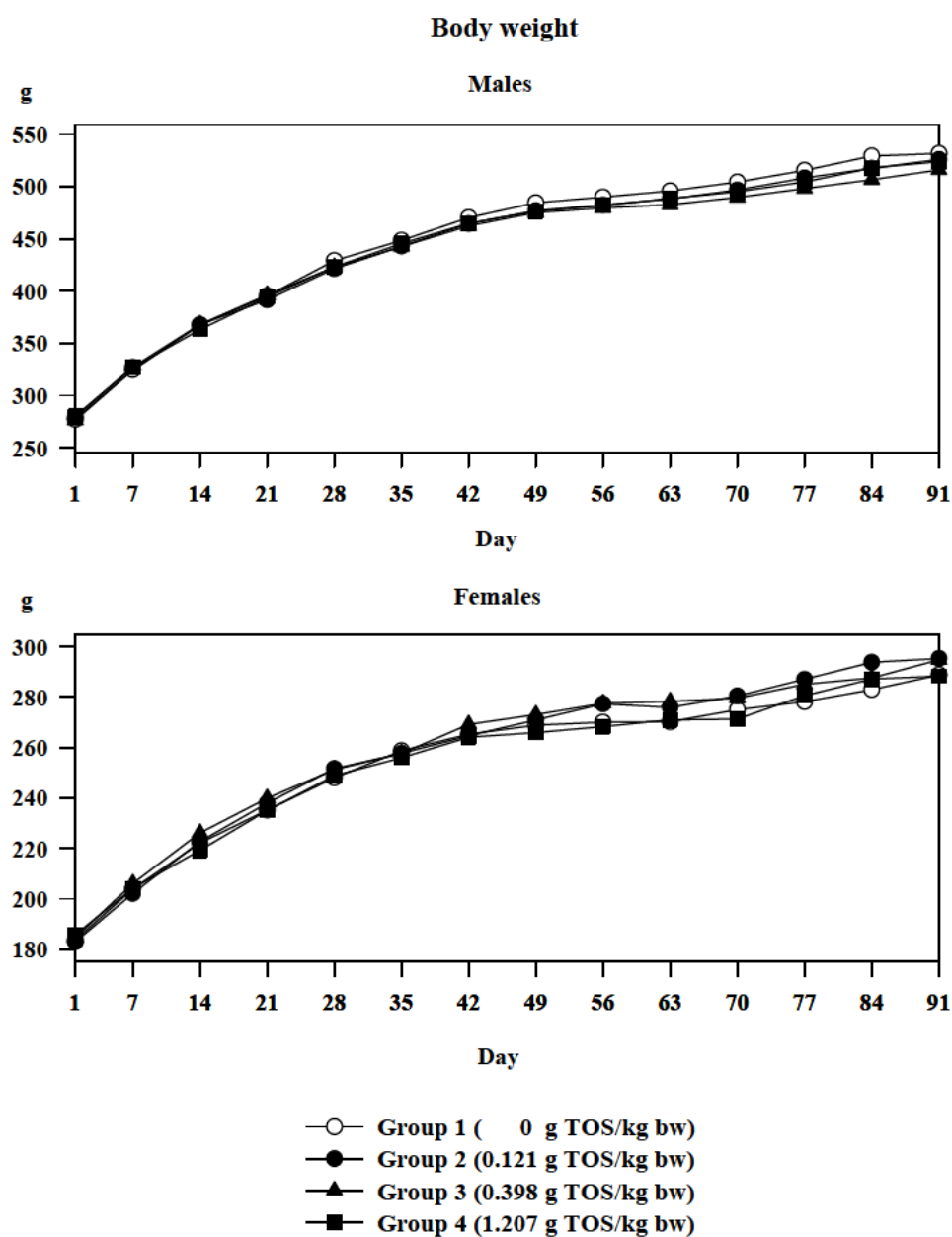
Focal infiltration of inflammatory cells and/or haemorrhage and necrosis between/in the myofibres of the tongue were considered consequences of the repeated needle insertion for blood sampling.

All findings reported are considered to be within the background incidence of findings reported in this age and strain of laboratory maintained rats and as such to be of no toxicological significance.

## **5 Conclusion**

Ninety (90) days of oral (gavage) treatment of rats with Asparaginase, PPV33595, at dose levels of up to 1.207g TOS/kg bw or 584568 TASU/kg bw administered at a dose volume of 10 ml/kg did not cause any treatment related changes. The NOAEL (No Observed Adverse Effect Level) for both female and male animals for Asparaginase, PPV33595, is 1.207g TOS/kg bw corresponding to 584568 TASU/kg bw.

**Figure 1 Body weight**



**Table 7 Open field observations – Group mean values – Before start of treatment**

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Group mean values - Before start of treatment

Males

| GROUP (Dose g TOS<br>/kg bw) | TIME MOVING |      |    |   | TOTAL DISTANCE (m) |      |    |   | NO. OF REARINGS |      |    |   |
|------------------------------|-------------|------|----|---|--------------------|------|----|---|-----------------|------|----|---|
|                              | Mean        | S.D. | N  | p | Mean               | S.D. | N  | p | Mean            | S.D. | N  | p |
| 1 (0)                        | 224.4       | 12.3 | 10 |   | 284.4              | 23.8 | 10 |   | 25.2            | 8.7  | 10 |   |
| 2 (0.121)                    | 223.0       | 26.6 | 10 |   | 278.7              | 45.2 | 10 |   | 24.7            | 8.4  | 10 |   |
| 3 (0.398)                    | 230.4       | 17.4 | 10 |   | 307.1              | 46.2 | 10 |   | 26.5            | 8.4  | 10 |   |
| 4 (1.207)                    | 221.5       | 20.8 | 10 |   | 291.3              | 62.5 | 10 |   | 23.7            | 9.4  | 10 |   |

| GROUP (Dose g TOS<br>/kg bw) | TIME CENTRE |      |    |   | TIME PERIPHERY |      |    |   | TOTAL CORNER VISITS |      |    |   |
|------------------------------|-------------|------|----|---|----------------|------|----|---|---------------------|------|----|---|
|                              | Mean        | S.D. | N  | p | Mean           | S.D. | N  | p | Mean                | S.D. | N  | p |
| 1 (0)                        | 16.1        | 8.9  | 10 |   | 283.9          | 8.9  | 10 |   | 317.2               | 55.8 | 10 |   |
| 2 (0.121)                    | 13.2        | 8.5  | 10 |   | 286.8          | 8.5  | 10 |   | 315.2               | 54.2 | 10 |   |
| 3 (0.398)                    | 17.1        | 5.9  | 10 |   | 282.9          | 5.9  | 10 |   | 342.1               | 58.2 | 10 |   |
| 4 (1.207)                    | 17.5        | 10.9 | 10 |   | 282.5          | 10.9 | 10 |   | 333.4               | 84.6 | 10 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Group mean values - Before start of treatment

Males

| GROUP (Dose g TOS<br>/kg bw) | MOVES/COUNTS |       |    |   |
|------------------------------|--------------|-------|----|---|
|                              | Mean         | S.D.  | N  | p |
| 1 (0)                        | 6120.4       | 394.0 | 10 |   |
| 2 (0.121)                    | 5967.9       | 799.8 | 10 |   |
| 3 (0.398)                    | 6490.7       | 676.5 | 10 |   |
| 4 (1.207)                    | 6174.9       | 853.8 | 10 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation    N = number of animals

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Group mean values - Before start of treatment

Females

| GROUP (Dose g TOS<br>/kg bw) | TIME MOVING |      |    |   | TOTAL DISTANCE (m) |      |    |   | NO. OF REARINGS |      |    |   |
|------------------------------|-------------|------|----|---|--------------------|------|----|---|-----------------|------|----|---|
|                              | Mean        | S.D. | N  | p | Mean               | S.D. | N  | p | Mean            | S.D. | N  | p |
| 1 (0)                        | 255.5       | 8.5  | 10 |   | 273.8              | 29.4 | 10 |   | 32.2            | 10.0 | 10 |   |
| 2 (0.121)                    | 250.2       | 11.8 | 10 |   | 286.4              | 48.4 | 10 |   | 34.3            | 9.3  | 10 |   |
| 3 (0.398)                    | 251.8       | 7.7  | 10 |   | 259.0              | 32.5 | 10 |   | 32.9            | 9.7  | 10 |   |
| 4 (1.207)                    | 252.1       | 9.2  | 10 |   | 280.3              | 48.7 | 10 |   | 33.3            | 10.0 | 10 |   |

| GROUP (Dose g TOS<br>/kg bw) | TIME CENTRE |      |    |   | TIME PERIPHERY |      |    |   | TOTAL CORNER VISITS |      |    |   |
|------------------------------|-------------|------|----|---|----------------|------|----|---|---------------------|------|----|---|
|                              | Mean        | S.D. | N  | p | Mean           | S.D. | N  | p | Mean                | S.D. | N  | p |
| 1 (0)                        | 18.2        | 9.9  | 10 |   | 281.8          | 9.9  | 10 |   | 271.0               | 47.7 | 10 |   |
| 2 (0.121)                    | 21.2        | 7.5  | 10 |   | 278.8          | 7.5  | 10 |   | 285.4               | 67.0 | 10 |   |
| 3 (0.398)                    | 18.5        | 11.8 | 10 |   | 281.5          | 11.8 | 10 |   | 255.0               | 35.7 | 10 |   |
| 4 (1.207)                    | 20.1        | 10.4 | 10 |   | 279.9          | 10.4 | 10 |   | 294.8               | 68.8 | 10 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Group mean values - Before start of treatment

Females

| GROUP (Dose g TOS<br>/kg bw) | MOVES/COUNTS |       |    |   |
|------------------------------|--------------|-------|----|---|
|                              | Mean         | S.D.  | N  | p |
| 1 (0)                        | 6885.7       | 412.8 | 10 |   |
| 2 (0.121)                    | 6844.8       | 490.4 | 10 |   |
| 3 (0.398)                    | 6742.8       | 429.7 | 10 |   |
| 4 (1.207)                    | 6825.8       | 514.7 | 10 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation    N = number of animals

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Incidence of findings - Before start of treatment

Males

| GROUP (Dose g TOS<br>/kg bw) | ABNORMAL<br>BEHAV-<br>IOUR | Total | p |
|------------------------------|----------------------------|-------|---|
|                              | 0                          |       |   |
| 1 (0)                        | 10                         | 10    |   |
| 2 (0.121)                    | 10                         | 10    |   |
| 3 (0.398)                    | 10                         | 10    |   |
| 4 (1.207)                    | 10                         | 10    |   |
| Total                        | 40                         | 40    |   |

Codes are described in Open field observations

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Incidence of findings - Before start of treatment

Males

| GROUP (Dose g TOS<br>/kg bw) | ATAXIA | Total | p |
|------------------------------|--------|-------|---|
|                              | 0      |       |   |
| 1 (0)                        | 10     | 10    |   |
| 2 (0.121)                    | 10     | 10    |   |
| 3 (0.398)                    | 10     | 10    |   |
| 4 (1.207)                    | 10     | 10    |   |
| Total                        | 40     | 40    |   |

Codes are described in Open field observations

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group



Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Incidence of findings - Before start of treatment

Males

| GROUP (Dose g TOS<br>/kg bw) | NUMBER OF FAECAL PELLETS |   |   |   |   |   |   |
|------------------------------|--------------------------|---|---|---|---|---|---|
|                              | 0                        | 1 | 2 | 3 | 4 | 5 | 6 |
| 1 (0)                        | 1                        | 1 | 1 | 3 | 2 | 0 | 0 |
| 2 (0.121)                    | 0                        | 4 | 1 | 1 | 1 | 0 | 1 |
| 3 (0.398)                    | 2                        | 0 | 1 | 2 | 1 | 2 | 2 |
| 4 (1.207)                    | 2                        | 2 | 0 | 0 | 1 | 1 | 3 |
| Total                        | 5                        | 7 | 3 | 6 | 5 | 3 | 6 |

| GROUP (Dose g TOS<br>/kg bw) | NUMBER OF FAECAL PELLETS |   |   | Total | p |
|------------------------------|--------------------------|---|---|-------|---|
|                              | 7                        | 8 | 9 |       |   |
| 1 (0)                        | 1                        | 0 | 1 | 10    |   |
| 2 (0.121)                    | 1                        | 1 | 0 | 10    |   |
| 3 (0.398)                    | 0                        | 0 | 0 | 10    |   |
| 4 (1.207)                    | 1                        | 0 | 0 | 10    |   |
| Total                        | 3                        | 1 | 1 | 40    |   |

Codes are described in Open field observations

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Incidence of findings - Before start of treatment

Males

| GROUP (Dose g TOS<br>/kg bw) | URINATION DURING<br>TEST |    | Total | p |
|------------------------------|--------------------------|----|-------|---|
|                              | 0                        | 1  |       |   |
| 1 (0)                        | 3                        | 7  | 10    |   |
| 2 (0.121)                    | 2                        | 8  | 10    |   |
| 3 (0.398)                    | 3                        | 7  | 10    |   |
| 4 (1.207)                    | 3                        | 7  | 10    |   |
| Total                        | 11                       | 29 | 40    |   |

Codes are described in Open field observations

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Incidence of findings - Before start of treatment

Females

| GROUP (Dose g TOS<br>/kg bw) | ABNORMAL<br>BEHAV-<br>IOUR | Total | p |
|------------------------------|----------------------------|-------|---|
|                              | 0                          |       |   |
| 1 (0)                        | 10                         | 10    |   |
| 2 (0.121)                    | 10                         | 10    |   |
| 3 (0.398)                    | 10                         | 10    |   |
| 4 (1.207)                    | 10                         | 10    |   |
| Total                        | 40                         | 40    |   |

Codes are described in Open field observations

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Incidence of findings - Before start of treatment

Females

| GROUP (Dose g TOS<br>/kg bw) | ATAXIA | Total | p |
|------------------------------|--------|-------|---|
|                              | 0      |       |   |
| 1 (0)                        | 10     | 10    |   |
| 2 (0.121)                    | 10     | 10    |   |
| 3 (0.398)                    | 10     | 10    |   |
| 4 (1.207)                    | 10     | 10    |   |
| Total                        | 40     | 40    |   |

Codes are described in Open field observations

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Incidence of findings - Before start of treatment

Females

| GROUP (Dose g TOS<br>/kg bw) | NUMBER OF FAECAL PELLETS |   |   |   |   |   | Total | p |
|------------------------------|--------------------------|---|---|---|---|---|-------|---|
|                              | 0                        | 1 | 2 | 3 | 4 | 5 |       |   |
| 1 (0)                        | 9                        | 0 | 0 | 1 | 0 | 0 | 10    |   |
| 2 (0.121)                    | 6                        | 1 | 1 | 0 | 1 | 1 | 10    |   |
| 3 (0.398)                    | 4                        | 1 | 1 | 1 | 1 | 2 | 10    |   |
| 4 (1.207)                    | 7                        | 2 | 0 | 0 | 1 | 0 | 10    |   |
| Total                        | 26                       | 4 | 2 | 2 | 3 | 3 | 40    |   |

Codes are described in Open field observations

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Incidence of findings - Before start of treatment

Females

| GROUP (Dose g TOS<br>/kg bw) | URINATION DURING<br>TEST |    | Total | p  |
|------------------------------|--------------------------|----|-------|----|
|                              | 0                        | 1  |       |    |
| 1 (0)                        | 10                       | 0  | 10    |    |
| 2 (0.121)                    | 9                        | 1  | 10    |    |
| 3 (0.398)                    | 3                        | 7  | 10    | ** |
| 4 (1.207)                    | 5                        | 5  | 10    | *  |
| Total                        | 27                       | 13 | 40    |    |

Codes are described in Open field observations

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

**Table 8 Open field observation – Group mean values – At termination of treatment**

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Group mean values - At termination of treatment

Males

| GROUP (Dose g TOS /kg bw) | TIME MOVING |      |    |   | TOTAL DISTANCE (m) |      |    |   | NO. OF REARINGS |      |    |   |
|---------------------------|-------------|------|----|---|--------------------|------|----|---|-----------------|------|----|---|
|                           | Mean        | S.D. | N  | p | Mean               | S.D. | N  | p | Mean            | S.D. | N  | p |
| 1 (0)                     | 175.6       | 46.8 | 10 |   | 59.8               | 22.6 | 10 |   | 28.1            | 9.6  | 10 |   |
| 2 (0.121)                 | 156.4       | 48.6 | 10 |   | 51.8               | 22.0 | 10 |   | 27.6            | 7.9  | 10 |   |
| 3 (0.398)                 | 164.8       | 72.6 | 9  |   | 64.6               | 37.2 | 9  |   | 27.0            | 12.9 | 9  |   |
| 4 (1.207)                 | 200.6       | 37.0 | 10 |   | 77.0               | 25.5 | 10 |   | 29.3            | 11.4 | 10 |   |

| GROUP (Dose g TOS /kg bw) | TIME CENTRE |      |    |   | TIME PERIPHERY |      |    |   | TOTAL CORNER VISITS |      |    |   |
|---------------------------|-------------|------|----|---|----------------|------|----|---|---------------------|------|----|---|
|                           | Mean        | S.D. | N  | p | Mean           | S.D. | N  | p | Mean                | S.D. | N  | p |
| 1 (0)                     | 17.8        | 16.9 | 10 |   | 282.2          | 16.9 | 10 |   | 53.9                | 25.6 | 10 |   |
| 2 (0.121)                 | 22.8        | 31.8 | 10 |   | 277.2          | 31.8 | 10 |   | 41.1                | 27.6 | 10 |   |
| 3 (0.398)                 | 16.1        | 11.1 | 9  |   | 283.9          | 11.1 | 9  |   | 53.7                | 38.9 | 9  |   |
| 4 (1.207)                 | 18.1        | 11.7 | 10 |   | 281.9          | 11.7 | 10 |   | 57.0                | 22.9 | 10 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Group mean values - At termination of treatment

Males

| GROUP (Dose g TOS<br>/kg bw) | MOVES/COUNTS |        |    |   |
|------------------------------|--------------|--------|----|---|
|                              | Mean         | S.D.   | N  | p |
| 1 (0)                        | 4794.1       | 1418.1 | 10 |   |
| 2 (0.121)                    | 4286.2       | 1467.5 | 10 |   |
| 3 (0.398)                    | 4622.6       | 2161.7 | 9  |   |
| 4 (1.207)                    | 5640.1       | 1260.3 | 10 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation    N = number of animals



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90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Group mean values - At termination of treatment

Females

| GROUP (Dose g TOS<br>/kg bw) | TIME MOVING |      |    |   | TOTAL DISTANCE (m) |      |    |   | NO. OF REARINGS |      |    |   |
|------------------------------|-------------|------|----|---|--------------------|------|----|---|-----------------|------|----|---|
|                              | Mean        | S.D. | N  | p | Mean               | S.D. | N  | p | Mean            | S.D. | N  | p |
| 1 (0)                        | 226.6       | 23.2 | 10 |   | 101.6              | 20.6 | 10 |   | 33.1            | 10.0 | 10 |   |
| 2 (0.121)                    | 227.7       | 18.8 | 10 |   | 94.4               | 15.9 | 10 |   | 30.5            | 4.3  | 10 |   |
| 3 (0.398)                    | 219.5       | 25.3 | 10 |   | 91.2               | 13.8 | 10 |   | 34.1            | 9.8  | 10 |   |
| 4 (1.207)                    | 227.7       | 14.4 | 10 |   | 97.3               | 15.0 | 10 |   | 32.6            | 4.9  | 10 |   |

| GROUP (Dose g TOS<br>/kg bw) | TIME CENTRE |      |    |   | TIME PERIPHERY |      |    |   | TOTAL CORNER VISITS |      |    |   |
|------------------------------|-------------|------|----|---|----------------|------|----|---|---------------------|------|----|---|
|                              | Mean        | S.D. | N  | p | Mean           | S.D. | N  | p | Mean                | S.D. | N  | p |
| 1 (0)                        | 17.8        | 21.1 | 10 |   | 282.2          | 21.1 | 10 |   | 81.5                | 22.5 | 10 |   |
| 2 (0.121)                    | 15.8        | 9.2  | 10 |   | 284.2          | 9.2  | 10 |   | 69.8                | 13.0 | 10 |   |
| 3 (0.398)                    | 14.4        | 13.1 | 10 |   | 285.6          | 13.2 | 10 |   | 67.5                | 18.8 | 10 |   |
| 4 (1.207)                    | 17.0        | 8.3  | 10 |   | 283.0          | 8.3  | 10 |   | 74.1                | 11.2 | 10 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals

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90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Group mean values - At termination of treatment

Females

| GROUP (Dose g TOS<br>/kg bw) | MOVES/COUNTS |       |    |   |
|------------------------------|--------------|-------|----|---|
|                              | Mean         | S.D.  | N  | p |
| 1 (0)                        | 6419.7       | 771.9 | 10 |   |
| 2 (0.121)                    | 6317.8       | 751.2 | 10 |   |
| 3 (0.398)                    | 6092.1       | 756.2 | 10 |   |
| 4 (1.207)                    | 6317.3       | 529.4 | 10 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation    N = number of animals

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90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Incidence of findings - At termination of treatment

Males

| GROUP (Dose g TOS<br>/kg bw) | ABNORMAL BEHAV-<br>IOUR |   | Total | p |
|------------------------------|-------------------------|---|-------|---|
|                              | 0                       | 1 |       |   |
| 1 (0)                        | 10                      | 0 | 10    |   |
| 2 (0.121)                    | 9                       | 1 | 10    |   |
| 3 (0.398)                    | 10                      | 0 | 10    |   |
| 4 (1.207)                    | 10                      | 0 | 10    |   |
| Total                        | 39                      | 1 | 40    |   |

Codes are described in Open field observations

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

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90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Incidence of findings - At termination of treatment

Males

| GROUP (Dose g TOS<br>/kg bw) | ATAXIA | Total | p |
|------------------------------|--------|-------|---|
|                              | 0      |       |   |
| 1 (0)                        | 10     | 10    |   |
| 2 (0.121)                    | 10     | 10    |   |
| 3 (0.398)                    | 10     | 10    |   |
| 4 (1.207)                    | 10     | 10    |   |
| Total                        | 40     | 40    |   |

Codes are described in Open field observations

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

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90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Incidence of findings - At termination of treatment

Males

| GROUP (Dose g TOS<br>/kg bw) | NUMBER OF FAECAL PELLETS |   |   |   |   |   |   |
|------------------------------|--------------------------|---|---|---|---|---|---|
|                              | 0                        | 1 | 2 | 3 | 4 | 5 | 6 |
| 1 (0)                        | 2                        | 1 | 1 | 1 | 2 | 1 | 2 |
| 2 (0.121)                    | 2                        | 3 | 2 | 0 | 1 | 2 | 0 |
| 3 (0.398)                    | 4                        | 3 | 0 | 1 | 0 | 1 | 1 |
| 4 (1.207)                    | 2                        | 2 | 3 | 0 | 2 | 0 | 0 |
| Total                        | 10                       | 9 | 6 | 2 | 5 | 4 | 3 |

| GROUP (Dose g TOS<br>/kg bw) | NUMBER<br>OF<br>FAECAL<br>PELLETS | Total | p |
|------------------------------|-----------------------------------|-------|---|
|                              | 7                                 |       |   |
| 1 (0)                        | 0                                 | 10    |   |
| 2 (0.121)                    | 0                                 | 10    |   |
| 3 (0.398)                    | 0                                 | 10    |   |
| 4 (1.207)                    | 1                                 | 10    |   |
| Total                        | 1                                 | 40    |   |

Codes are described in Open field observations

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

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90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Incidence of findings - At termination of treatment

Males

| GROUP (Dose g TOS<br>/kg bw) | URINATION DURING<br>TEST |    | Total | p |
|------------------------------|--------------------------|----|-------|---|
|                              | 0                        | 1  |       |   |
| 1 (0)                        | 1                        | 9  | 10    |   |
| 2 (0.121)                    | 0                        | 10 | 10    |   |
| 3 (0.398)                    | 2                        | 8  | 10    |   |
| 4 (1.207)                    | 3                        | 7  | 10    |   |
| Total                        | 6                        | 34 | 40    |   |

Codes are described in Open field observations

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Incidence of findings - At termination of treatment

Females

| GROUP (Dose g TOS<br>/kg bw) | ABNORMAL<br>BEHAV-<br>IOUR | Total | p |
|------------------------------|----------------------------|-------|---|
|                              | 0                          |       |   |
| 1 (0)                        | 10                         | 10    |   |
| 2 (0.121)                    | 10                         | 10    |   |
| 3 (0.398)                    | 10                         | 10    |   |
| 4 (1.207)                    | 10                         | 10    |   |
| Total                        | 40                         | 40    |   |

Codes are described in Open field observations

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Incidence of findings - At termination of treatment

Females

| GROUP (Dose g TOS<br>/kg bw) | ATAXIA | Total | p |
|------------------------------|--------|-------|---|
|                              | 0      |       |   |
| 1 (0)                        | 10     | 10    |   |
| 2 (0.121)                    | 10     | 10    |   |
| 3 (0.398)                    | 10     | 10    |   |
| 4 (1.207)                    | 10     | 10    |   |
| Total                        | 40     | 40    |   |

Codes are described in Open field observations

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group



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90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Incidence of findings - At termination of treatment

Females

| GROUP (Dose g TOS<br>/kg bw) | NUMBER OF FAECAL PELLETS |   |   |   |   |   | Total | p |
|------------------------------|--------------------------|---|---|---|---|---|-------|---|
|                              | 0                        | 1 | 2 | 4 | 5 | 8 |       |   |
| 1 (0)                        | 8                        | 1 | 0 | 0 | 1 | 0 | 10    |   |
| 2 (0.121)                    | 9                        | 0 | 1 | 0 | 0 | 0 | 10    |   |
| 3 (0.398)                    | 7                        | 0 | 1 | 1 | 0 | 1 | 10    |   |
| 4 (1.207)                    | 9                        | 0 | 1 | 0 | 0 | 0 | 10    |   |
| Total                        | 33                       | 1 | 3 | 1 | 1 | 1 | 40    |   |

Codes are described in Open field observations

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Incidence of findings - At termination of treatment

Females

| GROUP (Dose g TOS<br>/kg bw) | URINATION DURING<br>TEST |    | Total | p |
|------------------------------|--------------------------|----|-------|---|
|                              | 0                        | 1  |       |   |
| 1 (0)                        | 4                        | 6  | 10    |   |
| 2 (0.121)                    | 3                        | 7  | 10    |   |
| 3 (0.398)                    | 2                        | 8  | 10    |   |
| 4 (1.207)                    | 5                        | 5  | 10    |   |
| Total                        | 14                       | 26 | 40    |   |

Codes are described in Open field observations

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

**Table 9 Body weight – Group mean values**

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Body weight and body weight gain (g)

Group mean values - From arrival to Day 91

Males

| GROUP (Dose g TOS / kg bw) | DAY OF ARRIVAL |      |    |   | DAY -8 |      |    |   | DAY -1 |      |    |   |
|----------------------------|----------------|------|----|---|--------|------|----|---|--------|------|----|---|
|                            | Mean           | S.D  | N  | p | Mean   | S.D  | N  | p | Mean   | S.D  | N  | p |
| 1 (0)                      | 143.1          | 9.9  | 10 |   | 205.0  | 9.1  | 10 |   | 267.8  | 8.7  | 10 |   |
| 2 (0.121)                  | 142.5          | 10.1 | 10 |   | 205.1  | 8.0  | 10 |   | 269.7  | 7.2  | 10 |   |
| 3 (0.398)                  | 146.9          | 9.9  | 10 |   | 203.3  | 11.7 | 10 |   | 268.9  | 14.3 | 10 |   |
| 4 (1.207)                  | 148.1          | 13.6 | 10 |   | 207.6  | 15.1 | 10 |   | 269.6  | 14.6 | 10 |   |

| GROUP (Dose g TOS / kg bw) | DAY 1 |      |    |   | DAY 7 |      |    |   | DAY 14 |      |    |   |
|----------------------------|-------|------|----|---|-------|------|----|---|--------|------|----|---|
|                            | Mean  | S.D  | N  | p | Mean  | S.D  | N  | p | Mean   | S.D  | N  | p |
| 1 (0)                      | 277.2 | 10.2 | 10 |   | 324.7 | 12.0 | 10 |   | 367.5  | 16.9 | 10 |   |
| 2 (0.121)                  | 279.0 | 7.1  | 10 |   | 327.1 | 9.2  | 10 |   | 367.9  | 17.4 | 10 |   |
| 3 (0.398)                  | 276.4 | 13.9 | 10 |   | 324.4 | 16.3 | 10 |   | 368.0  | 21.0 | 10 |   |
| 4 (1.207)                  | 280.3 | 13.4 | 10 |   | 326.8 | 15.8 | 10 |   | 363.1  | 18.0 | 10 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Body weight and body weight gain (g)

Group mean values - From arrival to Day 91

Males

| GROUP (Dose g TOS / kg bw) | DAY 21 |      |    | p | DAY 28 |      |    | p | DAY 35 |      |    | p |
|----------------------------|--------|------|----|---|--------|------|----|---|--------|------|----|---|
|                            | Mean   | S.D  | N  |   | Mean   | S.D  | N  |   | Mean   | S.D  | N  |   |
| 1 (0)                      | 395.4  | 23.4 | 10 |   | 429.3  | 29.1 | 10 |   | 448.5  | 31.3 | 10 |   |
| 2 (0.121)                  | 391.5  | 16.7 | 10 |   | 421.5  | 23.6 | 10 |   | 443.0  | 28.0 | 10 |   |
| 3 (0.398)                  | 396.3  | 25.0 | 10 |   | 423.0  | 26.8 | 10 |   | 442.8  | 28.5 | 10 |   |
| 4 (1.207)                  | 394.2  | 20.2 | 10 |   | 423.3  | 21.4 | 10 |   | 445.5  | 22.3 | 10 |   |

| GROUP (Dose g TOS / kg bw) | DAY 42 |      |    | p | DAY 49 |      |    | p | DAY 56 |      |    | p |
|----------------------------|--------|------|----|---|--------|------|----|---|--------|------|----|---|
|                            | Mean   | S.D  | N  |   | Mean   | S.D  | N  |   | Mean   | S.D  | N  |   |
| 1 (0)                      | 470.5  | 34.2 | 10 |   | 484.6  | 38.4 | 10 |   | 490.1  | 40.9 | 10 |   |
| 2 (0.121)                  | 464.7  | 26.8 | 10 |   | 477.1  | 30.2 | 10 |   | 482.5  | 31.6 | 10 |   |
| 3 (0.398)                  | 462.5  | 28.9 | 10 |   | 475.3  | 30.6 | 10 |   | 479.6  | 33.7 | 10 |   |
| 4 (1.207)                  | 465.0  | 26.1 | 10 |   | 476.4  | 25.8 | 10 |   | 482.0  | 26.8 | 10 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation    N = number of animals

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Body weight and body weight gain (g)

Group mean values - From arrival to Day 91

Males

| GROUP (Dose g TOS / kg bw) | DAY 63 |      |    | p | DAY 70 |      |    | p | DAY 77 |      |    | p |
|----------------------------|--------|------|----|---|--------|------|----|---|--------|------|----|---|
|                            | Mean   | S.D  | N  |   | Mean   | S.D  | N  |   | Mean   | S.D  | N  |   |
| 1 (0)                      | 496.0  | 42.3 | 10 |   | 504.5  | 43.0 | 10 |   | 515.7  | 43.0 | 10 |   |
| 2 (0.121)                  | 488.3  | 33.4 | 10 |   | 496.9  | 34.6 | 10 |   | 508.5  | 35.9 | 10 |   |
| 3 (0.398)                  | 482.8  | 33.0 | 10 |   | 489.7  | 35.8 | 10 |   | 498.3  | 38.6 | 10 |   |
| 4 (1.207)                  | 488.7  | 26.5 | 10 |   | 495.2  | 28.8 | 10 |   | 504.7  | 30.0 | 10 |   |

| GROUP (Dose g TOS / kg bw) | DAY 84 |      |    | p | DAY 91 |      |    | p | BODY WT GAIN 1 TO 91 |      |    | p |
|----------------------------|--------|------|----|---|--------|------|----|---|----------------------|------|----|---|
|                            | Mean   | S.D  | N  |   | Mean   | S.D  | N  |   | Mean                 | S.D  | N  |   |
| 1 (0)                      | 529.5  | 44.5 | 10 |   | 531.9  | 45.8 | 10 |   | 254.7                | 44.0 | 10 |   |
| 2 (0.121)                  | 517.8  | 36.0 | 10 |   | 526.1  | 37.0 | 10 |   | 247.1                | 35.5 | 10 |   |
| 3 (0.398)                  | 506.7  | 40.6 | 10 |   | 516.1  | 39.9 | 10 |   | 239.7                | 38.0 | 10 |   |
| 4 (1.207)                  | 518.1  | 28.5 | 10 |   | 524.3  | 27.6 | 10 |   | 244.0                | 28.3 | 10 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Body weight and body weight gain (g)

Group mean values - From arrival to Day 91

Females

| GROUP (Dose g TOS / kg bw) | DAY OF ARRIVAL |      |    | p | DAY -8 |      |    | p | DAY -1 |      |    | p |
|----------------------------|----------------|------|----|---|--------|------|----|---|--------|------|----|---|
|                            | Mean           | S.D  | N  |   | Mean   | S.D  | N  |   | Mean   | S.D  | N  |   |
| 1 (0)                      | 124.1          | 11.2 | 10 |   | 157.2  | 8.5  | 10 |   | 178.0  | 11.9 | 10 |   |
| 2 (0.121)                  | 124.0          | 9.6  | 10 |   | 154.4  | 9.5  | 10 |   | 178.2  | 13.1 | 10 |   |
| 3 (0.398)                  | 122.4          | 10.8 | 10 |   | 154.6  | 10.8 | 10 |   | 178.2  | 9.4  | 10 |   |
| 4 (1.207)                  | 129.0          | 13.5 | 10 |   | 158.1  | 10.9 | 10 |   | 178.6  | 12.1 | 10 |   |

| GROUP (Dose g TOS / kg bw) | DAY 1 |      |    | p | DAY 7 |      |    | p | DAY 14 |      |    | p |
|----------------------------|-------|------|----|---|-------|------|----|---|--------|------|----|---|
|                            | Mean  | S.D  | N  |   | Mean  | S.D  | N  |   | Mean   | S.D  | N  |   |
| 1 (0)                      | 183.6 | 11.6 | 10 |   | 203.9 | 13.6 | 10 |   | 222.1  | 15.7 | 10 |   |
| 2 (0.121)                  | 182.9 | 11.7 | 10 |   | 202.1 | 12.2 | 10 |   | 222.7  | 15.2 | 10 |   |
| 3 (0.398)                  | 184.5 | 12.5 | 10 |   | 206.1 | 12.3 | 10 |   | 226.1  | 13.2 | 10 |   |
| 4 (1.207)                  | 185.7 | 12.5 | 10 |   | 204.2 | 16.4 | 10 |   | 219.2  | 12.1 | 10 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Body weight and body weight gain (g)

Group mean values - From arrival to Day 91

Females

| GROUP (Dose g TOS / kg bw) | DAY 21 |      |    | p | DAY 28 |      |    | p | DAY 35 |      |    | p |
|----------------------------|--------|------|----|---|--------|------|----|---|--------|------|----|---|
|                            | Mean   | S.D  | N  |   | Mean   | S.D  | N  |   | Mean   | S.D  | N  |   |
| 1 (0)                      | 235.2  | 16.0 | 10 |   | 248.0  | 14.4 | 10 |   | 258.7  | 16.7 | 10 |   |
| 2 (0.121)                  | 237.9  | 20.4 | 10 |   | 251.6  | 17.2 | 10 |   | 257.7  | 20.0 | 10 |   |
| 3 (0.398)                  | 239.9  | 14.4 | 10 |   | 251.2  | 14.2 | 10 |   | 257.6  | 12.7 | 10 |   |
| 4 (1.207)                  | 235.0  | 14.0 | 10 |   | 248.8  | 17.0 | 10 |   | 255.9  | 22.4 | 10 |   |

| GROUP (Dose g TOS / kg bw) | DAY 42 |      |    | p | DAY 49 |      |    | p | DAY 56 |      |    | p |
|----------------------------|--------|------|----|---|--------|------|----|---|--------|------|----|---|
|                            | Mean   | S.D  | N  |   | Mean   | S.D  | N  |   | Mean   | S.D  | N  |   |
| 1 (0)                      | 265.3  | 17.0 | 10 |   | 268.8  | 19.9 | 10 |   | 270.0  | 15.8 | 10 |   |
| 2 (0.121)                  | 264.7  | 18.4 | 10 |   | 270.9  | 22.2 | 10 |   | 277.3  | 19.3 | 10 |   |
| 3 (0.398)                  | 269.2  | 14.6 | 10 |   | 273.1  | 16.7 | 10 |   | 277.5  | 17.4 | 10 |   |
| 4 (1.207)                  | 264.1  | 16.9 | 10 |   | 265.9  | 18.8 | 10 |   | 268.3  | 16.4 | 10 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Body weight and body weight gain (g)

Group mean values - From arrival to Day 91

Females

| GROUP (Dose g TOS / kg bw) | DAY 63 |      |    | p | DAY 70 |      |    | p | DAY 77 |      |    | p |
|----------------------------|--------|------|----|---|--------|------|----|---|--------|------|----|---|
|                            | Mean   | S.D  | N  |   | Mean   | S.D  | N  |   | Mean   | S.D  | N  |   |
| 1 (0)                      | 270.2  | 19.1 | 10 |   | 275.0  | 18.5 | 10 |   | 278.2  | 18.2 | 10 |   |
| 2 (0.121)                  | 275.9  | 20.5 | 10 |   | 280.5  | 16.7 | 10 |   | 287.1  | 21.9 | 10 |   |
| 3 (0.398)                  | 278.3  | 16.2 | 10 |   | 279.6  | 16.0 | 10 |   | 285.1  | 17.2 | 10 |   |
| 4 (1.207)                  | 271.0  | 16.8 | 10 |   | 271.3  | 14.5 | 10 |   | 280.6  | 14.9 | 10 |   |

| GROUP (Dose g TOS / kg bw) | DAY 84 |      |    | p | DAY 91 |      |    | p | BODY WT GAIN 1 TO 91 |      |    | p |
|----------------------------|--------|------|----|---|--------|------|----|---|----------------------|------|----|---|
|                            | Mean   | S.D  | N  |   | Mean   | S.D  | N  |   | Mean                 | S.D  | N  |   |
| 1 (0)                      | 283.0  | 18.5 | 10 |   | 288.8  | 22.0 | 10 |   | 105.2                | 16.3 | 10 |   |
| 2 (0.121)                  | 293.8  | 22.4 | 10 |   | 295.3  | 21.8 | 10 |   | 112.4                | 11.9 | 10 |   |
| 3 (0.398)                  | 287.6  | 15.3 | 10 |   | 294.8  | 14.1 | 10 |   | 110.3                | 7.7  | 10 |   |
| 4 (1.207)                  | 287.2  | 19.5 | 10 |   | 288.3  | 19.3 | 10 |   | 102.6                | 10.7 | 10 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals



**Table 10 Food consumption – Group mean values**

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Food consumption (g)

Group mean values (g) - Week 1 to Week 13

Males

| GROUP (Dose g TOS / kg bw) | WEEK 1 |      |   | p | WEEK 2 |      |   | p | WEEK 3 |      |   | p |
|----------------------------|--------|------|---|---|--------|------|---|---|--------|------|---|---|
|                            | Mean   | S.D. | N |   | Mean   | S.D. | N |   | Mean   | S.D. | N |   |
| 1 (0)                      | 179.7  | 2.0  | 5 |   | 190.1  | 6.7  | 5 |   | 186.4  | 9.9  | 5 |   |
| 2 (0.121)                  | 187.2  | 9.1  | 5 |   | 191.6  | 15.1 | 5 |   | 181.9  | 9.5  | 5 |   |
| 3 (0.398)                  | 181.8  | 7.1  | 5 |   | 189.8  | 11.4 | 5 |   | 186.9  | 11.7 | 5 |   |
| 4 (1.207)                  | 184.8  | 5.7  | 5 |   | 180.4  | 8.5  | 5 |   | 180.1  | 11.1 | 5 |   |

| GROUP (Dose g TOS / kg bw) | WEEK 4 |      |   | p | WEEK 5 |      |   | p | WEEK 6 |      |   | p |
|----------------------------|--------|------|---|---|--------|------|---|---|--------|------|---|---|
|                            | Mean   | S.D. | N |   | Mean   | S.D. | N |   | Mean   | S.D. | N |   |
| 1 (0)                      | 190.4  | 8.8  | 5 |   | 187.8  | 6.7  | 5 |   | 187.1  | 7.8  | 5 |   |
| 2 (0.121)                  | 181.6  | 12.3 | 5 |   | 186.1  | 8.9  | 5 |   | 185.6  | 6.3  | 5 |   |
| 3 (0.398)                  | 181.9  | 7.8  | 5 |   | 179.9  | 7.1  | 5 |   | 178.1  | 7.1  | 5 |   |
| 4 (1.207)                  | 182.4  | 9.4  | 5 |   | 180.6  | 5.7  | 5 |   | 173.2  | 6.9  | 5 | * |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Food consumption (g)

Group mean values (g) - Week 1 to Week 13

Males

| GROUP (Dose g TOS / kg bw) | WEEK 7 |      |   | p | WEEK 8 |      |   | p | WEEK 9 |      |   | p |
|----------------------------|--------|------|---|---|--------|------|---|---|--------|------|---|---|
|                            | Mean   | S.D. | N |   | Mean   | S.D. | N |   | Mean   | S.D. | N |   |
| 1 (0)                      | 184.0  | 6.0  | 5 |   | 191.4  | 11.0 | 5 |   | 191.1  | 10.8 | 5 |   |
| 2 (0.121)                  | 184.1  | 9.0  | 5 |   | 191.2  | 14.4 | 5 |   | 186.3  | 14.0 | 5 |   |
| 3 (0.398)                  | 178.9  | 8.1  | 5 |   | 183.1  | 6.3  | 5 |   | 186.6  | 7.1  | 5 |   |
| 4 (1.207)                  | 173.1  | 4.9  | 5 |   | 179.8  | 8.1  | 5 |   | 183.6  | 5.0  | 5 |   |

| GROUP (Dose g TOS / kg bw) | WEEK 10 |      |   | p | WEEK 11 |      |   | p | WEEK 12 |      |   | p |
|----------------------------|---------|------|---|---|---------|------|---|---|---------|------|---|---|
|                            | Mean    | S.D. | N |   | Mean    | S.D. | N |   | Mean    | S.D. | N |   |
| 1 (0)                      | 196.8   | 11.9 | 5 |   | 190.5   | 12.7 | 5 |   | 191.2   | 10.8 | 5 |   |
| 2 (0.121)                  | 196.2   | 9.9  | 5 |   | 188.0   | 11.0 | 5 |   | 188.9   | 6.5  | 5 |   |
| 3 (0.398)                  | 191.7   | 9.7  | 5 |   | 182.7   | 6.1  | 5 |   | 184.1   | 10.0 | 5 |   |
| 4 (1.207)                  | 191.9   | 6.1  | 5 |   | 182.6   | 6.2  | 5 |   | 185.7   | 6.8  | 5 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Food consumption (g)

Group mean values (g) - Week 1 to Week 13

Males

| GROUP (Dose g TOS<br>/ kg bw) | WEEK 13 |      |   | p | TOTAL, WEEK 1<br>TO WEEK 13 |       |   | p |
|-------------------------------|---------|------|---|---|-----------------------------|-------|---|---|
|                               | Mean    | S.D. | N |   | Mean                        | S.D.  | N |   |
| 1 (0)                         | 187.5   | 9.0  | 5 |   | 2454.0                      | 102.5 | 5 |   |
| 2 (0.121)                     | 188.7   | 6.6  | 5 |   | 2437.4                      | 113.1 | 5 |   |
| 3 (0.398)                     | 189.3   | 5.7  | 5 |   | 2394.8                      | 86.9  | 5 |   |
| 4 (1.207)                     | 186.5   | 11.5 | 5 |   | 2364.7                      | 39.3  | 5 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Food consumption (g)

Group mean values (g) - Week 1 to Week 13

Females

| GROUP (Dose g TOS / kg bw) | WEEK 1 |      |   | p | WEEK 2 |      |   | p | WEEK 3 |      |   | p |
|----------------------------|--------|------|---|---|--------|------|---|---|--------|------|---|---|
|                            | Mean   | S.D. | N |   | Mean   | S.D. | N |   | Mean   | S.D. | N |   |
| 1 (0)                      | 114.8  | 6.8  | 5 |   | 118.6  | 5.2  | 5 |   | 120.4  | 6.5  | 5 |   |
| 2 (0.121)                  | 115.8  | 4.3  | 5 |   | 114.4  | 5.7  | 5 |   | 125.6  | 14.6 | 5 |   |
| 3 (0.398)                  | 117.7  | 9.4  | 5 |   | 121.4  | 10.9 | 5 |   | 119.8  | 9.0  | 5 |   |
| 4 (1.207)                  | 113.9  | 9.1  | 5 |   | 114.5  | 3.7  | 5 |   | 115.3  | 5.4  | 5 |   |

| GROUP (Dose g TOS / kg bw) | WEEK 4 |      |   | p | WEEK 5 |      |   | p | WEEK 6 |      |   | p |
|----------------------------|--------|------|---|---|--------|------|---|---|--------|------|---|---|
|                            | Mean   | S.D. | N |   | Mean   | S.D. | N |   | Mean   | S.D. | N |   |
| 1 (0)                      | 120.9  | 10.4 | 5 |   | 122.5  | 7.7  | 5 |   | 119.4  | 7.3  | 5 |   |
| 2 (0.121)                  | 122.6  | 4.5  | 5 |   | 118.9  | 6.5  | 5 |   | 116.6  | 8.0  | 5 |   |
| 3 (0.398)                  | 119.1  | 9.4  | 5 |   | 118.2  | 5.8  | 5 |   | 116.5  | 8.0  | 5 |   |
| 4 (1.207)                  | 118.7  | 7.3  | 5 |   | 119.0  | 9.1  | 5 |   | 116.2  | 4.9  | 5 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation    N = number of animals

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Food consumption (g)

Group mean values (g) - Week 1 to Week 13

Females

| GROUP (Dose g TOS / kg bw) | WEEK 7 |      |   | p | WEEK 8 |      |   | p | WEEK 9 |      |   | p |
|----------------------------|--------|------|---|---|--------|------|---|---|--------|------|---|---|
|                            | Mean   | S.D. | N |   | Mean   | S.D. | N |   | Mean   | S.D. | N |   |
| 1 (0)                      | 116.0  | 8.5  | 5 |   | 116.8  | 9.3  | 5 |   | 122.3  | 8.8  | 5 |   |
| 2 (0.121)                  | 118.9  | 5.4  | 5 |   | 129.7  | 2.8  | 5 | * | 122.3  | 6.5  | 5 |   |
| 3 (0.398)                  | 116.8  | 9.0  | 5 |   | 124.7  | 6.2  | 5 |   | 123.1  | 8.0  | 5 |   |
| 4 (1.207)                  | 108.4  | 5.7  | 5 |   | 113.1  | 5.3  | 5 |   | 117.5  | 4.1  | 5 |   |

| GROUP (Dose g TOS / kg bw) | WEEK 10 |      |   | p | WEEK 11 |      |   | p | WEEK 12 |      |   | p |
|----------------------------|---------|------|---|---|---------|------|---|---|---------|------|---|---|
|                            | Mean    | S.D. | N |   | Mean    | S.D. | N |   | Mean    | S.D. | N |   |
| 1 (0)                      | 126.2   | 9.7  | 5 |   | 124.3   | 7.9  | 5 |   | 124.2   | 9.4  | 5 |   |
| 2 (0.121)                  | 130.0   | 7.1  | 5 |   | 130.1   | 6.8  | 5 |   | 130.4   | 5.7  | 5 |   |
| 3 (0.398)                  | 122.2   | 12.2 | 5 |   | 119.7   | 6.0  | 5 |   | 122.0   | 10.9 | 5 |   |
| 4 (1.207)                  | 122.0   | 4.1  | 5 |   | 124.3   | 13.9 | 5 |   | 125.4   | 7.8  | 5 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Food consumption (g)

Group mean values (g) - Week 1 to Week 13

Females

| GROUP (Dose g TOS<br>/ kg bw) | WEEK 13 |      |   | p | TOTAL, WEEK 1<br>TO WEEK 13 |      |   | p |
|-------------------------------|---------|------|---|---|-----------------------------|------|---|---|
|                               | Mean    | S.D. | N |   | Mean                        | S.D. | N |   |
| 1 (0)                         | 123.9   | 6.0  | 5 |   | 1570.3                      | 93.0 | 5 |   |
| 2 (0.121)                     | 122.6   | 2.4  | 5 |   | 1597.9                      | 56.1 | 5 |   |
| 3 (0.398)                     | 122.0   | 5.7  | 5 |   | 1563.2                      | 84.7 | 5 |   |
| 4 (1.207)                     | 115.9   | 11.8 | 5 |   | 1524.2                      | 68.8 | 5 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals

**Table 11 Water consumption – Group mean values**

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Water consumption (g)

Group mean values (g) – Day -1 to Day 91

Males

| GROUP (Dose g TOS / kg bw) | DAY -1-3 |      |   | p | DAY 3-7 |       |   | p | DAY 7-10 |      |   | p |
|----------------------------|----------|------|---|---|---------|-------|---|---|----------|------|---|---|
|                            | Mean     | S.D. | N |   | Mean    | S.D.  | N |   | Mean     | S.D. | N |   |
| 1 (0)                      | 97.0     | 7.9  | 5 |   | 125.0   | 7.5   | 5 |   | 95.0     | 7.6  | 5 |   |
| 2 (0.121)                  | 106.9    | 8.8  | 5 |   | 141.9   | 9.2   | 5 |   | 101.7    | 8.1  | 5 |   |
| 3 (0.398)                  | 100.2    | 3.2  | 5 |   | 175.2   | 101.2 | 5 |   | 98.4     | 5.3  | 5 |   |
| 4 (1.207)                  | 104.2    | 5.1  | 5 |   | 132.3   | 4.8   | 5 |   | 110.6    | 21.8 | 5 |   |

| GROUP (Dose g TOS / kg bw) | DAY 10-14 |      |   | p | DAY 14-17 |      |   | p | DAY 17-21 |      |   | p |
|----------------------------|-----------|------|---|---|-----------|------|---|---|-----------|------|---|---|
|                            | Mean      | S.D. | N |   | Mean      | S.D. | N |   | Mean      | S.D. | N |   |
| 1 (0)                      | 134.5     | 14.0 | 5 |   | 102.6     | 8.6  | 5 |   | 174.6     | 68.7 | 5 |   |
| 2 (0.121)                  | 138.8     | 13.4 | 5 |   | 105.1     | 12.2 | 5 |   | 137.1     | 13.1 | 5 |   |
| 3 (0.398)                  | 133.8     | 10.9 | 5 |   | 103.0     | 6.6  | 5 |   | 142.5     | 12.4 | 5 |   |
| 4 (1.207)                  | 121.6     | 14.9 | 5 |   | 105.0     | 6.8  | 5 |   | 136.7     | 7.9  | 5 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of cages

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Water consumption (g)

Group mean values (g) - Day -1 to Day 91

Males

| GROUP (Dose g TOS / kg bw) | DAY 21-24 |      |   | p | DAY 24-28 |      |   | p | DAY 28-31 |      |   | p |
|----------------------------|-----------|------|---|---|-----------|------|---|---|-----------|------|---|---|
|                            | Mean      | S.D. | N |   | Mean      | S.D. | N |   | Mean      | S.D. | N |   |
| 1 (0)                      | 109.2     | 18.1 | 5 |   | 146.3     | 17.4 | 4 |   | 99.7      | 9.1  | 5 |   |
| 2 (0.121)                  | 102.6     | 10.8 | 5 |   | 140.6     | 21.6 | 4 |   | 99.1      | 11.9 | 5 |   |
| 3 (0.398)                  | 97.7      | 2.6  | 5 |   | 134.5     | 5.7  | 4 |   | 94.5      | 5.4  | 5 |   |
| 4 (1.207)                  | 101.9     | 6.3  | 4 |   | 140.9     | 9.6  | 5 |   | 97.4      | 7.6  | 5 |   |

| GROUP (Dose g TOS / kg bw) | DAY 31-35 |      |   | p | DAY 35-38 |      |   | p | DAY 38-42 |      |   | p |
|----------------------------|-----------|------|---|---|-----------|------|---|---|-----------|------|---|---|
|                            | Mean      | S.D. | N |   | Mean      | S.D. | N |   | Mean      | S.D. | N |   |
| 1 (0)                      | 161.2     | 61.8 | 5 |   | 99.3      | 8.9  | 5 |   | 150.3     | 28.1 | 5 |   |
| 2 (0.121)                  | 134.3     | 15.3 | 5 |   | 101.1     | 9.9  | 5 |   | 139.8     | 11.7 | 5 |   |
| 3 (0.398)                  | 124.2     | 8.3  | 5 |   | 89.7      | 6.7  | 5 |   | 129.4     | 2.9  | 5 |   |
| 4 (1.207)                  | 131.2     | 8.9  | 5 |   | 97.0      | 6.9  | 5 |   | 135.8     | 11.9 | 5 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of cages



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90-Days Oral Gavage Toxicity Study in Rats

Water consumption (g)

Group mean values (g) - Day -1 to Day 91

Males

| GROUP (Dose g TOS / kg bw) | DAY 42-45 |      |   | p | DAY 45-49 |      |   | p | DAY 49-52 |      |   | p |
|----------------------------|-----------|------|---|---|-----------|------|---|---|-----------|------|---|---|
|                            | Mean      | S.D. | N |   | Mean      | S.D. | N |   | Mean      | S.D. | N |   |
| 1 (0)                      | 104.0     | 15.7 | 5 |   | 135.6     | 17.4 | 5 |   | 110.9     | 23.4 | 5 |   |
| 2 (0.121)                  | 108.2     | 10.6 | 5 |   | 137.5     | 15.3 | 5 |   | 114.5     | 10.4 | 5 |   |
| 3 (0.398)                  | 97.4      | 7.4  | 5 |   | 120.2     | 7.6  | 5 |   | 106.6     | 13.1 | 5 |   |
| 4 (1.207)                  | 100.3     | 10.9 | 5 |   | 127.4     | 15.9 | 5 |   | 111.2     | 12.8 | 5 |   |

| GROUP (Dose g TOS / kg bw) | DAY 52-56 |      |   | p | DAY 56-59 |      |   | p | DAY 59-63 |      |   | p |
|----------------------------|-----------|------|---|---|-----------|------|---|---|-----------|------|---|---|
|                            | Mean      | S.D. | N |   | Mean      | S.D. | N |   | Mean      | S.D. | N |   |
| 1 (0)                      | 160.8     | 28.9 | 5 |   | 85.8      | 12.3 | 5 |   | 135.6     | 29.3 | 5 |   |
| 2 (0.121)                  | 164.7     | 21.9 | 5 |   | 88.7      | 6.6  | 5 |   | 133.1     | 12.0 | 5 |   |
| 3 (0.398)                  | 138.1     | 10.8 | 5 |   | 81.0      | 6.5  | 5 |   | 128.3     | 9.7  | 5 |   |
| 4 (1.207)                  | 149.1     | 9.1  | 5 |   | 86.4      | 4.0  | 5 |   | 149.6     | 10.7 | 5 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of cages

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Water consumption (g)

Group mean values (g) - Day -1 to Day 91

Males

| GROUP (Dose g TOS / kg bw) | DAY 63-66 |      |   | p | DAY 66-70 |      |   | p | DAY 70-73 |      |   | p |
|----------------------------|-----------|------|---|---|-----------|------|---|---|-----------|------|---|---|
|                            | Mean      | S.D. | N |   | Mean      | S.D. | N |   | Mean      | S.D. | N |   |
| 1 (0)                      | 112.0     | 23.3 | 5 |   | 159.4     | 68.6 | 5 |   | 99.8      | 14.9 | 5 |   |
| 2 (0.121)                  | 108.2     | 10.2 | 5 |   | 133.4     | 9.5  | 5 |   | 96.0      | 5.4  | 5 |   |
| 3 (0.398)                  | 98.4      | 2.2  | 5 |   | 123.6     | 11.5 | 5 |   | 88.5      | 13.5 | 5 |   |
| 4 (1.207)                  | 110.3     | 7.8  | 5 |   | 151.7     | 17.0 | 5 |   | 109.1     | 13.1 | 5 |   |

| GROUP (Dose g TOS / kg bw) | DAY 73-77 |      |   | p | DAY 77-80 |      |   | p | DAY 80-84 |      |   | p |
|----------------------------|-----------|------|---|---|-----------|------|---|---|-----------|------|---|---|
|                            | Mean      | S.D. | N |   | Mean      | S.D. | N |   | Mean      | S.D. | N |   |
| 1 (0)                      | 141.3     | 26.1 | 5 |   | 111.2     | 24.9 | 5 |   | 141.8     | 29.0 | 5 |   |
| 2 (0.121)                  | 139.1     | 11.7 | 5 |   | 110.2     | 10.8 | 5 |   | 138.8     | 9.1  | 5 |   |
| 3 (0.398)                  | 130.6     | 10.0 | 5 |   | 110.4     | 23.2 | 5 |   | 138.5     | 11.4 | 5 |   |
| 4 (1.207)                  | 144.6     | 15.8 | 5 |   | 116.5     | 15.7 | 5 |   | 147.6     | 16.5 | 5 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of cages

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90-Days Oral Gavage Toxicity Study in Rats

Water consumption (g)

Group mean values (g) - Day -1 to Day 91

Males

| GROUP (Dose g TOS<br>/ kg bw) | DAY 84-87 |      |   | p | DAY 87-91 |      |   | p | TOTAL, DAY -1<br>TO DAY 91 |       |   | p |
|-------------------------------|-----------|------|---|---|-----------|------|---|---|----------------------------|-------|---|---|
|                               | Mean      | S.D. | N |   | Mean      | S.D. | N |   | Mean                       | S.D.  | N |   |
| 1 (0)                         | 128.1     | 21.0 | 5 |   | 151.6     | 29.5 | 5 |   | 3068.5                     | 313.1 | 4 |   |
| 2 (0.121)                     | 127.3     | 7.2  | 5 |   | 153.0     | 16.1 | 5 |   | 3177.4                     | 260.7 | 4 |   |
| 3 (0.398)                     | 130.6     | 7.3  | 5 |   | 139.6     | 5.5  | 5 |   | 3108.9                     | 197.5 | 4 |   |
| 4 (1.207)                     | 141.7     | 19.3 | 5 |   | 150.2     | 22.3 | 5 |   | 3287.1                     | 139.3 | 4 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of cages

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90-Days Oral Gavage Toxicity Study in Rats

Water consumption (g)

Group mean values (g) - Day -1 to Day 91

Females

| GROUP (Dose g TOS / kg bw) | DAY -1-3 |      |   | p | DAY 3-7 |      |   | p | DAY 7-10 |      |   | p |
|----------------------------|----------|------|---|---|---------|------|---|---|----------|------|---|---|
|                            | Mean     | S.D. | N |   | Mean    | S.D. | N |   | Mean     | S.D. | N |   |
| 1 (0)                      | 76.2     | 6.6  | 5 |   | 88.1    | 9.3  | 5 |   | 64.4     | 4.9  | 5 |   |
| 2 (0.121)                  | 75.4     | 7.7  | 5 |   | 92.5    | 8.5  | 5 |   | 68.3     | 4.6  | 5 |   |
| 3 (0.398)                  | 82.5     | 7.3  | 5 |   | 93.5    | 6.6  | 5 |   | 71.0     | 5.4  | 5 |   |
| 4 (1.207)                  | 75.8     | 7.6  | 5 |   | 96.1    | 12.9 | 5 |   | 68.6     | 9.0  | 5 |   |

| GROUP (Dose g TOS / kg bw) | DAY 10-14 |      |   | p | DAY 14-17 |       |   | p | DAY 17-21 |      |   | p |
|----------------------------|-----------|------|---|---|-----------|-------|---|---|-----------|------|---|---|
|                            | Mean      | S.D. | N |   | Mean      | S.D.  | N |   | Mean      | S.D. | N |   |
| 1 (0)                      | 95.7      | 9.5  | 5 |   | 74.2      | 3.6   | 5 |   | 99.4      | 6.0  | 5 |   |
| 2 (0.121)                  | 87.9      | 18.0 | 5 |   | 76.9      | 8.3   | 5 |   | 107.4     | 17.1 | 5 |   |
| 3 (0.398)                  | 95.8      | 9.8  | 5 |   | 126.6     | 125.4 | 5 |   | 113.0     | 33.2 | 5 |   |
| 4 (1.207)                  | 94.6      | 8.4  | 5 |   | 73.8      | 12.4  | 5 |   | 102.1     | 11.0 | 5 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of cages

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Water consumption (g)

Group mean values (g) - Day -1 to Day 91

Females

| GROUP (Dose g TOS / kg bw) | DAY 21-24 |      |   | p | DAY 24-28 |      |   | p | DAY 28-31 |      |   | p |
|----------------------------|-----------|------|---|---|-----------|------|---|---|-----------|------|---|---|
|                            | Mean      | S.D. | N |   | Mean      | S.D. | N |   | Mean      | S.D. | N |   |
| 1 (0)                      | 108.9     | 75.8 | 5 |   | 100.3     | 6.7  | 5 |   | 69.5      | 6.4  | 5 |   |
| 2 (0.121)                  | 81.5      | 10.2 | 5 |   | 105.4     | 7.1  | 5 |   | 70.2      | 5.4  | 5 |   |
| 3 (0.398)                  | 71.7      | 4.9  | 5 |   | 103.8     | 6.8  | 5 |   | 73.8      | 7.2  | 5 |   |
| 4 (1.207)                  | 71.5      | 9.0  | 5 |   | 100.5     | 7.6  | 5 |   | 67.5      | 5.3  | 5 |   |

| GROUP (Dose g TOS / kg bw) | DAY 31-35 |      |   | p | DAY 35-38 |      |   | p | DAY 38-42 |      |   | p |
|----------------------------|-----------|------|---|---|-----------|------|---|---|-----------|------|---|---|
|                            | Mean      | S.D. | N |   | Mean      | S.D. | N |   | Mean      | S.D. | N |   |
| 1 (0)                      | 93.4      | 8.0  | 5 |   | 68.4      | 3.2  | 4 |   | 101.2     | 11.7 | 5 |   |
| 2 (0.121)                  | 96.0      | 6.2  | 5 |   | 70.1      | 7.7  | 5 |   | 104.4     | 8.8  | 5 |   |
| 3 (0.398)                  | 93.7      | 10.7 | 5 |   | 69.9      | 6.3  | 5 |   | 100.7     | 9.2  | 5 |   |
| 4 (1.207)                  | 95.1      | 7.5  | 5 |   | 69.3      | 6.3  | 5 |   | 103.1     | 11.6 | 5 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of cages

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Water consumption (g)

Group mean values (g) - Day -1 to Day 91

Females

| GROUP (Dose g TOS / kg bw) | DAY 42-45 |      |   | p | DAY 45-49 |      |   | p | DAY 49-52 |      |   | p |
|----------------------------|-----------|------|---|---|-----------|------|---|---|-----------|------|---|---|
|                            | Mean      | S.D. | N |   | Mean      | S.D. | N |   | Mean      | S.D. | N |   |
| 1 (0)                      | 70.9      | 5.5  | 5 |   | 98.8      | 9.5  | 5 |   | 81.3      | 5.4  | 5 |   |
| 2 (0.121)                  | 76.9      | 7.2  | 5 |   | 103.4     | 9.5  | 5 |   | 81.9      | 4.3  | 5 |   |
| 3 (0.398)                  | 75.3      | 9.9  | 5 |   | 95.3      | 8.5  | 5 |   | 85.2      | 13.2 | 5 |   |
| 4 (1.207)                  | 74.3      | 8.4  | 5 |   | 91.1      | 13.2 | 5 |   | 75.5      | 13.0 | 5 |   |

| GROUP (Dose g TOS / kg bw) | DAY 52-56 |      |   | p | DAY 56-59 |      |   | p | DAY 59-63 |      |   | p |
|----------------------------|-----------|------|---|---|-----------|------|---|---|-----------|------|---|---|
|                            | Mean      | S.D. | N |   | Mean      | S.D. | N |   | Mean      | S.D. | N |   |
| 1 (0)                      | 106.0     | 7.9  | 5 |   | 62.1      | 7.6  | 5 |   | 94.1      | 10.6 | 5 |   |
| 2 (0.121)                  | 116.6     | 6.7  | 5 |   | 61.1      | 3.7  | 5 |   | 97.3      | 8.9  | 5 |   |
| 3 (0.398)                  | 112.4     | 16.7 | 5 |   | 65.1      | 7.9  | 5 |   | 99.7      | 13.8 | 5 |   |
| 4 (1.207)                  | 106.0     | 11.6 | 5 |   | 64.1      | 3.2  | 5 |   | 102.9     | 9.8  | 5 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of cages

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90-Days Oral Gavage Toxicity Study in Rats

Water consumption (g)

Group mean values (g) - Day -1 to Day 91

Females

| GROUP (Dose g TOS / kg bw) | DAY 63-66 |      |   | p | DAY 66-70 |      |   | p | DAY 70-73 |      |   | p |
|----------------------------|-----------|------|---|---|-----------|------|---|---|-----------|------|---|---|
|                            | Mean      | S.D. | N |   | Mean      | S.D. | N |   | Mean      | S.D. | N |   |
| 1 (0)                      | 76.3      | 8.4  | 5 |   | 100.2     | 14.2 | 5 |   | 74.4      | 10.8 | 5 |   |
| 2 (0.121)                  | 87.1      | 13.9 | 5 |   | 102.1     | 8.8  | 5 |   | 75.1      | 7.2  | 5 |   |
| 3 (0.398)                  | 72.1      | 7.0  | 5 |   | 94.1      | 9.7  | 5 |   | 72.4      | 4.4  | 5 |   |
| 4 (1.207)                  | 72.3      | 6.1  | 5 |   | 102.0     | 8.6  | 5 |   | 108.3     | 73.6 | 5 |   |

| GROUP (Dose g TOS / kg bw) | DAY 73-77 |      |   | p | DAY 77-80 |      |   | p | DAY 80-84 |      |   | p |
|----------------------------|-----------|------|---|---|-----------|------|---|---|-----------|------|---|---|
|                            | Mean      | S.D. | N |   | Mean      | S.D. | N |   | Mean      | S.D. | N |   |
| 1 (0)                      | 106.3     | 11.1 | 5 |   | 80.1      | 5.3  | 5 |   | 104.6     | 10.0 | 5 |   |
| 2 (0.121)                  | 109.6     | 8.2  | 5 |   | 85.9      | 8.1  | 5 |   | 113.8     | 11.9 | 5 |   |
| 3 (0.398)                  | 99.7      | 4.7  | 5 |   | 77.4      | 7.3  | 5 |   | 103.7     | 10.2 | 5 |   |
| 4 (1.207)                  | 108.3     | 13.8 | 5 |   | 80.2      | 7.4  | 5 |   | 102.5     | 11.0 | 5 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of cages

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90-Days Oral Gavage Toxicity Study in Rats

Water consumption (g)

Group mean values (g) - Day -1 to Day 91

Females

| GROUP (Dose g TOS<br>/ kg bw) | DAY 84-87 |      |   | p | DAY 87-91 |      |   | p | TOTAL, DAY -1<br>TO DAY 91 |       |   | p |
|-------------------------------|-----------|------|---|---|-----------|------|---|---|----------------------------|-------|---|---|
|                               | Mean      | S.D. | N |   | Mean      | S.D. | N |   | Mean                       | S.D.  | N |   |
| 1 (0)                         | 95.2      | 10.4 | 5 |   | 107.9     | 3.4  | 5 |   | 2266.9                     | 243.6 | 4 |   |
| 2 (0.121)                     | 97.3      | 8.0  | 5 |   | 116.4     | 11.9 | 5 |   | 2360.5                     | 176.8 | 5 |   |
| 3 (0.398)                     | 111.9     | 36.0 | 5 |   | 105.6     | 12.8 | 5 |   | 2365.9                     | 251.2 | 5 |   |
| 4 (1.207)                     | 109.2     | 13.3 | 5 |   | 110.1     | 15.9 | 5 |   | 2324.8                     | 250.2 | 5 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of cages



**Table 12 Haematology – Group mean values**

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Haematology

Group mean values

Males

| GROUP (Dose g TOS / kg bw) | Hb   |      |    | p | RBC  |      |    | p | % RETIC |      |    | p |
|----------------------------|------|------|----|---|------|------|----|---|---------|------|----|---|
|                            | Mean | S.D. | N  |   | Mean | S.D. | N  |   | Mean    | S.D. | N  |   |
| 1 (0)                      | 9.66 | 0.50 | 10 |   | 8.76 | 0.51 | 10 |   | 2.07    | 0.28 | 10 |   |
| 2 (0.121)                  | 9.33 | 0.85 | 10 |   | 8.61 | 0.44 | 10 |   | 2.38    | 0.83 | 10 |   |
| 3 (0.398)                  | 9.16 | 0.71 | 10 |   | 8.07 | 0.88 | 10 |   | 2.55    | 0.29 | 10 |   |
| 4 (1.207)                  | 9.57 | 0.21 | 10 |   | 8.55 | 0.24 | 10 |   | 2.29    | 0.35 | 10 |   |

| GROUP (Dose g TOS / kg bw) | RETIC |       |    | p | HT   |      |    | p | MCV  |      |    | p |
|----------------------------|-------|-------|----|---|------|------|----|---|------|------|----|---|
|                            | Mean  | S.D.  | N  |   | Mean | S.D. | N  |   | Mean | S.D. | N  |   |
| 1 (0)                      | 0.182 | 0.029 | 10 |   | 43.8 | 2.1  | 10 |   | 50.1 | 1.7  | 10 |   |
| 2 (0.121)                  | 0.206 | 0.080 | 10 |   | 42.8 | 2.7  | 10 |   | 49.7 | 3.7  | 10 |   |
| 3 (0.398)                  | 0.206 | 0.031 | 10 |   | 40.2 | 3.8  | 10 | * | 50.2 | 2.1  | 10 |   |
| 4 (1.207)                  | 0.195 | 0.026 | 10 |   | 42.5 | 1.4  | 10 |   | 49.8 | 1.0  | 10 |   |

Abbreviations and units are explained in Haematology

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Haematology

Group mean values

Males

| GROUP (Dose g TOS / kg bw) | MCH  |      |    | p | MCHC |      |    | p | WBC   |      |    | p |
|----------------------------|------|------|----|---|------|------|----|---|-------|------|----|---|
|                            | Mean | S.D. | N  |   | Mean | S.D. | N  |   | Mean  | S.D. | N  |   |
| 1 (0)                      | 1.12 | 0.04 | 10 |   | 22.1 | 0.4  | 10 |   | 13.93 | 2.66 | 10 |   |
| 2 (0.121)                  | 1.09 | 0.10 | 10 |   | 21.8 | 1.5  | 10 |   | 13.68 | 2.06 | 10 |   |
| 3 (0.398)                  | 1.14 | 0.07 | 10 |   | 22.8 | 1.0  | 10 |   | 12.66 | 1.34 | 10 |   |
| 4 (1.207)                  | 1.12 | 0.04 | 10 |   | 22.6 | 0.7  | 10 |   | 13.74 | 1.44 | 10 |   |

| GROUP (Dose g TOS / kg bw) | % NEUTRO |      |    | p | NEUTRO |      |    | p | % LYMPHO |      |    | p |
|----------------------------|----------|------|----|---|--------|------|----|---|----------|------|----|---|
|                            | Mean     | S.D. | N  |   | Mean   | S.D. | N  |   | Mean     | S.D. | N  |   |
| 1 (0)                      | 12.7     | 2.4  | 10 |   | 1.81   | 0.64 | 10 |   | 84.2     | 3.1  | 10 |   |
| 2 (0.121)                  | 11.3     | 2.2  | 10 |   | 1.53   | 0.39 | 10 |   | 85.4     | 2.4  | 10 |   |
| 3 (0.398)                  | 11.4     | 2.6  | 10 |   | 1.42   | 0.34 | 10 |   | 86.0     | 2.9  | 10 |   |
| 4 (1.207)                  | 11.6     | 1.7  | 10 |   | 1.60   | 0.24 | 10 |   | 85.1     | 1.9  | 10 |   |

Abbreviations and units are explained in Haematology

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation    N = number of animals

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90-Days Oral Gavage Toxicity Study in Rats

Haematology

Group mean values

Males

| GROUP (Dose g TOS / kg bw) | LYMPHO |      |    | p | % EOS |      |    | p | EOS  |      |    | p |
|----------------------------|--------|------|----|---|-------|------|----|---|------|------|----|---|
|                            | Mean   | S.D. | N  |   | Mean  | S.D. | N  |   | Mean | S.D. | N  |   |
| 1 (0)                      | 11.68  | 2.00 | 10 |   | 1.1   | 0.6  | 10 |   | 0.14 | 0.12 | 10 |   |
| 2 (0.121)                  | 11.69  | 1.76 | 10 |   | 1.4   | 0.8  | 10 |   | 0.17 | 0.08 | 10 |   |
| 3 (0.398)                  | 10.88  | 1.20 | 10 |   | 1.0   | 0.0  | 10 |   | 0.11 | 0.03 | 10 |   |
| 4 (1.207)                  | 11.67  | 1.31 | 10 |   | 1.0   | 0.0  | 10 |   | 0.12 | 0.04 | 10 |   |

| GROUP (Dose g TOS / kg bw) | % BASO |      |    | p | BASO |      |    | p | % MONO |      |    | p |
|----------------------------|--------|------|----|---|------|------|----|---|--------|------|----|---|
|                            | Mean   | S.D. | N  |   | Mean | S.D. | N  |   | Mean   | S.D. | N  |   |
| 1 (0)                      | 0.3    | 0.5  | 10 |   | 0.07 | 0.05 | 10 |   | 1.8    | 0.6  | 10 |   |
| 2 (0.121)                  | 0.4    | 0.5  | 10 |   | 0.07 | 0.05 | 10 |   | 1.7    | 0.9  | 10 |   |
| 3 (0.398)                  | 0.4    | 0.5  | 10 |   | 0.05 | 0.05 | 10 |   | 1.7    | 0.8  | 10 |   |
| 4 (1.207)                  | 0.4    | 0.5  | 10 |   | 0.07 | 0.05 | 10 |   | 2.2    | 0.4  | 10 |   |

Abbreviations and units are explained in Haematology

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation    N = number of animals

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90-Days Oral Gavage Toxicity Study in Rats

Haematology

Group mean values

Males

| GROUP (Dose g TOS / kg bw) | MONO |      |    | p | Plt  |      |    | p | APTT |      |    | p |
|----------------------------|------|------|----|---|------|------|----|---|------|------|----|---|
|                            | Mean | S.D. | N  |   | Mean | S.D. | N  |   | Mean | S.D. | N  |   |
| 1 (0)                      | 0.26 | 0.08 | 10 |   | 707  | 87   | 10 |   | 12.7 | 3.6  | 10 |   |
| 2 (0.121)                  | 0.26 | 0.14 | 10 |   | 792  | 122  | 10 |   | 14.9 | 0.4  | 10 |   |
| 3 (0.398)                  | 0.22 | 0.08 | 10 |   | 742  | 94   | 10 |   | 14.0 | 1.7  | 10 |   |
| 4 (1.207)                  | 0.32 | 0.09 | 10 |   | 768  | 46   | 10 |   | 14.9 | 1.3  | 10 |   |

| GROUP (Dose g TOS / kg bw) | Pt   |      |    | p  | Fib  |      |    | p |
|----------------------------|------|------|----|----|------|------|----|---|
|                            | Mean | S.D. | N  |    | Mean | S.D. | N  |   |
| 1 (0)                      | 15.6 | 0.6  | 10 |    | 2.63 | 0.59 | 10 |   |
| 2 (0.121)                  | 15.9 | 0.6  | 10 |    | 2.37 | 0.38 | 10 |   |
| 3 (0.398)                  | 15.9 | 0.8  | 10 |    | 2.36 | 0.44 | 10 |   |
| 4 (1.207)                  | 16.8 | 0.8  | 10 | ** | 2.11 | 0.42 | 10 |   |

Abbreviations and units are explained in Haematology

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\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals

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90-Days Oral Gavage Toxicity Study in Rats

Haematology

Group mean values

Females

| GROUP (Dose g TOS / kg bw) | Hb   |      |    | p | RBC  |      |    | p | % RETIC |      |    | p |
|----------------------------|------|------|----|---|------|------|----|---|---------|------|----|---|
|                            | Mean | S.D. | N  |   | Mean | S.D. | N  |   | Mean    | S.D. | N  |   |
| 1 (0)                      | 9.18 | 0.29 | 10 |   | 7.68 | 0.31 | 10 |   | 2.59    | 0.35 | 10 |   |
| 2 (0.121)                  | 9.12 | 0.32 | 10 |   | 7.66 | 0.27 | 10 |   | 2.56    | 0.52 | 10 |   |
| 3 (0.398)                  | 9.19 | 0.30 | 10 |   | 7.62 | 0.33 | 10 |   | 2.70    | 0.56 | 10 |   |
| 4 (1.207)                  | 9.06 | 0.26 | 10 |   | 7.68 | 0.38 | 10 |   | 2.39    | 0.46 | 10 |   |

| GROUP (Dose g TOS / kg bw) | RETIC |       |    | p | HT   |      |    | p | MCV  |      |    | p |
|----------------------------|-------|-------|----|---|------|------|----|---|------|------|----|---|
|                            | Mean  | S.D.  | N  |   | Mean | S.D. | N  |   | Mean | S.D. | N  |   |
| 1 (0)                      | 0.199 | 0.030 | 10 |   | 40.6 | 1.3  | 10 |   | 52.7 | 1.2  | 10 |   |
| 2 (0.121)                  | 0.196 | 0.040 | 10 |   | 40.6 | 1.2  | 10 |   | 52.9 | 1.0  | 10 |   |
| 3 (0.398)                  | 0.205 | 0.040 | 10 |   | 40.3 | 0.9  | 10 |   | 52.8 | 1.3  | 10 |   |
| 4 (1.207)                  | 0.183 | 0.032 | 10 |   | 40.6 | 1.3  | 10 |   | 53.0 | 1.8  | 10 |   |

Abbreviations and units are explained in Haematology

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals

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Haematology

Group mean values

Females

| GROUP (Dose g TOS / kg bw) | MCH  |      |    | p | MCHC |      |    | p | WBC   |      |    | p |
|----------------------------|------|------|----|---|------|------|----|---|-------|------|----|---|
|                            | Mean | S.D. | N  |   | Mean | S.D. | N  |   | Mean  | S.D. | N  |   |
| 1 (0)                      | 1.19 | 0.06 | 10 |   | 22.7 | 0.5  | 10 |   | 9.78  | 1.91 | 9  |   |
| 2 (0.121)                  | 1.20 | 0.05 | 10 |   | 22.5 | 0.7  | 10 |   | 11.16 | 2.37 | 10 |   |
| 3 (0.398)                  | 1.20 | 0.05 | 10 |   | 22.8 | 0.5  | 10 |   | 11.74 | 3.03 | 9  |   |
| 4 (1.207)                  | 1.20 | 0.05 | 10 |   | 22.3 | 0.5  | 10 |   | 9.66  | 2.46 | 10 |   |

| GROUP (Dose g TOS / kg bw) | % NEUTRO |      |    | p | NEUTRO |      |    | p | % LYMPHO |      |    | p |
|----------------------------|----------|------|----|---|--------|------|----|---|----------|------|----|---|
|                            | Mean     | S.D. | N  |   | Mean   | S.D. | N  |   | Mean     | S.D. | N  |   |
| 1 (0)                      | 12.8     | 4.2  | 10 |   | 1.18   | 0.45 | 9  |   | 83.5     | 5.1  | 10 |   |
| 2 (0.121)                  | 10.9     | 2.6  | 10 |   | 1.22   | 0.37 | 10 |   | 86.6     | 3.1  | 10 |   |
| 3 (0.398)                  | 10.8     | 2.9  | 9  |   | 1.28   | 0.50 | 9  |   | 86.7     | 3.6  | 9  |   |
| 4 (1.207)                  | 11.7     | 4.3  | 10 |   | 1.20   | 0.81 | 10 |   | 85.8     | 5.0  | 10 |   |

Abbreviations and units are explained in Haematology

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals

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Haematology

Group mean values

Females

| GROUP (Dose g TOS / kg bw) | LYMPHO |      |    | p | % EOS |      |    | p | EOS  |      |    | p |
|----------------------------|--------|------|----|---|-------|------|----|---|------|------|----|---|
|                            | Mean   | S.D. | N  |   | Mean  | S.D. | N  |   | Mean | S.D. | N  |   |
| 1 (0)                      | 8.24   | 1.65 | 9  |   | 1.6   | 1.3  | 10 |   | 0.17 | 0.10 | 9  |   |
| 2 (0.121)                  | 9.64   | 1.99 | 10 |   | 1.0   | 0.0  | 10 |   | 0.11 | 0.03 | 10 |   |
| 3 (0.398)                  | 10.14  | 2.58 | 9  |   | 1.2   | 0.4  | 9  |   | 0.13 | 0.07 | 9  |   |
| 4 (1.207)                  | 8.22   | 1.60 | 10 |   | 1.5   | 0.5  | 10 |   | 0.16 | 0.10 | 10 |   |

| GROUP (Dose g TOS / kg bw) | % BASO |      |    | p  | BASO |      |    | p | % MONO |      |    | p |
|----------------------------|--------|------|----|----|------|------|----|---|--------|------|----|---|
|                            | Mean   | S.D. | N  |    | Mean | S.D. | N  |   | Mean   | S.D. | N  |   |
| 1 (0)                      | 0.6    | 0.5  | 10 |    | 0.04 | 0.05 | 9  |   | 1.2    | 1.1  | 10 |   |
| 2 (0.121)                  | 0.6    | 0.7  | 10 |    | 0.08 | 0.09 | 10 |   | 1.1    | 0.9  | 10 |   |
| 3 (0.398)                  | 0.6    | 0.5  | 9  |    | 0.06 | 0.05 | 9  |   | 1.1    | 0.8  | 9  |   |
| 4 (1.207)                  | 0.0    | 0.0  | 10 | ** | 0.01 | 0.03 | 10 |   | 1.2    | 0.8  | 10 |   |

Abbreviations and units are explained in Haematology

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation    N = number of animals

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Haematology

Group mean values

Females

| GROUP (Dose g TOS / kg bw) | MONO |      |    | p | Plt  |      |    | p | APTT |      |    | p |
|----------------------------|------|------|----|---|------|------|----|---|------|------|----|---|
|                            | Mean | S.D. | N  |   | Mean | S.D. | N  |   | Mean | S.D. | N  |   |
| 1 (0)                      | 0.12 | 0.11 | 9  |   | 691  | 59   | 10 |   | 15.0 | 1.2  | 10 |   |
| 2 (0.121)                  | 0.11 | 0.10 | 10 |   | 727  | 51   | 10 |   | 14.9 | 1.7  | 10 |   |
| 3 (0.398)                  | 0.13 | 0.11 | 9  |   | 720  | 87   | 10 |   | 13.7 | 2.8  | 10 |   |
| 4 (1.207)                  | 0.11 | 0.09 | 10 |   | 655  | 108  | 10 |   | 14.2 | 1.7  | 9  |   |

| GROUP (Dose g TOS / kg bw) | Pt   |      |    | p | Fib  |      |    | p |
|----------------------------|------|------|----|---|------|------|----|---|
|                            | Mean | S.D. | N  |   | Mean | S.D. | N  |   |
| 1 (0)                      | 14.2 | 0.3  | 10 |   | 1.84 | 0.18 | 10 |   |
| 2 (0.121)                  | 14.4 | 0.6  | 10 |   | 1.83 | 0.31 | 10 |   |
| 3 (0.398)                  | 14.6 | 0.6  | 10 |   | 1.73 | 0.37 | 10 |   |
| 4 (1.207)                  | 14.5 | 0.6  | 9  |   | 1.93 | 0.34 | 9  |   |

Abbreviations and units are explained in Haematology

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals



**Table 13 Clinical chemistry – Group mean values**

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Clinical chemistry

Group mean values

Males

| GROUP (Dose g TOS<br>/ kg bw) | ALAT |      |    | p | ASAT |      |    | p | ALKPH |      |    | p |
|-------------------------------|------|------|----|---|------|------|----|---|-------|------|----|---|
|                               | Mean | S.D. | N  |   | Mean | S.D. | N  |   | Mean  | S.D. | N  |   |
| 1 (0)                         | 1.57 | 0.45 | 10 |   | 1.70 | 0.41 | 10 |   | 1.83  | 0.26 | 10 |   |
| 2 (0.121)                     | 1.61 | 0.28 | 10 |   | 1.92 | 0.40 | 10 |   | 1.82  | 0.33 | 10 |   |
| 3 (0.398)                     | 1.44 | 0.36 | 10 |   | 1.78 | 0.49 | 10 |   | 1.76  | 0.37 | 10 |   |
| 4 (1.207)                     | 1.39 | 0.14 | 10 |   | 1.68 | 0.16 | 10 |   | 1.89  | 0.26 | 10 |   |

| GROUP (Dose g TOS<br>/ kg bw) | TBILI |      |    | p | GGT   |       |    | p | CHOL |      |    | p |
|-------------------------------|-------|------|----|---|-------|-------|----|---|------|------|----|---|
|                               | Mean  | S.D. | N  |   | Mean  | S.D.  | N  |   | Mean | S.D. | N  |   |
| 1 (0)                         | 1.07  | 0.30 | 10 |   | <0.03 | >0.00 | 10 |   | 2.64 | 0.49 | 10 |   |
| 2 (0.121)                     | 1.02  | 0.24 | 10 |   | <0.03 | >0.00 | 10 |   | 2.64 | 0.43 | 10 |   |
| 3 (0.398)                     | 1.06  | 0.30 | 10 |   | <0.03 | >0.00 | 10 |   | 2.47 | 0.53 | 10 |   |
| 4 (1.207)                     | 1.06  | 0.16 | 10 |   | <0.03 | >0.00 | 10 |   | 2.35 | 0.30 | 10 |   |

Abbreviations and units are explained in Clinical chemistry

Limit of detection for GGT is 0.03 - this value is used in the calculation

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Clinical chemistry

Group mean values

Males

| GROUP (Dose g TOS<br>/ kg bw) | TRIG |      |    | p | UREA |      |    | p | CREAT |      |    | p |
|-------------------------------|------|------|----|---|------|------|----|---|-------|------|----|---|
|                               | Mean | S.D. | N  |   | Mean | S.D. | N  |   | Mean  | S.D. | N  |   |
| 1 (0)                         | 1.97 | 0.41 | 10 |   | 8.46 | 1.07 | 10 |   | 25.1  | 2.0  | 10 |   |
| 2 (0.121)                     | 2.13 | 0.47 | 10 |   | 8.03 | 1.08 | 10 |   | 26.0  | 2.6  | 10 |   |
| 3 (0.398)                     | 1.90 | 0.67 | 10 |   | 8.24 | 0.93 | 10 |   | 24.6  | 1.8  | 10 |   |
| 4 (1.207)                     | 1.81 | 0.58 | 10 |   | 8.07 | 0.68 | 10 |   | 24.8  | 1.5  | 10 |   |

| GROUP (Dose g TOS<br>/ kg bw) | GLUC |      |    | p | Na    |      |    | p | K    |      |    | p |
|-------------------------------|------|------|----|---|-------|------|----|---|------|------|----|---|
|                               | Mean | S.D. | N  |   | Mean  | S.D. | N  |   | Mean | S.D. | N  |   |
| 1 (0)                         | 6.51 | 0.48 | 10 |   | 145.2 | 0.9  | 10 |   | 7.92 | 0.57 | 10 |   |
| 2 (0.121)                     | 6.32 | 0.35 | 10 |   | 145.4 | 1.3  | 10 |   | 8.17 | 0.48 | 10 |   |
| 3 (0.398)                     | 7.02 | 1.56 | 10 |   | 145.4 | 1.6  | 10 |   | 7.47 | 0.88 | 10 |   |
| 4 (1.207)                     | 6.18 | 0.36 | 10 |   | 145.0 | 1.7  | 10 |   | 8.12 | 0.77 | 10 |   |

Abbreviations and units are explained in Clinical chemistry

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation    N = number of animals

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Clinical chemistry

Group mean values

Males

| GROUP (Dose g TOS / kg bw) | Ca   |      |    | p | Mg   |      |    | p | P    |      |    | p |
|----------------------------|------|------|----|---|------|------|----|---|------|------|----|---|
|                            | Mean | S.D. | N  |   | Mean | S.D. | N  |   | Mean | S.D. | N  |   |
| 1 (0)                      | 2.84 | 0.06 | 10 |   | 1.07 | 0.07 | 10 |   | 2.48 | 0.19 | 10 |   |
| 2 (0.121)                  | 2.82 | 0.08 | 10 |   | 1.06 | 0.07 | 10 |   | 2.58 | 0.20 | 10 |   |
| 3 (0.398)                  | 2.88 | 0.08 | 10 |   | 1.06 | 0.08 | 10 |   | 2.56 | 0.23 | 10 |   |
| 4 (1.207)                  | 2.81 | 0.09 | 10 |   | 1.01 | 0.08 | 10 |   | 2.51 | 0.19 | 10 |   |

| GROUP (Dose g TOS / kg bw) | Cl   |      |    | p | PROTEIN |      |    | p | ALB  |      |    | p |
|----------------------------|------|------|----|---|---------|------|----|---|------|------|----|---|
|                            | Mean | S.D. | N  |   | Mean    | S.D. | N  |   | Mean | S.D. | N  |   |
| 1 (0)                      | 99.1 | 1.2  | 10 |   | 67.3    | 3.0  | 10 |   | 42.6 | 1.4  | 10 |   |
| 2 (0.121)                  | 99.0 | 1.0  | 10 |   | 68.6    | 2.1  | 10 |   | 43.6 | 1.3  | 10 |   |
| 3 (0.398)                  | 99.5 | 1.7  | 10 |   | 66.9    | 4.0  | 10 |   | 43.6 | 3.0  | 10 |   |
| 4 (1.207)                  | 98.8 | 1.5  | 10 |   | 66.2    | 2.0  | 10 |   | 43.3 | 1.3  | 10 |   |

Abbreviations and units are explained in Clinical chemistry

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Clinical chemistry

Group mean values

Males

| GROUP (Dose g TOS<br>/ kg bw) | GLOBULIN |      |    | p | ALB/G Ratio |      |    | p |
|-------------------------------|----------|------|----|---|-------------|------|----|---|
|                               | Mean     | S.D. | N  |   | Mean        | S.D. | N  |   |
| 1 (0)                         | 24.7     | 2.2  | 10 |   | 1.74        | 0.14 | 10 |   |
| 2 (0.121)                     | 25.0     | 1.7  | 10 |   | 1.75        | 0.14 | 10 |   |
| 3 (0.398)                     | 23.3     | 1.4  | 10 |   | 1.88        | 0.11 | 10 | * |
| 4 (1.207)                     | 22.9     | 1.1  | 10 |   | 1.89        | 0.09 | 10 | * |

Abbreviations and units are explained in Clinical chemistry

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Clinical chemistry

Group mean values

Females

| GROUP (Dose g TOS / kg bw) | ALAT |      |    | p | ASAT |      |    | p | ALKPH |      |    | p |
|----------------------------|------|------|----|---|------|------|----|---|-------|------|----|---|
|                            | Mean | S.D. | N  |   | Mean | S.D. | N  |   | Mean  | S.D. | N  |   |
| 1 (0)                      | 1.47 | 0.71 | 10 |   | 2.01 | 1.21 | 10 |   | 1.17  | 0.20 | 10 |   |
| 2 (0.121)                  | 1.19 | 0.23 | 10 |   | 1.39 | 0.14 | 10 |   | 1.30  | 0.43 | 10 |   |
| 3 (0.398)                  | 1.06 | 0.22 | 10 |   | 1.53 | 0.33 | 10 |   | 1.86  | 1.64 | 10 |   |
| 4 (1.207)                  | 1.17 | 0.29 | 10 |   | 1.59 | 0.36 | 10 |   | 1.32  | 0.26 | 10 |   |

| GROUP (Dose g TOS / kg bw) | TBILI |      |    | p | GGT   |       |    | p | CHOL |      |    | p |
|----------------------------|-------|------|----|---|-------|-------|----|---|------|------|----|---|
|                            | Mean  | S.D. | N  |   | Mean  | S.D.  | N  |   | Mean | S.D. | N  |   |
| 1 (0)                      | 1.08  | 0.23 | 10 |   | <0.03 | >0.00 | 10 |   | 2.87 | 0.34 | 10 |   |
| 2 (0.121)                  | 1.05  | 0.22 | 10 |   | <0.03 | >0.00 | 10 |   | 2.71 | 0.36 | 10 |   |
| 3 (0.398)                  | 1.17  | 0.18 | 10 |   | <0.03 | >0.00 | 10 |   | 2.64 | 0.58 | 10 |   |
| 4 (1.207)                  | 0.91  | 0.23 | 10 |   | <0.03 | >0.00 | 10 |   | 2.51 | 0.25 | 10 | * |

Abbreviations and units are explained in Clinical chemistry

Limit of detection for GGT is 0.03 - this value is used in the calculation

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Clinical chemistry

Group mean values

Females

| GROUP (Dose g TOS<br>/ kg bw) | TRIG |      |    | p | UREA |      |    | p | CREAT |      |    | p |
|-------------------------------|------|------|----|---|------|------|----|---|-------|------|----|---|
|                               | Mean | S.D. | N  |   | Mean | S.D. | N  |   | Mean  | S.D. | N  |   |
| 1 (0)                         | 1.13 | 0.47 | 10 |   | 7.83 | 1.24 | 10 |   | 26.6  | 3.3  | 10 |   |
| 2 (0.121)                     | 1.60 | 0.65 | 10 |   | 8.10 | 1.20 | 10 |   | 27.2  | 3.6  | 10 |   |
| 3 (0.398)                     | 1.09 | 0.29 | 10 |   | 7.43 | 1.65 | 10 |   | 27.0  | 3.1  | 10 |   |
| 4 (1.207)                     | 1.18 | 0.73 | 10 |   | 8.44 | 0.77 | 10 |   | 27.0  | 1.8  | 10 |   |

| GROUP (Dose g TOS<br>/ kg bw) | GLUC |      |    | p | Na    |      |    | p | K    |      |    | p |
|-------------------------------|------|------|----|---|-------|------|----|---|------|------|----|---|
|                               | Mean | S.D. | N  |   | Mean  | S.D. | N  |   | Mean | S.D. | N  |   |
| 1 (0)                         | 6.74 | 1.14 | 10 |   | 144.7 | 2.0  | 10 |   | 7.19 | 0.53 | 10 |   |
| 2 (0.121)                     | 7.23 | 1.67 | 10 |   | 144.3 | 1.8  | 10 |   | 6.70 | 0.70 | 10 |   |
| 3 (0.398)                     | 6.97 | 0.89 | 10 |   | 144.4 | 2.3  | 10 |   | 6.97 | 0.57 | 10 |   |
| 4 (1.207)                     | 6.99 | 0.84 | 10 |   | 144.7 | 1.8  | 10 |   | 7.20 | 0.67 | 10 |   |

Abbreviations and units are explained in Clinical chemistry

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Clinical chemistry

Group mean values

Females

| GROUP (Dose g TOS<br>/ kg bw) | Ca   |      |    | p | Mg   |      |    | p | P    |      |    | p |
|-------------------------------|------|------|----|---|------|------|----|---|------|------|----|---|
|                               | Mean | S.D. | N  |   | Mean | S.D. | N  |   | Mean | S.D. | N  |   |
| 1 (0)                         | 2.91 | 0.06 | 10 |   | 1.07 | 0.04 | 10 |   | 2.23 | 0.29 | 10 |   |
| 2 (0.121)                     | 2.91 | 0.05 | 10 |   | 1.08 | 0.07 | 10 |   | 2.17 | 0.19 | 10 |   |
| 3 (0.398)                     | 2.95 | 0.09 | 10 |   | 1.08 | 0.09 | 10 |   | 2.16 | 0.26 | 10 |   |
| 4 (1.207)                     | 2.88 | 0.06 | 10 |   | 1.05 | 0.08 | 10 |   | 2.03 | 0.28 | 10 |   |

| GROUP (Dose g TOS<br>/ kg bw) | Cl    |      |    | p | PROTEIN |      |    | p | ALB  |      |    | p |
|-------------------------------|-------|------|----|---|---------|------|----|---|------|------|----|---|
|                               | Mean  | S.D. | N  |   | Mean    | S.D. | N  |   | Mean | S.D. | N  |   |
| 1 (0)                         | 100.2 | 1.6  | 10 |   | 67.1    | 2.3  | 10 |   | 47.4 | 2.0  | 10 |   |
| 2 (0.121)                     | 100.0 | 2.0  | 10 |   | 67.2    | 3.0  | 10 |   | 47.2 | 2.7  | 10 |   |
| 3 (0.398)                     | 100.6 | 1.1  | 10 |   | 67.6    | 2.6  | 10 |   | 48.3 | 3.1  | 10 |   |
| 4 (1.207)                     | 100.6 | 1.4  | 10 |   | 66.5    | 2.1  | 10 |   | 47.1 | 1.4  | 10 |   |

Abbreviations and units are explained in Clinical chemistry

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Clinical chemistry

Group mean values

Females

| GROUP (Dose g TOS<br>/ kg bw) | GLOBULIN |      |    | p | ALB/G Ratio |      |    | p |
|-------------------------------|----------|------|----|---|-------------|------|----|---|
|                               | Mean     | S.D. | N  |   | Mean        | S.D. | N  |   |
| 1 (0)                         | 19.7     | 1.1  | 10 |   | 2.42        | 0.17 | 10 |   |
| 2 (0.121)                     | 20.0     | 1.3  | 10 |   | 2.37        | 0.20 | 10 |   |
| 3 (0.398)                     | 19.3     | 1.0  | 10 |   | 2.51        | 0.26 | 10 |   |
| 4 (1.207)                     | 19.4     | 1.9  | 10 |   | 2.45        | 0.25 | 10 |   |

Abbreviations and units are explained in Clinical chemistry

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation    N = number of animals



**Table 14 Absolute and relative organ weights – Group mean values**

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Absolute (mg) and relative (% of body wt and brain wt) organ weight

Group mean values - Day 91/92

Males

| GROUP (Dose g TOS<br>/ kg bw) | BODY WT, g |      |    | p | ADRENALS |      |    | p | ADRENALS     |        |    | p |
|-------------------------------|------------|------|----|---|----------|------|----|---|--------------|--------|----|---|
|                               |            |      |    |   | ABSOLUTE |      |    |   | % of BODY WT |        |    |   |
|                               | MEAN       | S.D. | N  |   | MEAN     | S.D. | N  |   | MEAN         | S.D.   | N  |   |
| 1 (0)                         | 531.9      | 45.8 | 10 |   | 54.4     | 6.9  | 10 |   | 0.0103       | 0.0014 | 10 |   |
| 2 (0.121)                     | 526.1      | 37.0 | 10 |   | 53.4     | 10.4 | 10 |   | 0.0102       | 0.0019 | 10 |   |
| 3 (0.398)                     | 516.1      | 39.9 | 10 |   | 57.2     | 9.3  | 10 |   | 0.0111       | 0.0016 | 10 |   |
| 4 (1.207)                     | 524.3      | 27.6 | 10 |   | 58.5     | 11.0 | 10 |   | 0.0112       | 0.0021 | 10 |   |

| GROUP (Dose g TOS / kg bw) | ADRENALS      |      |    | p | BRAIN    |      |    | p | BRAIN        |       |    | p |
|----------------------------|---------------|------|----|---|----------|------|----|---|--------------|-------|----|---|
|                            | % OF BRAIN WT |      |    |   | ABSOLUTE |      |    |   | % of BODY WT |       |    |   |
|                            | MEAN          | S.D. | N  |   | MEAN     | S.D. | N  |   | MEAN         | S.D.  | N  |   |
| 1 (0)                      | 2.40          | 0.34 | 10 |   | 2275     | 173  | 10 |   | 0.431        | 0.056 | 10 |   |
| 2 (0.121)                  | 2.32          | 0.46 | 10 |   | 2315     | 97   | 10 |   | 0.442        | 0.032 | 10 |   |
| 3 (0.398)                  | 2.49          | 0.41 | 10 |   | 2299     | 68   | 10 |   | 0.448        | 0.035 | 10 |   |
| 4 (1.207)                  | 2.55          | 0.53 | 10 |   | 2303     | 84   | 10 |   | 0.440        | 0.024 | 10 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Absolute (mg) and relative (% of body wt and brain wt) organ weight

Group mean values - Day 91/92

Males

| GROUP (Dose g TOS / kg bw) | EPIDIDYIMIDES |      |    | p | EPIDIDYIMIDES |       |    | p | EPIDIDYIMIDES |      |    | p |
|----------------------------|---------------|------|----|---|---------------|-------|----|---|---------------|------|----|---|
|                            | ABSOLUTE      |      |    |   | % of BODY WT  |       |    |   | % OF BRAIN WT |      |    |   |
|                            | MEAN          | S.D. | N  |   | MEAN          | S.D.  | N  |   | MEAN          | S.D. | N  |   |
| 1 (0)                      | 1478          | 175  | 10 |   | 0.279         | 0.033 | 10 |   | 65.6          | 12.7 | 10 |   |
| 2 (0.121)                  | 1565          | 124  | 10 |   | 0.298         | 0.018 | 10 |   | 67.7          | 6.6  | 10 |   |
| 3 (0.398)                  | 1528          | 93   | 10 |   | 0.298         | 0.029 | 10 |   | 66.5          | 4.5  | 10 |   |
| 4 (1.207)                  | 1495          | 142  | 10 |   | 0.286         | 0.033 | 10 |   | 65.0          | 6.4  | 10 |   |

| GROUP (Dose g TOS<br>/ kg bw) | HEART    |      |    | p | HEART        |       |    | p | HEART         |      |    | p |
|-------------------------------|----------|------|----|---|--------------|-------|----|---|---------------|------|----|---|
|                               | ABSOLUTE |      |    |   | % of BODY WT |       |    |   | % OF BRAIN WT |      |    |   |
|                               | MEAN     | S.D. | N  |   | MEAN         | S.D.  | N  |   | MEAN          | S.D. | N  |   |
| 1 (0)                         | 1727     | 249  | 10 |   | 0.325        | 0.038 | 10 |   | 76.2          | 11.4 | 10 |   |
| 2 (0.121)                     | 1668     | 126  | 10 |   | 0.318        | 0.024 | 10 |   | 72.0          | 3.5  | 10 |   |
| 3 (0.398)                     | 1776     | 254  | 10 |   | 0.343        | 0.030 | 10 |   | 77.2          | 10.4 | 10 |   |
| 4 (1.207)                     | 1754     | 133  | 10 |   | 0.335        | 0.024 | 10 |   | 76.2          | 5.2  | 10 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Absolute (mg) and relative (% of body wt and brain wt) organ weight

Group mean values - Day 91/92

Males

| GROUP (Dose g TOS<br>/ kg bw) | KIDNEYS  |      |    | p | KIDNEYS      |       |    | p | KIDNEYS       |      |    | p |
|-------------------------------|----------|------|----|---|--------------|-------|----|---|---------------|------|----|---|
|                               | ABSOLUTE |      |    |   | % of BODY WT |       |    |   | % OF BRAIN WT |      |    |   |
|                               | MEAN     | S.D. | N  |   | MEAN         | S.D.  | N  |   | MEAN          | S.D. | N  |   |
| 1 (0)                         | 3352     | 245  | 10 |   | 0.632        | 0.044 | 10 |   | 148.7         | 21.5 | 10 |   |
| 2 (0.121)                     | 3410     | 269  | 10 |   | 0.649        | 0.036 | 10 |   | 147.4         | 11.6 | 10 |   |
| 3 (0.398)                     | 3421     | 379  | 10 |   | 0.662        | 0.044 | 10 |   | 148.8         | 15.6 | 10 |   |
| 4 (1.207)                     | 3381     | 210  | 10 |   | 0.646        | 0.036 | 10 |   | 146.8         | 6.9  | 10 |   |

| GROUP (Dose g TOS<br>/ kg bw) | LIVER    |      |    | p | LIVER        |      |    | p | LIVER         |       |    | p |
|-------------------------------|----------|------|----|---|--------------|------|----|---|---------------|-------|----|---|
|                               | ABSOLUTE |      |    |   | % of BODY WT |      |    |   | % OF BRAIN WT |       |    |   |
|                               | MEAN     | S.D. | N  |   | MEAN         | S.D. | N  |   | MEAN          | S.D.  | N  |   |
| 1 (0)                         | 18931    | 2263 | 10 |   | 3.56         | 0.25 | 10 |   | 840.4         | 148.0 | 10 |   |
| 2 (0.121)                     | 20131    | 2758 | 10 |   | 3.81         | 0.33 | 10 |   | 870.1         | 117.2 | 10 |   |
| 3 (0.398)                     | 20357    | 1802 | 10 |   | 3.95         | 0.29 | 10 | * | 885.3         | 69.4  | 10 |   |
| 4 (1.207)                     | 19427    | 2089 | 10 |   | 3.70         | 0.32 | 10 |   | 843.8         | 88.2  | 10 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Absolute (mg) and relative (% of body wt and brain wt) organ weight

Group mean values - Day 91/92

Males

| GROUP (Dose g TOS<br>/ kg bw) | PITUITARY |      |    | p | PITUITARY    |         |    | p | PITUITARY     |       |    | p |
|-------------------------------|-----------|------|----|---|--------------|---------|----|---|---------------|-------|----|---|
|                               | ABSOLUTE  |      |    |   | % of BODY WT |         |    |   | % OF BRAIN WT |       |    |   |
|                               | MEAN      | S.D. | N  |   | MEAN         | S.D.    | N  |   | MEAN          | S.D.  | N  |   |
| 1 (0)                         | 14.3      | 1.8  | 10 |   | 0.00269      | 0.00029 | 10 |   | 0.630         | 0.074 | 10 |   |
| 2 (0.121)                     | 14.4      | 1.5  | 10 |   | 0.00274      | 0.00023 | 10 |   | 0.623         | 0.065 | 10 |   |
| 3 (0.398)                     | 13.4      | 2.2  | 10 |   | 0.00260      | 0.00042 | 10 |   | 0.585         | 0.103 | 10 |   |
| 4 (1.207)                     | 13.6      | 2.8  | 10 |   | 0.00261      | 0.00059 | 10 |   | 0.593         | 0.131 | 10 |   |

| GROUP (Dose g TOS<br>/ kg bw) | PROSTATE |      |    | p  | PROSTATE     |       |    | p | PROSTATE      |      |    | p  |
|-------------------------------|----------|------|----|----|--------------|-------|----|---|---------------|------|----|----|
|                               | ABSOLUTE |      |    |    | % of BODY WT |       |    |   | % OF BRAIN WT |      |    |    |
|                               | MEAN     | S.D. | N  |    | MEAN         | S.D.  | N  |   | MEAN          | S.D. | N  |    |
| 1 (0)                         | 797      | 140  | 10 |    | 0.150        | 0.022 | 10 |   | 35.4          | 7.8  | 10 |    |
| 2 (0.121)                     | 637      | 91   | 10 | ** | 0.121        | 0.017 | 10 | * | 27.5          | 3.7  | 10 | ** |
| 3 (0.398)                     | 766      | 113  | 10 |    | 0.150        | 0.030 | 10 |   | 33.4          | 5.2  | 10 |    |
| 4 (1.207)                     | 760      | 97   | 10 |    | 0.146        | 0.022 | 10 |   | 33.1          | 4.5  | 10 |    |

\* means p<0.05, versus control group

\*\* means p<0.01, versus control group

S.D. = standard deviation N = number of animals

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90-Days Oral Gavage Toxicity Study in Rats

Absolute (mg) and relative (% of body wt and brain wt) organ weight

Group mean values - Day 91/92

Males

| GROUP (Dose g TOS<br>/ kg bw) | SPLEEN   |      |    | p | SPLEEN       |       |    | p | SPLEEN        |      |    | p |
|-------------------------------|----------|------|----|---|--------------|-------|----|---|---------------|------|----|---|
|                               | ABSOLUTE |      |    |   | % of BODY WT |       |    |   | % OF BRAIN WT |      |    |   |
|                               | MEAN     | S.D. | N  |   | MEAN         | S.D.  | N  |   | MEAN          | S.D. | N  |   |
| 1 (0)                         | 1025     | 188  | 10 |   | 0.192        | 0.023 | 10 |   | 45.7          | 11.7 | 10 |   |
| 2 (0.121)                     | 1054     | 164  | 10 |   | 0.200        | 0.025 | 10 |   | 45.5          | 6.5  | 10 |   |
| 3 (0.398)                     | 1043     | 206  | 10 |   | 0.202        | 0.035 | 10 |   | 45.3          | 8.2  | 10 |   |
| 4 (1.207)                     | 1024     | 159  | 10 |   | 0.195        | 0.030 | 10 |   | 44.5          | 7.1  | 10 |   |

| GROUP (Dose g TOS<br>/ kg bw) | TESTES   |      |    | p | TESTES       |       |    | p | TESTES        |      |    | p |
|-------------------------------|----------|------|----|---|--------------|-------|----|---|---------------|------|----|---|
|                               | ABSOLUTE |      |    |   | % of BODY WT |       |    |   | % OF BRAIN WT |      |    |   |
|                               | MEAN     | S.D. | N  |   | MEAN         | S.D.  | N  |   | MEAN          | S.D. | N  |   |
| 1 (0)                         | 4105     | 344  | 10 |   | 0.775        | 0.074 | 10 |   | 182.3         | 29.8 | 10 |   |
| 2 (0.121)                     | 4095     | 120  | 10 |   | 0.781        | 0.052 | 10 |   | 177.1         | 7.3  | 10 |   |
| 3 (0.398)                     | 3971     | 295  | 10 |   | 0.772        | 0.065 | 10 |   | 172.7         | 11.4 | 10 |   |
| 4 (1.207)                     | 3925     | 316  | 10 |   | 0.750        | 0.071 | 10 |   | 170.5         | 12.4 | 10 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals

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90-Days Oral Gavage Toxicity Study in Rats

Absolute (mg) and relative (% of body wt and brain wt) organ weight

Group mean values - Day 91/92

Males

| GROUP (Dose g TOS<br>/ kg bw) | THYMUS   |      |    | p | THYMUS       |        |    | p | THYMUS        |      |    | p |
|-------------------------------|----------|------|----|---|--------------|--------|----|---|---------------|------|----|---|
|                               | ABSOLUTE |      |    |   | % of BODY WT |        |    |   | % OF BRAIN WT |      |    |   |
|                               | MEAN     | S.D. | N  |   | MEAN         | S.D.   | N  |   | MEAN          | S.D. | N  |   |
| 1 (0)                         | 503      | 113  | 10 |   | 0.0945       | 0.0194 | 10 |   | 22.2          | 5.1  | 10 |   |
| 2 (0.121)                     | 446      | 103  | 10 |   | 0.0850       | 0.0200 | 10 |   | 19.3          | 4.5  | 10 |   |
| 3 (0.398)                     | 415      | 98   | 10 |   | 0.0800       | 0.0158 | 10 |   | 18.1          | 4.4  | 10 |   |
| 4 (1.207)                     | 422      | 102  | 10 |   | 0.0806       | 0.0197 | 10 |   | 18.4          | 4.6  | 10 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals

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90-Days Oral Gavage Toxicity Study in Rats

Absolute (mg) and relative (% of body wt and brain wt) organ weight

Group mean values - Day 91/92

Females

| GROUP (Dose g TOS<br>/ kg bw) | BODY WT, g |      |    | p | ADRENALS |      |    | p | ADRENALS     |        |    | p |
|-------------------------------|------------|------|----|---|----------|------|----|---|--------------|--------|----|---|
|                               |            |      |    |   | ABSOLUTE |      |    |   | % of BODY WT |        |    |   |
|                               | Mean       | S.D  | N  |   | Mean     | S.D  | N  |   | Mean         | S.D    | N  |   |
| 1 (0)                         | 289.0      | 21.9 | 10 |   | 81.4     | 11.6 | 10 |   | 0.0282       | 0.0038 | 10 |   |
| 2 (0.121)                     | 294.6      | 23.5 | 10 |   | 79.8     | 12.6 | 10 |   | 0.0272       | 0.0044 | 10 |   |
| 3 (0.398)                     | 292.1      | 14.7 | 10 |   | 80.9     | 6.0  | 10 |   | 0.0277       | 0.0021 | 10 |   |
| 4 (1.207)                     | 287.7      | 17.3 | 10 |   | 79.9     | 10.6 | 10 |   | 0.0278       | 0.0035 | 10 |   |

| GROUP (Dose g TOS<br>/ kg bw) | ADRENALS      |      |    | p | BRAIN    |     |    | p | BRAIN        |       |    | p |
|-------------------------------|---------------|------|----|---|----------|-----|----|---|--------------|-------|----|---|
|                               | % OF BRAIN WT |      |    |   | ABSOLUTE |     |    |   | % of BODY WT |       |    |   |
|                               | Mean          | S.D  | N  |   | Mean     | S.D | N  |   | Mean         | S.D   | N  |   |
| 1 (0)                         | 3.96          | 0.55 | 10 |   | 2058     | 76  | 10 |   | 0.715        | 0.053 | 10 |   |
| 2 (0.121)                     | 3.78          | 0.60 | 10 |   | 2112     | 73  | 10 |   | 0.721        | 0.059 | 10 |   |
| 3 (0.398)                     | 3.97          | 0.37 | 10 |   | 2040     | 67  | 10 |   | 0.701        | 0.049 | 10 |   |
| 4 (1.207)                     | 3.80          | 0.56 | 10 |   | 2108     | 54  | 10 |   | 0.735        | 0.051 | 10 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals

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90-Days Oral Gavage Toxicity Study in Rats

Absolute (mg) and relative (% of body wt and brain wt) organ weight

Group mean values - Day 91/92

Females

| GROUP (Dose g TOS<br>/ kg bw) | HEART    |     |    | p | HEART        |       |    | p | HEART         |     |    | p |
|-------------------------------|----------|-----|----|---|--------------|-------|----|---|---------------|-----|----|---|
|                               | ABSOLUTE |     |    |   | % of BODY WT |       |    |   | % OF BRAIN WT |     |    |   |
|                               | Mean     | S.D | N  |   | Mean         | S.D   | N  |   | Mean          | S.D | N  |   |
| 1 (0)                         | 1106     | 135 | 10 |   | 0.383        | 0.039 | 10 |   | 53.8          | 6.7 | 10 |   |
| 2 (0.121)                     | 1153     | 127 | 10 |   | 0.393        | 0.046 | 10 |   | 54.5          | 4.9 | 10 |   |
| 3 (0.398)                     | 1155     | 106 | 10 |   | 0.396        | 0.039 | 10 |   | 56.8          | 6.3 | 10 |   |
| 4 (1.207)                     | 1137     | 81  | 10 |   | 0.396        | 0.024 | 10 |   | 54.0          | 3.9 | 10 |   |

| GROUP (Dose g TOS<br>/ kg bw) | KIDNEYS  |     |    | p | KIDNEYS      |       |    | p | KIDNEYS       |      |    | p |
|-------------------------------|----------|-----|----|---|--------------|-------|----|---|---------------|------|----|---|
|                               | ABSOLUTE |     |    |   | % of BODY WT |       |    |   | % OF BRAIN WT |      |    |   |
|                               | Mean     | S.D | N  |   | Mean         | S.D   | N  |   | Mean          | S.D  | N  |   |
| 1 (0)                         | 2004     | 248 | 10 |   | 0.694        | 0.068 | 10 |   | 97.4          | 10.8 | 10 |   |
| 2 (0.121)                     | 2044     | 225 | 10 |   | 0.695        | 0.062 | 10 |   | 96.9          | 11.2 | 10 |   |
| 3 (0.398)                     | 2047     | 177 | 10 |   | 0.701        | 0.049 | 10 |   | 100.5         | 10.2 | 10 |   |
| 4 (1.207)                     | 2006     | 160 | 10 |   | 0.698        | 0.052 | 10 |   | 95.2          | 7.7  | 10 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals



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90-Days Oral Gavage Toxicity Study in Rats

Absolute (mg) and relative (% of body wt and brain wt) organ weight

Group mean values - Day 91/92

Females

| GROUP (Dose g TOS<br>/ kg bw) | LIVER    |      |    | p | LIVER        |      |    | p | LIVER         |      |    | p |
|-------------------------------|----------|------|----|---|--------------|------|----|---|---------------|------|----|---|
|                               | ABSOLUTE |      |    |   | % of BODY WT |      |    |   | % OF BRAIN WT |      |    |   |
|                               | Mean     | S.D  | N  |   | Mean         | S.D  | N  |   | Mean          | S.D  | N  |   |
| 1 (0)                         | 10342    | 1010 | 10 |   | 3.58         | 0.22 | 10 |   | 502.6         | 45.6 | 10 |   |
| 2 (0.121)                     | 10849    | 1696 | 10 |   | 3.68         | 0.48 | 10 |   | 513.3         | 75.8 | 10 |   |
| 3 (0.398)                     | 10463    | 783  | 10 |   | 3.59         | 0.29 | 10 |   | 513.0         | 36.5 | 10 |   |
| 4 (1.207)                     | 10635    | 1715 | 10 |   | 3.68         | 0.40 | 10 |   | 505.5         | 87.9 | 10 |   |

| GROUP (Dose g TOS<br>/ kg bw) | OVARIES  |      |    | p | OVARIES      |        |    | p | OVARIES       |      |    | p |
|-------------------------------|----------|------|----|---|--------------|--------|----|---|---------------|------|----|---|
|                               | ABSOLUTE |      |    |   | % of BODY WT |        |    |   | % OF BRAIN WT |      |    |   |
|                               | Mean     | S.D  | N  |   | Mean         | S.D    | N  |   | Mean          | S.D  | N  |   |
| 1 (0)                         | 110.2    | 25.6 | 10 |   | 0.0383       | 0.0089 | 10 |   | 5.37          | 1.32 | 10 |   |
| 2 (0.121)                     | 116.2    | 30.8 | 10 |   | 0.0390       | 0.0083 | 10 |   | 5.52          | 1.53 | 10 |   |
| 3 (0.398)                     | 122.6    | 18.7 | 10 |   | 0.0420       | 0.0062 | 10 |   | 6.01          | 0.90 | 10 |   |
| 4 (1.207)                     | 106.5    | 41.5 | 10 |   | 0.0367       | 0.0121 | 10 |   | 5.08          | 2.08 | 10 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals

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90-Days Oral Gavage Toxicity Study in Rats

Absolute (mg) and relative (% of body wt and brain wt) organ weight

Group mean values - Day 91/92

Females

| GROUP (Dose g TOS<br>/ kg bw) | PITUITARY |     |    | p | PITUITARY    |         |    | p | PITUITARY     |       |    | p |
|-------------------------------|-----------|-----|----|---|--------------|---------|----|---|---------------|-------|----|---|
|                               | ABSOLUTE  |     |    |   | % of BODY WT |         |    |   | % OF BRAIN WT |       |    |   |
|                               | Mean      | S.D | N  |   | Mean         | S.D     | N  |   | Mean          | S.D   | N  |   |
| 1 (0)                         | 16.2      | 2.8 | 10 |   | 0.00563      | 0.00104 | 10 |   | 0.787         | 0.131 | 10 |   |
| 2 (0.121)                     | 16.0      | 3.8 | 10 |   | 0.00551      | 0.00158 | 10 |   | 0.760         | 0.184 | 10 |   |
| 3 (0.398)                     | 15.4      | 4.2 | 10 |   | 0.00531      | 0.00157 | 10 |   | 0.754         | 0.203 | 10 |   |
| 4 (1.207)                     | 15.4      | 2.2 | 10 |   | 0.00537      | 0.00080 | 10 |   | 0.730         | 0.094 | 10 |   |

| GROUP (Dose g TOS<br>/ kg bw) | SPLEEN   |     |    | p | SPLEEN       |       |    | p | SPLEEN        |     |    | p |
|-------------------------------|----------|-----|----|---|--------------|-------|----|---|---------------|-----|----|---|
|                               | ABSOLUTE |     |    |   | % of BODY WT |       |    |   | % OF BRAIN WT |     |    |   |
|                               | Mean     | S.D | N  |   | Mean         | S.D   | N  |   | Mean          | S.D | N  |   |
| 1 (0)                         | 653      | 111 | 10 |   | 0.225        | 0.028 | 10 |   | 31.6          | 4.4 | 10 |   |
| 2 (0.121)                     | 702      | 90  | 10 |   | 0.238        | 0.023 | 10 |   | 33.2          | 3.9 | 10 |   |
| 3 (0.398)                     | 719      | 69  | 10 |   | 0.247        | 0.029 | 10 |   | 35.2          | 3.3 | 10 |   |
| 4 (1.207)                     | 685      | 80  | 10 |   | 0.239        | 0.033 | 10 |   | 32.5          | 3.6 | 10 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals

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90-Days Oral Gavage Toxicity Study in Rats

Absolute (mg) and relative (% of body wt and brain wt) organ weight

Group mean values - Day 91/92

Females

| GROUP (Dose g TOS / kg bw) | THYMUS   |     |    | p | THYMUS       |        |    | p | THYMUS        |     |    | p |
|----------------------------|----------|-----|----|---|--------------|--------|----|---|---------------|-----|----|---|
|                            | ABSOLUTE |     |    |   | % of BODY WT |        |    |   | % OF BRAIN WT |     |    |   |
|                            | Mean     | S.D | N  |   | Mean         | S.D    | N  |   | Mean          | S.D | N  |   |
| 1 (0)                      | 338      | 76  | 10 |   | 0.1167       | 0.0237 | 10 |   | 16.5          | 3.9 | 10 |   |
| 2 (0.121)                  | 346      | 72  | 10 |   | 0.1180       | 0.0242 | 10 |   | 16.4          | 3.5 | 10 |   |
| 3 (0.398)                  | 354      | 68  | 10 |   | 0.1208       | 0.0202 | 10 |   | 17.4          | 3.6 | 10 |   |
| 4 (1.207)                  | 367      | 95  | 10 |   | 0.1273       | 0.0308 | 10 |   | 17.5          | 4.6 | 10 |   |

| GROUP (Dose g TOS<br>/ kg bw) | UTERUS   |     |    | p | UTERUS       |       |    | p | UTERUS        |      |    | p |
|-------------------------------|----------|-----|----|---|--------------|-------|----|---|---------------|------|----|---|
|                               | ABSOLUTE |     |    |   | % of BODY WT |       |    |   | % OF BRAIN WT |      |    |   |
|                               | Mean     | S.D | N  |   | Mean         | S.D   | N  |   | Mean          | S.D  | N  |   |
| 1 (0)                         | 676      | 65  | 10 |   | 0.236        | 0.035 | 10 |   | 32.9          | 3.3  | 10 |   |
| 2 (0.121)                     | 823      | 273 | 10 |   | 0.282        | 0.094 | 10 |   | 39.2          | 14.1 | 10 |   |
| 3 (0.398)                     | 750      | 183 | 10 |   | 0.259        | 0.076 | 10 |   | 36.7          | 8.6  | 10 |   |
| 4 (1.207)                     | 643      | 96  | 10 |   | 0.224        | 0.037 | 10 |   | 30.5          | 4.1  | 10 |   |

\* means  $p < 0.05$ , versus control group

\*\* means  $p < 0.01$ , versus control group

S.D. = standard deviation N = number of animals

## Table 15 Clinical signs – Individual findings

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90-Days Oral Gavage Toxicity Study in Rats

Clinical signs

Individual findings

### Group 1

Animal No 8, male

Days 35-36: Slight discharge from right eye.

Animal No 15, female

Days 53-55: Slight reddish discharge from right eye.

Animal No 17, female

Days 45-92: Slight to marked hairloss on foreleg

Animal No 18, female

Days 64-67: Slight hairloss on hindpart.

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### Group 2

Animal No 22, male

Days 85: Exudating wound on hindleg 0-0.5 cm. Torn nail on the outer toe on the right hind leg.

Days 86-91: Dry wound on hindleg 0-0.5 cm. Torn nail on the outer toe on the right hind leg.

Animal No 24, male

Days 1: Dry wound on neck 0-0.5 cm.

Days 42-45: Slight discharge from right eye

Animal No 30, male

Days 86-91: Dry wound on ear 0-0.5 cm.

Animal No 33, female

Days 25-56, 77-92: Slight to marked hairloss on foreleg.

Animal No 34, female

Days 17-34: Hairloss in the neck and head.

### Group 3

Animal No 45, male

Days 86-90: Slight discharge from right eye.

Animal No 47, male

Days 14-22, 26, 46-48, 84-88: Slight to moderate reddish discharge from both eyes.

Days 27-38, 42-45, 74-75: Slight reddish discharge from right eye.

Days 89-90: Slight discharge from left eye.

Animal No 49, male

Days 27-29, 42: Slight discharge from left eye.

Animal No 57, female

Days 31-92: Slight to marked hairloss on foreleg.

### Group 4

Animal No 61, male

Days 42, 86-90: Slight to moderate discharge from both eyes.

Animal No 63, male

Days 42: Slight discharge from left eye.

Animal No 68, male

Days 25-91: Slight to marked hairloss on foreleg.

Animal No 77, male

Days 46-52: Slight discharge from left eye.

Days 74-82: Slight to moderate discharge from left eye.

**Table 16 Open field observations – Individual values – Before start of treatment**

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90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Individual values - Before start of treatment

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | ABNORMAL<br>BEHAVIOUR | TIME<br>MOVING | TOTAL<br>DISTANCE<br>(m) | NO. OF<br>REARINGS | TIME<br>CENTRE | TIME<br>PERIPHERY |
|------------------------------------|--------------|-----------------------|----------------|--------------------------|--------------------|----------------|-------------------|
| 1 (0)                              | 1            | 0                     | 225.6          | 290.8                    | 18                 | 12.7           | 287.4             |
|                                    | 2            | 0                     | 250.8          | 257.6                    | 16                 | 35.6           | 264.3             |
|                                    | 3            | 0                     | 229.2          | 297.2                    | 34                 | 26.4           | 273.6             |
|                                    | 4            | 0                     | 215.0          | 282.6                    | 28                 | 13.0           | 287.0             |
|                                    | 5            | 0                     | 220.4          | 280.7                    | 32                 | 13.4           | 286.6             |
|                                    | 6            | 0                     | 225.7          | 318.9                    | 27                 | 20.1           | 279.9             |
|                                    | 7            | 0                     | 220.7          | 288.5                    | 31                 | 11.9           | 288.1             |
|                                    | 8            | 0                     | 212.8          | 258.0                    | 36                 | 13.4           | 286.6             |
|                                    | 9            | 0                     | 235.6          | 318.5                    | 10                 | 6.8            | 293.2             |
|                                    | 10           | 0                     | 208.0          | 251.2                    | 20                 | 7.8            | 292.2             |
| 2 (0.121)                          | 21           | 0                     | 222.8          | 278.5                    | 25                 | 28.3           | 271.7             |
|                                    | 22           | 0                     | 229.3          | 284.7                    | 37                 | 12.5           | 287.5             |
|                                    | 23           | 0                     | 235.7          | 264.6                    | 36                 | 21.9           | 278.1             |
|                                    | 24           | 0                     | 227.6          | 272.7                    | 21                 | 18.5           | 281.5             |
|                                    | 25           | 0                     | 261.2          | 301.2                    | 24                 | 11.9           | 288.1             |
|                                    | 26           | 0                     | 235.5          | 319.2                    | 19                 | 11.0           | 289.0             |
|                                    | 27           | 0                     | 234.1          | 360.0                    | 15                 | 17.0           | 283.0             |
|                                    | 28           | 0                     | 218.0          | 269.5                    | 35                 | 6.6            | 293.4             |
|                                    | 29           | 0                     | 158.8          | 186.6                    | 19                 | 3.5            | 296.5             |
|                                    | 30           | 0                     | 206.7          | 250.2                    | 16                 | 0.6            | 299.4             |

Codes are described in Open field observations

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Individual values - Before start of treatment

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | ABNORMAL<br>BEHAVIOUR | TIME<br>MOVING | TOTAL<br>DISTANCE<br>(m) | NO. OF<br>REARINGS | TIME<br>CENTRE | TIME<br>PERIPHERY |
|------------------------------------|--------------|-----------------------|----------------|--------------------------|--------------------|----------------|-------------------|
| 3 (0.398)                          | 41           | 0                     | 217.5          | 288.3                    | 14                 | 17.6           | 282.4             |
|                                    | 42           | 0                     | 212.7          | 284.9                    | 32                 | 18.9           | 281.1             |
|                                    | 43           | 0                     | 246.2          | 358.3                    | 43                 | 12.4           | 287.6             |
|                                    | 44           | 0                     | 251.0          | 363.5                    | 17                 | 12.8           | 287.2             |
|                                    | 45           | 0                     | 246.1          | 359.9                    | 25                 | 23.5           | 276.5             |
|                                    | 46           | 0                     | 233.8          | 246.7                    | 23                 | 11.5           | 288.5             |
|                                    | 47           | 0                     | 252.6          | 344.3                    | 28                 | 13.4           | 286.6             |
|                                    | 48           | 0                     | 219.3          | 289.5                    | 34                 | 25.2           | 274.8             |
|                                    | 49           | 0                     | 216.0          | 292.7                    | 27                 | 25.6           | 274.4             |
|                                    | 50           | 0                     | 208.3          | 242.4                    | 22                 | 10.0           | 290.0             |
| 4 (1.207)                          | 61           | 0                     | 192.6          | 231.4                    | 34                 | 36.7           | 263.3             |
|                                    | 62           | 0                     | 239.2          | 304.2                    | 25                 | 32.0           | 268.0             |
|                                    | 63           | 0                     | 227.2          | 334.2                    | 37                 | 4.3            | 295.7             |
|                                    | 64           | 0                     | 203.1          | 256.7                    | 32                 | 2.8            | 297.3             |
|                                    | 65           | 0                     | 251.8          | 348.6                    | 32                 | 14.2           | 285.8             |
|                                    | 66           | 0                     | 243.9          | 419.0                    | 11                 | 15.6           | 284.4             |
|                                    | 67           | 0                     | 204.4          | 210.5                    | 16                 | 21.4           | 278.6             |
|                                    | 68           | 0                     | 212.7          | 264.1                    | 18                 | 15.8           | 284.1             |
|                                    | 69           | 0                     | 237.1          | 253.1                    | 17                 | 22.0           | 278.0             |
|                                    | 70           | 0                     | 202.6          | 291.4                    | 15                 | 10.5           | 289.5             |

Codes are described in Open field observations

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Individual values - Before start of treatment

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | TOTAL<br>CORNER<br>VISITS | MOVES/<br>COUNTS | ATAXIA | NUMBER OF<br>FAECAL<br>PELLETS | URINATION<br>DURING<br>TEST |
|------------------------------------|--------------|---------------------------|------------------|--------|--------------------------------|-----------------------------|
| 1 (0)                              | 1            | 322                       | 6074             | 0      | 7                              | 1                           |
|                                    | 2            | 214                       | 6450             | 0      | 9                              | 1                           |
|                                    | 3            | 316                       | 6275             | 0      | 3                              | 1                           |
|                                    | 4            | 305                       | 5650             | 0      | 4                              | 1                           |
|                                    | 5            | 328                       | 5833             | 0      | 1                              | 0                           |
|                                    | 6            | 367                       | 6490             | 0      | 0                              | 0                           |
|                                    | 7            | 309                       | 6158             | 0      | 2                              | 0                           |
|                                    | 8            | 270                       | 5691             | 0      | 4                              | 1                           |
|                                    | 9            | 428                       | 6829             | 0      | 3                              | 1                           |
|                                    | 10           | 313                       | 5754             | 0      | 3                              | 1                           |
| 2 (0.121)                          | 21           | 305                       | 5981             | 0      | 1                              | 0                           |
|                                    | 22           | 271                       | 6129             | 0      | 2                              | 1                           |
|                                    | 23           | 234                       | 6143             | 0      | 4                              | 1                           |
|                                    | 24           | 322                       | 6186             | 0      | 1                              | 0                           |
|                                    | 25           | 334                       | 6709             | 0      | 8                              | 1                           |
|                                    | 26           | 347                       | 6548             | 0      | 1                              | 1                           |
|                                    | 27           | 425                       | 6874             | 0      | 1                              | 1                           |
|                                    | 28           | 323                       | 5800             | 0      | 7                              | 1                           |
|                                    | 29           | 254                       | 4171             | 0      | 6                              | 1                           |
|                                    | 30           | 337                       | 5138             | 0      | 3                              | 1                           |

Codes are described in Open field observations



Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Individual values - Before start of treatment

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | TOTAL<br>CORNER<br>VISITS | MOVES/<br>COUNTS | ATAXIA | NUMBER OF<br>FAECAL<br>PELLETS | URINATION<br>DURING<br>TEST |
|------------------------------------|--------------|---------------------------|------------------|--------|--------------------------------|-----------------------------|
| 3 (0.398)                          | 41           | 331                       | 6151             | 0      | 2                              | 0                           |
|                                    | 42           | 333                       | 5896             | 0      | 4                              | 1                           |
|                                    | 43           | 403                       | 7109             | 0      | 3                              | 1                           |
|                                    | 44           | 403                       | 7382             | 0      | 5                              | 1                           |
|                                    | 45           | 410                       | 7020             | 0      | 5                              | 1                           |
|                                    | 46           | 277                       | 6108             | 0      | 3                              | 1                           |
|                                    | 47           | 404                       | 7278             | 0      | 0                              | 0                           |
|                                    | 48           | 309                       | 6355             | 0      | 0                              | 0                           |
|                                    | 49           | 287                       | 6286             | 0      | 6                              | 1                           |
|                                    | 50           | 264                       | 5322             | 0      | 6                              | 1                           |
| 4 (1.207)                          | 61           | 223                       | 5093             | 0      | 1                              | 0                           |
|                                    | 62           | 321                       | 6820             | 0      | 4                              | 1                           |
|                                    | 63           | 438                       | 6334             | 0      | 5                              | 1                           |
|                                    | 64           | 362                       | 5554             | 0      | 6                              | 1                           |
|                                    | 65           | 394                       | 7200             | 0      | 7                              | 1                           |
|                                    | 66           | 471                       | 7528             | 0      | 0                              | 1                           |
|                                    | 67           | 218                       | 5026             | 0      | 6                              | 0                           |
|                                    | 68           | 316                       | 5873             | 0      | 0                              | 0                           |
|                                    | 69           | 271                       | 6528             | 0      | 6                              | 1                           |
|                                    | 70           | 320                       | 5793             | 0      | 1                              | 1                           |

Codes are described in Open field observations

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Individual values - Before start of treatment

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | ABNORMAL<br>BEHAVIOUR | TIME<br>MOVING | TOTAL<br>DISTANCE<br>(m) | NO. OF<br>REARINGS | TIME<br>CENTRE | TIME<br>PERIPHERY |
|------------------------------------|--------------|-----------------------|----------------|--------------------------|--------------------|----------------|-------------------|
| 1 (0)                              | 11           | 0                     | 255.5          | 233.2                    | 39                 | 33.8           | 266.2             |
|                                    | 12           | 0                     | 258.9          | 284.8                    | 19                 | 18.4           | 281.6             |
|                                    | 13           | 0                     | 251.2          | 285.8                    | 29                 | 10.9           | 289.1             |
|                                    | 14           | 0                     | 258.7          | 237.9                    | 27                 | 5.8            | 294.2             |
|                                    | 15           | 0                     | 265.6          | 277.0                    | 29                 | 15.6           | 284.4             |
|                                    | 16           | 0                     | 267.9          | 272.3                    | 22                 | 2.6            | 297.4             |
|                                    | 17           | 0                     | 243.9          | 238.4                    | 46                 | 20.8           | 279.2             |
|                                    | 18           | 0                     | 240.5          | 284.0                    | 36                 | 30.5           | 269.5             |
|                                    | 19           | 0                     | 256.5          | 323.4                    | 49                 | 21.9           | 278.1             |
|                                    | 20           | 0                     | 256.4          | 301.6                    | 26                 | 21.4           | 278.6             |
| 2 (0.121)                          | 31           | 0                     | 247.8          | 299.5                    | 38                 | 25.4           | 274.6             |
|                                    | 32           | 0                     | 221.3          | 216.8                    | 23                 | 36.0           | 264.0             |
|                                    | 33           | 0                     | 246.7          | 262.4                    | 35                 | 23.4           | 276.6             |
|                                    | 34           | 0                     | 262.4          | 276.5                    | 44                 | 18.1           | 281.9             |
|                                    | 35           | 0                     | 255.7          | 354.4                    | 21                 | 15.2           | 284.8             |
|                                    | 36           | 0                     | 251.1          | 245.0                    | 27                 | 24.9           | 275.1             |
|                                    | 37           | 0                     | 260.9          | 329.7                    | 37                 | 22.6           | 277.4             |
|                                    | 38           | 0                     | 246.1          | 294.8                    | 39                 | 14.1           | 285.9             |
|                                    | 39           | 0                     | 259.9          | 351.7                    | 50                 | 9.2            | 290.8             |
|                                    | 40           | 0                     | 250.2          | 233.3                    | 29                 | 22.9           | 277.1             |

Codes are described in Open field observations

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Individual values - Before start of treatment

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | ABNORMAL<br>BEHAVIOUR | TIME<br>MOVING | TOTAL<br>DISTANCE<br>(m) | NO. OF<br>REARINGS | TIME<br>CENTRE | TIME<br>PERIPHERY |
|------------------------------------|--------------|-----------------------|----------------|--------------------------|--------------------|----------------|-------------------|
| 3 (0.398)                          | 51           | 0                     | 255.3          | 276.1                    | 34                 | 10.8           | 289.2             |
|                                    | 52           | 0                     | 255.8          | 198.1                    | 16                 | 35.0           | 265.0             |
|                                    | 53           | 0                     | 261.3          | 286.5                    | 49                 | 28.9           | 271.1             |
|                                    | 54           | 0                     | 250.8          | 293.8                    | 36                 | 6.0            | 293.9             |
|                                    | 55           | 0                     | 247.3          | 257.4                    | 32                 | 23.8           | 276.2             |
|                                    | 56           | 0                     | 260.6          | 289.6                    | 24                 | 33.8           | 266.2             |
|                                    | 57           | 0                     | 234.8          | 221.6                    | 36                 | 8.2            | 291.8             |
|                                    | 58           | 0                     | 248.0          | 238.3                    | 23                 | 24.1           | 275.9             |
|                                    | 59           | 0                     | 254.3          | 283.3                    | 36                 | 6.9            | 293.1             |
|                                    | 60           | 0                     | 250.0          | 245.7                    | 43                 | 7.2            | 292.8             |
| 4 (1.207)                          | 71           | 0                     | 265.7          | 370.6                    | 27                 | 23.1           | 276.8             |
|                                    | 72           | 0                     | 243.0          | 232.3                    | 41                 | 43.8           | 256.2             |
|                                    | 73           | 0                     | 253.9          | 294.5                    | 31                 | 18.0           | 282.0             |
|                                    | 74           | 0                     | 262.5          | 259.4                    | 48                 | 17.5           | 282.5             |
|                                    | 75           | 0                     | 255.7          | 249.9                    | 41                 | 10.8           | 289.1             |
|                                    | 76           | 0                     | 257.5          | 281.8                    | 42                 | 23.4           | 276.6             |
|                                    | 77           | 0                     | 255.0          | 277.4                    | 14                 | 21.9           | 278.1             |
|                                    | 78           | 0                     | 245.2          | 348.6                    | 27                 | 16.6           | 283.4             |
|                                    | 79           | 0                     | 246.0          | 276.2                    | 34                 | 22.4           | 277.6             |
|                                    | 80           | 0                     | 236.4          | 212.0                    | 28                 | 3.7            | 296.3             |

Codes are described in Open field observations

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Individual values - Before start of treatment

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | TOTAL<br>CORNER<br>VISITS | MOVES/<br>COUNTS | ATAXIA | NUMBER OF<br>FAECAL<br>PELLETS | URINATION<br>DURING<br>TEST |
|------------------------------------|--------------|---------------------------|------------------|--------|--------------------------------|-----------------------------|
| 1 (0)                              | 11           | 201                       | 6076             | 0      | 3                              | 0                           |
|                                    | 12           | 307                       | 7153             | 0      | 0                              | 0                           |
|                                    | 13           | 296                       | 6776             | 0      | 0                              | 0                           |
|                                    | 14           | 261                       | 6898             | 0      | 0                              | 0                           |
|                                    | 15           | 260                       | 7233             | 0      | 0                              | 0                           |
|                                    | 16           | 304                       | 6815             | 0      | 0                              | 0                           |
|                                    | 17           | 181                       | 6484             | 0      | 0                              | 0                           |
|                                    | 18           | 283                       | 6687             | 0      | 0                              | 0                           |
|                                    | 19           | 334                       | 7411             | 0      | 0                              | 0                           |
|                                    | 20           | 283                       | 7324             | 0      | 0                              | 0                           |
| 2 (0.121)                          | 31           | 305                       | 6668             | 0      | 0                              | 0                           |
|                                    | 32           | 235                       | 5884             | 0      | 1                              | 0                           |
|                                    | 33           | 220                       | 6668             | 0      | 0                              | 0                           |
|                                    | 34           | 252                       | 7246             | 0      | 0                              | 0                           |
|                                    | 35           | 375                       | 7106             | 0      | 2                              | 0                           |
|                                    | 36           | 224                       | 6441             | 0      | 0                              | 0                           |
|                                    | 37           | 326                       | 7400             | 0      | 0                              | 0                           |
|                                    | 38           | 341                       | 6875             | 0      | 0                              | 0                           |
|                                    | 39           | 376                       | 7508             | 0      | 4                              | 1                           |
|                                    | 40           | 200                       | 6652             | 0      | 5                              | 0                           |

Codes are described in Open field observations

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Individual values - Before start of treatment

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | TOTAL<br>CORNER<br>VISITS | MOVES/<br>COUNTS | ATAXIA | NUMBER OF<br>FAECAL<br>PELLETS | URINATION<br>DURING<br>TEST |
|------------------------------------|--------------|---------------------------|------------------|--------|--------------------------------|-----------------------------|
| 3 (0.398)                          | 51           | 258                       | 6739             | 0      | 0                              | 1                           |
|                                    | 52           | 193                       | 6490             | 0      | 0                              | 1                           |
|                                    | 53           | 258                       | 7047             | 0      | 4                              | 1                           |
|                                    | 54           | 310                       | 7302             | 0      | 1                              | 0                           |
|                                    | 55           | 248                       | 6526             | 0      | 5                              | 1                           |
|                                    | 56           | 247                       | 7283             | 0      | 0                              | 0                           |
|                                    | 57           | 255                       | 5861             | 0      | 3                              | 1                           |
|                                    | 58           | 244                       | 6832             | 0      | 2                              | 0                           |
|                                    | 59           | 313                       | 6503             | 0      | 0                              | 1                           |
|                                    | 60           | 224                       | 6845             | 0      | 5                              | 1                           |
| 4 (1.207)                          | 71           | 405                       | 7725             | 0      | 0                              | 1                           |
|                                    | 72           | 210                       | 5954             | 0      | 0                              | 1                           |
|                                    | 73           | 331                       | 6843             | 0      | 1                              | 0                           |
|                                    | 74           | 256                       | 7092             | 0      | 1                              | 0                           |
|                                    | 75           | 243                       | 6751             | 0      | 0                              | 1                           |
|                                    | 76           | 288                       | 6970             | 0      | 0                              | 0                           |
|                                    | 77           | 308                       | 7155             | 0      | 4                              | 1                           |
|                                    | 78           | 409                       | 7049             | 0      | 0                              | 0                           |
|                                    | 79           | 261                       | 6610             | 0      | 0                              | 1                           |
|                                    | 80           | 237                       | 6109             | 0      | 0                              | 0                           |

Codes are described in Open field observations

**Table 17 Open field observations – Individual values – At termination of treatment**

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Individual values - At termination of treatment

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | ABNORMAL<br>BEHAVIOUR | TIME<br>MOVING | TOTAL<br>DISTANCE<br>(m) | NO. OF<br>REARINGS | TIME<br>CENTRE | TIME<br>PERIPHERY |
|------------------------------------|--------------|-----------------------|----------------|--------------------------|--------------------|----------------|-------------------|
| 1 (0)                              | 1            | 0                     | 201.7          | 60.9                     | 40                 | 11.4           | 288.6             |
|                                    | 2            | 0                     | 104.7          | 33.0                     | 24                 | 1.9            | 298.1             |
|                                    | 3            | 0                     | 212.7          | 80.7                     | 39                 | 4.6            | 295.4             |
|                                    | 4            | 0                     | 136.6          | 38.2                     | 20                 | 13.2           | 286.8             |
|                                    | 5            | 0                     | 165.6          | 47.4                     | 15                 | 10.0           | 290.0             |
|                                    | 6            | 0                     | 233.0          | 85.1                     | 31                 | 29.0           | 271.0             |
|                                    | 7            | 0                     | 237.2          | 100.5                    | 42                 | 40.4           | 259.6             |
|                                    | 8            | 0                     | 191.8          | 61.9                     | 28                 | 8.8            | 291.3             |
|                                    | 9            | 0                     | 154.1          | 51.5                     | 23                 | 52.0           | 248.0             |
|                                    | 10           | 0                     | 118.8          | 38.4                     | 19                 | 6.7            | 293.3             |
| 2 (0.121)                          | 21           | 0                     | 208.5          | 75.6                     | 35                 | 23.8           | 276.2             |
|                                    | 22           | 1                     | 119.3          | 29.7                     | 24                 | 0.6            | 299.4             |
|                                    | 23           | 0                     | 119.1          | 42.5                     | 29                 | 0.3            | 299.7             |
|                                    | 24           | 0                     | 97.7           | 26.3                     | 12                 | 9.2            | 290.9             |
|                                    | 25           | 0                     | 147.2          | 43.9                     | 30                 | 8.8            | 291.2             |
|                                    | 26           | 0                     | 109.2          | 31.6                     | 23                 | 15.3           | 284.7             |
|                                    | 27           | 0                     | 227.8          | 85.5                     | 35                 | 3.7            | 296.3             |
|                                    | 28           | 0                     | 178.2          | 54.3                     | 33                 | 21.9           | 278.1             |
|                                    | 29           | 0                     | 136.6          | 46.9                     | 19                 | 107.0          | 193.0             |
|                                    | 30           | 0                     | 220.2          | 82.0                     | 36                 | 37.4           | 262.6             |

Codes are described in Open field observations

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Individual values - At termination of treatment

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | ABNORMAL<br>BEHAVIOUR | TIME<br>MOVING | TOTAL<br>DISTANCE<br>(m) | NO. OF<br>REARINGS | TIME<br>CENTRE | TIME<br>PERIPHERY |
|------------------------------------|--------------|-----------------------|----------------|--------------------------|--------------------|----------------|-------------------|
| 3 (0.398)                          | 41           | 0                     | 123.4          | 37.6                     | 18                 | 6.3            | 293.7             |
|                                    | 42           | 0                     | 89.8           | 24.5                     | 12                 | 8.4            | 291.6             |
|                                    | 43           | 0                     | .              | .                        | .                  | .              | .                 |
|                                    | 44           | 0                     | 135.4          | 50.9                     | 39                 | 2.6            | 297.4             |
|                                    | 45           | 0                     | 218.7          | 89.9                     | 25                 | 27.7           | 272.3             |
|                                    | 46           | 0                     | 262.4          | 120.4                    | 42                 | 25.6           | 274.4             |
|                                    | 47           | 0                     | 228.4          | 99.6                     | 38                 | 17.9           | 282.1             |
|                                    | 48           | 0                     | 220.9          | 92.2                     | 39                 | 15.9           | 284.1             |
|                                    | 49           | 0                     | 159.2          | 53.5                     | 22                 | 34.1           | 265.9             |
|                                    | 50           | 0                     | 45.2           | 12.7                     | 8                  | 6.6            | 293.4             |
| 4 (1.207)                          | 61           | 0                     | 196.9          | 64.7                     | 24                 | 29.1           | 270.9             |
|                                    | 62           | 0                     | 135.3          | 43.6                     | 15                 | 9.8            | 290.2             |
|                                    | 63           | 0                     | 162.5          | 48.2                     | 13                 | 6.3            | 293.7             |
|                                    | 64           | 0                     | 156.5          | 55.3                     | 26                 | 11.8           | 288.2             |
|                                    | 65           | 0                     | 240.0          | 120.3                    | 53                 | 15.7           | 284.3             |
|                                    | 66           | 0                     | 230.3          | 110.7                    | 28                 | 30.4           | 269.6             |
|                                    | 67           | 0                     | 230.9          | 82.5                     | 30                 | 13.5           | 286.5             |
|                                    | 68           | 0                     | 229.3          | 87.2                     | 35                 | 10.2           | 289.8             |
|                                    | 69           | 0                     | 201.3          | 70.3                     | 35                 | 12.0           | 288.0             |
|                                    | 70           | 0                     | 222.9          | 87.3                     | 34                 | 42.5           | 257.5             |

Codes are described in Open field observations

. = measuring error

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Individual values - At termination of treatment

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | TOTAL<br>CORNER<br>VISITS | MOVES/<br>COUNTS | ATAXIA | NUMBER OF<br>FAECAL<br>PELLETS | URINATION<br>DURING<br>TEST |
|------------------------------------|--------------|---------------------------|------------------|--------|--------------------------------|-----------------------------|
| 1 (0)                              | 1            | 40                        | 5058             | 0      | 3                              | 1                           |
|                                    | 2            | 36                        | 2992             | 0      | 4                              | 1                           |
|                                    | 3            | 87                        | 5972             | 0      | 0                              | 1                           |
|                                    | 4            | 39                        | 3493             | 0      | 2                              | 1                           |
|                                    | 5            | 34                        | 4044             | 0      | 1                              | 1                           |
|                                    | 6            | 84                        | 6659             | 0      | 6                              | 1                           |
|                                    | 7            | 91                        | 6851             | 0      | 0                              | 0                           |
|                                    | 8            | 62                        | 5436             | 0      | 4                              | 1                           |
|                                    | 9            | 48                        | 4311             | 0      | 6                              | 1                           |
|                                    | 10           | 18                        | 3125             | 0      | 5                              | 1                           |
| 2 (0.121)                          | 21           | 79                        | 5812             | 0      | 0                              | 1                           |
|                                    | 22           | 13                        | 3147             | 0      | 0                              | 1                           |
|                                    | 23           | 22                        | 3154             | 0      | 2                              | 1                           |
|                                    | 24           | 21                        | 2562             | 0      | 2                              | 1                           |
|                                    | 25           | 17                        | 3734             | 0      | 1                              | 1                           |
|                                    | 26           | 31                        | 3106             | 0      | 5                              | 1                           |
|                                    | 27           | 85                        | 6989             | 0      | 4                              | 1                           |
|                                    | 28           | 36                        | 4625             | 0      | 1                              | 1                           |
|                                    | 29           | 32                        | 3942             | 0      | 1                              | 1                           |
|                                    | 30           | 75                        | 5791             | 0      | 5                              | 1                           |

Codes are described in Open field observations



Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Individual values - At termination of treatment

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | TOTAL<br>CORNER<br>VISITS | MOVES/<br>COUNTS | ATAXIA | NUMBER OF<br>FAECAL<br>PELLETS | URINATION<br>DURING<br>TEST |
|------------------------------------|--------------|---------------------------|------------------|--------|--------------------------------|-----------------------------|
| 3 (0.398)                          | 41           | 26                        | 3408             | 0      | 0                              | 0                           |
|                                    | 42           | 13                        | 2148             | 0      | 5                              | 1                           |
|                                    | 43           | .                         | .                | 0      | 1                              | 1                           |
|                                    | 44           | 43                        | 3866             | 0      | 1                              | 1                           |
|                                    | 45           | 98                        | 6363             | 0      | 0                              | 0                           |
|                                    | 46           | 90                        | 7298             | 0      | 0                              | 1                           |
|                                    | 47           | 96                        | 6587             | 0      | 3                              | 1                           |
|                                    | 48           | 87                        | 6441             | 0      | 0                              | 1                           |
|                                    | 49           | 29                        | 4298             | 0      | 6                              | 1                           |
|                                    | 50           | 1                         | 1194             | 0      | 1                              | 1                           |
| 4 (1.207)                          | 61           | 52                        | 5138             | 0      | 0                              | 0                           |
|                                    | 62           | 33                        | 3625             | 0      | 2                              | 1                           |
|                                    | 63           | 27                        | 4133             | 0      | 1                              | 1                           |
|                                    | 64           | 48                        | 4438             | 0      | 1                              | 1                           |
|                                    | 65           | 99                        | 7162             | 0      | 4                              | 1                           |
|                                    | 66           | 82                        | 6942             | 0      | 0                              | 1                           |
|                                    | 67           | 58                        | 6682             | 0      | 4                              | 0                           |
|                                    | 68           | 79                        | 6535             | 0      | 2                              | 1                           |
|                                    | 69           | 45                        | 5512             | 0      | 7                              | 1                           |
|                                    | 70           | 47                        | 6234             | 0      | 2                              | 0                           |

Codes are described in Open field observations

. = measuring error

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Individual values - At termination of treatment

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | ABNORMAL<br>BEHAVIOUR | TIME<br>MOVING | TOTAL<br>DISTANCE<br>(m) | NO. OF<br>REARINGS | TIME<br>CENTRE | TIME<br>PERIPHERY |
|------------------------------------|--------------|-----------------------|----------------|--------------------------|--------------------|----------------|-------------------|
| 1 (0)                              | 11           | 0                     | 231.7          | 107.8                    | 34                 | 73.8           | 226.2             |
|                                    | 12           | 0                     | 207.2          | 81.2                     | 31                 | 2.5            | 297.5             |
|                                    | 13           | 0                     | 219.2          | 99.0                     | 24                 | 7.6            | 292.4             |
|                                    | 14           | 0                     | 236.8          | 102.5                    | 23                 | 0.0            | 300.0             |
|                                    | 15           | 0                     | 254.0          | 132.8                    | 39                 | 21.1           | 278.9             |
|                                    | 16           | 0                     | 230.0          | 104.4                    | 17                 | 8.9            | 291.1             |
|                                    | 17           | 0                     | 172.8          | 59.0                     | 31                 | 13.6           | 286.5             |
|                                    | 18           | 0                     | 230.1          | 108.6                    | 50                 | 15.3           | 284.7             |
|                                    | 19           | 0                     | 233.9          | 96.9                     | 42                 | 25.2           | 274.9             |
|                                    | 20           | 0                     | 250.2          | 123.8                    | 40                 | 9.8            | 290.2             |
| 2 (0.121)                          | 31           | 0                     | 248.5          | 96.3                     | 25                 | 32.1           | 267.9             |
|                                    | 32           | 0                     | 231.1          | 90.6                     | 35                 | 17.5           | 282.5             |
|                                    | 33           | 0                     | 243.9          | 101.1                    | 32                 | 15.6           | 284.4             |
|                                    | 34           | 0                     | 244.6          | 106.1                    | 35                 | 28.6           | 271.4             |
|                                    | 35           | 0                     | 240.0          | 120.3                    | 23                 | 14.6           | 285.4             |
|                                    | 36           | 0                     | 192.4          | 72.5                     | 36                 | 7.8            | 292.2             |
|                                    | 37           | 0                     | 231.0          | 109.6                    | 28                 | 17.7           | 282.3             |
|                                    | 38           | 0                     | 212.7          | 77.6                     | 30                 | 9.6            | 290.4             |
|                                    | 39           | 0                     | 228.6          | 96.0                     | 31                 | 13.5           | 286.5             |
|                                    | 40           | 0                     | 203.9          | 74.0                     | 30                 | 1.3            | 298.7             |

Codes are described in Open field observations

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Individual values - At termination of treatment

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | ABNORMAL<br>BEHAVIOUR | TIME<br>MOVING | TOTAL<br>DISTANCE<br>(m) | NO. OF<br>REARINGS | TIME<br>CENTRE | TIME<br>PERIPHERY |
|------------------------------------|--------------|-----------------------|----------------|--------------------------|--------------------|----------------|-------------------|
| 3 (0.398)                          | 51           | 0                     | 210.3          | 89.1                     | 19                 | 2.6            | 297.4             |
|                                    | 52           | 0                     | 248.2          | 100.1                    | 32                 | 28.0           | 272.0             |
|                                    | 53           | 0                     | 201.9          | 72.3                     | 27                 | 1.7            | 298.4             |
|                                    | 54           | 0                     | 205.4          | 91.7                     | 34                 | 10.3           | 289.7             |
|                                    | 55           | 0                     | 253.6          | 110.1                    | 48                 | 42.8           | 257.2             |
|                                    | 56           | 0                     | 249.3          | 110.5                    | 38                 | 16.5           | 283.5             |
|                                    | 57           | 0                     | 172.8          | 68.4                     | 26                 | 6.5            | 293.5             |
|                                    | 58           | 0                     | 218.9          | 88.1                     | 36                 | 20.7           | 279.3             |
|                                    | 59           | 0                     | 210.4          | 89.3                     | 30                 | 2.7            | 297.3             |
|                                    | 60           | 0                     | 223.8          | 92.2                     | 51                 | 12.6           | 287.4             |
| 4 (1.207)                          | 71           | 0                     | 219.8          | 114.3                    | 33                 | 17.6           | 282.4             |
|                                    | 72           | 0                     | 225.2          | 79.6                     | 30                 | 14.2           | 285.9             |
|                                    | 73           | 0                     | 234.6          | 96.2                     | 28                 | 13.6           | 286.4             |
|                                    | 74           | 0                     | 251.8          | 127.5                    | 41                 | 35.0           | 265.0             |
|                                    | 75           | 0                     | 227.0          | 91.6                     | 31                 | 18.3           | 281.7             |
|                                    | 76           | 0                     | 244.6          | 109.0                    | 36                 | 18.2           | 281.8             |
|                                    | 77           | 0                     | 231.8          | 92.1                     | 32                 | 23.6           | 276.4             |
|                                    | 78           | 0                     | 214.7          | 90.0                     | 40                 | 4.2            | 295.8             |
|                                    | 79           | 0                     | 201.5          | 88.5                     | 27                 | 16.6           | 283.4             |
|                                    | 80           | 0                     | 225.6          | 84.0                     | 28                 | 8.7            | 291.3             |

Codes are described in Open field observations

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Individual values - At termination of treatment

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | TOTAL<br>CORNER<br>VISITS | MOVES/<br>COUNTS | ATAXIA | NUMBER OF<br>FAECAL<br>PELLETS | URINATION<br>DURING<br>TEST |
|------------------------------------|--------------|---------------------------|------------------|--------|--------------------------------|-----------------------------|
| 1 (0)                              | 11           | 117                       | 6148             | 0      | 5                              | 1                           |
|                                    | 12           | 69                        | 5922             | 0      | 0                              | 1                           |
|                                    | 13           | 69                        | 6480             | 0      | 0                              | 1                           |
|                                    | 14           | 76                        | 6854             | 0      | 0                              | 0                           |
|                                    | 15           | 108                       | 7440             | 0      | 0                              | 0                           |
|                                    | 16           | 83                        | 6554             | 0      | 1                              | 1                           |
|                                    | 17           | 45                        | 4582             | 0      | 0                              | 1                           |
|                                    | 18           | 81                        | 6660             | 0      | 0                              | 0                           |
|                                    | 19           | 62                        | 6558             | 0      | 0                              | 0                           |
|                                    | 20           | 105                       | 6999             | 0      | 0                              | 1                           |
| 2 (0.121)                          | 31           | 72                        | 6852             | 0      | 0                              | 0                           |
|                                    | 32           | 63                        | 6195             | 0      | 0                              | 0                           |
|                                    | 33           | 87                        | 6746             | 0      | 0                              | 1                           |
|                                    | 34           | 82                        | 7100             | 0      | 0                              | 1                           |
|                                    | 35           | 78                        | 6949             | 0      | 0                              | 1                           |
|                                    | 36           | 61                        | 4991             | 0      | 0                              | 1                           |
|                                    | 37           | 74                        | 6788             | 0      | 0                              | 0                           |
|                                    | 38           | 52                        | 5770             | 0      | 0                              | 1                           |
|                                    | 39           | 80                        | 6580             | 0      | 0                              | 1                           |
|                                    | 40           | 49                        | 5207             | 0      | 2                              | 1                           |

Codes are described in Open field observations

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Open field observation

Individual values - At termination of treatment

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | TOTAL<br>CORNER<br>VISITS | MOVES/<br>COUNTS | ATAXIA | NUMBER OF<br>FAECAL<br>PELLETS | URINATION<br>DURING<br>TEST |
|------------------------------------|--------------|---------------------------|------------------|--------|--------------------------------|-----------------------------|
| 3 (0.398)                          | 51           | 74                        | 6084             | 0      | 0                              | 1                           |
|                                    | 52           | 61                        | 6666             | 0      | 0                              | 1                           |
|                                    | 53           | 48                        | 5185             | 0      | 4                              | 1                           |
|                                    | 54           | 80                        | 5759             | 0      | 0                              | 1                           |
|                                    | 55           | 72                        | 7135             | 0      | 0                              | 1                           |
|                                    | 56           | 92                        | 6891             | 0      | 0                              | 0                           |
|                                    | 57           | 40                        | 4823             | 0      | 8                              | 1                           |
|                                    | 58           | 49                        | 6197             | 0      | 2                              | 1                           |
|                                    | 59           | 63                        | 5573             | 0      | 0                              | 1                           |
|                                    | 60           | 96                        | 6608             | 0      | 0                              | 0                           |
| 4 (1.207)                          | 71           | 77                        | 6583             | 0      | 0                              | 0                           |
|                                    | 72           | 68                        | 5840             | 0      | 0                              | 1                           |
|                                    | 73           | 78                        | 6543             | 0      | 0                              | 0                           |
|                                    | 74           | 89                        | 7384             | 0      | 0                              | 1                           |
|                                    | 75           | 68                        | 5745             | 0      | 0                              | 0                           |
|                                    | 76           | 94                        | 6785             | 0      | 0                              | 0                           |
|                                    | 77           | 75                        | 6381             | 0      | 2                              | 1                           |
|                                    | 78           | 62                        | 6147             | 0      | 0                              | 1                           |
|                                    | 79           | 58                        | 5685             | 0      | 0                              | 0                           |
|                                    | 80           | 72                        | 6080             | 0      | 0                              | 1                           |

Codes are described in Open field observations

**Table 18 Stimuli-induced clinical observations – Individual values – Before start of treatment**

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Stimuli-induced clinical observations

Individual values - Before start of treatment

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | PUPIL | TOE<br>PINCH | GRASP | GRIP | CORNEA | STARTLE |
|------------------------------------|--------------|-------|--------------|-------|------|--------|---------|
| 1 (0)                              | 1            | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 2            | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 3            | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 4            | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 5            | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 6            | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 7            | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 8            | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 9            | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 10           | 1     | 1            | 1     | 1    | 1      | 1       |
| 2 (0.121)                          | 21           | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 22           | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 23           | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 24           | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 25           | 1     | 1            | 0     | 1    | 1      | 1       |
|                                    | 26           | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 27           | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 28           | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 29           | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 30           | 1     | 1            | 1     | 1    | 1      | 1       |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Stimuli-induced clinical observations

Individual values - Before start of treatment

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | TOE   |       | GRASP | GRIP | CORNEA | STARTLE |
|------------------------------------|--------------|-------|-------|-------|------|--------|---------|
|                                    |              | PUPIL | PINCH |       |      |        |         |
| 3 (0.398)                          | 41           | 1     | 1     | 0     | 1    | 1      | 1       |
|                                    | 42           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 43           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 44           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 45           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 46           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 47           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 48           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 49           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 50           | 1     | 1     | 1     | 1    | 1      | 1       |
| 4 (1.207)                          | 61           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 62           | 1     | 1     | 0     | 1    | 1      | 1       |
|                                    | 63           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 64           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 65           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 66           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 67           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 68           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 69           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 70           | 1     | 1     | 1     | 1    | 1      | 1       |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Stimuli-induced clinical observations

Individual values - Before start of treatment

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | HEAD<br>SHAKE | RIGHTING<br>TABLE | RIGHTING<br>HAND | PLACING | GEOTAXIS |
|------------------------------------|--------------|---------------|-------------------|------------------|---------|----------|
| 1 (0)                              | 1            | 1             | 1                 | 1                | 1       | 1        |
|                                    | 2            | 1             | 1                 | 1                | 1       | 1        |
|                                    | 3            | 1             | 1                 | 1                | 1       | 1        |
|                                    | 4            | 1             | 1                 | 1                | 1       | 1        |
|                                    | 5            | 1             | 1                 | 1                | 1       | 1        |
|                                    | 6            | 1             | 1                 | 1                | 1       | 1        |
|                                    | 7            | 1             | 1                 | 1                | 1       | 1        |
|                                    | 8            | 1             | 1                 | 1                | 1       | 1        |
|                                    | 9            | 1             | 1                 | 1                | 1       | 1        |
|                                    | 10           | 1             | 1                 | 1                | 1       | 1        |
| 2 (0.121)                          | 21           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 22           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 23           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 24           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 25           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 26           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 27           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 28           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 29           | 1             | 1                 | 1                | 0       | 1        |
|                                    | 30           | 1             | 1                 | 1                | 1       | 1        |



Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Stimuli-induced clinical observations

Individual values - Before start of treatment

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | HEAD<br>SHAKE | RIGHTING<br>TABLE | RIGHTING<br>HAND | PLACING | GEOTAXIS |
|------------------------------------|--------------|---------------|-------------------|------------------|---------|----------|
| 3 (0.398)                          | 41           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 42           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 43           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 44           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 45           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 46           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 47           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 48           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 49           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 50           | 1             | 1                 | 1                | 1       | 1        |
| 4 (1.207)                          | 61           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 62           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 63           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 64           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 65           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 66           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 67           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 68           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 69           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 70           | 1             | 1                 | 1                | 1       | 1        |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Stimuli-induced clinical observations

Individual values - Before start of treatment

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | TOE   |       | GRASP | GRIP | CORNEA | STARTLE |
|------------------------------------|--------------|-------|-------|-------|------|--------|---------|
|                                    |              | PUPIL | PINCH |       |      |        |         |
| 1 (0)                              | 11           | 1     | 1     | 0     | 1    | 1      | 1       |
|                                    | 12           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 13           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 14           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 15           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 16           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 17           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 18           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 19           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 20           | 1     | 1     | 1     | 1    | 1      | 1       |
| 2 (0.121)                          | 31           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 32           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 33           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 34           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 35           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 36           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 37           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 38           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 39           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 40           | 1     | 1     | 1     | 1    | 1      | 1       |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Stimuli-induced clinical observations

Individual values - Before start of treatment

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | TOE   |       | GRASP | GRIP | CORNEA | STARTLE |
|------------------------------------|--------------|-------|-------|-------|------|--------|---------|
|                                    |              | PUPIL | PINCH |       |      |        |         |
| 3 (0.398)                          | 51           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 52           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 53           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 54           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 55           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 56           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 57           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 58           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 59           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 60           | 1     | 1     | 1     | 1    | 1      | 1       |
| 4 (1.207)                          | 71           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 72           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 73           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 74           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 75           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 76           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 77           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 78           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 79           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 80           | 1     | 1     | 1     | 1    | 1      | 1       |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Stimuli-induced clinical observations

Individual values - Before start of treatment

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | HEAD<br>SHAKE | RIGHTING<br>TABLE | RIGHTING<br>HAND | PLACING | GEOTAXIS |
|------------------------------------|--------------|---------------|-------------------|------------------|---------|----------|
| 1 (0)                              | 11           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 12           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 13           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 14           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 15           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 16           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 17           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 18           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 19           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 20           | 1             | 1                 | 1                | 1       | 1        |
| 2 (0.121)                          | 31           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 32           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 33           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 34           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 35           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 36           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 37           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 38           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 39           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 40           | 1             | 1                 | 1                | 1       | 1        |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Stimuli-induced clinical observations

Individual values - Before start of treatment

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | HEAD<br>SHAKE | RIGHTING<br>TABLE | RIGHTING<br>HAND | PLACING | GEOTAXIS |
|------------------------------------|--------------|---------------|-------------------|------------------|---------|----------|
| 3 (0.398)                          | 51           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 52           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 53           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 54           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 55           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 56           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 57           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 58           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 59           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 60           | 1             | 1                 | 1                | 1       | 1        |
| 4 (1.207)                          | 71           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 72           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 73           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 74           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 75           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 76           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 77           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 78           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 79           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 80           | 1             | 1                 | 1                | 1       | 1        |

**Table 19 Stimuli – induced clinical observations – Individual values – At termination of treatment**

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Stimuli-induced clinical observations

Individual values - At termination of treatment

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | PUPIL | TOE<br>PINCH | GRASP | GRIP | CORNEA | STARTLE |
|------------------------------------|--------------|-------|--------------|-------|------|--------|---------|
| 1 (0)                              | 1            | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 2            | 1     | 1            | 1     | 1    | 1      | 0       |
|                                    | 3            | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 4            | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 5            | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 6            | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 7            | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 8            | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 9            | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 10           | 1     | 1            | 1     | 1    | 1      | 1       |
| 2 (0.121)                          | 21           | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 22           | 1     | 1            | 1     | 1    | 0      | 1       |
|                                    | 23           | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 24           | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 25           | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 26           | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 27           | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 28           | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 29           | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 30           | 1     | 1            | 1     | 1    | 1      | 1       |

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90-Days Oral Gavage Toxicity Study in Rats

Stimuli-induced clinical observations

Individual values - At termination of treatment

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | TOE   |       | GRASP | GRIP | CORNEA | STARTLE |
|------------------------------------|--------------|-------|-------|-------|------|--------|---------|
|                                    |              | PUPIL | PINCH |       |      |        |         |
| 3 (0.398)                          | 41           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 42           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 43           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 44           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 45           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 46           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 47           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 48           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 49           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 50           | 1     | 1     | 1     | 1    | 1      | 1       |
| 4 (1.207)                          | 61           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 62           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 63           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 64           | 1     | 0     | 1     | 1    | 1      | 1       |
|                                    | 65           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 66           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 67           | 1     | 0     | 1     | 1    | 1      | 1       |
|                                    | 68           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 69           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 70           | 1     | 1     | 1     | 1    | 1      | 1       |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Stimuli-induced clinical observations

Individual values - At termination of treatment

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | HEAD<br>SHAKE | RIGHTING<br>TABLE | RIGHTING<br>HAND | PLACING | GEOTAXIS |
|------------------------------------|--------------|---------------|-------------------|------------------|---------|----------|
| 1 (0)                              | 1            | 1             | 1                 | 1                | 1       | 0        |
|                                    | 2            | 1             | 1                 | 1                | 1       | 1        |
|                                    | 3            | 1             | 1                 | 1                | 1       | 1        |
|                                    | 4            | 1             | 1                 | 1                | 1       | 1        |
|                                    | 5            | 1             | 1                 | 1                | 1       | 1        |
|                                    | 6            | 1             | 1                 | 1                | 1       | 1        |
|                                    | 7            | 1             | 1                 | 1                | 1       | 1        |
|                                    | 8            | 1             | 1                 | 1                | 1       | 1        |
|                                    | 9            | 1             | 1                 | 1                | 0       | 1        |
|                                    | 10           | 1             | 1                 | 1                | 1       | 1        |
| 2 (0.121)                          | 21           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 22           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 23           | 1             | 1                 | 1                | 1       | 0        |
|                                    | 24           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 25           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 26           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 27           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 28           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 29           | 1             | 1                 | 1                | 1       | 0        |
|                                    | 30           | 1             | 1                 | 1                | 1       | 1        |



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90-Days Oral Gavage Toxicity Study in Rats

Stimuli-induced clinical observations

Individual values - At termination of treatment

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | HEAD<br>SHAKE | RIGHTING<br>TABLE | RIGHTING<br>HAND | PLACING | GEOTAXIS |
|------------------------------------|--------------|---------------|-------------------|------------------|---------|----------|
| 3 (0.398)                          | 41           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 42           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 43           | 1             | 1                 | 1                | 1       | 0        |
|                                    | 44           | 1             | 1                 | 1                | 1       | 0        |
|                                    | 45           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 46           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 47           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 48           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 49           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 50           | 1             | 1                 | 1                | 1       | 0        |
| 4 (1.207)                          | 61           | 0             | 1                 | 1                | 1       | 0        |
|                                    | 62           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 63           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 64           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 65           | 1             | 1                 | 0                | 1       | 1        |
|                                    | 66           | 0             | 1                 | 1                | 1       | 1        |
|                                    | 67           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 68           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 69           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 70           | 1             | 1                 | 1                | 1       | 1        |

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90-Days Oral Gavage Toxicity Study in Rats

Stimuli-induced clinical observations

Individual values - At termination of treatment

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | PUPIL | TOE<br>PINCH | GRASP | GRIP | CORNEA | STARTLE |
|------------------------------------|--------------|-------|--------------|-------|------|--------|---------|
| 1 (0)                              | 11           | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 12           | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 13           | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 14           | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 15           | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 16           | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 17           | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 18           | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 19           | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 20           | 1     | 1            | 1     | 0    | 1      | 1       |
| 2 (0.121)                          | 31           | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 32           | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 33           | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 34           | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 35           | 1     | 1            | 0     | 1    | 1      | 1       |
|                                    | 36           | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 37           | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 38           | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 39           | 1     | 1            | 1     | 1    | 1      | 1       |
|                                    | 40           | 1     | 1            | 0     | 1    | 1      | 1       |

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90-Days Oral Gavage Toxicity Study in Rats

Stimuli-induced clinical observations

Individual values - At termination of treatment

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | TOE   |       | GRASP | GRIP | CORNEA | STARTLE |
|------------------------------------|--------------|-------|-------|-------|------|--------|---------|
|                                    |              | PUPIL | PINCH |       |      |        |         |
| 3 (0.398)                          | 51           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 52           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 53           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 54           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 55           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 56           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 57           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 58           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 59           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 60           | 1     | 1     | 1     | 1    | 1      | 1       |
| 4 (1.207)                          | 71           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 72           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 73           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 74           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 75           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 76           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 77           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 78           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 79           | 1     | 1     | 1     | 1    | 1      | 1       |
|                                    | 80           | 1     | 1     | 0     | 1    | 1      | 1       |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Stimuli-induced clinical observations

Individual values - At termination of treatment

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | HEAD<br>SHAKE | RIGHTING<br>TABLE | RIGHTING<br>HAND | PLACING | GEOTAXIS |
|------------------------------------|--------------|---------------|-------------------|------------------|---------|----------|
| 1 (0)                              | 11           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 12           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 13           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 14           | 1             | 1                 | 1                | 1       | 0        |
|                                    | 15           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 16           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 17           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 18           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 19           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 20           | 1             | 1                 | 1                | 1       | 1        |
| 2 (0.121)                          | 31           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 32           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 33           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 34           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 35           | 1             | 1                 | 1                | 1       | 0        |
|                                    | 36           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 37           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 38           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 39           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 40           | 1             | 1                 | 1                | 1       | 1        |

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90-Days Oral Gavage Toxicity Study in Rats

Stimuli-induced clinical observations

Individual values - At termination of treatment

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | HEAD<br>SHAKE | RIGHTING<br>TABLE | RIGHTING<br>HAND | PLACING | GEOTAXIS |
|------------------------------------|--------------|---------------|-------------------|------------------|---------|----------|
| 3 (0.398)                          | 51           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 52           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 53           | 1             | 1                 | 0                | 1       | 1        |
|                                    | 54           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 55           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 56           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 57           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 58           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 59           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 60           | 1             | 1                 | 1                | 1       | 1        |
| 4 (1.207)                          | 71           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 72           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 73           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 74           | 1             | 1                 | 1                | 0       | 1        |
|                                    | 75           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 76           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 77           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 78           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 79           | 1             | 1                 | 1                | 1       | 1        |
|                                    | 80           | 1             | 1                 | 0                | 1       | 1        |

**Table 20 Body weight – Individual values**

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Body weight and body weight gain (g)

Individual values - From arrival to Day 91

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | DAY OF<br>ARRIVAL | DAY<br>-8 | DAY<br>-1 | DAY<br>1 | DAY<br>7 | DAY<br>14 | DAY<br>21 | DAY<br>28 | DAY<br>35 |
|------------------------------------|--------------|-------------------|-----------|-----------|----------|----------|-----------|-----------|-----------|-----------|
| 1 (0)                              | 1            | 150               | 202       | 263       | 275      | 323      | 367       | 374       | 429       | 448       |
|                                    | 2            | 134               | 203       | 268       | 275      | 326      | 381       | 404       | 460       | 488       |
|                                    | 3            | 140               | 197       | 264       | 271      | 316      | 358       | 384       | 407       | 422       |
|                                    | 4            | 154               | 213       | 276       | 282      | 325      | 359       | 379       | 403       | 420       |
|                                    | 5            | 149               | 207       | 269       | 276      | 320      | 355       | 380       | 403       | 422       |
|                                    | 6            | 155               | 219       | 282       | 297      | 351      | 397       | 435       | 467       | 480       |
|                                    | 7            | 129               | 190       | 257       | 266      | 315      | 364       | 400       | 434       | 450       |
|                                    | 8            | 150               | 214       | 279       | 292      | 339      | 385       | 423       | 457       | 480       |
|                                    | 9            | 129               | 196       | 258       | 269      | 321      | 371       | 413       | 450       | 475       |
|                                    | 10           | 141               | 209       | 262       | 269      | 311      | 338       | 362       | 383       | 400       |
| 2 (0.121)                          | 21           | 137               | 198       | 261       | 271      | 322      | 365       | 392       | 406       | 428       |
|                                    | 22           | 142               | 206       | 263       | 273      | 316      | 349       | 381       | 411       | 435       |
|                                    | 23           | 144               | 211       | 269       | 278      | 327      | 354       | 379       | 400       | 424       |
|                                    | 24           | 158               | 215       | 270       | 280      | 320      | 345       | 372       | 386       | 398       |
|                                    | 25           | 134               | 195       | 262       | 270      | 312      | 350       | 377       | 403       | 413       |
|                                    | 26           | 138               | 198       | 270       | 278      | 336      | 388       | 377       | 451       | 476       |
|                                    | 27           | 124               | 195       | 268       | 280      | 332      | 390       | 419       | 455       | 485       |
|                                    | 28           | 146               | 209       | 280       | 285      | 337      | 382       | 407       | 429       | 454       |
|                                    | 29           | 146               | 208       | 271       | 281      | 331      | 374       | 400       | 431       | 454       |
|                                    | 30           | 156               | 216       | 283       | 294      | 338      | 382       | 411       | 443       | 463       |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Body weight and body weight gain (g)

Individual values - From arrival to Day 91

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | DAY OF<br>ARRIVAL | DAY<br>-8 | DAY<br>-1 | DAY<br>1 | DAY<br>7 | DAY<br>14 | DAY<br>21 | DAY<br>28 | DAY<br>35 |
|------------------------------------|--------------|-------------------|-----------|-----------|----------|----------|-----------|-----------|-----------|-----------|
| 3 (0.398)                          | 41           | 129               | 182       | 261       | 269      | 329      | 388       | 432       | 466       | 491       |
|                                    | 42           | 143               | 203       | 263       | 273      | 319      | 360       | 386       | 407       | 426       |
|                                    | 43           | 154               | 209       | 270       | 276      | 318      | 351       | 376       | 400       | 412       |
|                                    | 44           | 161               | 217       | 282       | 292      | 339      | 390       | 413       | 445       | 463       |
|                                    | 45           | 154               | 210       | 279       | 282      | 330      | 371       | 406       | 431       | 455       |
|                                    | 46           | 135               | 187       | 242       | 253      | 298      | 338       | 355       | 386       | 402       |
|                                    | 47           | 153               | 217       | 292       | 297      | 349      | 391       | 414       | 435       | 453       |
|                                    | 48           | 140               | 204       | 275       | 285      | 329      | 376       | 409       | 437       | 459       |
|                                    | 49           | 152               | 197       | 256       | 258      | 299      | 335       | 363       | 386       | 411       |
|                                    | 50           | 148               | 207       | 269       | 279      | 334      | 380       | 409       | 437       | 456       |
| 4 (1.207)                          | 61           | 155               | 214       | 275       | 290      | 340      | 380       | 410       | 440       | 454       |
|                                    | 62           | 158               | 219       | 279       | 291      | 339      | 368       | 393       | 421       | 445       |
|                                    | 63           | 165               | 228       | 284       | 291      | 337      | 370       | 397       | 429       | 445       |
|                                    | 64           | 155               | 214       | 271       | 283      | 329      | 361       | 397       | 428       | 455       |
|                                    | 65           | 123               | 181       | 247       | 260      | 309      | 351       | 388       | 418       | 447       |
|                                    | 66           | 135               | 192       | 256       | 268      | 309      | 336       | 357       | 381       | 398       |
|                                    | 67           | 158               | 217       | 288       | 296      | 347      | 392       | 425       | 450       | 473       |
|                                    | 68           | 148               | 208       | 269       | 274      | 325      | 358       | 388       | 414       | 440       |
|                                    | 69           | 152               | 214       | 279       | 289      | 333      | 377       | 416       | 450       | 474       |
|                                    | 70           | 132               | 189       | 248       | 261      | 300      | 338       | 371       | 402       | 424       |

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90-Days Oral Gavage Toxicity Study in Rats

Body weight and body weight gain (g)

Individual values - From arrival to Day 91

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | DAY<br>42 | DAY<br>49 | DAY<br>56 | DAY<br>63 | DAY<br>70 | DAY<br>77 | DAY<br>84 | DAY<br>91 | BODY WT<br>GAIN 1<br>TO 91 |
|------------------------------------|--------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------------------------|
| 1 (0)                              | 1            | 472       | 488       | 497       | 513       | 523       | 537       | 552       | 558       | 283                        |
|                                    | 2            | 516       | 535       | 544       | 547       | 557       | 575       | 590       | 597       | 322                        |
|                                    | 3            | 441       | 449       | 451       | 452       | 459       | 474       | 489       | 493       | 222                        |
|                                    | 4            | 441       | 453       | 456       | 461       | 464       | 475       | 479       | 472       | 190                        |
|                                    | 5            | 446       | 459       | 458       | 458       | 471       | 481       | 490       | 489       | 213                        |
|                                    | 6            | 505       | 525       | 531       | 531       | 536       | 549       | 570       | 573       | 276                        |
|                                    | 7            | 470       | 477       | 486       | 493       | 505       | 512       | 525       | 531       | 265                        |
|                                    | 8            | 502       | 518       | 527       | 537       | 540       | 548       | 562       | 561       | 269                        |
|                                    | 9            | 498       | 519       | 525       | 536       | 551       | 556       | 569       | 569       | 300                        |
|                                    | 10           | 414       | 423       | 426       | 432       | 439       | 450       | 469       | 476       | 207                        |
| 2 (0.121)                          | 21           | 458       | 476       | 475       | 487       | 496       | 506       | 517       | 530       | 259                        |
|                                    | 22           | 458       | 476       | 486       | 498       | 509       | 525       | 533       | 538       | 265                        |
|                                    | 23           | 452       | 460       | 465       | 464       | 476       | 487       | 503       | 507       | 229                        |
|                                    | 24           | 416       | 421       | 422       | 430       | 431       | 441       | 448       | 458       | 178                        |
|                                    | 25           | 435       | 442       | 450       | 447       | 455       | 463       | 471       | 480       | 210                        |
|                                    | 26           | 500       | 511       | 511       | 519       | 526       | 534       | 554       | 566       | 288                        |
|                                    | 27           | 497       | 518       | 528       | 534       | 539       | 556       | 563       | 576       | 296                        |
|                                    | 28           | 467       | 477       | 480       | 480       | 493       | 509       | 519       | 521       | 236                        |
|                                    | 29           | 476       | 488       | 498       | 507       | 512       | 522       | 525       | 529       | 248                        |
|                                    | 30           | 488       | 502       | 510       | 517       | 532       | 542       | 545       | 556       | 262                        |



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90-Days Oral Gavage Toxicity Study in Rats

Body weight and body weight gain (g)

Individual values - From arrival to Day 91

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | DAY<br>42 | DAY<br>49 | DAY<br>56 | DAY<br>63 | DAY<br>70 | DAY<br>77 | DAY<br>84 | DAY<br>91 | BODY WT<br>GAIN 1<br>TO 91 |
|------------------------------------|--------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------------------------|
| 3 (0.398)                          | 41           | 518       | 539       | 552       | 554       | 571       | 582       | 595       | 599       | 330                        |
|                                    | 42           | 440       | 451       | 456       | 462       | 472       | 479       | 487       | 490       | 217                        |
|                                    | 43           | 436       | 443       | 447       | 454       | 457       | 457       | 470       | 470       | 194                        |
|                                    | 44           | 474       | 489       | 487       | 496       | 500       | 501       | 509       | 524       | 232                        |
|                                    | 45           | 472       | 486       | 490       | 483       | 496       | 506       | 516       | 522       | 240                        |
|                                    | 46           | 425       | 440       | 443       | 443       | 450       | 453       | 460       | 472       | 219                        |
|                                    | 47           | 473       | 481       | 485       | 486       | 489       | 499       | 501       | 514       | 217                        |
|                                    | 48           | 481       | 494       | 506       | 508       | 512       | 532       | 542       | 557       | 272                        |
|                                    | 49           | 431       | 448       | 446       | 451       | 454       | 467       | 467       | 487       | 229                        |
|                                    | 50           | 475       | 482       | 484       | 491       | 496       | 507       | 520       | 526       | 247                        |
| 4 (1.207)                          | 61           | 470       | 477       | 485       | 497       | 497       | 502       | 516       | 520       | 230                        |
|                                    | 62           | 461       | 477       | 475       | 486       | 488       | 497       | 506       | 510       | 219                        |
|                                    | 63           | 459       | 471       | 469       | 472       | 474       | 483       | 493       | 498       | 207                        |
|                                    | 64           | 467       | 480       | 488       | 490       | 495       | 504       | 515       | 519       | 236                        |
|                                    | 65           | 469       | 484       | 491       | 496       | 505       | 518       | 535       | 543       | 283                        |
|                                    | 66           | 411       | 421       | 428       | 439       | 449       | 458       | 475       | 488       | 220                        |
|                                    | 67           | 493       | 506       | 520       | 521       | 534       | 543       | 551       | 558       | 262                        |
|                                    | 68           | 466       | 471       | 476       | 478       | 479       | 488       | 501       | 504       | 230                        |
|                                    | 69           | 509       | 517       | 521       | 534       | 548       | 562       | 573       | 576       | 287                        |
|                                    | 70           | 445       | 460       | 467       | 474       | 483       | 492       | 516       | 527       | 266                        |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Body weight and body weight gain (g)

Individual values - From arrival to Day 91

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | DAY OF<br>ARRIVAL | DAY<br>-8 | DAY<br>-1 | DAY<br>1 | DAY<br>7 | DAY<br>14 | DAY<br>21 | DAY<br>28 | DAY<br>35 |
|------------------------------------|--------------|-------------------|-----------|-----------|----------|----------|-----------|-----------|-----------|-----------|
| 1 (0)                              | 11           | 115               | 149       | 175       | 180      | 198      | 219       | 236       | 245       | 259       |
|                                    | 12           | 135               | 162       | 189       | 196      | 209      | 222       | 237       | 248       | 249       |
|                                    | 13           | 131               | 159       | 172       | 182      | 199      | 222       | 231       | 251       | 270       |
|                                    | 14           | 116               | 154       | 166       | 174      | 199      | 217       | 228       | 241       | 248       |
|                                    | 15           | 121               | 154       | 173       | 178      | 200      | 216       | 225       | 241       | 253       |
|                                    | 16           | 142               | 171       | 192       | 203      | 230      | 252       | 266       | 270       | 288       |
|                                    | 17           | 111               | 152       | 188       | 189      | 214      | 241       | 249       | 260       | 264       |
|                                    | 18           | 113               | 145       | 157       | 166      | 182      | 193       | 208       | 218       | 227       |
|                                    | 19           | 137               | 170       | 192       | 194      | 216      | 224       | 247       | 262       | 274       |
|                                    | 20           | 120               | 156       | 176       | 174      | 192      | 215       | 225       | 244       | 255       |
| 2 (0.121)                          | 31           | 127               | 162       | 188       | 187      | 214      | 234       | 240       | 264       | 274       |
|                                    | 32           | 108               | 136       | 152       | 157      | 175      | 191       | 197       | 215       | 210       |
|                                    | 33           | 117               | 152       | 171       | 185      | 204      | 229       | 249       | 263       | 265       |
|                                    | 34           | 129               | 157       | 181       | 187      | 202      | 224       | 236       | 250       | 257       |
|                                    | 35           | 129               | 158       | 188       | 180      | 198      | 223       | 236       | 241       | 257       |
|                                    | 36           | 122               | 147       | 162       | 172      | 194      | 203       | 214       | 238       | 242       |
|                                    | 37           | 125               | 165       | 187       | 197      | 216      | 227       | 260       | 273       | 283       |
|                                    | 38           | 126               | 153       | 181       | 184      | 198      | 229       | 244       | 257       | 266       |
|                                    | 39           | 143               | 167       | 194       | 197      | 215      | 244       | 267       | 267       | 264       |
|                                    | 40           | 114               | 147       | 178       | 183      | 205      | 223       | 236       | 248       | 259       |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Body weight and body weight gain (g)

Individual values - From arrival to Day 91

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | DAY OF<br>ARRIVAL | DAY<br>-8 | DAY<br>-1 | DAY<br>1 | DAY<br>7 | DAY<br>14 | DAY<br>21 | DAY<br>28 | DAY<br>35 |
|------------------------------------|--------------|-------------------|-----------|-----------|----------|----------|-----------|-----------|-----------|-----------|
| 3 (0.398)                          | 51           | 118               | 151       | 168       | 178      | 199      | 219       | 232       | 240       | 257       |
|                                    | 52           | 115               | 146       | 178       | 180      | 211      | 226       | 239       | 254       | 257       |
|                                    | 53           | 122               | 155       | 176       | 185      | 203      | 232       | 238       | 248       | 249       |
|                                    | 54           | 115               | 146       | 174       | 169      | 196      | 226       | 251       | 245       | 253       |
|                                    | 55           | 123               | 161       | 191       | 196      | 212      | 232       | 252       | 260       | 267       |
|                                    | 56           | 134               | 167       | 182       | 192      | 215      | 233       | 248       | 260       | 273       |
|                                    | 57           | 130               | 156       | 184       | 189      | 209      | 218       | 242       | 263       | 259       |
|                                    | 58           | 115               | 142       | 162       | 164      | 180      | 196       | 203       | 222       | 228       |
|                                    | 59           | 144               | 176       | 192       | 206      | 225      | 245       | 249       | 273       | 268       |
|                                    | 60           | 108               | 146       | 175       | 186      | 211      | 234       | 245       | 247       | 265       |
| 4 (1.207)                          | 71           | 133               | 164       | 195       | 205      | 226      | 233       | 264       | 282       | 288       |
|                                    | 72           | 130               | 156       | 163       | 172      | 190      | 204       | 218       | 232       | 225       |
|                                    | 73           | 109               | 140       | 162       | 171      | 183      | 207       | 223       | 236       | 243       |
|                                    | 74           | 119               | 148       | 170       | 176      | 187      | 215       | 228       | 235       | 236       |
|                                    | 75           | 115               | 152       | 177       | 184      | 207      | 224       | 239       | 256       | 269       |
|                                    | 76           | 132               | 163       | 185       | 194      | 216      | 227       | 247       | 254       | 265       |
|                                    | 77           | 153               | 179       | 191       | 197      | 219      | 233       | 236       | 254       | 264       |
|                                    | 78           | 144               | 165       | 193       | 198      | 224      | 231       | 242       | 267       | 289       |
|                                    | 79           | 135               | 162       | 179       | 188      | 201      | 216       | 233       | 243       | 245       |
|                                    | 80           | 120               | 152       | 171       | 172      | 189      | 202       | 220       | 229       | 235       |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Body weight and body weight gain (g)

Individual values - From arrival to Day 91

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | DAY<br>42 | DAY<br>49 | DAY<br>56 | DAY<br>63 | DAY<br>70 | DAY<br>77 | DAY<br>84 | DAY<br>91 | BODY WT<br>GAIN 1<br>TO 91 |
|------------------------------------|--------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------------------------|
| 1 (0)                              | 11           | 272       | 272       | 268       | 272       | 277       | 280       | 280       | 290       | 110                        |
|                                    | 12           | 248       | 260       | 263       | 252       | 262       | 270       | 273       | 270       | 74                         |
|                                    | 13           | 263       | 270       | 263       | 267       | 264       | 269       | 277       | 278       | 96                         |
|                                    | 14           | 258       | 256       | 267       | 266       | 271       | 276       | 272       | 280       | 106                        |
|                                    | 15           | 260       | 257       | 266       | 266       | 267       | 263       | 274       | 278       | 100                        |
|                                    | 16           | 296       | 294       | 295       | 302       | 309       | 311       | 308       | 325       | 122                        |
|                                    | 17           | 281       | 291       | 282       | 288       | 294       | 292       | 309       | 313       | 124                        |
|                                    | 18           | 236       | 229       | 238       | 235       | 242       | 246       | 251       | 252       | 86                         |
|                                    | 19           | 276       | 290       | 288       | 288       | 285       | 295       | 303       | 309       | 115                        |
|                                    | 20           | 263       | 269       | 270       | 266       | 279       | 280       | 283       | 293       | 119                        |
| 2 (0.121)                          | 31           | 285       | 280       | 286       | 289       | 294       | 299       | 305       | 310       | 123                        |
|                                    | 32           | 227       | 226       | 238       | 230       | 244       | 248       | 254       | 250       | 93                         |
|                                    | 33           | 275       | 282       | 281       | 277       | 290       | 298       | 304       | 312       | 127                        |
|                                    | 34           | 260       | 259       | 266       | 275       | 277       | 276       | 280       | 284       | 97                         |
|                                    | 35           | 262       | 272       | 277       | 280       | 280       | 291       | 298       | 293       | 113                        |
|                                    | 36           | 241       | 247       | 264       | 256       | 260       | 254       | 267       | 273       | 101                        |
|                                    | 37           | 279       | 297       | 307       | 303       | 294       | 308       | 320       | 314       | 117                        |
|                                    | 38           | 268       | 274       | 280       | 277       | 282       | 290       | 287       | 295       | 111                        |
|                                    | 39           | 282       | 299       | 300       | 295       | 296       | 316       | 326       | 322       | 125                        |
|                                    | 40           | 268       | 273       | 274       | 277       | 288       | 291       | 297       | 300       | 117                        |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Body weight and body weight gain (g)

Individual values - From arrival to Day 91

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | DAY<br>42 | DAY<br>49 | DAY<br>56 | DAY<br>63 | DAY<br>70 | DAY<br>77 | DAY<br>84 | DAY<br>91 | BODY WT<br>GAIN 1<br>TO 91 |
|------------------------------------|--------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------------------------|
| 3 (0.398)                          | 51           | 265       | 261       | 258       | 263       | 264       | 270       | 270       | 281       | 103                        |
|                                    | 52           | 277       | 283       | 293       | 287       | 284       | 295       | 288       | 304       | 124                        |
|                                    | 53           | 265       | 268       | 269       | 280       | 277       | 286       | 285       | 296       | 111                        |
|                                    | 54           | 264       | 266       | 270       | 264       | 273       | 276       | 279       | 284       | 115                        |
|                                    | 55           | 272       | 277       | 281       | 284       | 285       | 293       | 303       | 303       | 107                        |
|                                    | 56           | 282       | 289       | 304       | 305       | 304       | 309       | 299       | 311       | 119                        |
|                                    | 57           | 266       | 278       | 281       | 272       | 274       | 284       | 292       | 298       | 109                        |
|                                    | 58           | 235       | 235       | 246       | 251       | 250       | 248       | 257       | 265       | 101                        |
|                                    | 59           | 289       | 292       | 293       | 296       | 300       | 299       | 301       | 307       | 101                        |
|                                    | 60           | 277       | 282       | 280       | 281       | 285       | 291       | 302       | 299       | 113                        |
| 4 (1.207)                          | 71           | 285       | 294       | 300       | 299       | 291       | 309       | 325       | 323       | 118                        |
|                                    | 72           | 245       | 241       | 248       | 250       | 245       | 264       | 263       | 270       | 98                         |
|                                    | 73           | 255       | 250       | 257       | 263       | 271       | 270       | 280       | 283       | 112                        |
|                                    | 74           | 256       | 263       | 258       | 253       | 263       | 270       | 268       | 261       | 85                         |
|                                    | 75           | 276       | 280       | 279       | 278       | 285       | 285       | 297       | 289       | 105                        |
|                                    | 76           | 274       | 283       | 276       | 285       | 286       | 294       | 300       | 301       | 107                        |
|                                    | 77           | 269       | 266       | 275       | 278       | 272       | 284       | 280       | 292       | 95                         |
|                                    | 78           | 289       | 285       | 278       | 286       | 277       | 292       | 306       | 312       | 114                        |
|                                    | 79           | 252       | 254       | 265       | 267       | 269       | 275       | 283       | 278       | 90                         |
|                                    | 80           | 240       | 243       | 247       | 251       | 254       | 263       | 270       | 274       | 102                        |

**Table 21 Food consumption – Individual values**

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Food consumption (g)

Values per animal - Week 1 to Week 13

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | CAGE<br>NO | WEEK<br>1 | WEEK<br>2 | WEEK<br>3 | WEEK<br>4 | WEEK<br>5 | WEEK<br>6 | WEEK<br>7 |
|------------------------------------|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 1 (0)                              | 1          | 181.5     | 193.5     | 184.0     | 198.0     | 195.5     | 197.0     | 192.5     |
|                                    | 2          | 179.0     | 185.5     | 175.5     | 184.0     | 182.0     | 182.0     | 179.5     |
|                                    | 3          | 180.5     | 191.5     | 192.0     | 187.0     | 186.5     | 184.5     | 187.0     |
|                                    | 4          | 181.0     | 198.5     | 200.5     | 201.5     | 194.0     | 193.5     | 183.5     |
|                                    | 5          | 176.5     | 181.5     | 180.0     | 181.5     | 181.0     | 178.5     | 177.5     |
| 2 (0.121)                          | 11         | 174.5     | 175.0     | 178.0     | 172.0     | 180.0     | 185.0     | 188.0     |
|                                    | 12         | 184.5     | 177.0     | 167.0     | 165.0     | 174.0     | 176.0     | 169.0     |
|                                    | 13         | 187.0     | 199.0     | 189.0     | 189.5     | 191.0     | 184.5     | 185.5     |
|                                    | 14         | 199.5     | 210.0     | 189.0     | 192.0     | 196.0     | 191.5     | 185.0     |
|                                    | 15         | 190.5     | 197.0     | 186.5     | 189.5     | 189.5     | 191.0     | 193.0     |
| 3 (0.398)                          | 21         | 187.5     | 204.5     | 206.5     | 195.0     | 190.5     | 190.5     | 192.5     |
|                                    | 22         | 173.5     | 180.5     | 185.0     | 180.0     | 171.0     | 172.5     | 174.5     |
|                                    | 23         | 182.0     | 190.0     | 182.5     | 179.0     | 177.5     | 175.5     | 180.5     |
|                                    | 24         | 190.0     | 197.0     | 185.5     | 181.5     | 182.0     | 176.0     | 173.5     |
|                                    | 25         | 176.0     | 177.0     | 175.0     | 174.0     | 178.5     | 176.0     | 173.5     |
| 4 (1.207)                          | 31         | 194.5     | 187.0     | 186.0     | 192.5     | 182.5     | 167.5     | 171.5     |
|                                    | 32         | 185.0     | 165.5     | 195.0     | 187.5     | 184.0     | 170.5     | 171.0     |
|                                    | 33         | 182.5     | 182.0     | 165.5     | 167.5     | 170.5     | 167.5     | 167.0     |
|                                    | 34         | 181.5     | 184.5     | 176.0     | 180.5     | 182.0     | 177.0     | 177.0     |
|                                    | 35         | 180.5     | 183.0     | 178.0     | 184.0     | 184.0     | 183.5     | 179.0     |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Food consumption (g)

Values per animal - Week 1 to Week 13

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | CAGE<br>NO | WEEK<br>8 | WEEK<br>9 | WEEK<br>10 | WEEK<br>11 | WEEK<br>12 | WEEK<br>13 | TOTAL,<br>WEEK 1 TO<br>WEEK 13 |
|------------------------------------|------------|-----------|-----------|------------|------------|------------|------------|--------------------------------|
| 1 (0)                              | 1          | 207.0     | 207.0     | 216.5      | 212.0      | 208.5      | 201.0      | 2594.0                         |
|                                    | 2          | 185.0     | 183.0     | 186.5      | 182.0      | 183.5      | 182.5      | 2370.0                         |
|                                    | 3          | 188.5     | 186.0     | 195.0      | 189.5      | 193.5      | 189.5      | 2451.0                         |
|                                    | 4          | 197.5     | 197.5     | 197.5      | 189.0      | 189.5      | 187.5      | 2511.0                         |
|                                    | 5          | 179.0     | 182.0     | 188.5      | 180.0      | 181.0      | 177.0      | 2344.0                         |
| 2 (0.121)                          | 11         | 194.0     | 190.5     | 199.0      | 196.5      | 191.5      | 192.5      | 2416.5                         |
|                                    | 12         | 172.5     | 166.0     | 181.0      | 173.0      | 178.0      | 181.5      | 2264.5                         |
|                                    | 13         | 180.5     | 179.0     | 193.0      | 179.5      | 188.5      | 182.0      | 2428.0                         |
|                                    | 14         | 202.5     | 194.0     | 201.0      | 195.0      | 195.0      | 196.0      | 2546.5                         |
|                                    | 15         | 206.5     | 202.0     | 207.0      | 196.0      | 191.5      | 191.5      | 2531.5                         |
| 3 (0.398)                          | 21         | 190.0     | 196.5     | 200.5      | 190.5      | 201.0      | 198.5      | 2544.0                         |
|                                    | 22         | 187.0     | 188.5     | 203.5      | 187.5      | 184.5      | 185.5      | 2373.5                         |
|                                    | 23         | 183.5     | 177.0     | 182.0      | 177.0      | 177.5      | 187.0      | 2351.0                         |
|                                    | 24         | 181.5     | 187.5     | 188.0      | 181.5      | 176.0      | 184.5      | 2384.5                         |
|                                    | 25         | 173.5     | 183.5     | 184.5      | 177.0      | 181.5      | 191.0      | 2321.0                         |
| 4 (1.207)                          | 31         | 175.5     | 178.0     | 183.5      | 175.5      | 186.5      | 182.5      | 2363.0                         |
|                                    | 32         | 170.5     | 180.5     | 187.5      | 179.0      | 174.0      | 169.0      | 2319.0                         |
|                                    | 33         | 178.5     | 183.0     | 198.0      | 191.0      | 191.5      | 196.5      | 2341.0                         |
|                                    | 34         | 182.5     | 185.5     | 194.5      | 181.0      | 188.0      | 188.0      | 2378.0                         |
|                                    | 35         | 192.0     | 191.0     | 196.0      | 186.5      | 188.5      | 196.5      | 2422.5                         |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Food consumption (g)

Values per animal - Week 1 to Week 13

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | CAGE<br>NO | WEEK<br>1 | WEEK<br>2 | WEEK<br>3 | WEEK<br>4 | WEEK<br>5 | WEEK<br>6 | WEEK<br>7 |
|------------------------------------|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 1 (0)                              | 6          | 114.0     | 115.5     | 118.5     | 114.0     | 115.5     | 114.0     | 111.5     |
|                                    | 7          | 109.0     | 118.0     | 114.0     | 129.0     | 124.0     | 117.5     | 109.5     |
|                                    | 8          | 126.0     | 124.5     | 127.0     | 126.5     | 130.5     | 121.5     | 122.5     |
|                                    | 9          | 110.0     | 112.0     | 115.0     | 106.0     | 113.5     | 113.0     | 109.0     |
|                                    | 10         | 115.0     | 123.0     | 127.5     | 129.0     | 129.0     | 131.0     | 127.5     |
| 2 (0.121)                          | 16         | 114.0     | 116.0     | 116.0     | 119.5     | 115.0     | 117.0     | 120.0     |
|                                    | 17         | 119.5     | 123.0     | 130.5     | 129.0     | 123.5     | 122.0     | 118.5     |
|                                    | 18         | 109.0     | 110.0     | 107.5     | 117.5     | 121.5     | 103.0     | 110.5     |
|                                    | 19         | 118.0     | 114.5     | 128.5     | 122.5     | 125.0     | 118.0     | 125.5     |
|                                    | 20         | 118.5     | 108.5     | 145.5     | 124.5     | 109.5     | 123.0     | 120.0     |
| 3 (0.398)                          | 26         | 119.5     | 122.0     | 109.5     | 119.0     | 123.0     | 117.0     | 108.0     |
|                                    | 27         | 113.0     | 128.5     | 126.0     | 104.5     | 112.5     | 116.5     | 113.0     |
|                                    | 28         | 119.5     | 118.0     | 126.0     | 119.5     | 123.5     | 115.5     | 120.0     |
|                                    | 29         | 105.5     | 105.0     | 110.5     | 122.0     | 111.5     | 105.5     | 112.0     |
|                                    | 30         | 131.0     | 133.5     | 127.0     | 130.5     | 120.5     | 128.0     | 131.0     |
| 4 (1.207)                          | 36         | 126.5     | 116.0     | 123.5     | 128.0     | 123.5     | 124.0     | 117.5     |
|                                    | 37         | 104.5     | 113.5     | 112.5     | 112.5     | 113.5     | 114.5     | 104.5     |
|                                    | 38         | 110.0     | 108.5     | 111.0     | 118.0     | 116.0     | 115.5     | 109.5     |
|                                    | 39         | 120.0     | 117.5     | 111.5     | 124.0     | 132.5     | 116.5     | 103.0     |
|                                    | 40         | 108.5     | 117.0     | 118.0     | 111.0     | 109.5     | 110.5     | 107.5     |



Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Food consumption (g)

Values per animal - Week 1 to Week 13

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | CAGE<br>NO | WEEK<br>8 | WEEK<br>9 | WEEK<br>10 | WEEK<br>11 | WEEK<br>12 | WEEK<br>13 | TOTAL,<br>WEEK 1 TO<br>WEEK 13 |
|------------------------------------|------------|-----------|-----------|------------|------------|------------|------------|--------------------------------|
| 1 (0)                              | 6          | 111.0     | 120.5     | 117.5      | 121.0      | 117.5      | 120.0      | 1510.5                         |
|                                    | 7          | 111.5     | 122.5     | 124.5      | 122.0      | 117.5      | 117.5      | 1536.5                         |
|                                    | 8          | 131.0     | 134.0     | 136.5      | 132.0      | 139.0      | 132.0      | 1683.0                         |
|                                    | 9          | 109.0     | 109.5     | 116.5      | 114.0      | 119.0      | 122.0      | 1468.5                         |
|                                    | 10         | 121.5     | 125.0     | 136.0      | 132.5      | 128.0      | 128.0      | 1653.0                         |
| 2 (0.121)                          | 16         | 125.5     | 121.5     | 132.0      | 127.0      | 129.5      | 123.5      | 1576.5                         |
|                                    | 17         | 130.5     | 129.0     | 138.5      | 132.0      | 134.0      | 126.0      | 1656.0                         |
|                                    | 18         | 131.0     | 121.0     | 120.5      | 120.0      | 122.0      | 119.5      | 1513.0                         |
|                                    | 19         | 133.0     | 127.5     | 133.5      | 137.5      | 129.5      | 122.5      | 1635.5                         |
|                                    | 20         | 128.5     | 112.5     | 125.5      | 134.0      | 137.0      | 121.5      | 1608.5                         |
| 3 (0.398)                          | 26         | 122.5     | 113.5     | 111.0      | 116.5      | 113.0      | 118.5      | 1513.0                         |
|                                    | 27         | 117.5     | 127.5     | 128.0      | 122.0      | 116.5      | 121.5      | 1547.0                         |
|                                    | 28         | 133.5     | 131.0     | 118.5      | 117.5      | 116.0      | 121.5      | 1580.0                         |
|                                    | 29         | 122.0     | 115.5     | 113.0      | 113.5      | 124.5      | 117.0      | 1477.5                         |
|                                    | 30         | 128.0     | 128.0     | 140.5      | 129.0      | 140.0      | 131.5      | 1698.5                         |
| 4 (1.207)                          | 36         | 116.0     | 122.5     | 119.0      | 148.5      | 138.0      | 128.5      | 1631.5                         |
|                                    | 37         | 112.5     | 115.0     | 123.0      | 118.5      | 122.5      | 109.0      | 1476.0                         |
|                                    | 38         | 104.5     | 112.0     | 117.5      | 116.0      | 120.0      | 105.5      | 1464.0                         |
|                                    | 39         | 114.0     | 118.5     | 122.5      | 115.5      | 127.5      | 129.0      | 1552.0                         |
|                                    | 40         | 118.5     | 119.5     | 128.0      | 123.0      | 119.0      | 107.5      | 1497.5                         |

**Table 22 Water consumption – Individual values**

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Water consumption (g)

Values per animal - Day -1 to Day 91

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | CAGE<br>NO | DAY<br>-1-3 | DAY<br>3-7 | DAY<br>7-10 | DAY<br>10-14 | DAY<br>14-17 | DAY<br>17-21 | DAY<br>21-24 | DAY<br>24-28 | DAY<br>28-31 |
|------------------------------------|------------|-------------|------------|-------------|--------------|--------------|--------------|--------------|--------------|--------------|
| 1 (0)                              | 1          | 109.5       | 136.5      | 105.5       | 150.0        | 115.0        | 295.5        | 137.5        | .            | 110.0        |
|                                    | 2          | 89.0        | 122.0      | 99.5        | 145.0        | 96.0         | 151.5        | 116.0        | 164.0        | 106.0        |
|                                    | 3          | 98.0        | 124.0      | 94.0        | 131.5        | 105.5        | 144.0        | 100.0        | 143.0        | 99.0         |
|                                    | 4          | 97.0        | 126.5      | 89.5        | 132.0        | 103.5        | 157.0        | 101.0        | 154.5        | 97.0         |
|                                    | 5          | 91.5        | 116.0      | 86.5        | 114.0        | 93.0         | 125.0        | 91.5         | 123.5        | 86.5         |
| 2 (0.121)                          | 11         | 93.0        | 126.0      | 92.0        | 125.5        | 89.5         | 123.5        | 94.0         | 122.5        | 89.0         |
|                                    | 12         | 104.5       | 144.5      | 96.0        | 123.0        | 94.5         | 122.0        | 88.0         | 121.5        | 85.0         |
|                                    | 13         | 109.0       | 143.5      | 104.5       | 148.0        | 111.5        | 146.0        | 109.5        | .            | 112.0        |
|                                    | 14         | 115.5       | 149.5      | 113.0       | 150.5        | 114.0        | 146.0        | 112.0        | 161.0        | 109.0        |
|                                    | 15         | 112.5       | 146.0      | 103.0       | 147.0        | 116.0        | 148.0        | 109.5        | 157.5        | 100.5        |
| 3 (0.398)                          | 21         | 97.0        | 130.0      | 104.0       | 152.5        | 112.0        | 151.0        | 100.0        | 139.0        | 98.0         |
|                                    | 22         | 104.0       | 122.0      | 91.0        | 127.5        | 107.0        | 138.0        | 98.0         | 133.0        | 92.0         |
|                                    | 23         | 102.5       | 133.0      | 101.5       | 134.5        | 100.5        | 128.0        | 95.0         | 127.0        | 93.5         |
|                                    | 24         | 100.5       | 135.0      | 100.5       | 126.5        | 95.0         | 136.5        | 95.0         | .            | 87.5         |
|                                    | 25         | 97.0        | 356.0      | 95.0        | 128.0        | 100.5        | 159.0        | 100.5        | 139.0        | 101.5        |
| 4 (1.207)                          | 31         | 110.5       | 138.0      | 149.5       | 119.0        | 96.5         | 130.5        | 97.0         | 137.0        | 91.0         |
|                                    | 32         | 101.5       | 132.0      | 98.5        | 97.0         | 103.0        | 136.5        | .            | 132.0        | 89.5         |
|                                    | 33         | 98.5        | 135.0      | 102.5       | 129.5        | 105.0        | 138.5        | 97.5         | 146.5        | 97.0         |
|                                    | 34         | 108.5       | 125.0      | 100.5       | 135.0        | 115.5        | 149.0        | 110.5        | 155.0        | 108.0        |
|                                    | 35         | 102.0       | 131.5      | 102.0       | 127.5        | 105.0        | 129.0        | 102.5        | 134.0        | 101.5        |

. = problems with the bottle or not recorded in error

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Water consumption (g)

Values per animal - Day -1 to Day 91

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | CAGE<br>NO | DAY<br>31-35 | DAY<br>35-38 | DAY<br>38-42 | DAY<br>42-45 | DAY<br>45-49 | DAY<br>49-52 | DAY<br>52-56 | DAY<br>56-59 | DAY<br>59-63 |
|------------------------------------|------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| 1 (0)                              | 1          | 153.0        | 111.5        | 169.5        | 128.0        | 162.5        | 150.5        | 202.0        | 100.5        | 180.0        |
|                                    | 2          | 269.5        | 104.0        | 188.5        | 111.5        | 139.0        | 99.5         | 168.0        | 95.5         | 151.0        |
|                                    | 3          | 133.0        | 97.5         | 143.0        | 96.0         | 136.0        | 110.5        | 163.5        | 83.0         | 114.0        |
|                                    | 4          | 132.0        | 95.5         | 129.0        | 95.0         | 122.5        | 104.5        | 147.0        | 80.0         | 113.0        |
|                                    | 5          | 118.5        | 88.0         | 121.5        | 89.5         | 118.0        | 89.5         | 123.5        | 70.0         | 120.0        |
| 2 (0.121)                          | 11         | 123.5        | 94.0         | 135.0        | 106.5        | 141.5        | 111.5        | 142.0        | 82.5         | 123.5        |
|                                    | 12         | 115.5        | 87.5         | 136.0        | 90.5         | 114.0        | 99.5         | 196.5        | 85.0         | 121.0        |
|                                    | 13         | 152.0        | 110.5        | 154.5        | 116.5        | 139.0        | 113.0        | 146.0        | 84.5         | 129.5        |
|                                    | 14         | 146.5        | 105.5        | 148.5        | 112.0        | 136.5        | 123.0        | 168.0        | 94.0         | 147.5        |
|                                    | 15         | 134.0        | 108.0        | 125.0        | 115.5        | 156.5        | 125.5        | 171.0        | 97.5         | 144.0        |
| 3 (0.398)                          | 21         | 129.0        | 90.5         | 131.5        | 106.5        | 118.5        | 94.5         | 130.5        | 78.5         | 118.5        |
|                                    | 22         | 120.0        | 92.5         | 127.0        | 99.0         | 125.5        | 112.0        | 138.5        | 76.5         | 135.5        |
|                                    | 23         | 121.0        | 83.5         | 127.5        | 95.0         | 117.5        | 123.0        | 138.0        | 79.0         | 122.5        |
|                                    | 24         | 115.0        | 83.0         | 127.5        | 86.5         | 110.0        | 92.0         | 128.0        | 78.5         | 123.5        |
|                                    | 25         | 136.0        | 99.0         | 133.5        | 100.0        | 129.5        | 111.5        | 155.5        | 92.5         | 141.5        |
| 4 (1.207)                          | 31         | 119.5        | 92.0         | 127.0        | 92.5         | 117.5        | 104.0        | 138.5        | 80.5         | 137.0        |
|                                    | 32         | 127.5        | 87.5         | 121.0        | 90.5         | 113.0        | 92.0         | 141.0        | 88.5         | 141.0        |
|                                    | 33         | 131.5        | 101.5        | 142.0        | 101.0        | 139.5        | 118.0        | 150.5        | 84.0         | 159.5        |
|                                    | 34         | 144.0        | 103.5        | 151.0        | 118.0        | 149.0        | 121.5        | 158.5        | 89.5         | 149.5        |
|                                    | 35         | 133.5        | 100.5        | 138.0        | 99.5         | 118.0        | 120.5        | 157.0        | 89.5         | 161.0        |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Water consumption (g)

Values per animal - Day -1 to Day 91

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | CAGE<br>NO | DAY<br>63-66 | DAY<br>66-70 | DAY<br>70-73 | DAY<br>73-77 | DAY<br>77-80 | DAY<br>80-84 | DAY<br>84-87 | DAY<br>87-91 | TOTAL, DAY<br>-1 TO<br>DAY 91 |
|------------------------------------|------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-------------------------------|
| 1 (0)                              | 1          | 148.5        | 279.0        | 122.5        | 180.5        | 151.0        | 189.5        | 156.5        | 198.0        | .                             |
|                                    | 2          | 116.5        | 149.0        | 98.5         | 139.5        | 107.0        | 128.5        | 119.0        | 156.0        | 3429.5                        |
|                                    | 3          | 110.0        | 138.0        | 101.0        | 149.0        | 116.5        | 146.5        | 129.5        | 140.5        | 3146.5                        |
|                                    | 4          | 97.5         | 122.5        | 96.0         | 126.0        | 93.5         | 130.0        | 136.0        | 146.0        | 3024.0                        |
|                                    | 5          | 87.5         | 108.5        | 81.0         | 111.5        | 88.0         | 114.5        | 99.5         | 117.5        | 2674.0                        |
| 2 (0.121)                          | 11         | 97.5         | 125.5        | 95.5         | 126.5        | 99.0         | 129.5        | 117.5        | 145.0        | 2951.0                        |
|                                    | 12         | 99.5         | 121.0        | 88.5         | 126.5        | 101.0        | 129.5        | 131.0        | 134.0        | 2955.5                        |
|                                    | 13         | 108.0        | 140.0        | 97.5         | 146.0        | 119.5        | 145.0        | 123.5        | 149.5        | .                             |
|                                    | 14         | 114.0        | 142.5        | 103.5        | 151.0        | 123.0        | 149.5        | 128.0        | 176.5        | 3440.0                        |
|                                    | 15         | 122.0        | 138.0        | 95.0         | 145.5        | 108.5        | 140.5        | 136.5        | 160.0        | 3363.0                        |
| 3 (0.398)                          | 21         | 100.5        | 123.5        | 74.5         | 132.0        | 151.0        | 138.0        | 126.0        | 142.5        | 3069.5                        |
|                                    | 22         | 98.5         | 125.0        | 75.5         | 126.5        | 104.5        | 134.5        | 128.5        | 141.0        | 2973.0                        |
|                                    | 23         | 95.0         | 132.0        | 97.0         | 136.0        | 95.5         | 151.0        | 127.5        | 138.0        | 2994.5                        |
|                                    | 24         | 98.0         | 104.5        | 90.0         | 116.0        | 95.0         | 122.0        | 127.5        | 131.0        | .                             |
|                                    | 25         | 100.0        | 133.0        | 105.5        | 142.5        | 106.0        | 147.0        | 143.5        | 145.5        | 3398.5                        |
| 4 (1.207)                          | 31         | 97.0         | 162.5        | 98.0         | 130.5        | 105.5        | 142.0        | 143.0        | 143.5        | 3099.5                        |
|                                    | 32         | 110.0        | 122.0        | 95.0         | 129.5        | 95.5         | 123.0        | 108.0        | 126.0        | .                             |
|                                    | 33         | 117.0        | 158.5        | 126.5        | 168.0        | 129.5        | 166.0        | 152.0        | 182.5        | 3377.5                        |
|                                    | 34         | 114.0        | 153.5        | 117.0        | 150.0        | 132.0        | 158.0        | 154.0        | 137.0        | 3407.0                        |
|                                    | 35         | 113.5        | 162.0        | 109.0        | 145.0        | 120.0        | 149.0        | 151.5        | 162.0        | 3264.5                        |

. = problems with the bottle or not recorded in error

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Water consumption (g)

Values per animal - Day -1 to Day 91

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | CAGE<br>NO | DAY<br>-1-3 | DAY<br>3-7 | DAY<br>7-10 | DAY<br>10-14 | DAY<br>14-17 | DAY<br>17-21 | DAY<br>21-24 | DAY<br>24-28 | DAY<br>28-31 |
|------------------------------------|------------|-------------|------------|-------------|--------------|--------------|--------------|--------------|--------------|--------------|
| 1 (0)                              | 6          | 73.5        | 92.5       | 63.0        | 91.5         | 78.5         | 99.5         | 76.5         | 99.5         | 70.0         |
|                                    | 7          | 77.0        | 96.5       | 67.0        | 110.0        | 76.5         | 106.5        | 83.5         | 109.5        | 73.0         |
|                                    | 8          | 86.5        | 95.5       | 69.0        | 99.5         | 71.0         | 103.5        | 244.0        | 103.5        | 78.0         |
|                                    | 9          | 68.5        | 78.5       | 56.5        | 85.0         | 70.0         | 91.0         | 64.0         | 91.5         | 62.0         |
|                                    | 10         | 75.5        | 77.5       | 66.5        | 92.5         | 75.0         | 96.5         | 76.5         | 97.5         | 64.5         |
| 2 (0.121)                          | 16         | 85.0        | 104.0      | 75.5        | 111.0        | 80.0         | 113.5        | 89.0         | 107.5        | 73.5         |
|                                    | 17         | 81.0        | 89.5       | 66.0        | 98.0         | 77.5         | 106.0        | 80.0         | 109.0        | 76.0         |
|                                    | 18         | 66.5        | 81.5       | 63.0        | 79.5         | 63.5         | 82.0         | 70.0         | 93.0         | 64.0         |
|                                    | 19         | 75.0        | 90.5       | 68.0        | 87.5         | 77.5         | 106.0        | 74.0         | 106.5        | 72.5         |
|                                    | 20         | 69.5        | 97.0       | 69.0        | 63.5         | 86.0         | 129.5        | 94.5         | 111.0        | 65.0         |
| 3 (0.398)                          | 26         | 77.5        | 97.5       | 75.0        | 90.5         | 64.5         | 96.5         | 67.0         | 106.5        | 70.5         |
|                                    | 27         | 90.0        | 95.0       | 76.5        | 107.5        | 350.5        | 170.5        | 69.5         | 102.0        | 74.0         |
|                                    | 28         | 85.5        | 100.0      | 65.0        | 100.5        | 80.0         | 112.5        | 80.0         | 112.5        | 86.0         |
|                                    | 29         | 72.5        | 83.0       | 65.5        | 82.0         | 61.0         | 92.0         | 70.5         | 104.0        | 71.0         |
|                                    | 30         | 87.0        | 92.0       | 73.0        | 98.5         | 77.0         | 93.5         | 71.5         | 94.0         | 67.5         |
| 4 (1.207)                          | 36         | 84.5        | 108.5      | 67.5        | 100.5        | 80.5         | 112.0        | 82.0         | 107.0        | 70.5         |
|                                    | 37         | 66.0        | 85.5       | 76.5        | 86.5         | 67.5         | 99.5         | 67.5         | 98.0         | 63.0         |
|                                    | 38         | 70.5        | 79.5       | 54.0        | 88.0         | 59.5         | 85.0         | 59.0         | 91.0         | 61.0         |
|                                    | 39         | 81.0        | 101.0      | 69.5        | 92.0         | 70.0         | 102.5        | 71.0         | 97.0         | 69.5         |
|                                    | 40         | 77.0        | 106.0      | 75.5        | 106.0        | 91.5         | 111.5        | 78.0         | 109.5        | 73.5         |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Water consumption (g)

Values per animal - Day -1 to Day 91

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | CAGE<br>NO | DAY<br>31-35 | DAY<br>35-38 | DAY<br>38-42 | DAY<br>42-45 | DAY<br>45-49 | DAY<br>49-52 | DAY<br>52-56 | DAY<br>56-59 | DAY<br>59-63 |
|------------------------------------|------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| 1 (0)                              | 6          | 89.0         | 68.0         | 101.5        | 74.5         | 95.0         | 77.0         | 107.0        | 67.0         | 94.5         |
|                                    | 7          | 104.0        | .            | 116.0        | 77.5         | 108.5        | 86.5         | 108.0        | 60.5         | 99.5         |
|                                    | 8          | 97.0         | 71.0         | 105.0        | 67.0         | 109.0        | 87.0         | 116.0        | 71.0         | 106.0        |
|                                    | 9          | 83.0         | 64.0         | 83.5         | 64.0         | 87.5         | 75.0         | 94.0         | 51.0         | 77.5         |
|                                    | 10         | 94.0         | 70.5         | 100.0        | 71.5         | 94.0         | 81.0         | 105.0        | 61.0         | 93.0         |
| 2 (0.121)                          | 16         | 98.5         | 76.5         | 110.5        | 85.5         | 116.0        | 84.0         | 119.5        | 67.0         | 108.0        |
|                                    | 17         | 98.5         | 75.5         | 107.5        | 74.0         | 103.5        | 84.0         | 112.5        | 60.5         | 99.5         |
|                                    | 18         | 85.0         | 58.0         | 89.0         | 72.5         | 89.5         | 75.0         | 108.5        | 61.5         | 89.5         |
|                                    | 19         | 98.0         | 73.5         | 109.0        | 83.5         | 106.0        | 80.5         | 116.5        | 59.5         | 102.5        |
|                                    | 20         | 100.0        | 67.0         | 106.0        | 69.0         | 102.0        | 86.0         | 126.0        | 57.0         | 87.0         |
| 3 (0.398)                          | 26         | 86.5         | 66.0         | 95.0         | 67.5         | 89.0         | 79.5         | 102.0        | 61.5         | 87.0         |
|                                    | 27         | 94.5         | 77.5         | 110.0        | 73.5         | 100.0        | 86.5         | 113.0        | 63.0         | 103.5        |
|                                    | 28         | 112.0        | 74.5         | 111.5        | 92.5         | 108.0        | 106.0        | 139.5        | 78.5         | 122.0        |
|                                    | 29         | 87.0         | 62.0         | 93.0         | 70.0         | 89.0         | 84.0         | 111.5        | 64.5         | 94.0         |
|                                    | 30         | 88.5         | 69.5         | 94.0         | 73.0         | 90.5         | 70.0         | 96.0         | 58.0         | 92.0         |
| 4 (1.207)                          | 36         | 99.0         | 74.0         | 112.5        | 82.5         | 100.5        | 77.0         | 110.5        | 66.0         | 106.0        |
|                                    | 37         | 92.5         | 65.5         | 99.5         | 72.5         | 93.5         | 69.0         | 102.5        | 61.0         | 107.0        |
|                                    | 38         | 83.0         | 60.5         | 88.5         | 64.5         | 78.0         | 61.0         | 95.0         | 60.5         | 94.5         |
|                                    | 39         | 101.0        | 70.5         | 98.0         | 68.5         | 77.0         | 74.5         | 98.0         | 65.0         | 91.5         |
|                                    | 40         | 100.0        | 76.0         | 117.0        | 83.5         | 106.5        | 96.0         | 124.0        | 68.0         | 115.5        |

. = problems with the bottle

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Water consumption (g)

Values per animal - Day -1 to Day 91

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | CAGE<br>NO | DAY<br>63-66 | DAY<br>66-70 | DAY<br>70-73 | DAY<br>73-77 | DAY<br>77-80 | DAY<br>80-84 | DAY<br>84-87 | DAY<br>87-91 | TOTAL, DAY<br>-1 TO<br>DAY 91 |
|------------------------------------|------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-------------------------------|
| 1 (0)                              | 6          | 75.5         | 105.0        | 71.5         | 98.5         | 77.0         | 101.0        | 92.0         | 110.5        | 2249.0                        |
|                                    | 7          | 78.5         | 110.5        | 85.0         | 114.5        | 86.5         | 106.0        | 106.0        | 106.5        | .                             |
|                                    | 8          | 88.0         | 113.5        | 82.0         | 120.0        | 83.5         | 120.5        | 105.0        | 103.0        | 2595.0                        |
|                                    | 9          | 64.5         | 79.0         | 57.5         | 93.0         | 73.0         | 93.5         | 92.0         | 108.0        | 2007.0                        |
|                                    | 10         | 75.0         | 93.0         | 76.0         | 105.5        | 80.5         | 102.0        | 81.0         | 111.5        | 2216.5                        |
| 2 (0.121)                          | 16         | 95.0         | 109.0        | 82.5         | 116.0        | 98.0         | 124.0        | 108.5        | 121.5        | 2559.0                        |
|                                    | 17         | 107.0        | 108.0        | 73.5         | 108.0        | 84.0         | 106.5        | 90.0         | 114.0        | 2389.5                        |
|                                    | 18         | 71.5         | 87.0         | 66.5         | 96.0         | 75.5         | 96.5         | 89.5         | 98.5         | 2072.5                        |
|                                    | 19         | 81.0         | 103.5        | 82.5         | 114.0        | 85.0         | 122.5        | 97.5         | 117.0        | 2389.5                        |
|                                    | 20         | 81.0         | 103.0        | 70.5         | 114.0        | 87.0         | 119.5        | 101.0        | 131.0        | 2392.0                        |
| 3 (0.398)                          | 26         | 65.5         | 89.5         | 67.0         | 93.0         | 65.5         | 88.5         | 86.0         | 92.5         | 2127.0                        |
|                                    | 27         | 77.5         | 100.5        | 74.0         | 105.5        | 75.5         | 105.0        | 100.0        | 101.5        | 2696.5                        |
|                                    | 28         | 81.5         | 107.5        | 78.0         | 101.5        | 83.0         | 116.5        | 108.0        | 126.5        | 2569.0                        |
|                                    | 29         | 68.0         | 89.5         | 69.0         | 97.5         | 80.5         | 101.5        | 174.5        | 107.0        | 2244.0                        |
|                                    | 30         | 68.0         | 83.5         | 74.0         | 101.0        | 82.5         | 107.0        | 91.0         | 100.5        | 2193.0                        |
| 4 (1.207)                          | 36         | 66.5         | 108.5        | 239.0        | 122.5        | 86.0         | 112.5        | 110.0        | 129.0        | 2615.0                        |
|                                    | 37         | 75.5         | 102.0        | 71.0         | 98.0         | 74.5         | 96.5         | 90.0         | 96.0         | 2176.5                        |
|                                    | 38         | 69.0         | 92.5         | 69.5         | 96.0         | 72.0         | 90.0         | 127.5        | 93.5         | 2043.0                        |
|                                    | 39         | 69.0         | 94.5         | 71.5         | 101.0        | 79.0         | 98.0         | 110.0        | 108.5        | 2229.0                        |
|                                    | 40         | 81.5         | 112.5        | 90.5         | 124.0        | 89.5         | 115.5        | 108.5        | 123.5        | 2560.5                        |

. = problems with the bottle

## Table 23 Ophthalmoscopy – Individual findings

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Ophthalmoscopy

### Group 1

| Animal No/Sex | Before start of treatment  | Before termination of treatment                                   |
|---------------|--|---|
| 1, male       | No abnormal findings   | No abnormal findings  |
| 2, male       | No abnormal findings   | No abnormal findings  |
| 3, male       | No abnormal findings   | No abnormal findings  |
| 4, male       | No abnormal findings   | No abnormal findings  |
| 5, male       | No abnormal findings   | No abnormal findings  |
| 6, male       | No abnormal findings   | No abnormal findings  |
| 7, male       | No abnormal findings   | No abnormal findings  |
| 8, male       | Right and left eye: Slight central lenticular opacities                          | Right and left eye: Lenticular opacities                          |
| 9, male       | No abnormal findings   | No abnormal findings  |
| 10, male      | No abnormal findings   | No abnormal findings  |
| 11, female    | No abnormal findings   | No abnormal findings  |
| 12, female    | No abnormal findings   | Right eye: No abnormal findings<br>Left eye: Lenticular opacities |
| 13, female    | Right eye: No abnormal findings<br>Left eye: Slight central lenticular opacities | Right eye: No abnormal findings<br>Left eye: Lenticular opacities |
| 14, female    | No abnormal findings   | No abnormal findings  |
| 15, female    | No abnormal findings   | No abnormal findings  |
| 16, female    | Right eye: Superficial corneal opacities<br>Left eye: No abnormal findings       | Right and left eye: Lenticular opacities                          |
| 17, female    | No abnormal findings   | No abnormal findings  |
| 18, female    | No abnormal findings   | No abnormal findings  |
| 19, female    | No abnormal findings   | No abnormal findings  |
| 20, female    | No abnormal findings   | No abnormal findings  |



Ophthalmoscopy

Group 2

| Animal No/Sex | Before start of treatment | Before termination of treatment |
|---------------|---------------------------|---------------------------------|
| 21, male      | No abnormal findings      |                                 |
| 22, male      | No abnormal findings      |                                 |
| 23, male      | No abnormal findings      |                                 |
| 24, male      | No abnormal findings      |                                 |
| 25, male      | No abnormal findings      |                                 |
| 26, male      | No abnormal findings      |                                 |
| 27, male      | No abnormal findings      |                                 |
| 28, male      | No abnormal findings      |                                 |
| 29, male      | No abnormal findings      |                                 |
| 30, male      | No abnormal findings      |                                 |
| 31, female    | No abnormal findings      |                                 |
| 32, female    | No abnormal findings      |                                 |
| 33, female    | No abnormal findings      |                                 |
| 34, female    | No abnormal findings      |                                 |
| 35, female    | No abnormal findings      |                                 |
| 36, female    | No abnormal findings      |                                 |
| 37, female    | No abnormal findings      |                                 |
| 38, female    | No abnormal findings      |                                 |
| 39, female    | No abnormal findings      |                                 |
| 40, female    | No abnormal findings      |                                 |

Ophthalmoscopy

Group 3

| Animal No/Sex | Before start of treatment                     | Before termination of treatment |
|---------------|---|---------------------------------|
| 41, male      | No abnormal findings                          |                                 |
| 42, male      | No abnormal findings                          |                                 |
| 43, male      | No abnormal findings                          |                                 |
| 44, male      | No abnormal findings                          |                                 |
| 45, male      | No abnormal findings                          |                                 |
| 46, male      | No abnormal findings                          |                                 |
| 47, male      | No abnormal findings                          |                                 |
| 48, male      | No abnormal findings                          |                                 |
| 49, male      | Right and left eye: Marked lenticular opacity |                                 |
| 50, male      | No abnormal findings                          |                                 |
| 51, female    | No abnormal findings                          |                                 |
| 52, female    | No abnormal findings                          |                                 |
| 53, female    | No abnormal findings                          |                                 |
| 54, female    | No abnormal findings                          |                                 |
| 55, female    | No abnormal findings                          |                                 |
| 56, female    | No abnormal findings                          |                                 |
| 57, female    | No abnormal findings                          |                                 |
| 58, female    | No abnormal findings                          |                                 |
| 59, female    | No abnormal findings                          |                                 |
| 60, female    | No abnormal findings                          |                                 |

Ophthalmoscopy

Group 4

| Animal No/Sex | Before start of treatment  | Before termination of treatment  |
|---------------|--|--|
| 61, male      | No abnormal findings   | Right and left eye: Lenticular opacities                                       |
| 62, male      | No abnormal findings   | No abnormal findings   |
| 63, male      | No abnormal findings   | No abnormal findings   |
| 64, male      | No abnormal findings   | No abnormal findings   |
| 65, male      | No abnormal findings   | No abnormal findings   |
| 66, male      | No abnormal findings   | No abnormal findings   |
| 67, male      | No abnormal findings   | No abnormal findings   |
| 68, male      | No abnormal findings   | No abnormal findings   |
| 69, male      | No abnormal findings   | No abnormal findings   |
| 70, male      | No abnormal findings   | No abnormal findings   |
| 71, female    | No abnormal findings   | No abnormal findings   |
| 72, female    | No abnormal findings   | No abnormal findings   |
| 73, female    | No abnormal findings   | No abnormal findings   |
| 74, female    | No abnormal findings   | No abnormal findings   |
| 75, female    | Right eye: Persistence of pupillary membrane<br>Left eye: No abnormal findings | Right eye: Persistence of pupillary membrane<br>Left eye: No abnormal findings |
| 76, female    | No abnormal findings   | No abnormal findings   |
| 77, female    | No abnormal findings   | No abnormal findings   |
| 78, female    | No abnormal findings   | No abnormal findings   |
| 79, female    | No abnormal findings   | No abnormal findings   |
| 80, female    | No abnormal findings   | No abnormal findings   |

**Table 24 Haematology – Individual values**

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Haematology

Individual values

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | Hb    | RBC  | %<br>RETIC | RETIC | HT | MCV | MCH | MCHC | WBC  |
|------------------------------------|--------------|-------|------|------------|-------|----|-----|-----|------|------|
| 1 (0)                              | 1            | 9.97  | 9.13 | 2.14       | 0.195 | 45 | 50  | 1.1 | 22.0 | 20.6 |
|                                    | 2            | 9.60  | 8.63 | 1.89       | 0.163 | 46 | 53  | 1.1 | 21.1 | 14.0 |
|                                    | 3            | 9.00  | 8.21 | 1.87       | 0.154 | 41 | 50  | 1.1 | 21.8 | 11.3 |
|                                    | 4            | 9.71  | 9.14 | 1.78       | 0.163 | 43 | 47  | 1.1 | 22.4 | 14.3 |
|                                    | 5            | 9.82  | 8.51 | 2.03       | 0.173 | 44 | 52  | 1.2 | 22.1 | 12.2 |
|                                    | 6            | 9.64  | 8.36 | 1.83       | 0.153 | 43 | 51  | 1.2 | 22.5 | 12.9 |
|                                    | 7            | 9.70  | 8.75 | 2.75       | 0.240 | 44 | 50  | 1.1 | 22.1 | 13.8 |
|                                    | 8            | 8.89  | 8.22 | 2.10       | 0.172 | 41 | 50  | 1.1 | 21.8 | 13.4 |
|                                    | 9            | 10.70 | 9.86 | 2.23       | 0.220 | 48 | 49  | 1.1 | 22.3 | 15.3 |
|                                    | 10           | 9.58  | 8.77 | 2.10       | 0.184 | 43 | 49  | 1.1 | 22.5 | 11.5 |
| 2 (0.121)                          | 21           | 9.50  | 8.75 | 2.19       | 0.191 | 45 | 51  | 1.1 | 21.2 | 12.3 |
|                                    | 22           | 7.53  | 7.70 | 2.07       | 0.159 | 40 | 52  | 1.0 | 18.7 | 9.4  |
|                                    | 23           | 9.58  | 8.50 | 2.39       | 0.204 | 44 | 52  | 1.1 | 21.8 | 13.6 |
|                                    | 24           | 9.77  | 8.26 | 2.29       | 0.189 | 44 | 53  | 1.2 | 22.4 | 12.4 |
|                                    | 25           | 9.95  | 8.94 | 2.21       | 0.198 | 44 | 49  | 1.1 | 22.8 | 16.3 |
|                                    | 26           | 8.23  | 9.21 | 4.66       | 0.429 | 37 | 40  | 0.9 | 22.1 | 13.9 |
|                                    | 27           | 10.27 | 8.96 | 1.75       | 0.157 | 45 | 51  | 1.2 | 22.7 | 13.1 |
|                                    | 28           | 9.58  | 8.52 | 2.37       | 0.202 | 41 | 48  | 1.1 | 23.4 | 16.0 |
|                                    | 29           | 8.99  | 8.89 | 1.88       | 0.168 | 45 | 50  | 1.0 | 20.2 | 14.3 |
|                                    | 30           | 9.93  | 8.40 | 1.99       | 0.167 | 43 | 51  | 1.2 | 23.1 | 15.5 |

Abbreviations and units are explained in Haematology

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Haematology

Individual values

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | Hb    | RBC  | %<br>RETIC |       | HT | MCV | MCH | MCHC | WBC  |
|------------------------------------|--------------|-------|------|------------|-------|----|-----|-----|------|------|
|                                    |              |       |      | RETIC      | RETIC |    |     |     |      |      |
| 3 (0.398)                          | 41           | 8.66  | 7.92 | 2.60       | 0.206 | 40 | 50  | 1.1 | 21.8 | 11.2 |
|                                    | 42           | 9.12  | 8.03 | 2.72       | 0.218 | 42 | 53  | 1.1 | 21.5 | 13.5 |
|                                    | 43           | 7.51  | 6.22 | 2.28       | 0.142 | 31 | 50  | 1.2 | 24.3 | 11.9 |
|                                    | 44           | 10.00 | 9.09 | 2.40       | 0.218 | 43 | 48  | 1.1 | 23.0 | 14.4 |
|                                    | 45           | 9.82  | 8.86 | 2.51       | 0.222 | 43 | 49  | 1.1 | 22.7 | 13.4 |
|                                    | 46           | 9.11  | 7.21 | 3.04       | 0.220 | 37 | 51  | 1.3 | 24.6 | 14.4 |
|                                    | 47           | 9.34  | 8.41 | 2.19       | 0.184 | 43 | 51  | 1.1 | 22.0 | 11.4 |
|                                    | 48           | 9.58  | 8.39 | 2.21       | 0.186 | 43 | 52  | 1.1 | 22.1 | 12.6 |
|                                    | 49           | 8.87  | 7.64 | 2.61       | 0.199 | 39 | 52  | 1.2 | 22.5 | 10.6 |
|                                    | 50           | 9.57  | 8.91 | 2.92       | 0.260 | 41 | 46  | 1.1 | 23.2 | 13.2 |
| 4 (1.207)                          | 61           | 9.47  | 8.92 | 2.02       | 0.180 | 44 | 49  | 1.1 | 21.6 | 11.5 |
|                                    | 62           | 9.58  | 8.63 | 2.32       | 0.200 | 43 | 50  | 1.1 | 22.4 | 11.2 |
|                                    | 63           | 9.36  | 8.40 | 2.10       | 0.176 | 40 | 48  | 1.1 | 23.3 | 14.6 |
|                                    | 64           | 9.58  | 8.25 | 2.12       | 0.175 | 41 | 49  | 1.2 | 23.7 | 14.9 |
|                                    | 65           | 9.46  | 8.65 | 2.43       | 0.210 | 43 | 50  | 1.1 | 22.0 | 14.0 |
|                                    | 66           | 9.82  | 8.20 | 2.96       | 0.243 | 42 | 51  | 1.2 | 23.3 | 15.9 |
|                                    | 67           | 9.46  | 8.69 | 1.96       | 0.170 | 42 | 49  | 1.1 | 22.4 | 14.0 |
|                                    | 68           | 10.07 | 8.82 | 1.95       | 0.172 | 45 | 51  | 1.1 | 22.6 | 13.5 |
|                                    | 69           | 9.48  | 8.36 | 2.79       | 0.233 | 42 | 51  | 1.1 | 22.3 | 14.3 |
|                                    | 70           | 9.45  | 8.54 | 2.20       | 0.188 | 43 | 50  | 1.1 | 22.3 | 13.5 |

Abbreviations and units are explained in Haematology

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Haematology

Individual values

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | %<br>NEUTRO |        | %<br>LYMPHO |        | %<br>EOS |     | %<br>BASO |      |
|------------------------------------|--------------|-------------|--------|-------------|--------|----------|-----|-----------|------|
|                                    |              | NEUTRO      | NEUTRO | LYMPHO      | LYMPHO | EOS      | EOS | BASO      | BASO |
| 1 (0)                              | 1            | 16          | 3.3    | 81          | 16.7   | 2        | 0.4 | 0         | 0.0  |
|                                    | 2            | 14          | 2.0    | 80          | 11.2   | 2        | 0.3 | 1         | 0.1  |
|                                    | 3            | 9           | 1.0    | 89          | 10.1   | 1        | 0.1 | 0         | 0.0  |
|                                    | 4            | 15          | 2.1    | 82          | 11.7   | 1        | 0.1 | 0         | 0.1  |
|                                    | 5            | 14          | 1.7    | 83          | 10.1   | 1        | 0.1 | 1         | 0.1  |
|                                    | 6            | 12          | 1.5    | 85          | 11.0   | 1        | 0.1 | 0         | 0.1  |
|                                    | 7            | 14          | 2.0    | 83          | 11.4   | 1        | 0.1 | 0         | 0.1  |
|                                    | 8            | 9           | 1.2    | 89          | 11.9   | 1        | 0.1 | 0         | 0.1  |
|                                    | 9            | 12          | 1.9    | 84          | 12.9   | 1        | 0.1 | 1         | 0.1  |
|                                    | 10           | 12          | 1.4    | 86          | 9.8    | 0        | 0.0 | 0         | 0.0  |
| 2 (0.121)                          | 21           | 10          | 1.2    | 87          | 10.6   | 3        | 0.3 | 1         | 0.1  |
|                                    | 22           | 10          | 0.9    | 87          | 8.2    | 3        | 0.3 | 1         | 0.1  |
|                                    | 23           | 12          | 1.6    | 85          | 11.6   | 1        | 0.1 | 0         | 0.1  |
|                                    | 24           | 11          | 1.3    | 85          | 10.6   | 1        | 0.1 | 1         | 0.1  |
|                                    | 25           | 11          | 1.8    | 84          | 13.7   | 1        | 0.2 | 1         | 0.1  |
|                                    | 26           | 17          | 2.3    | 80          | 11.1   | 1        | 0.2 | 0         | 0.0  |
|                                    | 27           | 11          | 1.5    | 85          | 11.2   | 1        | 0.2 | 0         | 0.0  |
|                                    | 28           | 10          | 1.6    | 88          | 14.0   | 1        | 0.1 | 0         | 0.1  |
|                                    | 29           | 9           | 1.3    | 88          | 12.7   | 1        | 0.1 | 0         | 0.0  |
|                                    | 30           | 12          | 1.8    | 85          | 13.2   | 1        | 0.1 | 0         | 0.1  |

Abbreviations and units are explained in Haematology

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Haematology

Individual values

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | %<br>NEUTRO |        | %<br>LYMPHO |        | %<br>EOS |     | %<br>BASO |      |
|------------------------------------|--------------|-------------|--------|-------------|--------|----------|-----|-----------|------|
|                                    |              | NEUTRO      | NEUTRO | LYMPHO      | LYMPHO | EOS      | EOS | BASO      | BASO |
| 3 (0.398)                          | 41           | 11          | 1.2    | 87          | 9.8    | 1        | 0.1 | 1         | 0.1  |
|                                    | 42           | 14          | 1.9    | 84          | 11.3   | 1        | 0.1 | 0         | 0.0  |
|                                    | 43           | 12          | 1.4    | 87          | 10.3   | 1        | 0.1 | 0         | 0.0  |
|                                    | 44           | 11          | 1.5    | 86          | 12.3   | 1        | 0.1 | 1         | 0.1  |
|                                    | 45           | 9           | 1.2    | 88          | 11.8   | 1        | 0.1 | 1         | 0.1  |
|                                    | 46           | 13          | 1.8    | 85          | 12.2   | 1        | 0.2 | 0         | 0.1  |
|                                    | 47           | 8           | 0.9    | 89          | 10.1   | 1        | 0.1 | 0         | 0.0  |
|                                    | 48           | 8           | 1.0    | 90          | 11.4   | 1        | 0.1 | 0         | 0.0  |
|                                    | 49           | 16          | 1.7    | 80          | 8.5    | 1        | 0.1 | 1         | 0.1  |
|                                    | 50           | 12          | 1.6    | 84          | 11.1   | 1        | 0.1 | 0         | 0.0  |
| 4 (1.207)                          | 61           | 12          | 1.4    | 85          | 9.7    | 1        | 0.1 | 1         | 0.1  |
|                                    | 62           | 11          | 1.3    | 86          | 9.6    | 1        | 0.1 | 0         | 0.0  |
|                                    | 63           | 12          | 1.8    | 85          | 12.4   | 1        | 0.2 | 0         | 0.0  |
|                                    | 64           | 12          | 1.8    | 85          | 12.7   | 1        | 0.1 | 0         | 0.1  |
|                                    | 65           | 11          | 1.6    | 86          | 12.0   | 1        | 0.1 | 0         | 0.1  |
|                                    | 66           | 10          | 1.5    | 87          | 13.7   | 1        | 0.1 | 1         | 0.1  |
|                                    | 67           | 11          | 1.5    | 86          | 12.1   | 1        | 0.1 | 1         | 0.1  |
|                                    | 68           | 16          | 2.1    | 80          | 10.7   | 1        | 0.1 | 1         | 0.1  |
|                                    | 69           | 10          | 1.5    | 86          | 12.3   | 1        | 0.2 | 0         | 0.1  |
|                                    | 70           | 11          | 1.5    | 85          | 11.5   | 1        | 0.1 | 0         | 0.0  |

Abbreviations and units are explained in Haematology

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Haematology

Individual values

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | %<br>MONO | MONO | Plt  | APTT | Pt   | Fib  |
|------------------------------------|--------------|-----------|------|------|------|------|------|
| 1 (0)                              | 1            | 1         | 0.2  | 498  | 14.7 | 16.2 | 2.37 |
|                                    | 2            | 2         | 0.3  | 728  | 16.5 | 16.2 | 2.38 |
|                                    | 3            | 1         | 0.1  | 761  | 4.2# | 14.9 | 2.14 |
|                                    | 4            | 2         | 0.3  | 757  | 13.5 | 15.2 | 2.52 |
|                                    | 5            | 2         | 0.3  | 624  | 15.2 | 15.5 | 2.23 |
|                                    | 6            | 2         | 0.3  | 767  | 15.2 | 16.7 | 2.07 |
|                                    | 7            | 2         | 0.3  | 763  | 13.7 | 15.6 | 2.77 |
|                                    | 8            | 1         | 0.2  | 689  | 13.2 | 14.9 | 2.81 |
|                                    | 9            | 3         | 0.4  | 710  | 10.7 | 15.6 | 4.08 |
|                                    | 10           | 2         | 0.2  | 772  | 10.5 | 15.5 | 2.90 |
| 2 (0.121)                          | 21           | 1         | 0.1  | 795  | 15.2 | 16.2 | 2.52 |
|                                    | 22           | 0         | 0.0  | 813  | 15.5 | 16.5 | 2.25 |
|                                    | 23           | 2         | 0.3  | 662  | 15.2 | 14.6 | 2.18 |
|                                    | 24           | 3         | 0.4  | 646  | 15.2 | 16.5 | 2.38 |
|                                    | 25           | 3         | 0.5  | 760  | 14.5 | 16.2 | 2.39 |
|                                    | 26           | 2         | 0.3  | 1084 | 14.5 | 16.2 | 2.85 |
|                                    | 27           | 2         | 0.3  | 764  | 14.7 | 15.3 | 2.72 |
|                                    | 28           | 1         | 0.2  | 818  | 14.5 | 15.8 | 1.45 |
|                                    | 29           | 1         | 0.2  | 847  | 15.2 | 15.8 | 2.56 |
|                                    | 30           | 2         | 0.3  | 732  | 14.2 | 15.6 | 2.42 |

Abbreviations and units are explained in Haematology

# = manually calculated



Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Haematology

Individual values

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | %<br>MONO |      | Plt | APTT | Pt   | Fib  |
|------------------------------------|--------------|-----------|------|-----|------|------|------|
|                                    |              | MONO      | MONO |     |      |      |      |
| 3 (0.398)                          | 41           | 1         | 0.1  | 705 | 15.2 | 17.1 | 2.47 |
|                                    | 42           | 1         | 0.2  | 810 | 16.5 | 15.5 | 1.98 |
|                                    | 43           | 1         | 0.1  | 565 | 16.0 | 14.6 | 2.55 |
|                                    | 44           | 2         | 0.3  | 814 | 13.5 | 16.1 | 2.52 |
|                                    | 45           | 2         | 0.3  | 700 | 13.7 | 17.1 | 2.24 |
|                                    | 46           | 1         | 0.2  | 684 | 12.5 | 15.3 | 2.82 |
|                                    | 47           | 2         | 0.2  | 668 | 13.2 | 15.6 | 2.74 |
|                                    | 48           | 1         | 0.2  | 783 | 15.0 | 15.8 | 2.51 |
|                                    | 49           | 3         | 0.3  | 881 | 13.5 | 15.5 | 2.50 |
|                                    | 50           | 3         | 0.3  | 810 | 10.7 | 16.2 | 1.29 |
| 4 (1.207)                          | 61           | 2         | 0.2  | 753 | 15.5 | 17.0 | 2.37 |
|                                    | 62           | 2         | 0.2  | 723 | 14.2 | 17.1 | 2.07 |
|                                    | 63           | 2         | 0.3  | 794 | 12.7 | 15.6 | 2.23 |
|                                    | 64           | 2         | 0.3  | 778 | 13.7 | 16.4 | 2.17 |
|                                    | 65           | 2         | 0.3  | 827 | 16.0 | 17.0 | 1.92 |
|                                    | 66           | 2         | 0.4  | 757 | 15.2 | 18.5 | 1.83 |
|                                    | 67           | 2         | 0.3  | 774 | 15.2 | 16.2 | 2.15 |
|                                    | 68           | 3         | 0.5  | 683 | 15.0 | 16.5 | 1.65 |
|                                    | 69           | 2         | 0.3  | 838 | 14.0 | 17.1 | 3.08 |
|                                    | 70           | 3         | 0.4  | 749 | 17.5 | 16.7 | 1.63 |

Abbreviations and units are explained in Haematology

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Haematology

Individual values

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | Hb   | RBC  | %<br>RETIC | RETIC | HT | MCV | MCH | MCHC | WBC  |
|------------------------------------|--------------|------|------|------------|-------|----|-----|-----|------|------|
| 1 (0)                              | 11           | 9.28 | 7.77 | 3.17       | 0.246 | 42 | 54  | 1.2 | 22.2 | .    |
|                                    | 12           | 9.15 | 7.91 | 2.43       | 0.192 | 40 | 51  | 1.2 | 22.7 | 12.2 |
|                                    | 13           | 8.97 | 7.29 | 2.33       | 0.170 | 40 | 54  | 1.2 | 22.6 | 9.8  |
|                                    | 14           | 9.50 | 8.39 | 2.73       | 0.229 | 43 | 51  | 1.1 | 22.4 | 9.2  |
|                                    | 15           | 8.67 | 7.61 | 3.09       | 0.235 | 40 | 52  | 1.1 | 21.8 | 7.6  |
|                                    | 16           | 9.00 | 7.42 | 2.67       | 0.198 | 39 | 53  | 1.2 | 22.9 | 8.8  |
|                                    | 17           | 9.20 | 7.67 | 2.66       | 0.204 | 42 | 54  | 1.2 | 22.2 | 7.7  |
|                                    | 18           | 9.68 | 7.77 | 2.00       | 0.155 | 41 | 53  | 1.3 | 23.4 | 11.0 |
|                                    | 19           | 9.00 | 7.41 | 2.36       | 0.175 | 39 | 52  | 1.2 | 23.2 | 8.7  |
|                                    | 20           | 9.30 | 7.56 | 2.50       | 0.189 | 40 | 53  | 1.2 | 23.3 | 13.0 |
| 2 (0.121)                          | 31           | 8.79 | 7.77 | 2.78       | 0.216 | 41 | 52  | 1.1 | 21.7 | 9.1  |
|                                    | 32           | 9.13 | 7.84 | 2.23       | 0.175 | 41 | 53  | 1.2 | 22.2 | 9.3  |
|                                    | 33           | 9.20 | 7.85 | 3.07       | 0.241 | 41 | 52  | 1.2 | 22.4 | 9.9  |
|                                    | 34           | 9.38 | 7.45 | 3.52       | 0.263 | 39 | 53  | 1.3 | 23.9 | 11.8 |
|                                    | 35           | 8.38 | 7.01 | 1.81       | 0.127 | 38 | 54  | 1.2 | 22.0 | 7.6  |
|                                    | 36           | 9.35 | 7.67 | 2.60       | 0.199 | 41 | 53  | 1.2 | 22.9 | 13.7 |
|                                    | 37           | 9.18 | 7.60 | 2.22       | 0.169 | 42 | 55  | 1.2 | 22.1 | 10.5 |
|                                    | 38           | 9.48 | 7.66 | 2.82       | 0.216 | 41 | 53  | 1.2 | 23.4 | 15.3 |
|                                    | 39           | 9.23 | 7.98 | 2.00       | 0.159 | 41 | 52  | 1.2 | 22.4 | 13.2 |
|                                    | 40           | 9.11 | 7.79 | 2.54       | 0.198 | 41 | 52  | 1.2 | 22.4 | 11.2 |

Abbreviations and units are explained in Haematology

. = result not reliable

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Haematology

Individual values

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | Hb   | RBC  | %<br>RETIC | RETIC | HT | MCV | MCH | MCHC | WBC  |
|------------------------------------|--------------|------|------|------------|-------|----|-----|-----|------|------|
| 3 (0.398)                          | 51           | 8.68 | 7.20 | 3.28       | 0.236 | 40 | 55  | 1.2 | 21.9 | .    |
|                                    | 52           | 9.08 | 7.64 | 2.64       | 0.202 | 40 | 52  | 1.2 | 22.7 | 9.8  |
|                                    | 53           | 9.50 | 7.86 | 2.70       | 0.213 | 41 | 53  | 1.2 | 23.0 | 15.6 |
|                                    | 54           | 9.26 | 7.66 | 2.51       | 0.192 | 40 | 52  | 1.2 | 23.1 | 9.3  |
|                                    | 55           | 9.02 | 7.88 | 1.71       | 0.135 | 41 | 51  | 1.1 | 22.3 | 7.2  |
|                                    | 56           | 9.23 | 7.55 | 3.10       | 0.234 | 40 | 53  | 1.2 | 22.9 | 8.8  |
|                                    | 57           | 9.61 | 7.81 | 2.39       | 0.187 | 41 | 52  | 1.2 | 23.8 | 14.5 |
|                                    | 58           | 9.36 | 7.76 | 3.60       | 0.280 | 41 | 53  | 1.2 | 22.7 | 14.7 |
|                                    | 59           | 8.78 | 6.89 | 2.95       | 0.203 | 38 | 55  | 1.3 | 23.1 | 13.5 |
|                                    | 60           | 9.34 | 7.93 | 2.16       | 0.171 | 41 | 52  | 1.2 | 22.6 | 12.3 |
| 4 (1.207)                          | 71           | 9.03 | 8.59 | 2.11       | 0.181 | 42 | 49  | 1.1 | 21.5 | 15.9 |
|                                    | 72           | 8.97 | 7.27 | 3.09       | 0.225 | 39 | 54  | 1.2 | 23.0 | 9.7  |
|                                    | 73           | 8.91 | 7.35 | 2.08       | 0.153 | 40 | 54  | 1.2 | 22.5 | 9.7  |
|                                    | 74           | 9.67 | 7.98 | 2.07       | 0.165 | 43 | 53  | 1.2 | 22.8 | 8.5  |
|                                    | 75           | 9.00 | 7.68 | 1.77       | 0.136 | 40 | 52  | 1.2 | 22.6 | 6.5  |
|                                    | 76           | 9.32 | 7.46 | 2.00       | 0.149 | 41 | 56  | 1.3 | 22.5 | 7.9  |
|                                    | 77           | 8.90 | 7.54 | 2.93       | 0.220 | 40 | 53  | 1.2 | 22.3 | 9.9  |
|                                    | 78           | 8.82 | 7.50 | 2.91       | 0.218 | 39 | 52  | 1.2 | 22.5 | 8.8  |
|                                    | 79           | 8.88 | 7.63 | 2.54       | 0.194 | 41 | 54  | 1.2 | 21.5 | 9.4  |
|                                    | 80           | 9.09 | 7.82 | 2.42       | 0.189 | 41 | 53  | 1.2 | 22.1 | 10.3 |

Abbreviations and units are explained in Haematology

. = result not reliable

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Haematology

Individual values

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | %<br>NEUTRO | NEUTRO | %<br>LYMPHO | LYMPHO | %<br>EOS | EOS | %<br>BASO | BASO |
|------------------------------------|--------------|-------------|--------|-------------|--------|----------|-----|-----------|------|
| 1 (0)                              | 11           | 20          | .      | 77          | .      | 2        | .   | 1         | .    |
|                                    | 12           | 9           | 1.1    | 87          | 10.6   | 1        | 0.2 | 1         | 0.1  |
|                                    | 13           | 8           | 0.8    | 90          | 8.9    | 1        | 0.1 | 0         | 0.0  |
|                                    | 14           | 12          | 1.1    | 85          | 7.8    | 1        | 0.1 | 1         | 0.1  |
|                                    | 15           | 12          | 0.9    | 84          | 6.4    | 1        | 0.1 | 1         | 0.0  |
|                                    | 16           | 17          | 1.5    | 79          | 7.0    | 1        | 0.1 | 0         | 0.0  |
|                                    | 17           | 9           | 0.7    | 88          | 6.8    | 1        | 0.1 | 0         | 0.0  |
|                                    | 18           | 9           | 1.0    | 89          | 9.8    | 2        | 0.2 | 0         | 0.0  |
|                                    | 19           | 15          | 1.3    | 77          | 6.7    | 5        | 0.4 | 1         | 0.1  |
|                                    | 20           | 17          | 2.2    | 79          | 10.2   | 1        | 0.2 | 1         | 0.1  |
| 2 (0.121)                          | 31           | 17          | 1.5    | 80          | 7.3    | 1        | 0.1 | 0         | 0.0  |
|                                    | 32           | 11          | 1.1    | 86          | 8.0    | 1        | 0.1 | 1         | 0.1  |
|                                    | 33           | 8           | 0.8    | 91          | 9.0    | 1        | 0.1 | 0         | 0.0  |
|                                    | 34           | 8           | 1.0    | 89          | 10.5   | 1        | 0.1 | 1         | 0.1  |
|                                    | 35           | 9           | 0.7    | 89          | 6.8    | 1        | 0.1 | 0         | 0.0  |
|                                    | 36           | 11          | 1.5    | 86          | 11.7   | 1        | 0.1 | 2         | 0.3  |
|                                    | 37           | 10          | 1.0    | 89          | 9.3    | 1        | 0.1 | 0         | 0.0  |
|                                    | 38           | 12          | 1.9    | 85          | 13.0   | 1        | 0.2 | 0         | 0.1  |
|                                    | 39           | 11          | 1.4    | 86          | 11.3   | 1        | 0.1 | 1         | 0.1  |
|                                    | 40           | 12          | 1.3    | 85          | 9.5    | 1        | 0.1 | 1         | 0.1  |

Abbreviations and units are explained in Haematology

. = result not reliable

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Haematology

Individual values

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | %<br>NEUTRO | NEUTRO | %<br>LYMPHO | LYMPHO | %<br>EOS | EOS | %<br>BASO | BASO |
|------------------------------------|--------------|-------------|--------|-------------|--------|----------|-----|-----------|------|
| 3 (0.398)                          | 51           | .           | .      | .           | .      | .        | .   | .         | .    |
|                                    | 52           | 6           | 0.6    | 92          | 9.0    | 1        | 0.1 | 0         | 0.0  |
|                                    | 53           | 12          | 1.8    | 84          | 13.1   | 2        | 0.3 | 1         | 0.1  |
|                                    | 54           | 14          | 1.3    | 82          | 7.6    | 2        | 0.2 | 1         | 0.1  |
|                                    | 55           | 8           | 0.6    | 90          | 6.5    | 1        | 0.1 | 0         | 0.0  |
|                                    | 56           | 11          | 1.0    | 87          | 7.6    | 1        | 0.1 | 0         | 0.0  |
|                                    | 57           | 11          | 1.5    | 88          | 12.7   | 1        | 0.1 | 0         | 0.0  |
|                                    | 58           | 8           | 1.2    | 90          | 13.2   | 1        | 0.1 | 1         | 0.1  |
|                                    | 59           | 15          | 2.1    | 82          | 11.1   | 1        | 0.1 | 1         | 0.1  |
|                                    | 60           | 12          | 1.4    | 85          | 10.5   | 1        | 0.1 | 1         | 0.1  |
| 4 (1.207)                          | 71           | 21          | 3.3    | 75          | 11.9   | 2        | 0.4 | 0         | 0.1  |
|                                    | 72           | 9           | 0.9    | 88          | 8.6    | 2        | 0.2 | 0         | 0.0  |
|                                    | 73           | 16          | 1.6    | 80          | 7.7    | 1        | 0.1 | 0         | 0.0  |
|                                    | 74           | 8           | 0.7    | 90          | 7.6    | 2        | 0.1 | 0         | 0.0  |
|                                    | 75           | 11          | 0.7    | 87          | 5.7    | 1        | 0.1 | 0         | 0.0  |
|                                    | 76           | 9           | 0.7    | 89          | 7.1    | 1        | 0.1 | 0         | 0.0  |
|                                    | 77           | 8           | 0.8    | 91          | 9.0    | 1        | 0.1 | 0         | 0.0  |
|                                    | 78           | 11          | 1.0    | 87          | 7.7    | 1        | 0.1 | 0         | 0.0  |
|                                    | 79           | 9           | 0.8    | 88          | 8.3    | 2        | 0.2 | 0         | 0.0  |
|                                    | 80           | 15          | 1.5    | 83          | 8.6    | 2        | 0.2 | 0         | 0.0  |

Abbreviations and units are explained in Haematology

. = result not reliable

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Haematology

Individual values

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | %<br>MONO | MONO | Plt | APTT | Pt   | Fib  |
|------------------------------------|--------------|-----------|------|-----|------|------|------|
| 1 (0)                              | 11           | 0         | .    | 673 | 16.5 | 14.1 | 2.03 |
|                                    | 12           | 1         | 0.1  | 780 | 15.0 | 14.6 | 1.61 |
|                                    | 13           | 0         | 0.0  | 756 | 16.2 | 14.3 | 1.95 |
|                                    | 14           | 2         | 0.2  | 612 | 15.0 | 14.4 | 2.03 |
|                                    | 15           | 2         | 0.1  | 717 | 13.2 | 14.0 | 1.69 |
|                                    | 16           | 2         | 0.2  | 758 | 16.0 | 14.0 | 1.99 |
|                                    | 17           | 0         | 0.0  | 623 | 13.7 | 14.1 | 1.84 |
|                                    | 18           | 0         | 0.0  | 653 | 14.7 | 13.8 | 1.89 |
|                                    | 19           | 2         | 0.2  | 656 | 15.7 | 14.4 | 1.87 |
|                                    | 20           | 3         | 0.3  | 684 | 13.5 | 14.7 | 1.51 |
| 2 (0.121)                          | 31           | 2         | 0.1  | 732 | 17.0 | 14.3 | 1.77 |
|                                    | 32           | 1         | 0.1  | 791 | 15.0 | 14.9 | 1.88 |
|                                    | 33           | 0         | 0.0  | 741 | 11.7 | 14.6 | 1.36 |
|                                    | 34           | 1         | 0.1  | 678 | 14.5 | 14.0 | 2.21 |
|                                    | 35           | 0         | 0.0  | 741 | 13.5 | 14.3 | 1.90 |
|                                    | 36           | 1         | 0.1  | 610 | 17.5 | 14.4 | 1.79 |
|                                    | 37           | 0         | 0.0  | 719 | 15.7 | 15.3 | 1.55 |
|                                    | 38           | 2         | 0.2  | 764 | 14.5 | 13.1 | 1.76 |
|                                    | 39           | 2         | 0.2  | 760 | 14.0 | 14.6 | 2.43 |
|                                    | 40           | 2         | 0.3  | 732 | 15.2 | 14.7 | 1.67 |

Abbreviations and units are explained in Haematology

. = result not reliable

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Haematology

Individual values

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | %<br>MONO | MONO | Plt | APTT | Pt   | Fib  |
|------------------------------------|--------------|-----------|------|-----|------|------|------|
| 3 (0.398)                          | 51           | .         | .    | 566 | 12.7 | 15.0 | 1.44 |
|                                    | 52           | 0         | 0.0  | 882 | 14.2 | 14.9 | 2.08 |
|                                    | 53           | 2         | 0.3  | 674 | 13.5 | 14.3 | 1.67 |
|                                    | 54           | 2         | 0.2  | 662 | 14.2 | 14.7 | 1.53 |
|                                    | 55           | 0         | 0.0  | 735 | 6.6  | 13.7 | 2.53 |
|                                    | 56           | 1         | 0.1  | 657 | 17.2 | 14.6 | 1.42 |
|                                    | 57           | 1         | 0.1  | 781 | 15.2 | 13.8 | 1.87 |
|                                    | 58           | 1         | 0.1  | 712 | 15.0 | 14.1 | 1.26 |
|                                    | 59           | 1         | 0.1  | 758 | 14.0 | 15.5 | 1.84 |
|                                    | 60           | 2         | 0.3  | 777 | 14.0 | 14.9 | 1.62 |
| 4 (1.207)                          | 71           | 2         | 0.3  | 372 | 13.7 | 13.5 | 2.15 |
|                                    | 72           | 0         | 0.0  | 706 | 16.7 | 15.0 | 2.58 |
|                                    | 73           | 3         | 0.2  | 710 | 13.7 | 14.6 | 1.53 |
|                                    | 74           | 1         | 0.0  | 629 | C    | C    | C    |
|                                    | 75           | 1         | 0.1  | 700 | 13.7 | 14.7 | 1.79 |
|                                    | 76           | 1         | 0.1  | 680 | 10.7 | 13.8 | 2.18 |
|                                    | 77           | 1         | 0.1  | 678 | 14.0 | 14.0 | 2.02 |
|                                    | 78           | 1         | 0.1  | 775 | 16.2 | 14.6 | 1.57 |
|                                    | 79           | 1         | 0.1  | 645 | 14.5 | 15.5 | 1.69 |
|                                    | 80           | 1         | 0.1  | 654 | 14.5 | 14.7 | 1.85 |

Abbreviations and units are explained in Haematology

. = result not reliable

C = blood sample coagulated

**Table 25 Clinical chemistry – Individual values**

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Clinical chemistry

Individual values

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | ALAT | ASAT | ALKPH | TBILI | GGT  | CHOL | TRIG |
|------------------------------------|--------------|------|------|-------|-------|------|------|------|
| 1 (0)                              | 1            | 1.55 | 1.82 | 1.93  | 1.2   | 0.04 | 2.76 | 1.37 |
|                                    | 2            | 1.40 | 1.68 | 1.83  | 1.0   | <LOD | 2.46 | 1.90 |
|                                    | 3            | 2.78 | 2.67 | 1.87  | 0.5   | 0.03 | 2.38 | 1.75 |
|                                    | 4            | 1.46 | 1.50 | 1.65  | 1.1   | 0.03 | 3.22 | 1.82 |
|                                    | 5            | 1.44 | 1.18 | 1.49  | 1.1   | <LOD | 2.42 | 2.21 |
|                                    | 6            | 1.32 | 1.57 | 1.77  | 1.2   | <LOD | 2.19 | 2.09 |
|                                    | 7            | 1.38 | 1.61 | 2.44  | 1.0   | <LOD | 2.72 | 2.55 |
|                                    | 8            | 1.75 | 2.02 | 1.74  | 0.9   | 0.03 | 2.48 | 1.67 |
|                                    | 9            | 1.26 | 1.55 | 1.60  | 1.0   | 0.03 | 3.69 | 2.65 |
|                                    | 10           | 1.31 | 1.37 | 1.93  | 1.7   | <LOD | 2.04 | 1.68 |
| 2 (0.121)                          | 21           | 1.77 | 1.94 | 2.23  | 0.7   | <LOD | 3.05 | 2.84 |
|                                    | 22           | 1.61 | 1.64 | 1.61  | 0.6   | 0.04 | 2.36 | 1.64 |
|                                    | 23           | 2.20 | 2.92 | 2.41  | 1.3   | <LOD | 2.76 | 2.13 |
|                                    | 24           | 1.31 | 1.50 | 1.93  | 1.0   | <LOD | 1.77 | 1.46 |
|                                    | 25           | 1.60 | 1.78 | 1.50  | 0.9   | <LOD | 3.06 | 1.74 |
|                                    | 26           | 1.64 | 2.05 | 1.28  | 0.9   | 0.03 | 2.62 | 1.69 |
|                                    | 27           | 1.69 | 2.09 | 1.67  | 1.3   | <LOD | 3.00 | 2.38 |
|                                    | 28           | 1.67 | 1.84 | 1.73  | 1.1   | <LOD | 2.16 | 2.32 |
|                                    | 29           | 1.33 | 1.56 | 1.88  | 1.2   | 0.03 | 2.59 | 2.56 |
|                                    | 30           | 1.24 | 1.91 | 1.91  | 1.2   | 0.03 | 2.99 | 2.49 |

Abbreviations and units are explained in Clinical chemistry

Limit of detection for GGT = 0.03



Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Clinical chemistry

Individual values

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | ALAT | ASAT | ALKPH | TBILI | GGT  | CHOL | TRIG |
|------------------------------------|--------------|------|------|-------|-------|------|------|------|
| 3 (0.398)                          | 41           | 1.45 | 1.56 | 1.52  | 0.9   | <LOD | 2.52 | 3.55 |
|                                    | 42           | 1.46 | 1.72 | 2.29  | 0.8   | 0.03 | 2.90 | 1.83 |
|                                    | 43           | 1.32 | 1.55 | 2.24  | 0.8   | 0.03 | 2.41 | 1.73 |
|                                    | 44           | 2.31 | 2.92 | 1.84  | 1.5   | <LOD | 3.51 | 1.86 |
|                                    | 45           | 1.32 | 1.44 | 1.60  | 1.6   | <LOD | 2.17 | 2.35 |
|                                    | 46           | 1.56 | 2.20 | 2.06  | 0.9   | 0.03 | 2.95 | 1.30 |
|                                    | 47           | 0.98 | 1.31 | 1.13  | 0.8   | <LOD | 1.91 | 1.98 |
|                                    | 48           | 1.03 | 1.53 | 1.94  | 1.3   | <LOD | 2.49 | 1.59 |
|                                    | 49           | 1.49 | 1.50 | 1.43  | 0.9   | <LOD | 1.86 | 1.62 |
|                                    | 50           | 1.52 | 2.08 | 1.58  | 1.1   | 0.04 | 2.00 | 1.14 |
| 4 (1.207)                          | 61           | 1.28 | 1.53 | 1.60  | 0.9   | <LOD | 1.84 | 1.14 |
|                                    | 62           | 1.46 | 1.87 | 1.78  | 1.1   | 0.03 | 2.67 | 1.50 |
|                                    | 63           | 1.58 | 1.82 | 1.78  | 1.1   | <LOD | 2.46 | 1.58 |
|                                    | 64           | 1.30 | 1.68 | 1.99  | 0.9   | <LOD | 2.65 | 1.56 |
|                                    | 65           | 1.36 | 1.95 | 2.20  | 1.0   | <LOD | 2.02 | 2.89 |
|                                    | 66           | 1.56 | 1.77 | 2.31  | 1.2   | 0.04 | 2.25 | 1.58 |
|                                    | 67           | 1.29 | 1.52 | 1.62  | 0.8   | <LOD | 2.59 | 2.33 |
|                                    | 68           | 1.52 | 1.49 | 1.57  | 1.1   | <LOD | 2.02 | 1.55 |
|                                    | 69           | 1.14 | 1.56 | 2.03  | 1.3   | <LOD | 2.43 | 1.35 |
|                                    | 70           | 1.43 | 1.59 | 2.03  | 1.2   | 0.03 | 2.59 | 2.61 |

Abbreviations and units are explained in Clinical chemistry

Limit of detection for GGT = 0.03

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Clinical chemistry

Individual values

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | UREA  | CREAT | GLUC | Na    | K    | Ca   |
|------------------------------------|--------------|-------|-------|------|-------|------|------|
| 1 (0)                              | 1            | 7.24  | 27    | 6.4  | 145.4 | 7.05 | 2.94 |
|                                    | 2            | 8.78  | 27    | 6.3  | 145.4 | 7.35 | 2.91 |
|                                    | 3            | 7.77  | 23    | 6.1  | 145.6 | 7.93 | 2.81 |
|                                    | 4            | 9.38  | 23    | 6.3  | 145.8 | 7.99 | 2.91 |
|                                    | 5            | 10.45 | 23    | 6.3  | 147.0 | 7.49 | 2.75 |
|                                    | 6            | 7.46  | 23    | 6.6  | 143.9 | 8.02 | 2.80 |
|                                    | 7            | 7.51  | 25    | 5.8  | 143.9 | 8.97 | 2.80 |
|                                    | 8            | 8.78  | 26    | 7.4  | 145.5 | 8.15 | 2.86 |
|                                    | 9            | 9.46  | 28    | 6.8  | 144.9 | 8.58 | 2.84 |
|                                    | 10           | 7.76  | 26    | 7.1  | 144.9 | 7.64 | 2.79 |
| 2 (0.121)                          | 21           | 8.27  | 26    | 6.2  | 147.0 | 7.47 | 2.86 |
|                                    | 22           | 9.23  | 30    | 6.8  | 146.3 | 8.08 | 2.87 |
|                                    | 23           | 7.76  | 26    | 6.5  | 144.9 | 8.87 | 2.63 |
|                                    | 24           | 8.08  | 27    | 5.6  | 147.6 | 8.25 | 2.82 |
|                                    | 25           | 7.73  | 23    | 6.4  | 144.5 | 8.08 | 2.81 |
|                                    | 26           | 7.03  | 25    | 6.2  | 143.8 | 7.57 | 2.90 |
|                                    | 27           | 10.25 | 30    | 6.8  | 144.2 | 8.74 | 2.84 |
|                                    | 28           | 7.76  | 23    | 6.3  | 144.6 | 8.63 | 2.86 |
|                                    | 29           | 6.36  | 23    | 6.1  | 145.4 | 7.75 | 2.76 |
|                                    | 30           | 7.83  | 27    | 6.3  | 145.9 | 8.26 | 2.84 |

Abbreviations and units are explained in Clinical chemistry

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Clinical chemistry

Individual values

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | UREA | CREAT | GLUC | Na    | K    | Ca   |
|------------------------------------|--------------|------|-------|------|-------|------|------|
| 3 (0.398)                          | 41           | 9.45 | 25    | 6.8  | 144.1 | 7.60 | 2.78 |
|                                    | 42           | 9.68 | 26    | 6.8  | 146.7 | 7.32 | 2.83 |
|                                    | 43           | 7.86 | 22    | 5.5  | 144.3 | 8.63 | 2.91 |
|                                    | 44           | 7.89 | 23    | 5.5  | 143.8 | 8.94 | 3.00 |
|                                    | 45           | 8.81 | 24    | 6.3  | 146.9 | 6.11 | 2.84 |
|                                    | 46           | 8.95 | 24    | 7.1  | 147.1 | 7.05 | 2.85 |
|                                    | 47           | 7.85 | 26    | 6.6  | 145.9 | 6.96 | 2.92 |
|                                    | 48           | 7.74 | 28    | 11.0 | 145.4 | 6.68 | 3.04 |
|                                    | 49           | 7.41 | 23    | 6.8  | 147.4 | 7.20 | 2.80 |
|                                    | 50           | 6.79 | 25    | 7.8  | 142.8 | 8.16 | 2.85 |
| 4 (1.207)                          | 61           | 7.20 | 24    | 5.8  | 146.4 | 7.89 | 2.79 |
|                                    | 62           | 7.53 | 23    | 5.9  | 147.6 | 6.83 | 2.84 |
|                                    | 63           | 8.72 | 25    | 5.6  | 142.6 | 8.43 | 2.78 |
|                                    | 64           | 8.36 | 24    | 6.1  | 145.3 | 9.04 | 2.81 |
|                                    | 65           | 7.16 | 25    | 6.1  | 143.8 | 7.42 | 2.82 |
|                                    | 66           | 9.27 | 25    | 6.5  | 147.2 | 7.51 | 2.97 |
|                                    | 67           | 7.98 | 25    | 6.6  | 143.6 | 9.10 | 2.78 |
|                                    | 68           | 7.94 | 23    | 6.7  | 144.3 | 7.66 | 2.79 |
|                                    | 69           | 7.92 | 28    | 6.2  | 145.6 | 8.86 | 2.62 |
|                                    | 70           | 8.59 | 26    | 6.3  | 143.8 | 8.42 | 2.91 |

Abbreviations and units are explained in Clinical chemistry

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Clinical chemistry

Individual values

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | Mg   | P    | Cl    | PROTEIN | ALB | GLOBULIN | ALB/G<br>Ratio |
|------------------------------------|--------------|------|------|-------|---------|-----|----------|----------------|
| 1 (0)                              | 1            | 1.05 | 2.51 | 98.5  | 68.2    | 43  | 25.2     | 1.71           |
|                                    | 2            | 0.99 | 2.34 | 98.8  | 70.4    | 45  | 25.4     | 1.77           |
|                                    | 3            | 1.11 | 2.50 | 100.6 | 65.5    | 43  | 22.5     | 1.91           |
|                                    | 4            | 1.10 | 2.38 | 97.4  | 68.7    | 44  | 24.7     | 1.78           |
|                                    | 5            | 0.96 | 2.50 | 100.3 | 61.6    | 40  | 21.6     | 1.85           |
|                                    | 6            | 0.99 | 2.34 | 100.5 | 64.7    | 41  | 23.7     | 1.73           |
|                                    | 7            | 1.07 | 2.57 | 97.3  | 66.8    | 43  | 23.8     | 1.81           |
|                                    | 8            | 1.17 | 2.95 | 99.0  | 70.5    | 43  | 27.5     | 1.56           |
|                                    | 9            | 1.12 | 2.28 | 99.5  | 71.0    | 42  | 29.0     | 1.45           |
|                                    | 10           | 1.09 | 2.43 | 98.6  | 65.5    | 42  | 23.5     | 1.79           |
| 2 (0.121)                          | 21           | 1.08 | 2.19 | 98.4  | 69.1    | 44  | 25.1     | 1.75           |
|                                    | 22           | 1.03 | 2.60 | 97.8  | 68.5    | 42  | 26.5     | 1.58           |
|                                    | 23           | 0.98 | 2.42 | 98.5  | 69.5    | 45  | 24.5     | 1.84           |
|                                    | 24           | 1.02 | 2.50 | 99.8  | 65.7    | 44  | 21.7     | 2.03           |
|                                    | 25           | 0.99 | 2.55 | 98.0  | 65.4    | 42  | 23.4     | 1.79           |
|                                    | 26           | 1.07 | 2.60 | 97.9  | 70.7    | 43  | 27.7     | 1.55           |
|                                    | 27           | 1.21 | 2.91 | 99.7  | 70.0    | 44  | 26.0     | 1.69           |
|                                    | 28           | 1.16 | 2.82 | 100.2 | 71.6    | 46  | 25.6     | 1.80           |
|                                    | 29           | 1.06 | 2.59 | 99.3  | 66.9    | 43  | 23.9     | 1.80           |
|                                    | 30           | 1.02 | 2.58 | 100.2 | 68.4    | 43  | 25.4     | 1.69           |

Abbreviations and units are explained in Clinical chemistry

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Clinical chemistry

Individual values

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | Mg   | P    | Cl    | PROTEIN | ALB | GLOBULIN | ALB/G<br>Ratio |
|------------------------------------|--------------|------|------|-------|---------|-----|----------|----------------|
| 3 (0.398)                          | 41           | 0.93 | 2.24 | 99.0  | 60.1    | 38  | 22.1     | 1.72           |
|                                    | 42           | 1.02 | 2.62 | 100.0 | 66.6    | 42  | 24.6     | 1.71           |
|                                    | 43           | 1.12 | 2.32 | 98.9  | 67.9    | 45  | 22.9     | 1.97           |
|                                    | 44           | 1.07 | 2.37 | 96.0  | 71.8    | 47  | 24.8     | 1.90           |
|                                    | 45           | 0.94 | 2.43 | 98.3  | 68.4    | 45  | 23.4     | 1.92           |
|                                    | 46           | 1.06 | 2.67 | 99.1  | 70.1    | 47  | 23.1     | 2.03           |
|                                    | 47           | 1.05 | 2.95 | 102.0 | 63.9    | 41  | 22.9     | 1.79           |
|                                    | 48           | 1.18 | 2.75 | 101.6 | 67.0    | 44  | 23.0     | 1.91           |
|                                    | 49           | 1.07 | 2.47 | 100.4 | 61.4    | 41  | 20.4     | 2.01           |
|                                    | 50           | 1.16 | 2.76 | 99.4  | 71.4    | 46  | 25.4     | 1.81           |
| 4 (1.207)                          | 61           | 0.96 | 2.30 | 100.4 | 66.6    | 43  | 23.6     | 1.82           |
|                                    | 62           | 0.93 | 2.22 | 99.1  | 68.3    | 45  | 23.3     | 1.93           |
|                                    | 63           | 1.05 | 2.58 | 98.9  | 63.2    | 42  | 21.2     | 1.98           |
|                                    | 64           | 1.13 | 2.55 | 99.1  | 64.6    | 43  | 21.6     | 1.99           |
|                                    | 65           | 1.01 | 2.40 | 99.6  | 67.0    | 45  | 22.0     | 2.05           |
|                                    | 66           | 0.99 | 2.63 | 96.2  | 70.1    | 45  | 25.1     | 1.79           |
|                                    | 67           | 1.14 | 2.67 | 97.3  | 64.4    | 42  | 22.4     | 1.88           |
|                                    | 68           | 0.96 | 2.32 | 99.7  | 66.1    | 43  | 23.1     | 1.86           |
|                                    | 69           | 0.88 | 2.85 | 100.4 | 65.0    | 42  | 23.0     | 1.83           |
|                                    | 70           | 1.01 | 2.53 | 97.0  | 66.7    | 43  | 23.7     | 1.81           |

Abbreviations and units are explained in Clinical chemistry

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Clinical chemistry

Individual values

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | ALAT | ASAT | ALKPH | TBILI | GGT  | CHOL | TRIG |
|------------------------------------|--------------|------|------|-------|-------|------|------|------|
| 1 (0)                              | 11           | 0.91 | 1.56 | 1.03  | 0.9   | <LOD | 2.36 | 0.60 |
|                                    | 12           | 1.75 | 2.34 | 1.43  | 0.9   | <LOD | 3.15 | 1.62 |
|                                    | 13           | 1.66 | 1.57 | 0.93  | 1.1   | <LOD | 3.01 | 1.93 |
|                                    | 14           | 1.10 | 1.40 | 1.08  | 1.2   | <LOD | 2.63 | 1.05 |
|                                    | 15           | 1.31 | 1.73 | 1.10  | 1.1   | <LOD | 2.85 | 1.35 |
|                                    | 16           | 1.13 | 1.85 | 1.12  | 1.3   | <LOD | 3.56 | 0.97 |
|                                    | 17           | 0.93 | 1.31 | 1.37  | 0.9   | <LOD | 3.06 | 0.55 |
|                                    | 18           | 0.84 | 1.20 | 1.35  | 0.9   | <LOD | 2.83 | 0.65 |
|                                    | 19           | 1.85 | 1.75 | 1.41  | 0.9   | <LOD | 2.65 | 1.03 |
|                                    | 20           | 3.21 | 5.34 | 0.92  | 1.6   | <LOD | 2.64 | 1.51 |
| 2 (0.121)                          | 31           | 1.23 | 1.14 | 1.19  | 1.1   | <LOD | 2.55 | 2.33 |
|                                    | 32           | 0.96 | 1.47 | 1.36  | 1.5   | <LOD | 2.25 | 0.85 |
|                                    | 33           | 1.24 | 1.56 | 2.42  | 1.0   | <LOD | 3.10 | 1.13 |
|                                    | 34           | 1.07 | 1.28 | 1.20  | 0.9   | <LOD | 3.17 | 1.47 |
|                                    | 35           | 1.12 | 1.42 | 0.89  | 0.9   | <LOD | 3.25 | 1.46 |
|                                    | 36           | 0.91 | 1.47 | 1.14  | 1.2   | <LOD | 2.36 | 0.75 |
|                                    | 37           | 1.74 | 1.27 | 1.06  | 0.8   | <LOD | 2.54 | 2.90 |
|                                    | 38           | 1.11 | 1.32 | 1.28  | 0.9   | <LOD | 2.42 | 1.72 |
|                                    | 39           | 1.21 | 1.43 | 1.02  | 0.9   | <LOD | 2.78 | 1.58 |
|                                    | 40           | 1.26 | 1.58 | 1.47  | 1.3   | <LOD | 2.67 | 1.78 |

Abbreviations and units are explained in Clinical chemistry

Limit of detection for GGT = 0.03

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Clinical chemistry

Individual values

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | ALAT | ASAT | ALKPH | TBILI | GGT  | CHOL | TRIG |
|------------------------------------|--------------|------|------|-------|-------|------|------|------|
| 3 (0.398)                          | 51           | 1.02 | 1.54 | 1.72  | 1.3   | <LOD | 3.03 | 1.15 |
|                                    | 52           | 1.01 | 1.40 | 1.54  | 1.1   | <LOD | 2.51 | 1.13 |
|                                    | 53           | 1.10 | 1.38 | 1.60  | 1.2   | <LOD | 1.88 | 1.42 |
|                                    | 54           | 1.15 | 1.63 | 1.77  | 1.2   | <LOD | 2.27 | 0.79 |
|                                    | 55           | 1.44 | 2.27 | 1.21  | 1.2   | <LOD | 2.50 | 1.28 |
|                                    | 56           | 0.95 | 1.63 | 1.03  | 1.3   | <LOD | 2.82 | 1.23 |
|                                    | 57           | 0.82 | 1.20 | 6.44  | 1.3   | <LOD | 1.74 | 0.66 |
|                                    | 58           | 1.11 | 1.44 | 1.37  | 0.7   | <LOD | 2.85 | 1.48 |
|                                    | 59           | 0.68 | 1.08 | 0.83  | 1.2   | <LOD | 3.30 | 0.66 |
|                                    | 60           | 1.31 | 1.75 | 1.06  | 1.2   | <LOD | 3.52 | 1.05 |
| 4 (1.207)                          | 71           | 1.83 | 2.58 | 1.44  | 0.5   | <LOD | 2.75 | 2.71 |
|                                    | 72           | 1.28 | 1.46 | 1.41  | 0.7   | <LOD | 2.37 | 1.35 |
|                                    | 73           | 1.08 | 1.69 | 0.89  | 0.9   | <LOD | 2.48 | 0.90 |
|                                    | 74           | 1.18 | 1.49 | 1.71  | 1.1   | <LOD | 2.47 | 0.69 |
|                                    | 75           | 1.19 | 1.46 | 1.16  | 1.0   | <LOD | 2.86 | 0.63 |
|                                    | 76           | 1.36 | 1.62 | 1.02  | 1.0   | <LOD | 2.34 | 1.08 |
|                                    | 77           | 1.11 | 1.44 | 1.12  | 1.2   | <LOD | 2.64 | 0.51 |
|                                    | 78           | 0.81 | 1.44 | 1.38  | 1.1   | <LOD | 2.07 | 0.37 |
|                                    | 79           | 0.93 | 1.39 | 1.42  | 0.6   | <LOD | 2.81 | 1.93 |
|                                    | 80           | 0.94 | 1.34 | 1.61  | 1.0   | <LOD | 2.33 | 1.61 |

Abbreviations and units are explained in Clinical chemistry

Limit of detection for GGT = 0.03

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Clinical chemistry

Individual values

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | UREA  | CREAT | GLUC | Na    | K    | Ca   |
|------------------------------------|--------------|-------|-------|------|-------|------|------|
| 1 (0)                              | 11           | 9.27  | 35    | 6.8  | 147.0 | 7.17 | 2.81 |
|                                    | 12           | 10.36 | 23    | 5.8  | 146.4 | 7.66 | 2.95 |
|                                    | 13           | 7.73  | 26    | 5.6  | 144.3 | 7.61 | 2.88 |
|                                    | 14           | 7.67  | 26    | 6.3  | 146.5 | 6.69 | 2.97 |
|                                    | 15           | 7.77  | 27    | 6.7  | 146.4 | 6.61 | 2.95 |
|                                    | 16           | 8.22  | 27    | 9.7  | 144.1 | 6.50 | 2.90 |
|                                    | 17           | 6.87  | 28    | 6.3  | 145.5 | 6.90 | 2.88 |
|                                    | 18           | 6.04  | 25    | 6.3  | 143.9 | 7.08 | 2.90 |
|                                    | 19           | 7.54  | 25    | 7.1  | 141.3 | 7.56 | 2.88 |
|                                    | 20           | 6.87  | 24    | 6.8  | 141.7 | 8.09 | 3.00 |
| 2 (0.121)                          | 31           | 8.46  | 30    | 7.1  | 146.2 | 6.70 | 2.99 |
|                                    | 32           | 6.39  | 35    | 6.7  | 146.1 | 6.60 | 2.91 |
|                                    | 33           | 9.09  | 27    | 7.7  | 142.8 | 7.83 | 2.94 |
|                                    | 34           | 8.41  | 27    | 6.7  | 142.6 | 7.10 | 2.85 |
|                                    | 35           | 8.63  | 25    | 6.5  | 146.6 | 5.90 | 2.86 |
|                                    | 36           | 6.64  | 26    | 11.8 | 142.1 | 5.27 | 2.98 |
|                                    | 37           | 10.38 | 28    | 6.3  | 145.5 | 6.84 | 2.89 |
|                                    | 38           | 7.14  | 26    | 6.0  | 145.4 | 6.66 | 2.92 |
|                                    | 39           | 8.21  | 27    | 7.0  | 143.0 | 7.05 | 2.93 |
|                                    | 40           | 7.66  | 21    | 6.5  | 142.4 | 7.00 | 2.84 |

Abbreviations and units are explained in Clinical chemistry



Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Clinical chemistry

Individual values

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | UREA  | CREAT | GLUC | Na    | K    | Ca   |
|------------------------------------|--------------|-------|-------|------|-------|------|------|
| 3 (0.398)                          | 51           | 8.89  | 29    | 8.6  | 145.7 | 6.68 | 3.08 |
|                                    | 52           | 7.07  | 27    | 7.8  | 149.2 | 6.25 | 2.94 |
|                                    | 53           | 10.51 | 28    | 6.1  | 145.8 | 7.30 | 3.04 |
|                                    | 54           | 7.68  | 28    | 7.8  | 145.0 | 6.80 | 2.98 |
|                                    | 55           | 7.54  | 26    | 6.4  | 144.5 | 6.50 | 2.92 |
|                                    | 56           | 7.48  | 34    | 5.7  | 142.4 | 7.94 | 2.85 |
|                                    | 57           | 6.01  | 23    | 7.1  | 144.5 | 6.19 | 2.88 |
|                                    | 58           | 8.55  | 24    | 7.0  | 141.6 | 7.33 | 3.06 |
|                                    | 59           | 5.01  | 26    | 6.3  | 141.9 | 7.31 | 2.86 |
|                                    | 60           | 5.58  | 25    | 6.9  | 143.6 | 7.36 | 2.85 |
| 4 (1.207)                          | 71           | 9.59  | 27    | 6.1  | 146.4 | 6.83 | 2.94 |
|                                    | 72           | 8.20  | 25    | 7.3  | 147.1 | 6.74 | 2.94 |
|                                    | 73           | 7.02  | 25    | 6.8  | 143.2 | 7.49 | 2.78 |
|                                    | 74           | 9.46  | 27    | 6.9  | 145.0 | 7.42 | 2.90 |
|                                    | 75           | 8.73  | 30    | 6.3  | 147.1 | 7.26 | 2.86 |
|                                    | 76           | 8.75  | 26    | 9.1  | 141.7 | 8.60 | 3.00 |
|                                    | 77           | 7.69  | 28    | 6.6  | 144.8 | 6.72 | 2.85 |
|                                    | 78           | 8.26  | 30    | 7.3  | 142.8 | 7.81 | 2.89 |
|                                    | 79           | 8.53  | 26    | 6.5  | 144.8 | 6.81 | 2.84 |
|                                    | 80           | 8.13  | 26    | 7.0  | 144.4 | 6.31 | 2.83 |

Abbreviations and units are explained in Clinical chemistry

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Clinical chemistry

Individual values

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | Mg   | P    | Cl    | PROTEIN | ALB | GLOBULIN | ALB/G<br>Ratio |
|------------------------------------|--------------|------|------|-------|---------|-----|----------|----------------|
| 1 (0)                              | 11           | 1.12 | 1.86 | 102.2 | 65.5    | 45  | 20.5     | 2.20           |
|                                    | 12           | 1.10 | 2.36 | 102.7 | 67.2    | 47  | 20.2     | 2.33           |
|                                    | 13           | 1.12 | 2.28 | 100.3 | 64.9    | 45  | 19.9     | 2.26           |
|                                    | 14           | 1.08 | 2.15 | 100.2 | 67.4    | 47  | 20.4     | 2.30           |
|                                    | 15           | 1.06 | 1.89 | 100.8 | 70.4    | 50  | 20.4     | 2.45           |
|                                    | 16           | 1.01 | 2.05 | 100.1 | 71.0    | 51  | 20.0     | 2.55           |
|                                    | 17           | 1.03 | 2.34 | 99.6  | 63.9    | 47  | 16.9     | 2.78           |
|                                    | 18           | 1.13 | 2.65 | 100.4 | 66.2    | 47  | 19.2     | 2.45           |
|                                    | 19           | 1.07 | 2.03 | 97.4  | 65.8    | 46  | 19.8     | 2.32           |
|                                    | 20           | 1.02 | 2.72 | 98.1  | 68.3    | 49  | 19.3     | 2.54           |
| 2 (0.121)                          | 31           | 1.08 | 2.24 | 99.0  | 70.2    | 51  | 19.2     | 2.66           |
|                                    | 32           | 1.18 | 2.11 | 100.3 | 68.2    | 48  | 20.2     | 2.38           |
|                                    | 33           | 1.13 | 2.34 | 99.3  | 66.5    | 47  | 19.5     | 2.41           |
|                                    | 34           | 1.11 | 1.88 | 99.2  | 70.3    | 49  | 21.3     | 2.30           |
|                                    | 35           | 0.96 | 2.48 | 102.0 | 60.4    | 42  | 18.4     | 2.28           |
|                                    | 36           | 1.17 | 2.30 | 104.6 | 64.5    | 44  | 20.5     | 2.15           |
|                                    | 37           | 1.04 | 1.98 | 100.1 | 68.6    | 50  | 18.6     | 2.69           |
|                                    | 38           | 1.07 | 2.18 | 97.6  | 68.4    | 48  | 20.4     | 2.35           |
|                                    | 39           | 1.10 | 2.25 | 98.4  | 68.6    | 46  | 22.6     | 2.04           |
|                                    | 40           | 0.97 | 1.92 | 99.4  | 66.0    | 47  | 19.0     | 2.47           |

Abbreviations and units are explained in Clinical chemistry

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Clinical chemistry

Individual values

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | Mg   | P    | Cl    | PROTEIN | ALB | GLOBULIN | ALB/G<br>Ratio |
|------------------------------------|--------------|------|------|-------|---------|-----|----------|----------------|
| 3 (0.398)                          | 51           | 1.29 | 2.29 | 102.9 | 70.0    | 50  | 20.0     | 2.50           |
|                                    | 52           | 0.99 | 2.22 | 101.4 | 66.2    | 47  | 19.2     | 2.45           |
|                                    | 53           | 1.04 | 2.12 | 100.6 | 70.0    | 51  | 19.0     | 2.68           |
|                                    | 54           | 1.15 | 1.67 | 100.6 | 71.8    | 54  | 17.8     | 3.03           |
|                                    | 55           | 1.07 | 2.29 | 100.5 | 65.7    | 47  | 18.7     | 2.51           |
|                                    | 56           | 1.09 | 1.72 | 100.6 | 69.3    | 49  | 20.3     | 2.41           |
|                                    | 57           | 1.02 | 2.22 | 100.4 | 65.3    | 44  | 21.3     | 2.07           |
|                                    | 58           | 1.07 | 2.43 | 100.6 | 68.4    | 50  | 18.4     | 2.72           |
|                                    | 59           | 0.98 | 2.35 | 100.5 | 64.1    | 45  | 19.1     | 2.36           |
|                                    | 60           | 1.10 | 2.32 | 98.3  | 65.6    | 46  | 19.6     | 2.35           |
| 4 (1.207)                          | 71           | 1.05 | 2.15 | 99.2  | 71.0    | 49  | 22.0     | 2.23           |
|                                    | 72           | 1.00 | 2.13 | 101.3 | 67.1    | 45  | 22.1     | 2.04           |
|                                    | 73           | 1.03 | 2.15 | 99.9  | 64.6    | 46  | 18.6     | 2.47           |
|                                    | 74           | 1.10 | 2.28 | 100.9 | 64.8    | 48  | 16.8     | 2.86           |
|                                    | 75           | 1.14 | 2.40 | 101.0 | 64.1    | 46  | 18.1     | 2.54           |
|                                    | 76           | 1.20 | 2.05 | 100.9 | 66.8    | 46  | 20.8     | 2.21           |
|                                    | 77           | 1.09 | 1.50 | 102.1 | 67.9    | 47  | 20.9     | 2.25           |
|                                    | 78           | 1.03 | 1.81 | 102.8 | 66.2    | 48  | 18.2     | 2.64           |
|                                    | 79           | 0.97 | 2.12 | 99.4  | 64.8    | 47  | 17.8     | 2.64           |
|                                    | 80           | 0.91 | 1.66 | 98.3  | 68.0    | 49  | 19.0     | 2.58           |

Abbreviations and units are explained in Clinical chemistry

**Table 26 Absolute and relative organ weight – Individual values**

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Absolute (mg) organ weight

Individual values - Day 91/92

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | ADRENALS | BRAIN | EPIDI-<br>DYMIDES | HEART | KIDNEYS |
|------------------------------------|--------------|----------|-------|-------------------|-------|---------|
| 1 (0)                              | 1            | 59       | 2372  | 1523              | 1576  | 3227    |
|                                    | 2            | 64       | 2290  | 1470              | 1852  | 3725    |
|                                    | 3            | 48       | 2061  | 1375              | 1432  | 3611    |
|                                    | 4            | 49       | 2330  | 1440              | 1604  | 3110    |
|                                    | 5            | 64       | 2473  | 1469              | 1755  | 3183    |
|                                    | 6            | 56       | 1904  | 1914              | 1807  | 3616    |
|                                    | 7            | 45       | 2298  | 1472              | 1760  | 3370    |
|                                    | 8            | 47       | 2424  | 1500              | 2304  | 3283    |
|                                    | 9            | 58       | 2224  | 1226              | 1734  | 3432    |
|                                    | 10           | 54       | 2371  | 1388              | 1449  | 2967    |
| 2 (0.121)                          | 21           | 55       | 2087  | 1704              | 1456  | 3359    |
|                                    | 22           | 60       | 2376  | 1628              | 1629  | 3142    |
|                                    | 23           | 50       | 2345  | 1557              | 1644  | 3371    |
|                                    | 24           | 40       | 2330  | 1381              | 1662  | 2898    |
|                                    | 25           | 58       | 2199  | 1460              | 1558  | 3261    |
|                                    | 26           | 37       | 2402  | 1483              | 1860  | 3749    |
|                                    | 27           | 70       | 2379  | 1810              | 1842  | 3685    |
|                                    | 28           | 51       | 2333  | 1569              | 1740  | 3569    |
|                                    | 29           | 65       | 2350  | 1502              | 1576  | 3685    |
|                                    | 30           | 48       | 2347  | 1557              | 1716  | 3376    |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Absolute (mg) organ weight

Individual values - Day 91/92

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | ADRENALS | BRAIN | EPIDI-<br>DYMIDES | HEART | KIDNEYS |
|------------------------------------|--------------|----------|-------|-------------------|-------|---------|
| 3 (0.398)                          | 41           | 53       | 2333  | 1643              | 2306  | 4143    |
|                                    | 42           | 57       | 2338  | 1696              | 1543  | 2873    |
|                                    | 43           | 56       | 2266  | 1477              | 1431  | 3155    |
|                                    | 44           | 56       | 2221  | 1557              | 1742  | 3358    |
|                                    | 45           | 61       | 2357  | 1493              | 1703  | 3384    |
|                                    | 46           | 42       | 2323  | 1584              | 1714  | 3277    |
|                                    | 47           | 54       | 2357  | 1424              | 2016  | 3405    |
|                                    | 48           | 73       | 2204  | 1474              | 1860  | 3537    |
|                                    | 49           | 49       | 2208  | 1523              | 1574  | 3129    |
|                                    | 50           | 71       | 2381  | 1404              | 1870  | 3949    |
| 4 (1.207)                          | 61           | 53       | 2305  | 1432              | 1807  | 3423    |
|                                    | 62           | 47       | 2309  | 1606              | 1842  | 3467    |
|                                    | 63           | 47       | 2232  | 1281              | 1686  | 2996    |
|                                    | 64           | 54       | 2298  | 1808              | 1499  | 3495    |
|                                    | 65           | 70       | 2312  | 1477              | 1951  | 3659    |
|                                    | 66           | 69       | 2171  | 1545              | 1658  | 3033    |
|                                    | 67           | 52       | 2420  | 1436              | 1881  | 3454    |
|                                    | 68           | 50       | 2457  | 1533              | 1787  | 3525    |
|                                    | 69           | 65       | 2270  | 1427              | 1789  | 3416    |
|                                    | 70           | 78       | 2253  | 1401              | 1639  | 3344    |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Absolute (mg) organ weight

Individual values - Day 91/92

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | LIVER | PITUI-<br>TARY | PROSTATE | SPLEEN | TESTES | THYMUS |
|------------------------------------|--------------|-------|----------------|----------|--------|--------|--------|
| 1 (0)                              | 1            | 17070 | 16             | 738      | 1071   | 3831   | 398    |
|                                    | 2            | 22283 | 18             | 706      | 1123   | 4228   | 539    |
|                                    | 3            | 18787 | 14             | 809      | 926    | 3909   | 420    |
|                                    | 4            | 16229 | 13             | 672      | 842    | 3972   | 529    |
|                                    | 5            | 18488 | 13             | 684      | 900    | 4163   | 326    |
|                                    | 6            | 21403 | 12             | 965      | 1409   | 5020   | 440    |
|                                    | 7            | 18882 | 15             | 794      | 952    | 4021   | 568    |
|                                    | 8            | 19559 | 15             | 1101     | 1143   | 4038   | 614    |
|                                    | 9            | 21183 | 13             | 820      | 1127   | 3876   | 710    |
|                                    | 10           | 15424 | 14             | 678      | 761    | 3991   | 482    |
| 2 (0.121)                          | 21           | 20971 | 14             | 604      | 1024   | 4030   | 445    |
|                                    | 22           | 19978 | 15             | 657      | 1089   | 4159   | 488    |
|                                    | 23           | 20873 | 14             | 775      | 981    | 4266   | 357    |
|                                    | 24           | 14922 | 11             | 592      | 977    | 4043   | 343    |
|                                    | 25           | 17014 | 14             | 602      | 956    | 3983   | 456    |
|                                    | 26           | 22185 | 15             | 794      | 1503   | 4223   | 376    |
|                                    | 27           | 24185 | 15             | 660      | 1046   | 4149   | 323    |
|                                    | 28           | 21396 | 17             | 549      | 960    | 3956   | 590    |
|                                    | 29           | 17896 | 14             | 501      | 955    | 3934   | 629    |
|                                    | 30           | 21888 | 15             | 637      | 1050   | 4209   | 449    |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Absolute (mg) organ weight

Individual values - Day 91/92

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | LIVER | PITUI-<br>TARY | PROSTATE | SPLEEN | TESTES | THYMUS |
|------------------------------------|--------------|-------|----------------|----------|--------|--------|--------|
| 3 (0.398)                          | 41           | 22541 | 15             | 754      | 1050   | 4197   | 542    |
|                                    | 42           | 18349 | 12             | 745      | 877    | 3947   | 404    |
|                                    | 43           | 17588 | 14             | 844      | 886    | 3752   | 341    |
|                                    | 44           | 20704 | 14             | 837      | 950    | 4173   | 385    |
|                                    | 45           | 22023 | 8              | 542      | 1218   | 3855   | 494    |
|                                    | 46           | 21117 | 14             | 904      | 843    | 3974   | 450    |
|                                    | 47           | 19704 | 13             | 824      | 1305   | 3730   | 279    |
|                                    | 48           | 19982 | 16             | 642      | 1133   | 3743   | 575    |
|                                    | 49           | 18734 | 14             | 867      | 792    | 3701   | 348    |
|                                    | 50           | 22824 | 14             | 699      | 1377   | 4639   | 329    |
| 4 (1.207)                          | 61           | 18357 | 16             | 825      | 1080   | 3922   | 417    |
|                                    | 62           | 21051 | 15             | 611      | 789    | 3637   | 407    |
|                                    | 63           | 16237 | 12             | 743      | 758    | 3570   | 538    |
|                                    | 64           | 17022 | 9              | 611      | 863    | 4050   | 158    |
|                                    | 65           | 22852 | 12             | 784      | 1105   | 3746   | 476    |
|                                    | 66           | 18740 | 19             | 868      | 1161   | 3792   | 447    |
|                                    | 67           | 20482 | 15             | 723      | 1043   | 3653   | 435    |
|                                    | 68           | 19153 | 12             | 851      | 1143   | 4604   | 420    |
|                                    | 69           | 21767 | 13             | 715      | 1167   | 4145   | 500    |
|                                    | 70           | 18605 | 13             | 865      | 1132   | 4127   | 424    |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Relative (% of body wt) organ weight

Individual values - Day 91/92

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | BODY<br>WT, g | ADRENALS | BRAIN | EPIDI-<br>DYMIDES | HEART | KIDNEYS |
|------------------------------------|--------------|---------------|----------|-------|-------------------|-------|---------|
| 1 (0)                              | 1            | 558           | 0.0106   | 0.425 | 0.273             | 0.282 | 0.578   |
|                                    | 2            | 597           | 0.0107   | 0.384 | 0.246             | 0.310 | 0.624   |
|                                    | 3            | 493           | 0.0097   | 0.418 | 0.279             | 0.290 | 0.732   |
|                                    | 4            | 472           | 0.0104   | 0.494 | 0.305             | 0.340 | 0.659   |
|                                    | 5            | 489           | 0.0131   | 0.506 | 0.300             | 0.359 | 0.651   |
|                                    | 6            | 573           | 0.0098   | 0.332 | 0.334             | 0.315 | 0.631   |
|                                    | 7            | 531           | 0.0085   | 0.433 | 0.277             | 0.331 | 0.635   |
|                                    | 8            | 561           | 0.0084   | 0.432 | 0.267             | 0.411 | 0.585   |
|                                    | 9            | 569           | 0.0102   | 0.391 | 0.215             | 0.305 | 0.603   |
|                                    | 10           | 476           | 0.0113   | 0.498 | 0.292             | 0.304 | 0.623   |
| 2 (0.121)                          | 21           | 530           | 0.0104   | 0.394 | 0.322             | 0.275 | 0.634   |
|                                    | 22           | 538           | 0.0112   | 0.442 | 0.303             | 0.303 | 0.584   |
|                                    | 23           | 507           | 0.0099   | 0.463 | 0.307             | 0.324 | 0.665   |
|                                    | 24           | 458           | 0.0087   | 0.509 | 0.302             | 0.363 | 0.633   |
|                                    | 25           | 480           | 0.0121   | 0.458 | 0.304             | 0.325 | 0.679   |
|                                    | 26           | 566           | 0.0065   | 0.424 | 0.262             | 0.329 | 0.662   |
|                                    | 27           | 576           | 0.0122   | 0.413 | 0.314             | 0.320 | 0.640   |
|                                    | 28           | 521           | 0.0098   | 0.448 | 0.301             | 0.334 | 0.685   |
|                                    | 29           | 529           | 0.0123   | 0.444 | 0.284             | 0.298 | 0.697   |
|                                    | 30           | 556           | 0.0086   | 0.422 | 0.280             | 0.309 | 0.607   |



Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Relative (% of body wt) organ weight

Individual values - Day 91/92

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | BODY<br>WT, g | ADRENALS | BRAIN | EPIDI-<br>DYMIDES | HEART | KIDNEYS |
|------------------------------------|--------------|---------------|----------|-------|-------------------|-------|---------|
| 3 (0.398)                          | 41           | 599           | 0.0088   | 0.389 | 0.274             | 0.385 | 0.692   |
|                                    | 42           | 490           | 0.0116   | 0.477 | 0.346             | 0.315 | 0.586   |
|                                    | 43           | 470           | 0.0119   | 0.482 | 0.314             | 0.304 | 0.671   |
|                                    | 44           | 524           | 0.0107   | 0.424 | 0.297             | 0.332 | 0.641   |
|                                    | 45           | 522           | 0.0117   | 0.452 | 0.286             | 0.326 | 0.648   |
|                                    | 46           | 472           | 0.0089   | 0.492 | 0.336             | 0.363 | 0.694   |
|                                    | 47           | 514           | 0.0105   | 0.459 | 0.277             | 0.392 | 0.662   |
|                                    | 48           | 557           | 0.0131   | 0.396 | 0.265             | 0.334 | 0.635   |
|                                    | 49           | 487           | 0.0101   | 0.453 | 0.313             | 0.323 | 0.643   |
|                                    | 50           | 526           | 0.0135   | 0.453 | 0.267             | 0.356 | 0.751   |
| 4 (1.207)                          | 61           | 520           | 0.0102   | 0.443 | 0.275             | 0.348 | 0.658   |
|                                    | 62           | 510           | 0.0092   | 0.453 | 0.315             | 0.361 | 0.680   |
|                                    | 63           | 498           | 0.0094   | 0.448 | 0.257             | 0.339 | 0.602   |
|                                    | 64           | 519           | 0.0104   | 0.443 | 0.348             | 0.289 | 0.673   |
|                                    | 65           | 543           | 0.0129   | 0.426 | 0.272             | 0.359 | 0.674   |
|                                    | 66           | 488           | 0.0141   | 0.445 | 0.317             | 0.340 | 0.622   |
|                                    | 67           | 558           | 0.0093   | 0.434 | 0.257             | 0.337 | 0.619   |
|                                    | 68           | 504           | 0.0099   | 0.488 | 0.304             | 0.355 | 0.699   |
|                                    | 69           | 576           | 0.0113   | 0.394 | 0.248             | 0.311 | 0.593   |
|                                    | 70           | 527           | 0.0148   | 0.428 | 0.266             | 0.311 | 0.635   |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Relative (% of body wt) organ weight

Individual values - Day 91/92

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | LIVER | PITUI-<br>TARY | PROSTATE | SPLEEN | TESTES | THYMUS |
|------------------------------------|--------------|-------|----------------|----------|--------|--------|--------|
| 1 (0)                              | 1            | 3.06  | 0.00287        | 0.132    | 0.192  | 0.687  | 0.0713 |
|                                    | 2            | 3.73  | 0.00302        | 0.118    | 0.188  | 0.708  | 0.0903 |
|                                    | 3            | 3.81  | 0.00284        | 0.164    | 0.188  | 0.793  | 0.0852 |
|                                    | 4            | 3.44  | 0.00275        | 0.142    | 0.178  | 0.842  | 0.1121 |
|                                    | 5            | 3.78  | 0.00266        | 0.140    | 0.184  | 0.851  | 0.0667 |
|                                    | 6            | 3.74  | 0.00209        | 0.168    | 0.246  | 0.876  | 0.0768 |
|                                    | 7            | 3.56  | 0.00282        | 0.150    | 0.179  | 0.757  | 0.1070 |
|                                    | 8            | 3.49  | 0.00267        | 0.196    | 0.204  | 0.720  | 0.1094 |
|                                    | 9            | 3.72  | 0.00228        | 0.144    | 0.198  | 0.681  | 0.1248 |
|                                    | 10           | 3.24  | 0.00294        | 0.142    | 0.160  | 0.838  | 0.1013 |
| 2 (0.121)                          | 21           | 3.96  | 0.00264        | 0.114    | 0.193  | 0.760  | 0.0840 |
|                                    | 22           | 3.71  | 0.00279        | 0.122    | 0.202  | 0.773  | 0.0907 |
|                                    | 23           | 4.12  | 0.00276        | 0.153    | 0.193  | 0.841  | 0.0704 |
|                                    | 24           | 3.26  | 0.00240        | 0.129    | 0.213  | 0.883  | 0.0749 |
|                                    | 25           | 3.54  | 0.00292        | 0.125    | 0.199  | 0.830  | 0.0950 |
|                                    | 26           | 3.92  | 0.00265        | 0.140    | 0.266  | 0.746  | 0.0664 |
|                                    | 27           | 4.20  | 0.00260        | 0.115    | 0.182  | 0.720  | 0.0561 |
|                                    | 28           | 4.11  | 0.00326        | 0.105    | 0.184  | 0.759  | 0.1132 |
|                                    | 29           | 3.38  | 0.00265        | 0.095    | 0.181  | 0.744  | 0.1189 |
|                                    | 30           | 3.94  | 0.00270        | 0.115    | 0.189  | 0.757  | 0.0808 |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Relative (% of body wt) organ weight

Individual values - Day 91/92

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | LIVER | PITUI-<br>TARY | PROSTATE | SPLEEN | TESTES | THYMUS |
|------------------------------------|--------------|-------|----------------|----------|--------|--------|--------|
| 3 (0.398)                          | 41           | 3.76  | 0.00250        | 0.126    | 0.175  | 0.701  | 0.0905 |
|                                    | 42           | 3.74  | 0.00245        | 0.152    | 0.179  | 0.806  | 0.0824 |
|                                    | 43           | 3.74  | 0.00298        | 0.180    | 0.189  | 0.798  | 0.0726 |
|                                    | 44           | 3.95  | 0.00267        | 0.160    | 0.181  | 0.796  | 0.0735 |
|                                    | 45           | 4.22  | 0.00153        | 0.104    | 0.233  | 0.739  | 0.0946 |
|                                    | 46           | 4.47  | 0.00297        | 0.192    | 0.179  | 0.842  | 0.0953 |
|                                    | 47           | 3.83  | 0.00253        | 0.160    | 0.254  | 0.726  | 0.0543 |
|                                    | 48           | 3.59  | 0.00287        | 0.115    | 0.203  | 0.672  | 0.1032 |
|                                    | 49           | 3.85  | 0.00287        | 0.178    | 0.163  | 0.760  | 0.0715 |
|                                    | 50           | 4.34  | 0.00266        | 0.133    | 0.262  | 0.882  | 0.0625 |
| 4 (1.207)                          | 61           | 3.53  | 0.00308        | 0.159    | 0.208  | 0.754  | 0.0802 |
|                                    | 62           | 4.13  | 0.00294        | 0.120    | 0.155  | 0.713  | 0.0798 |
|                                    | 63           | 3.26  | 0.00241        | 0.149    | 0.152  | 0.717  | 0.1080 |
|                                    | 64           | 3.28  | 0.00173        | 0.118    | 0.166  | 0.780  | 0.0304 |
|                                    | 65           | 4.21  | 0.00221        | 0.144    | 0.203  | 0.690  | 0.0877 |
|                                    | 66           | 3.84  | 0.00389        | 0.178    | 0.238  | 0.777  | 0.0916 |
|                                    | 67           | 3.67  | 0.00269        | 0.130    | 0.187  | 0.655  | 0.0780 |
|                                    | 68           | 3.80  | 0.00238        | 0.169    | 0.227  | 0.913  | 0.0833 |
|                                    | 69           | 3.78  | 0.00226        | 0.124    | 0.203  | 0.720  | 0.0868 |
|                                    | 70           | 3.53  | 0.00247        | 0.164    | 0.215  | 0.783  | 0.0805 |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Relative (% of brain wt) organ weight

Individual values - Day 91/92

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | ADRENALS | EPIDI-<br>DYMIDES | HEART | KIDNEYS |
|------------------------------------|--------------|----------|-------------------|-------|---------|
| 1 (0)                              | 1            | 2.49     | 64.2              | 66.4  | 136.0   |
|                                    | 2            | 2.79     | 64.2              | 80.9  | 162.7   |
|                                    | 3            | 2.33     | 66.7              | 69.5  | 175.2   |
|                                    | 4            | 2.10     | 61.8              | 68.8  | 133.5   |
|                                    | 5            | 2.59     | 59.4              | 71.0  | 128.7   |
|                                    | 6            | 2.94     | 100.5             | 94.9  | 189.9   |
|                                    | 7            | 1.96     | 64.1              | 76.6  | 146.6   |
|                                    | 8            | 1.94     | 61.9              | 95.0  | 135.4   |
|                                    | 9            | 2.61     | 55.1              | 78.0  | 154.3   |
|                                    | 10           | 2.28     | 58.5              | 61.1  | 125.1   |
| 2 (0.121)                          | 21           | 2.64     | 81.6              | 69.8  | 160.9   |
|                                    | 22           | 2.53     | 68.5              | 68.6  | 132.2   |
|                                    | 23           | 2.13     | 66.4              | 70.1  | 143.8   |
|                                    | 24           | 1.72     | 59.3              | 71.3  | 124.4   |
|                                    | 25           | 2.64     | 66.4              | 70.9  | 148.3   |
|                                    | 26           | 1.54     | 61.7              | 77.4  | 156.1   |
|                                    | 27           | 2.94     | 76.1              | 77.4  | 154.9   |
|                                    | 28           | 2.19     | 67.3              | 74.6  | 153.0   |
|                                    | 29           | 2.77     | 63.9              | 67.1  | 156.8   |
|                                    | 30           | 2.05     | 66.3              | 73.1  | 143.8   |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Relative (% of brain wt) organ weight

Individual values - Day 91/92

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | ADRENALS | EPIDI-<br>DYMIDES | HEART | KIDNEYS |
|------------------------------------|--------------|----------|-------------------|-------|---------|
| 3 (0.398)                          | 41           | 2.27     | 70.4              | 98.8  | 177.6   |
|                                    | 42           | 2.44     | 72.5              | 66.0  | 122.9   |
|                                    | 43           | 2.47     | 65.2              | 63.2  | 139.2   |
|                                    | 44           | 2.52     | 70.1              | 78.4  | 151.2   |
|                                    | 45           | 2.59     | 63.3              | 72.3  | 143.6   |
|                                    | 46           | 1.81     | 68.2              | 73.8  | 141.1   |
|                                    | 47           | 2.29     | 60.4              | 85.5  | 144.5   |
|                                    | 48           | 3.31     | 66.9              | 84.4  | 160.5   |
|                                    | 49           | 2.22     | 69.0              | 71.3  | 141.7   |
|                                    | 50           | 2.98     | 59.0              | 78.5  | 165.9   |
| 4 (1.207)                          | 61           | 2.30     | 62.1              | 78.4  | 148.5   |
|                                    | 62           | 2.04     | 69.6              | 79.8  | 150.2   |
|                                    | 63           | 2.11     | 57.4              | 75.5  | 134.2   |
|                                    | 64           | 2.35     | 78.7              | 65.2  | 152.1   |
|                                    | 65           | 3.03     | 63.9              | 84.4  | 158.3   |
|                                    | 66           | 3.18     | 71.2              | 76.4  | 139.7   |
|                                    | 67           | 2.15     | 59.3              | 77.7  | 142.7   |
|                                    | 68           | 2.04     | 62.4              | 72.7  | 143.5   |
|                                    | 69           | 2.86     | 62.9              | 78.8  | 150.5   |
|                                    | 70           | 3.46     | 62.2              | 72.7  | 148.4   |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Relative (% of brain wt) organ weight

Individual values - Day 91/92

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | LIVER  | PITUI-<br>TARY | PROSTATE | SPLEEN | TESTES | THYMUS |
|------------------------------------|--------------|--------|----------------|----------|--------|--------|--------|
| 1 (0)                              | 1            | 719.6  | 0.675          | 31.1     | 45.2   | 161.5  | 16.8   |
|                                    | 2            | 973.1  | 0.786          | 30.8     | 49.0   | 184.6  | 23.5   |
|                                    | 3            | 911.5  | 0.679          | 39.3     | 44.9   | 189.7  | 20.4   |
|                                    | 4            | 696.5  | 0.558          | 28.8     | 36.1   | 170.5  | 22.7   |
|                                    | 5            | 747.6  | 0.526          | 27.7     | 36.4   | 168.3  | 13.2   |
|                                    | 6            | 1124.1 | 0.630          | 50.7     | 74.0   | 263.7  | 23.1   |
|                                    | 7            | 821.7  | 0.653          | 34.6     | 41.4   | 175.0  | 24.7   |
|                                    | 8            | 806.9  | 0.619          | 45.4     | 47.2   | 166.6  | 25.3   |
|                                    | 9            | 952.5  | 0.585          | 36.9     | 50.7   | 174.3  | 31.9   |
|                                    | 10           | 650.5  | 0.590          | 28.6     | 32.1   | 168.3  | 20.3   |
| 2 (0.121)                          | 21           | 1004.8 | 0.671          | 28.9     | 49.1   | 193.1  | 21.3   |
|                                    | 22           | 840.8  | 0.631          | 27.7     | 45.8   | 175.0  | 20.5   |
|                                    | 23           | 890.1  | 0.597          | 33.0     | 41.8   | 181.9  | 15.2   |
|                                    | 24           | 640.4  | 0.472          | 25.4     | 41.9   | 173.5  | 14.7   |
|                                    | 25           | 773.7  | 0.637          | 27.4     | 43.5   | 181.1  | 20.7   |
|                                    | 26           | 923.6  | 0.624          | 33.1     | 62.6   | 175.8  | 15.7   |
|                                    | 27           | 1016.6 | 0.631          | 27.7     | 44.0   | 174.4  | 13.6   |
|                                    | 28           | 917.1  | 0.729          | 23.5     | 41.1   | 169.6  | 25.3   |
|                                    | 29           | 761.5  | 0.596          | 21.3     | 40.6   | 167.4  | 26.8   |
|                                    | 30           | 932.6  | 0.639          | 27.1     | 44.7   | 179.3  | 19.1   |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Relative (% of brain wt) organ weight

Individual values - Day 91/92

Males

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | LIVER | PITUI-<br>TARY | PROSTATE | SPLEEN | TESTES | THYMUS |
|------------------------------------|--------------|-------|----------------|----------|--------|--------|--------|
| 3 (0.398)                          | 41           | 966.2 | 0.643          | 32.3     | 45.0   | 179.9  | 23.2   |
|                                    | 42           | 784.8 | 0.513          | 31.9     | 37.5   | 168.8  | 17.3   |
|                                    | 43           | 776.2 | 0.618          | 37.2     | 39.1   | 165.6  | 15.0   |
|                                    | 44           | 932.2 | 0.630          | 37.7     | 42.8   | 187.9  | 17.3   |
|                                    | 45           | 934.4 | 0.339          | 23.0     | 51.7   | 163.6  | 21.0   |
|                                    | 46           | 909.0 | 0.603          | 38.9     | 36.3   | 171.1  | 19.4   |
|                                    | 47           | 836.0 | 0.552          | 35.0     | 55.4   | 158.3  | 11.8   |
|                                    | 48           | 906.6 | 0.726          | 29.1     | 51.4   | 169.8  | 26.1   |
|                                    | 49           | 848.5 | 0.634          | 39.3     | 35.9   | 167.6  | 15.8   |
|                                    | 50           | 958.6 | 0.588          | 29.4     | 57.8   | 194.8  | 13.8   |
| 4 (1.207)                          | 61           | 796.4 | 0.694          | 35.8     | 46.9   | 170.2  | 18.1   |
|                                    | 62           | 911.7 | 0.650          | 26.5     | 34.2   | 157.5  | 17.6   |
|                                    | 63           | 727.5 | 0.538          | 33.3     | 34.0   | 159.9  | 24.1   |
|                                    | 64           | 740.7 | 0.392          | 26.6     | 37.6   | 176.2  | 6.9    |
|                                    | 65           | 988.4 | 0.519          | 33.9     | 47.8   | 162.0  | 20.6   |
|                                    | 66           | 863.2 | 0.875          | 40.0     | 53.5   | 174.7  | 20.6   |
|                                    | 67           | 846.4 | 0.620          | 29.9     | 43.1   | 151.0  | 18.0   |
|                                    | 68           | 779.5 | 0.488          | 34.6     | 46.5   | 187.4  | 17.1   |
|                                    | 69           | 958.9 | 0.573          | 31.5     | 51.4   | 182.6  | 22.0   |
|                                    | 70           | 825.8 | 0.577          | 38.4     | 50.2   | 183.2  | 18.8   |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Absolute (mg) organ weight

Individual values - Day 91/92

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | ADRENALS | BRAIN | HEART | KIDNEYS | LIVER |
|------------------------------------|--------------|----------|-------|-------|---------|-------|
| 1 (0)                              | 11           | 99       | 2016  | 1129  | 1626    | 9280  |
|                                    | 12           | 85       | 1943  | 1061  | 2134    | 9523  |
|                                    | 13           | 71       | 1999  | 1106  | 1983    | 10616 |
|                                    | 14           | 80       | 2040  | 986   | 1752    | 9678  |
|                                    | 15           | 69       | 2071  | 1090  | 1917    | 10022 |
|                                    | 16           | 84       | 2036  | 1415  | 2266    | 12474 |
|                                    | 17           | 78       | 2062  | 1036  | 1997    | 10580 |
|                                    | 18           | 77       | 2050  | 1038  | 1847    | 9277  |
|                                    | 19           | 102      | 2217  | 1242  | 2479    | 11302 |
|                                    | 20           | 69       | 2141  | 954   | 2040    | 10671 |
| 2 (0.121)                          | 31           | 89       | 1997  | 1187  | 2405    | 11418 |
|                                    | 32           | 76       | 2035  | 982   | 1623    | 8334  |
|                                    | 33           | 72       | 2164  | 1097  | 1954    | 10473 |
|                                    | 34           | 72       | 2201  | 1381  | 2008    | 11964 |
|                                    | 35           | 108      | 2135  | 1262  | 2330    | 14166 |
|                                    | 36           | 76       | 2097  | 1092  | 1922    | 9051  |
|                                    | 37           | 90       | 2235  | 1300  | 2186    | 11671 |
|                                    | 38           | 64       | 2097  | 1113  | 2099    | 10359 |
|                                    | 39           | 77       | 2074  | 1021  | 1924    | 11646 |
|                                    | 40           | 74       | 2083  | 1093  | 1987    | 9409  |



Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Absolute (mg) organ weight

Individual values - Day 91/92

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | ADRENALS | BRAIN | HEART | KIDNEYS | LIVER |
|------------------------------------|--------------|----------|-------|-------|---------|-------|
| 3 (0.398)                          | 51           | 81       | 2054  | 1175  | 1781    | 9324  |
|                                    | 52           | 83       | 1984  | 1258  | 2108    | 10417 |
|                                    | 53           | 83       | 2010  | 1164  | 1805    | 10659 |
|                                    | 54           | 81       | 2110  | 1174  | 1990    | 10109 |
|                                    | 55           | 96       | 1979  | 1130  | 2199    | 10953 |
|                                    | 56           | 78       | 2141  | 910   | 1966    | 11622 |
|                                    | 57           | 77       | 1927  | 1212  | 2163    | 9305  |
|                                    | 58           | 77       | 2071  | 1051  | 1946    | 11032 |
|                                    | 59           | 79       | 2026  | 1257  | 2306    | 11224 |
|                                    | 60           | 74       | 2099  | 1221  | 2202    | 9987  |
| 4 (1.207)                          | 71           | 91       | 2052  | 1272  | 2182    | 15089 |
|                                    | 72           | 66       | 2104  | 1042  | 1703    | 10130 |
|                                    | 73           | 81       | 2214  | 1119  | 2032    | 10001 |
|                                    | 74           | 73       | 2085  | 1095  | 1971    | 9056  |
|                                    | 75           | 79       | 2128  | 1102  | 2001    | 9983  |
|                                    | 76           | 70       | 2157  | 1253  | 2200    | 11181 |
|                                    | 77           | 102      | 2046  | 1102  | 2117    | 11090 |
|                                    | 78           | 79       | 2041  | 1051  | 1829    | 9775  |
|                                    | 79           | 74       | 2123  | 1216  | 2119    | 10749 |
|                                    | 80           | 84       | 2126  | 1117  | 1904    | 9296  |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Absolute (mg) organ weight

Individual values - Day 91/92

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | OVARIES | PITUITARY | SPLEEN | THYMUS | UTERUS |
|------------------------------------|--------------|---------|-----------|--------|--------|--------|
| 1 (0)                              | 11           | 132     | 12        | 577    | 331    | 666    |
|                                    | 12           | 148     | 13        | 571    | 456    | 619    |
|                                    | 13           | 94      | 17        | 589    | 242    | 617    |
|                                    | 14           | 128     | 17        | 695    | 302    | 666    |
|                                    | 15           | 95      | 15        | 634    | 308    | 702    |
|                                    | 16           | 98      | 21        | 690    | 327    | 783    |
|                                    | 17           | 118     | 14        | 656    | 480    | 607    |
|                                    | 18           | 92      | 18        | 484    | 296    | 792    |
|                                    | 19           | 133     | 16        | 884    | 358    | 653    |
|                                    | 20           | 64      | 19        | 745    | 276    | 652    |
| 2 (0.121)                          | 31           | 166     | 14        | 757    | 334    | 1457   |
|                                    | 32           | 70      | 21        | 521    | 321    | 933    |
|                                    | 33           | 129     | 8         | 724    | 350    | 961    |
|                                    | 34           | 79      | 18        | 701    | 411    | 765    |
|                                    | 35           | 114     | 21        | 717    | 287    | 569    |
|                                    | 36           | 98      | 14        | 643    | 367    | 700    |
|                                    | 37           | 137     | 15        | 840    | 331    | 677    |
|                                    | 38           | 127     | 16        | 800    | 203    | 881    |
|                                    | 39           | 148     | 17        | 639    | 468    | 461    |
|                                    | 40           | 94      | 16        | 676    | 392    | 829    |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Absolute (mg) organ weight

Individual values - Day 91/92

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | OVARIES | PITUITARY | SPLEEN | THYMUS | UTERUS |
|------------------------------------|--------------|---------|-----------|--------|--------|--------|
| 3 (0.398)                          | 51           | 114     | 17        | 723    | 349    | 708    |
|                                    | 52           | 135     | 8         | 790    | 432    | 780    |
|                                    | 53           | 137     | 16        | 609    | 285    | 604    |
|                                    | 54           | 155     | 11        | 744    | 304    | 851    |
|                                    | 55           | 111     | 11        | 681    | 470    | 802    |
|                                    | 56           | 138     | 16        | 823    | 304    | 710    |
|                                    | 57           | 118     | 15        | 712    | 350    | 494    |
|                                    | 58           | 92      | 20        | 750    | 260    | 1182   |
|                                    | 59           | 122     | 21        | 744    | 401    | 716    |
|                                    | 60           | 104     | 19        | 612    | 384    | 650    |
| 4 (1.207)                          | 71           | 212     | 13        | 644    | 367    | 697    |
|                                    | 72           | 88      | 14        | 775    | 293    | 664    |
|                                    | 73           | 80      | 20        | 746    | 380    | 870    |
|                                    | 74           | 97      | 13        | 675    | 313    | 570    |
|                                    | 75           | 89      | 17        | 639    | 566    | 589    |
|                                    | 76           | 87      | 15        | 764    | 336    | 572    |
|                                    | 77           | 146     | 16        | 742    | 446    | 621    |
|                                    | 78           | 87      | 17        | 559    | 440    | 581    |
|                                    | 79           | 88      | 14        | 740    | 257    | 563    |
|                                    | 80           | 91      | 15        | 567    | 273    | 703    |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Relative (% of body wt) organ weight

Individual values - Day 91/92

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | BODY<br>WT, g | ADRENALS | BRAIN | HEART | KIDNEYS | LIVER |
|------------------------------------|--------------|---------------|----------|-------|-------|---------|-------|
| 1 (0)                              | 11           | 286           | 0.0346   | 0.705 | 0.395 | 0.569   | 3.24  |
|                                    | 12           | 282           | 0.0301   | 0.689 | 0.376 | 0.757   | 3.38  |
|                                    | 13           | 278           | 0.0255   | 0.719 | 0.398 | 0.713   | 3.82  |
|                                    | 14           | 279           | 0.0287   | 0.731 | 0.353 | 0.628   | 3.47  |
|                                    | 15           | 278           | 0.0248   | 0.745 | 0.392 | 0.690   | 3.61  |
|                                    | 16           | 317           | 0.0265   | 0.642 | 0.446 | 0.715   | 3.94  |
|                                    | 17           | 315           | 0.0248   | 0.655 | 0.329 | 0.634   | 3.36  |
|                                    | 18           | 246           | 0.0313   | 0.833 | 0.422 | 0.751   | 3.77  |
|                                    | 19           | 313           | 0.0326   | 0.708 | 0.397 | 0.792   | 3.61  |
|                                    | 20           | 296           | 0.0233   | 0.723 | 0.322 | 0.689   | 3.61  |
| 2 (0.121)                          | 31           | 308           | 0.0289   | 0.648 | 0.385 | 0.781   | 3.71  |
|                                    | 32           | 247           | 0.0308   | 0.824 | 0.398 | 0.657   | 3.37  |
|                                    | 33           | 312           | 0.0231   | 0.694 | 0.352 | 0.626   | 3.36  |
|                                    | 34           | 285           | 0.0253   | 0.772 | 0.485 | 0.705   | 4.20  |
|                                    | 35           | 296           | 0.0365   | 0.721 | 0.426 | 0.787   | 4.79  |
|                                    | 36           | 265           | 0.0287   | 0.791 | 0.412 | 0.725   | 3.42  |
|                                    | 37           | 315           | 0.0286   | 0.710 | 0.413 | 0.694   | 3.71  |
|                                    | 38           | 294           | 0.0218   | 0.713 | 0.379 | 0.714   | 3.52  |
|                                    | 39           | 323           | 0.0238   | 0.642 | 0.316 | 0.596   | 3.61  |
|                                    | 40           | 301           | 0.0246   | 0.692 | 0.363 | 0.660   | 3.13  |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Relative (% of body wt) organ weight

Individual values - Day 91/92

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | BODY<br>WT, g | ADRENALS | BRAIN | HEART | KIDNEYS | LIVER |
|------------------------------------|--------------|---------------|----------|-------|-------|---------|-------|
| 3 (0.398)                          | 51           | 270           | 0.0300   | 0.761 | 0.435 | 0.660   | 3.45  |
|                                    | 52           | 298           | 0.0279   | 0.666 | 0.422 | 0.707   | 3.50  |
|                                    | 53           | 299           | 0.0278   | 0.672 | 0.389 | 0.604   | 3.56  |
|                                    | 54           | 283           | 0.0286   | 0.746 | 0.415 | 0.703   | 3.57  |
|                                    | 55           | 307           | 0.0313   | 0.645 | 0.368 | 0.716   | 3.57  |
|                                    | 56           | 303           | 0.0257   | 0.707 | 0.300 | 0.649   | 3.84  |
|                                    | 57           | 298           | 0.0258   | 0.647 | 0.407 | 0.726   | 3.12  |
|                                    | 58           | 264           | 0.0292   | 0.784 | 0.398 | 0.737   | 4.18  |
|                                    | 59           | 301           | 0.0262   | 0.673 | 0.418 | 0.766   | 3.73  |
|                                    | 60           | 298           | 0.0248   | 0.704 | 0.410 | 0.739   | 3.35  |
| 4 (1.207)                          | 71           | 324           | 0.0281   | 0.633 | 0.393 | 0.673   | 4.66  |
|                                    | 72           | 274           | 0.0241   | 0.768 | 0.380 | 0.622   | 3.70  |
|                                    | 73           | 281           | 0.0288   | 0.788 | 0.398 | 0.723   | 3.56  |
|                                    | 74           | 266           | 0.0274   | 0.784 | 0.412 | 0.741   | 3.40  |
|                                    | 75           | 293           | 0.0270   | 0.726 | 0.376 | 0.683   | 3.41  |
|                                    | 76           | 301           | 0.0233   | 0.717 | 0.416 | 0.731   | 3.71  |
|                                    | 77           | 285           | 0.0358   | 0.718 | 0.387 | 0.743   | 3.89  |
|                                    | 78           | 301           | 0.0262   | 0.678 | 0.349 | 0.608   | 3.25  |
|                                    | 79           | 279           | 0.0265   | 0.761 | 0.436 | 0.759   | 3.85  |
|                                    | 80           | 273           | 0.0308   | 0.779 | 0.409 | 0.697   | 3.41  |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Relative (% of body wt) organ weight

Individual values - Day 91/92

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | OVARIES | PITUI-<br>TARY | SPLEEN | THYMUS | UTERUS |
|------------------------------------|--------------|---------|----------------|--------|--------|--------|
| 1 (0)                              | 11           | 0.0462  | 0.00420        | 0.202  | 0.1157 | 0.233  |
|                                    | 12           | 0.0525  | 0.00461        | 0.202  | 0.1617 | 0.220  |
|                                    | 13           | 0.0338  | 0.00612        | 0.212  | 0.0871 | 0.222  |
|                                    | 14           | 0.0459  | 0.00609        | 0.249  | 0.1082 | 0.239  |
|                                    | 15           | 0.0342  | 0.00540        | 0.228  | 0.1108 | 0.253  |
|                                    | 16           | 0.0309  | 0.00662        | 0.218  | 0.1032 | 0.247  |
|                                    | 17           | 0.0375  | 0.00444        | 0.208  | 0.1524 | 0.193  |
|                                    | 18           | 0.0374  | 0.00732        | 0.197  | 0.1203 | 0.322  |
|                                    | 19           | 0.0425  | 0.00511        | 0.282  | 0.1144 | 0.209  |
|                                    | 20           | 0.0216  | 0.00642        | 0.252  | 0.0932 | 0.220  |
| 2 (0.121)                          | 31           | 0.0539  | 0.00455        | 0.246  | 0.1084 | 0.473  |
|                                    | 32           | 0.0283  | 0.00850        | 0.211  | 0.1300 | 0.378  |
|                                    | 33           | 0.0413  | 0.00256        | 0.232  | 0.1122 | 0.308  |
|                                    | 34           | 0.0277  | 0.00632        | 0.246  | 0.1442 | 0.268  |
|                                    | 35           | 0.0385  | 0.00709        | 0.242  | 0.0970 | 0.192  |
|                                    | 36           | 0.0370  | 0.00528        | 0.243  | 0.1385 | 0.264  |
|                                    | 37           | 0.0435  | 0.00476        | 0.267  | 0.1051 | 0.215  |
|                                    | 38           | 0.0432  | 0.00544        | 0.272  | 0.0690 | 0.300  |
|                                    | 39           | 0.0458  | 0.00526        | 0.198  | 0.1449 | 0.143  |
|                                    | 40           | 0.0312  | 0.00532        | 0.225  | 0.1302 | 0.275  |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Relative (% of body wt) organ weight

Individual values - Day 91/92

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | OVARIES | PITUI-<br>TARY | SPLEEN | THYMUS | UTERUS |
|------------------------------------|--------------|---------|----------------|--------|--------|--------|
| 3 (0.398)                          | 51           | 0.0422  | 0.00630        | 0.268  | 0.1293 | 0.262  |
|                                    | 52           | 0.0453  | 0.00268        | 0.265  | 0.1450 | 0.262  |
|                                    | 53           | 0.0458  | 0.00535        | 0.204  | 0.0953 | 0.202  |
|                                    | 54           | 0.0548  | 0.00389        | 0.263  | 0.1074 | 0.301  |
|                                    | 55           | 0.0362  | 0.00358        | 0.222  | 0.1531 | 0.261  |
|                                    | 56           | 0.0455  | 0.00528        | 0.272  | 0.1003 | 0.234  |
|                                    | 57           | 0.0396  | 0.00503        | 0.239  | 0.1174 | 0.166  |
|                                    | 58           | 0.0348  | 0.00758        | 0.284  | 0.0985 | 0.448  |
|                                    | 59           | 0.0405  | 0.00698        | 0.247  | 0.1332 | 0.238  |
|                                    | 60           | 0.0349  | 0.00638        | 0.205  | 0.1289 | 0.218  |
| 4 (1.207)                          | 71           | 0.0654  | 0.00401        | 0.199  | 0.1133 | 0.215  |
|                                    | 72           | 0.0321  | 0.00511        | 0.283  | 0.1069 | 0.242  |
|                                    | 73           | 0.0285  | 0.00712        | 0.265  | 0.1352 | 0.310  |
|                                    | 74           | 0.0365  | 0.00489        | 0.254  | 0.1177 | 0.214  |
|                                    | 75           | 0.0304  | 0.00580        | 0.218  | 0.1932 | 0.201  |
|                                    | 76           | 0.0289  | 0.00498        | 0.254  | 0.1116 | 0.190  |
|                                    | 77           | 0.0512  | 0.00561        | 0.260  | 0.1565 | 0.218  |
|                                    | 78           | 0.0289  | 0.00565        | 0.186  | 0.1462 | 0.193  |
|                                    | 79           | 0.0315  | 0.00502        | 0.265  | 0.0921 | 0.202  |
|                                    | 80           | 0.0333  | 0.00549        | 0.208  | 0.1000 | 0.258  |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Relative (% of brain wt) organ weight

Individual values - Day 91/92

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | ADRENALS | HEART | KIDNEYS | LIVER |
|------------------------------------|--------------|----------|-------|---------|-------|
| 1 (0)                              | 11           | 4.91     | 56.0  | 80.7    | 460.3 |
|                                    | 12           | 4.37     | 54.6  | 109.8   | 490.1 |
|                                    | 13           | 3.55     | 55.3  | 99.2    | 531.1 |
|                                    | 14           | 3.92     | 48.3  | 85.9    | 474.4 |
|                                    | 15           | 3.33     | 52.6  | 92.6    | 483.9 |
|                                    | 16           | 4.13     | 69.5  | 111.3   | 612.7 |
|                                    | 17           | 3.78     | 50.2  | 96.8    | 513.1 |
|                                    | 18           | 3.76     | 50.6  | 90.1    | 452.5 |
|                                    | 19           | 4.60     | 56.0  | 111.8   | 509.8 |
|                                    | 20           | 3.22     | 44.6  | 95.3    | 498.4 |
| 2 (0.121)                          | 31           | 4.46     | 59.4  | 120.4   | 571.8 |
|                                    | 32           | 3.73     | 48.3  | 79.8    | 409.5 |
|                                    | 33           | 3.33     | 50.7  | 90.3    | 484.0 |
|                                    | 34           | 3.27     | 62.7  | 91.2    | 543.6 |
|                                    | 35           | 5.06     | 59.1  | 109.1   | 663.5 |
|                                    | 36           | 3.62     | 52.1  | 91.7    | 431.6 |
|                                    | 37           | 4.03     | 58.2  | 97.8    | 522.2 |
|                                    | 38           | 3.05     | 53.1  | 100.1   | 494.0 |
|                                    | 39           | 3.71     | 49.2  | 92.8    | 561.5 |
|                                    | 40           | 3.55     | 52.5  | 95.4    | 451.7 |



Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Relative (% of brain wt) organ weight

Individual values - Day 91/92

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | ADRENALS | HEART | KIDNEYS | LIVER |
|------------------------------------|--------------|----------|-------|---------|-------|
| 3 (0.398)                          | 51           | 3.94     | 57.2  | 86.7    | 453.9 |
|                                    | 52           | 4.18     | 63.4  | 106.3   | 525.1 |
|                                    | 53           | 4.13     | 57.9  | 89.8    | 530.3 |
|                                    | 54           | 3.84     | 55.6  | 94.3    | 479.1 |
|                                    | 55           | 4.85     | 57.1  | 111.1   | 553.5 |
|                                    | 56           | 3.64     | 42.5  | 91.8    | 542.8 |
|                                    | 57           | 4.00     | 62.9  | 112.2   | 482.9 |
|                                    | 58           | 3.72     | 50.7  | 94.0    | 532.7 |
|                                    | 59           | 3.90     | 62.0  | 113.8   | 554.0 |
|                                    | 60           | 3.53     | 58.2  | 104.9   | 475.8 |
| 4 (1.207)                          | 71           | 4.43     | 62.0  | 106.3   | 735.3 |
|                                    | 72           | 3.14     | 49.5  | 80.9    | 481.5 |
|                                    | 73           | 3.66     | 50.5  | 91.8    | 451.7 |
|                                    | 74           | 3.50     | 52.5  | 94.5    | 434.3 |
|                                    | 75           | 3.71     | 51.8  | 94.0    | 469.1 |
|                                    | 76           | 3.25     | 58.1  | 102.0   | 518.4 |
|                                    | 77           | 4.99     | 53.9  | 103.5   | 542.0 |
|                                    | 78           | 3.87     | 51.5  | 89.6    | 478.9 |
|                                    | 79           | 3.49     | 57.3  | 99.8    | 506.3 |
|                                    | 80           | 3.95     | 52.5  | 89.6    | 437.3 |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Relative (% of brain wt) organ weight

Individual values - Day 91/92

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | OVARIES | PITUITARY | SPLEEN | THYMUS | UTERUS |
|------------------------------------|--------------|---------|-----------|--------|--------|--------|
| 1 (0)                              | 11           | 6.55    | 0.595     | 28.6   | 16.4   | 33.0   |
|                                    | 12           | 7.62    | 0.669     | 29.4   | 23.5   | 31.9   |
|                                    | 13           | 4.70    | 0.850     | 29.5   | 12.1   | 30.9   |
|                                    | 14           | 6.27    | 0.833     | 34.1   | 14.8   | 32.6   |
|                                    | 15           | 4.59    | 0.724     | 30.6   | 14.9   | 33.9   |
|                                    | 16           | 4.81    | 1.031     | 33.9   | 16.1   | 38.5   |
|                                    | 17           | 5.72    | 0.679     | 31.8   | 23.3   | 29.4   |
|                                    | 18           | 4.49    | 0.878     | 23.6   | 14.4   | 38.6   |
|                                    | 19           | 6.00    | 0.722     | 39.9   | 16.1   | 29.5   |
|                                    | 20           | 2.99    | 0.887     | 34.8   | 12.9   | 30.5   |
| 2 (0.121)                          | 31           | 8.31    | 0.701     | 37.9   | 16.7   | 73.0   |
|                                    | 32           | 3.44    | 1.032     | 25.6   | 15.8   | 45.8   |
|                                    | 33           | 5.96    | 0.370     | 33.5   | 16.2   | 44.4   |
|                                    | 34           | 3.59    | 0.818     | 31.8   | 18.7   | 34.8   |
|                                    | 35           | 5.34    | 0.984     | 33.6   | 13.4   | 26.7   |
|                                    | 36           | 4.67    | 0.668     | 30.7   | 17.5   | 33.4   |
|                                    | 37           | 6.13    | 0.671     | 37.6   | 14.8   | 30.3   |
|                                    | 38           | 6.06    | 0.763     | 38.1   | 9.7    | 42.0   |
|                                    | 39           | 7.14    | 0.820     | 30.8   | 22.6   | 22.2   |
|                                    | 40           | 4.51    | 0.768     | 32.5   | 18.8   | 39.8   |

Asparaginase PPV33595

90-Days Oral Gavage Toxicity Study in Rats

Relative (% of brain wt) organ weight

Individual values - Day 91/92

Females

| GROUP<br>(Dose<br>g TOS<br>/kg bw) | ANIMAL<br>NO | OVARIES | PITUITARY | SPLEEN | THYMUS | UTERUS |
|------------------------------------|--------------|---------|-----------|--------|--------|--------|
| 3 (0.398)                          | 51           | 5.55    | 0.828     | 35.2   | 17.0   | 34.5   |
|                                    | 52           | 6.80    | 0.403     | 39.8   | 21.8   | 39.3   |
|                                    | 53           | 6.82    | 0.796     | 30.3   | 14.2   | 30.0   |
|                                    | 54           | 7.35    | 0.521     | 35.3   | 14.4   | 40.3   |
|                                    | 55           | 5.61    | 0.556     | 34.4   | 23.7   | 40.5   |
|                                    | 56           | 6.45    | 0.747     | 38.4   | 14.2   | 33.2   |
|                                    | 57           | 6.12    | 0.778     | 36.9   | 18.2   | 25.6   |
|                                    | 58           | 4.44    | 0.966     | 36.2   | 12.6   | 57.1   |
|                                    | 59           | 6.02    | 1.037     | 36.7   | 19.8   | 35.3   |
|                                    | 60           | 4.95    | 0.905     | 29.2   | 18.3   | 31.0   |
| 4 (1.207)                          | 71           | 10.33   | 0.634     | 31.4   | 17.9   | 34.0   |
|                                    | 72           | 4.18    | 0.665     | 36.8   | 13.9   | 31.6   |
|                                    | 73           | 3.61    | 0.903     | 33.7   | 17.2   | 39.3   |
|                                    | 74           | 4.65    | 0.624     | 32.4   | 15.0   | 27.3   |
|                                    | 75           | 4.18    | 0.799     | 30.0   | 26.6   | 27.7   |
|                                    | 76           | 4.03    | 0.695     | 35.4   | 15.6   | 26.5   |
|                                    | 77           | 7.14    | 0.782     | 36.3   | 21.8   | 30.4   |
|                                    | 78           | 4.26    | 0.833     | 27.4   | 21.6   | 28.5   |
|                                    | 79           | 4.15    | 0.659     | 34.9   | 12.1   | 26.5   |
|                                    | 80           | 4.28    | 0.706     | 26.7   | 12.8   | 33.1   |

## **Appendix I      Analysis of dose formulation (11 pages, incl. this cover page)**

Novozymes A/S  
Process Support Laboratories  
Enzyme Analytical Laboratory

TmVd  
2012AUG29  
Luna no. 2012-15391-01

---

CiToxLAB Scantox Study Number: 74826  
Novozymes Reference No.: NZ 20126001

## Investigation Report

Asparaginase, PPV33595  
A 90-Day Oral (gavage) Toxicity Study in Rats

Analysis of Dose Formulation Samples Returned from CitoxLAB Scantox

### Content:

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**1. GLP Compliance**

This investigation was conducted at the Process Support Laboratories, Enzyme Analytical Laboratory, Novozymes A/S, in compliance with the OECD's principles of Good Laboratory Practice, ENV/MC/CHEM(98)17.

**2. Approval**

Approved by:

Date: 2012 AUG 29 Signature:  \_\_\_\_\_  
Principal Investigator

### 3. Quality Assurance Statement

REPORT: Asparaginase, PPV33595 A 90-Day Oral (gavage) Toxicity Study in Rats. Analysis of Dose formulation Samples Returned from CitoxLAB (Scantox)

STUDY NUMBER 74826

REFERENCE  
NUMBER 20126001

The conduct of this study has been subject to appropriate inspections and the report has been reviewed according to the relevant Standard Operation Procedures of Novozymes A/S Quality Assurance.

| Inspection/Audit        | Dates of inspection | Inspection results reported to Study Director and Study Management |
|-------------------------|---------------------|--|
| Sample receipt and reg. | 7 AUG 2012          | 8 AUG 2012   |
| Report                  | 27 AUG 2012         | 27 AUG 2012  |

I hereby confirm that the report reflects the raw data.

29 AUG 2012

Date

Quality Assurance

#### 4. General Information

**Principal Investigator:**

[REDACTED]  
Enzyme Analytical Laboratory  
Process Support Laboratories  
Novozymes A/S  
Krogshoejvej 36, 6E  
2880 Bagsvaerd, Denmark  
[REDACTED]

**Laboratory:**

Enzyme Analytical Laboratory  
Enzyme Laboratories  
Novozymes A/S  
Krogshoejvej 36, 6E  
2880 Bagsvaerd, Denmark

**Sponsor/Monitor:**

[REDACTED]  
Novozymes A/S  
Krogshoejvej 36  
DK-2880 Bagsvaerd, Denmark  
[REDACTED]

**Personnel:**

[REDACTED]



## 5. Purpose

The samples of the present investigation are dose solutions of Asparaginase, PPV33595.

The purpose of this phase of the study is to determine whether the enzyme activities (TASU/g) in the dose solutions prepared for use in week 1, 6 and 13 are approximately equal comparing preparations of corresponding levels of activity. It will also be checked if the activity of the 100% dose solution complies with the enzyme activity of the tox-batch. Furthermore, the control formulations from week 1, 6 and 13 will be analysed for proof of absence of enzyme activity.

Content check analysis is required as part of the OECD guideline for oral toxicity studies.

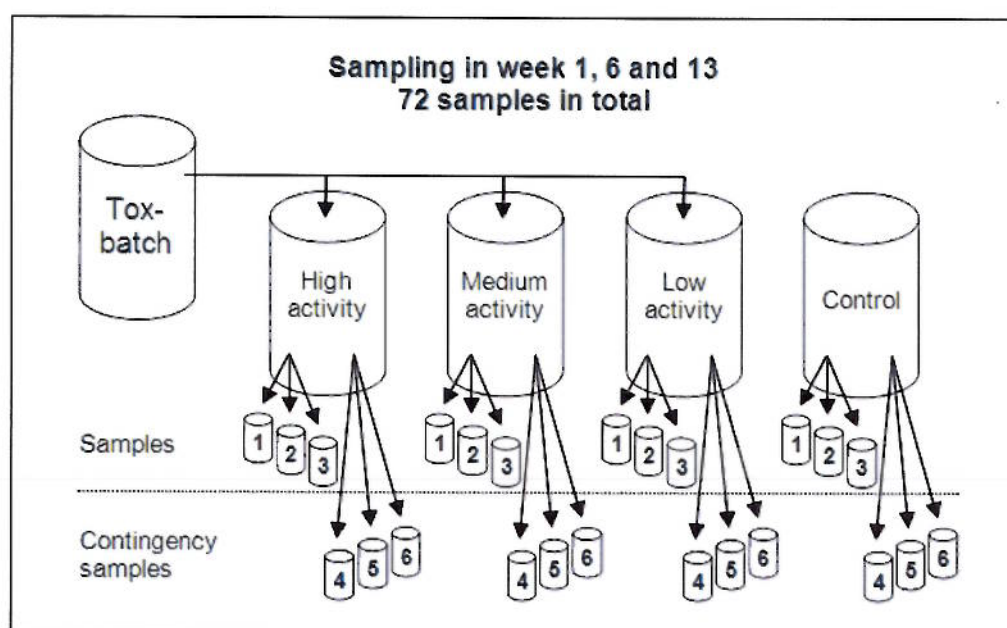
## 6. Sample Handling

### Sample sampling

During the study 36 samples were prepared for analysis of activity and another 36 samples were prepared as contingency samples (72 samples in total). These were categorised into four groups:

- High activity (approx. 100%)
- Medium activity (approx. 33%)
- Low activity (approx. 10%)
- Control group (approx. 0%)

In week 1, 6 and 13, six samples of 10 mL were taken from each of the groups and labelled, as illustrated below.



More details about the schedule for the analytical phase are found in the current version 11.0 of PSL-SP-0107.01-D.

**Sample transportation and registration**

Controls and samples marked "1", "2" and "3" from CitoxLAB Scantox were sent frozen (on dry ice) directly to the Enzyme Analytical Laboratory (EAL) on 2012AUG07 where the samples were registered later the same day.

**Storage of Samples for Analysis**

After registration of the 36 samples, incl. controls, in EAL the samples were stored frozen (-18 °C) until analysis.

**Sample Defrost and Date of Analysis**

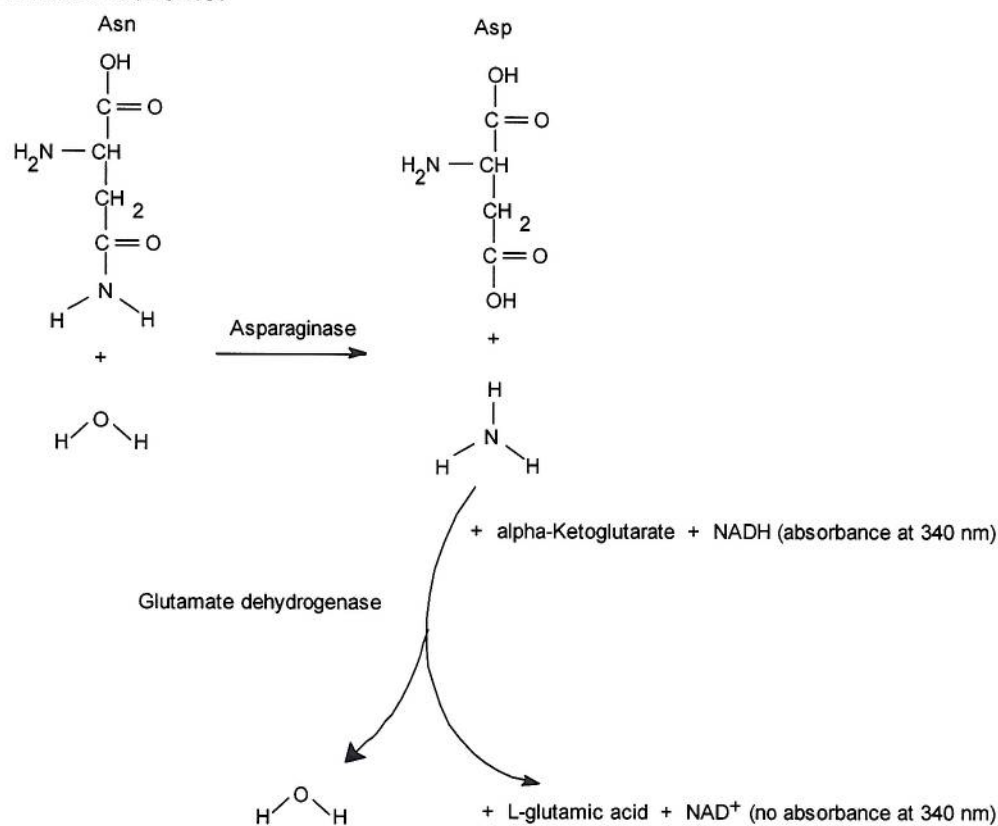
All samples, incl. controls, labelled "1" were defrosted at room temperature before analysis on 2012AUG09.

**7. Method**

All analyses were performed according to the validated method described the valid version 2.0 of PSL-SM-5072.01-D.

Asparaginase is an enzyme that converts L-Asparagine into L-Aspartate and Ammonia. In the analysis of Asparaginase activity the produced Ammonia is combined with  $\alpha$ -Ketoglutarate to form L-Glutamic acid, whereby NADH is oxidized to NAD<sup>+</sup>. The consumption of NADH is measured by photometry at 340 nm.

Reaction scheme:



The samples were analysed as 2 weighings at 1 standard curve as specified for GLP samples in the valid version 4.0 of PSL-SP-0598.01-D.

The control samples were analysed as 1 weighing at 1 standard curve as specified for control samples in valid version 11.0 of PSL-SP-0107.01-D

## 8. Deviation

No deviations have been observed in connection to the sample handling and analysis of the dose solutions.

According to the investigation plan 95% confidence intervals for ratio between weeks and between group "high" and Tox-batch were to be calculated and used for evaluation of the results. Instead a more correct statistical procedure using F-tests is used (Prob>F is below 0.05).

## 9. Results and Discussion

The analytical results in TASU/g were evaluated according to valid version 11.0 of PSL-SP-0107.01-D. Results are represented with three significant digits except from results below the methods determination limit, which is reported as <272.8 TASU/g according to PSL-SM-5072.01-D.

All calculations were carried out using SAS JMP Script according valid version 2.0 of to PSL-AS-0123. SAS JMP ver. 8.0.1 was used for the calculations.

Since no significant differences were observed between 'Weeks No.' or between 'Week No \* Group' only samples "1" were analysed, which is according to the SAS JMP script in PSL-AS-0123.

### Results of the 9 analysed samples and the 3 controls:

No activity above the detection limit (<272.8 TASU/g) was found for the Control group.

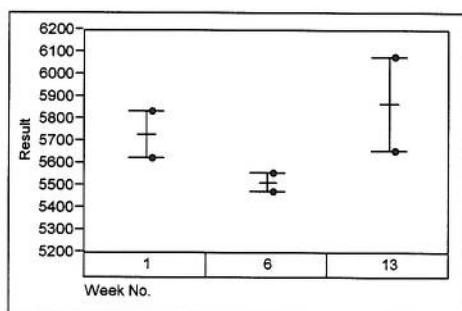
**Table 1.** Average result of each sample for the dose groups High, Medium and Low given in TASU/g:

| Week | Sample No. | High  | Medium | Low  |
|------|------------|-------|--------|------|
| 1    | 1          | 56600 | 19400  | 5730 |
| 6    | 1          | 54800 | 18400  | 5520 |
| 13   | 1          | 55300 | 19400  | 5880 |

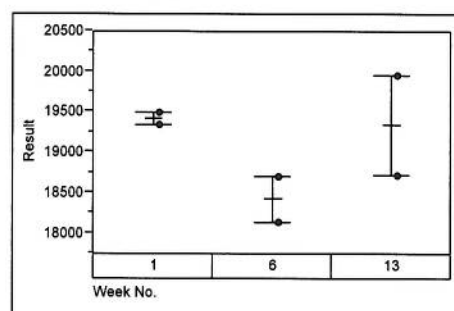
The observed CV was 2.84%, which is acceptable, i.e. below the method CV (6.48 %).

Below is a visual presentation of the individual results. The red line in the presentation of group high shows the mean activity of the tox-batch.

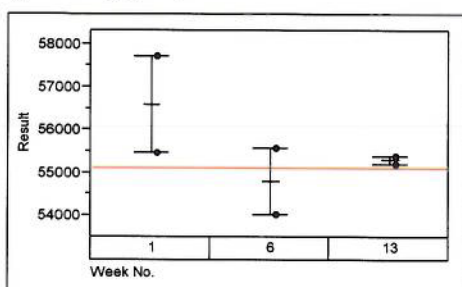
Low activity group:



Medium activity group:



High activity group:





**Investigation of whether dose solutions prepared for use in week 1, 6 and 13 are approximately equal comparing preparations of corresponding levels of activity:**

*The results of the statistical test show that there are no significant difference between the dose formulations given in weeks 1, 6 and 13.*

**Table 2:** Results from statistical analysis of difference between weeks.

| Source         | Nparm | DF | Sum of Squares | F Ratio  | Prob > F | Is there sign.diff. ('Prob>F' < 0.05) |
|----------------|-------|----|----------------|----------|----------|---------------------------------------|
| Group          | 2     | 2  | 15.568290      | 9658.450 | <.0001*  | Yes*                                  |
| Week No.       | 2     | 2  | 0.006444       | 3.9981   | 0.0572   | No                                    |
| Week No.*Group | 4     | 4  | 0.001869       | 0.5797   | 0.6851   | No                                    |

\* The significant difference between groups high, medium and low is as expected.

The mean activity for each group each week is listed in Table 3.

**Table 3.** Mean activity (TASU/g) per group and week for groups High, Medium and Low.

| Group High | Group Medium | Group Low |
|------------|--------------|-----------|
| 55600      | 19100        | 5710      |

**Investigation of whether the activity is approximately equal for group High and the tox-batch:**

The results of the statistical test show that there are *no significant difference between the dose formulation for group High and the tox-batch*. Table 4 shows the result of the statistical test.

**Table 4:** Results from statistical analysis of difference between group High and tox-batch

| Analysis result for tox-batch TASU/g | Mean of group High TASU/g | Prob > F | Is there significant difference? ('Prob>F' < 0.05) |
|--------------------------------------|---------------------------|----------|--|
| 55200                                | 55600                     | 0.5678   | No   |

## 10. Conclusion

The Asparaginase activity (TASU/g) in the three groups High, Medium and Low were found not to differ significantly for weeks 1, 6 and 13.

The following mean activities (TASU/g) per group and week were determined:

| Group High | Group Medium | Group Low |
|------------|--------------|-----------|
| 55600      | 19100        | 5710      |

There is no significant difference between the Asparaginase activity (TASU/g) of group High (100 % dose solution) and the tox-batch.

Absence of activity in the control samples was shown.

## 11. Archiving

The Investigation Plan, all raw data and Investigation Report are archived in Novozymes QM Central Archive by the Principal Investigator.

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Sponsor Ref: 20126001

Document:  
Status:  
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Report  
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## **Appendix II      Pathology Report (78 pages, incl. this cover page)**

## PHASE REPORT

### **PATHOLOGY**

**Asparaginase PPV33595**

**90-Days Oral Gavage Toxicity Study in Rats**


|                         |  |
|-------------------------|--|
| <b>Study No:</b>        | 74826  |
| <b>Sponsor Ref No:</b>  | 20126001   |
| <b>Date:</b>            | 09 October 2012  |
| <b>Prepared by:</b>     |  |
| <b>Number of pages:</b> | 77   |
| <b>Sponsor:</b>         | Novozymes A/S<br>Krogshøjvej 36<br>DK-2880 Bagsværd<br>Denmark                       |



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2.2 Microscopic findings .....3

3 Discussion and Conclusion.....3

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## **1 Summary**

Animals were treated daily, orally, by gavage, with Asparaginase PPV33595, for at least 90 days. Dose concentrations were: 0, 10, 33 and 100 %.

At necropsy only few incidental macroscopic findings were reported and histological evaluation of Groups 1 and 4 revealed no treatment related changes.

## **2 Results**

### **2.1 Macroscopic findings.**

Only few, incidental findings were reported at necropsy.

In Animal No 22 a diaphragmatic hernia with herniation of the right medial liver lobe was observed. In addition the seminal vesicles were reported diminished in size in two males, an ovarian cyst was reported in two females and thymic red discoloration was observed in three animals.

### **2.2 Microscopic findings**

Neither the ovarian cysts observed in female Nos 12 and 71 nor the diminished seminal vesicles of male Nos 4 and 22 could not be confirmed by microscopy.

Except for a small fibrotic area, no findings were observed in the herniated liver lobe.

Focal infiltration of inflammatory cells and/or haemorrhage and necrosis between/in the myofibres of the tongue are considered consequences of the repeated needle insertion for blood sampling.

All findings reported are considered to be within the background incidence of findings reported in this age and strain of laboratory maintained rats and as such to be of no toxicological significance.

## **3 Discussion and Conclusion**

No treatment related pathological findings was reported in this study.

## **Appendix I      PathData Report**

**(74 pages, incl. this cover page)**

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PATHOLOGY REPORT

PAGE : I

REF NO : 20126001

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TEST ARTICLE : Asparaginase PPV33595  
TEST SYSTEM : RAT, 90-DAYS, ORAL  
SPONSOR : Novozymes A/S

PATHOL. NO.: 74826 LIM  
DATE : 09-OCT-12  
PathData®System V6.2a2  
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SPONSOR : Novozymes A/S PathData®System V6.2a2  
-----

EXPLANATION OF CODES AND SYMBOLS  
-----

CODES AND SYMBOLS USED AT ANIMAL LEVEL:  
-----

M = Male animal  
F = Female animal  
K0 = Terminal sacrifice group

CODES AND SYMBOLS USED AT ORGAN LEVEL:  
-----

G = Gross observation checked off histologically  
0 = Tissue not present for histologic examination  
' = Histologic examination not required  
+ = Organ examined, findings present  
- = Organ examined, no pathologic findings noted (AOFT only)  
( = Only one of paired organs examined/present

CODES AND SYMBOLS USED AT FINDING LEVEL:  
-----

GRADE 1 = Minimal / very few / very small  
GRADE 2 = Slight / few / small  
P = Finding present, severity not scored  
( = Finding unilateral in paired organs  
\* = Comment in text of individual animal data

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SUMMARY TABLES REF NO : 20126001

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TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

NUMBER OF ANIMALS WITH NECROPSY FINDINGS BY ORGAN/GROUP/SEX  
STATUS AT NECROPSY: K0

| ORGAN/FINDING         | DOSE GROUP: |  | 01 |    | 02 |    | 03 |    | 04 |    |
|-----------------------|-------------|--|----|----|----|----|----|----|----|----|
|                       | SEX:        |  | M  | F  | M  | F  | M  | F  | M  | F  |
|                       | ANIM.EXAM.: |  | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| LIVER                 | :           |  |    |    |    |    |    |    |    |    |
| - hernia.             | :           |  | -  | -  | 1  | -  | -  | -  | -  | -  |
| SEMIN.VESICLE         | :           |  |    |    |    |    |    |    |    |    |
| - diminished in size. | :           |  | 1  | -  | 1  | -  | -  | -  | -  | -  |
| OVARIES               | :           |  |    |    |    |    |    |    |    |    |
| - cyst: hemorrhagic.  | :           |  | -  | 1  | -  | -  | -  | -  | -  | 1  |
| THYMUS                | :           |  |    |    |    |    |    |    |    |    |
| - discoloration: red. | :           |  | -  | -  | -  | -  | -  | 1  | 1  | 1  |

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|              |                         |                 |             |
|--------------|-------------------------|-----------------|-------------|
| TEST ARTICLE | : Asparaginase PPV33595 | PATHOL. NO.:    | 74826 LIM   |
| TEST SYSTEM  | : RAT, 90-DAYS, ORAL    | DATE            | : 09-OCT-12 |
| SPONSOR      | : Novozymes A/S         | PathData®System | V6.2a2      |

|                         | DOSE GROUP: | 01 |    | 04 |    | 02 |    | 03 |    |
|-------------------------|-------------|----|----|----|----|----|----|----|----|
|                         | SEX :       | M  | F  | M  | F  | M  | F  | M  | F  |
|                         | NO.ANIMALS: | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| HEART :                 |             | 10 | 10 | 10 | 10 | -  | -  | -  | -  |
| - Neutrophil infiltra.: |             | -  | -  | 2  | -  | -  | -  | -  | -  |
| Grade 1:                |             | -  | -  | 2  | -  | -  | -  | -  | -  |
| - Mononuc cells focal : |             | 3  | -  | 4  | -  | -  | -  | -  | -  |
| Grade 1:                |             | 2  | -  | 2  | -  | -  | -  | -  | -  |
| Grade 2:                |             | 1  | -  | 2  | -  | -  | -  | -  | -  |
| LUNG :                  |             | 10 | 10 | 10 | 10 | -  | -  | -  | -  |
| - Mononucl cells focal: |             | 1  | 1  | -  | -  | -  | -  | -  | -  |
| Grade 1:                |             | 1  | 1  | -  | -  | -  | -  | -  | -  |
| - Alv macroph. focal :  |             | -  | -  | -  | 2  | -  | -  | -  | -  |
| Grade 1:                |             | -  | -  | -  | 2  | -  | -  | -  | -  |
| - Inflam cells focal :  |             | -  | -  | 1  | -  | -  | -  | -  | -  |
| Grade 1:                |             | -  | -  | 1  | -  | -  | -  | -  | -  |
| TONGUE :                |             | 10 | 9  | 9  | 10 | -  | -  | -  | -  |
| - Haemorrhage/Inflam :  |             | 2  | 1  | 3  | 4  | -  | -  | -  | -  |
| STOMACH GLANDULAR :     |             | 10 | 10 | 10 | 10 | -  | -  | -  | -  |
| - Glands cystic dilat : |             | -  | 1  | 1  | 2  | -  | -  | -  | -  |
| Grade 1:                |             | -  | 1  | 1  | 2  | -  | -  | -  | -  |
| LIVER :                 |             | 10 | 10 | 10 | 10 | 1  | -  | -  | -  |
| - EMH/Mononuc cells :   |             | 3  | 3  | 6  | 3  | -  | -  | -  | -  |
| Grade 1:                |             | 3  | 2  | 6  | 3  | -  | -  | -  | -  |
| Grade 2:                |             | -  | 1  | -  | -  | -  | -  | -  | -  |
| - Vacuolation hepat`s : |             | -  | -  | 1  | -  | -  | -  | -  | -  |
| Grade 1:                |             | -  | -  | 1  | -  | -  | -  | -  | -  |
| - Granuloc.infilt foc : |             | -  | 1  | -  | -  | -  | -  | -  | -  |
| Grade 1:                |             | -  | 1  | -  | -  | -  | -  | -  | -  |
| - Necrosis focal :      |             | 1  | -  | -  | -  | -  | -  | -  | -  |
| Grade 1:                |             | 1  | -  | -  | -  | -  | -  | -  | -  |
| - Fibrosis, focal :     |             | -  | -  | -  | -  | 1  | -  | -  | -  |
| Grade 1:                |             | -  | -  | -  | -  | 1  | -  | -  | -  |

Study No: 74826  
Sponsor Ref No: 20126001

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PATHOLOGY REPORT  
SUMMARY TABLES

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REF NO : 20126001

TEST ARTICLE : Asparaginase PPV33595  
TEST SYSTEM : RAT, 90-DAYS, ORAL  
SPONSOR : Novozymes A/S

PATHOL. NO.: 74826 LIM  
DATE : 09-OCT-12  
PathData®System V6.2a2

NUMBER OF ANIMALS WITH MICROSCOPIC FINDINGS BY ORGAN/GROUP/SEX  
STATUS AT NECROPSY: K0

|                         | DOSE GROUP: |    | 01 |    | 04 |    | 02 |    | 03 |    |
|-------------------------|-------------|----|----|----|----|----|----|----|----|----|
| SEX :                   | M           | F  | M  | F  | M  | F  | M  | F  | M  | F  |
| NO.ANIMALS:             | 10          | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| PANCREAS :              | 10          | 10 | 10 | 10 | -  | -  | -  | -  | -  | -  |
| - Fibrosis interstit :  | 1           | -  | -  | -  | -  | -  | -  | -  | -  | -  |
| Grade 1:                | 1           | -  | -  | -  | -  | -  | -  | -  | -  | -  |
| - Atrophy acinar focal: | 1           | -  | -  | -  | -  | -  | -  | -  | -  | -  |
| Grade 1:                | 1           | -  | -  | -  | -  | -  | -  | -  | -  | -  |
| KIDNEYS :               | 10          | 10 | 10 | 10 | -  | -  | -  | -  | -  | -  |
| - Dilat tubular focal : | -           | 1  | -  | -  | -  | -  | -  | -  | -  | -  |
| Grade 1:                | -           | 1  | -  | -  | -  | -  | -  | -  | -  | -  |
| - Vacuolation tubular : | 1           | -  | -  | -  | -  | -  | -  | -  | -  | -  |
| Grade 1:                | 1           | -  | -  | -  | -  | -  | -  | -  | -  | -  |
| - Hyaline cast tub foc: | 2           | -  | 4  | -  | -  | -  | -  | -  | -  | -  |
| Grade 1:                | 2           | -  | 4  | -  | -  | -  | -  | -  | -  | -  |
| - Basophilia tub focal: | 5           | 2  | 4  | 2  | -  | -  | -  | -  | -  | -  |
| Grade 1:                | 5           | 2  | 4  | 2  | -  | -  | -  | -  | -  | -  |
| EPIDIDYMIDES :          | 10          | -  | 10 | -  | -  | -  | -  | -  | -  | -  |
| - Vacuolation tubular : | 1           | -  | -  | -  | -  | -  | -  | -  | -  | -  |
| Grade 1:                | 1           | -  | -  | -  | -  | -  | -  | -  | -  | -  |
| PROSTATE GLAND :        | 10          | -  | 10 | -  | -  | -  | -  | -  | -  | -  |
| - Mononuc cells focal : | 1           | -  | 1  | -  | -  | -  | -  | -  | -  | -  |
| Grade 1:                | 1           | -  | 1  | -  | -  | -  | -  | -  | -  | -  |
| UTERUS :                | -           | 10 | -  | 10 | -  | -  | -  | -  | -  | -  |
| - Diestrus :            | -           | 1  | -  | -  | -  | -  | -  | -  | -  | -  |
| - Proestrus :           | -           | 3  | -  | 7  | -  | -  | -  | -  | -  | -  |
| - Estrus :              | -           | 3  | -  | 1  | -  | -  | -  | -  | -  | -  |
| - Metestrus :           | -           | 3  | -  | 2  | -  | -  | -  | -  | -  | -  |
| THYROID GLAND :         | 10          | 10 | 10 | 10 | -  | -  | -  | -  | -  | -  |
| - Ultimobranchial cyst: | -           | -  | 1  | -  | -  | -  | -  | -  | -  | -  |



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|--------------|-------------------------|-----------------|-------------|
| TEST ARTICLE | : Asparaginase PPV33595 | PATHOL. NO.:    | 74826 LIM   |
| TEST SYSTEM  | : RAT, 90-DAYS, ORAL    | DATE            | : 09-OCT-12 |
| SPONSOR      | : Novozymes A/S         | PathData®System | V6.2a2      |

|                       | DOSE        | GROUP: | 01 |    | 04 |    | 02 |    | 03 |    |
|-----------------------|-------------|--------|----|----|----|----|----|----|----|----|
|                       | SEX         | :      | M  | F  | M  | F  | M  | F  | M  | F  |
|                       | NO.ANIMALS: |        | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| ADRENAL GLANDS        | :           |        | 10 | 10 | 10 | 10 | -  | -  | -  | -  |
| - Haemorrhage focal   | :           |        | -  | -  | -  | 1  | -  | -  | -  | -  |
| Grade 1:              |             |        | -  | -  | -  | 1  | -  | -  | -  | -  |
| - Vacuolation diffuse | :           |        | 5  | -  | 4  | -  | -  | -  | -  | -  |
| Grade 1:              |             |        | 5  | -  | 4  | -  | -  | -  | -  | -  |
| THYMUS                | :           |        | 10 | 10 | 10 | 10 | -  | -  | -  | 1  |
| - Haemorrhage diffuse | :           |        | -  | -  | 1  | 1  | -  | -  | -  | 1  |
| Grade 1:              |             |        | -  | -  | 1  | 1  | -  | -  | -  | 1  |
| SKELETAL MUSCLE       | :           |        | 10 | 10 | 10 | 10 | -  | -  | -  | -  |
| - Mononuc cells focal | :           |        | -  | -  | -  | 1  | -  | -  | -  | -  |
| Grade 1:              |             |        | -  | -  | -  | 1  | -  | -  | -  | -  |

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| TEST ARTICLE | : Asparaginase PPV33595 | PATHOL. NO.:    | 74826 LIM   |
| TEST SYSTEM  | : RAT, 90-DAYS, ORAL    | DATE            | : 09-OCT-12 |
| SPONSOR      | : Novozymes A/S         | PathData®System | V6.2a2      |

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PATHOLOGY REPORT  
INDIVIDUAL ANIMAL DATA

PAGE : 7/ 72  
REF NO : 20126001

TEST ARTICLE : Asparaginase PPV33595  
TEST SYSTEM : RAT, 90-DAYS, ORAL  
SPONSOR : Novozymes A/S

PATHOL. NO.: 74826 LIM  
DATE : 09-OCT-12  
PathData®System V6.2a2

TABLE OF INDIVIDUAL MICROSCOPIC FINDINGS (AOFT)  
DOSE GROUP : 01, 0% PPV33595

ANIMAL NUMBER :

|                          | 1   | 2    | 3   | 4    | 5    | 6   | 7    | 8   | 9   | 10  |
|--------------------------|-----|------|-----|------|------|-----|------|-----|-----|-----|
|                          | MK0 | MK0  | MK0 | MK0  | MK0  | MK0 | MK0  | MK0 | MK0 | MK0 |
| COLON                    | -   | -    | -   | -    | -    | -   | -    | -   | -   | -   |
| RECTUM                   | -   | -    | 0   | -    | -    | -   | -    | -   | -   | -   |
| LIVER                    | +   | +    | +   | -    | -    | +   | -    | -   | -   | -   |
| - EMH/Mononuc cells      | 1.  | .    | 1.  | .    | .    | 1.  | .    | .   | .   | .   |
| - Necrosis focal         | .   | 1.   | .   | .    | .    | .   | .    | .   | .   | .   |
| PANCREAS                 | -   | +    | -   | -    | -    | -   | -    | -   | -   | -   |
| - Fibrosis interstit     | .   | 1.   | .   | .    | .    | .   | .    | .   | .   | .   |
| - Atrophy acinar focal   | .   | 1.   | .   | .    | .    | .   | .    | .   | .   | .   |
| KIDNEYS                  | +   | +    | -   | +    | +    | -   | +    | +   | +   | -   |
| - Vacuolation tubular    | .   | .    | .   | .    | .    | .   | ( 1. | .   | .   | .   |
| - Hyaline cast tub foc   | .   | ( 1. | .   | .    | .    | .   | .    | .   | 1.  | .   |
| - Basophilia tub focal ( | 1.  | 1.   | .   | ( 1. | ( 1. | .   | .    | 1.  | .   | .   |
| URETERS                  | -   | -    | 0   | -    | -    | 0   | ( -  | -   | ( - | -   |
| URINARY BLADDER          | -   | -    | -   | -    | -    | -   | -    | -   | -   | -   |
| TESTES                   | -   | -    | -   | -    | -    | -   | -    | -   | -   | -   |
| EPIDIDYMIDES             | -   | -    | -   | -    | -    | -   | +    | -   | -   | -   |
| - Vacuolation tubular    | .   | .    | .   | .    | .    | .   | 1.   | .   | .   | .   |
| PROSTATE GLAND           | -   | -    | -   | -    | -    | -   | -    | -   | +   | -   |
| - Mononuc cells focal    | .   | .    | .   | .    | .    | .   | .    | .   | 1.  | .   |
| SEMIN.VESICLE            | -   | -    | -   | -G   | -    | -   | -    | -   | -   | -   |
| PITUITARY GLAND          | -   | -    | -   | -    | -    | -   | -    | -   | -   | -   |
| THYROID GLAND            | -   | -    | -   | -    | -    | -   | -    | -   | -   | -   |
| PARATHYROID GLANDS       | -   | -    | -   | -    | -    | -   | -    | -   | -   | -   |
| ADRENAL GLANDS           | -   | +    | +   | -    | +    | -   | -    | +   | -   | +   |
| - Vacuolation diffuse    | .   | 1.   | 1.  | .    | 1.   | .   | .    | 1.  | .   | 1.  |



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|--------------|-------------------------|-----------------|-------------|
| TEST ARTICLE | : Asparaginase PPV33595 | PATHOL. NO.:    | 74826 LIM   |
| TEST SYSTEM  | : RAT, 90-DAYS, ORAL    | DATE            | : 09-OCT-12 |
| SPONSOR      | : Novozymes A/S         | PathData®System | V6.2a2      |

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|--------------|-------------------------|-----------------|-------------|
| TEST ARTICLE | : Asparaginase PPV33595 | PATHOL. NO.:    | 74826 LIM   |
| TEST SYSTEM  | : RAT, 90-DAYS, ORAL    | DATE            | : 09-OCT-12 |
| SPONSOR      | : Novozymes A/S         | PathData®System | V6.2a2      |

## DOSE GROUP : 01, 0% PPV33595

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|--------------|-------------------------|-----------------|-------------|
| TEST ARTICLE | : Asparaginase PPV33595 | PATHOL. NO.:    | 74826 LIM   |
| TEST SYSTEM  | : RAT, 90-DAYS, ORAL    | DATE            | : 09-OCT-12 |
| SPONSOR      | : Novozymes A/S         | PathData®System | V6.2a2      |

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|--------------|-------------------------|-----------------|-------------|
| TEST ARTICLE | : Asparaginase PPV33595 | PATHOL. NO.:    | 74826 LIM   |
| TEST SYSTEM  | : RAT, 90-DAYS, ORAL    | DATE            | : 09-OCT-12 |
| SPONSOR      | : Novozymes A/S         | PathData®System | V6.2a2      |

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|--------------|-------------------------|-----------------|-------------|
| TEST ARTICLE | : Asparaginase PPV33595 | PATHOL. NO.:    | 74826 LIM   |
| TEST SYSTEM  | : RAT, 90-DAYS, ORAL    | DATE            | : 09-OCT-12 |
| SPONSOR      | : Novozymes A/S         | PathData®System | V6.2a2      |

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|                       |   |   |   |   |   |   |   |   |   |    |
|-----------------------|---|---|---|---|---|---|---|---|---|----|
| THYMUS                | ' | ' | ' | ' | ' | ' | ' | ' | ' | +G |
| - Haemorrhage diffuse |   |   |   |   |   |   |   |   |   | 1. |
| .....                 |   |   |   |   |   |   |   |   |   |    |

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|--------------|-------------------------|-----------------|-------------|
| TEST ARTICLE | : Asparaginase PPV33595 | PATHOL. NO.:    | 74826 LIM   |
| TEST SYSTEM  | : RAT, 90-DAYS, ORAL    | DATE            | : 09-OCT-12 |
| SPONSOR      | : Novozymes A/S         | PathData®System | V6.2a2      |

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|                        |   |   |   |    |    |      |    |    |
|------------------------|---|---|---|----|----|------|----|----|
| BRAIN                  | - | - | - | -  | -  | -    | -  | -  |
| <hr/>                  |   |   |   |    |    |      |    |    |
| SPINAL CORD, CERVIC.   | - | - | - | -  | -  | -    | -  | -  |
| <hr/>                  |   |   |   |    |    |      |    |    |
| SPINAL CORD, THORAC.   | - | - | - | -  | -  | -    | -  | -  |
| <hr/>                  |   |   |   |    |    |      |    |    |
| SPINAL CORD, LUMBAR    | - | - | - | -  | -  | -    | -  | -  |
| <hr/>                  |   |   |   |    |    |      |    |    |
| SCIATIC NERVE,RIGHT    | - | - | - | -  | -  | -    | -  | -  |
| <hr/>                  |   |   |   |    |    |      |    |    |
| HEART                  | - | - | - | +  | +  | +    | -  | +  |
| - Neutrophil infiltra. | . | . | . | 1. | .  | . 1. | .  | .  |
| - Mononuc cells focal  | . | . | . | 2. | 1. | 1.   | .  | 2. |
| <hr/>                  |   |   |   |    |    |      |    |    |
| AORTA                  | - | - | - | -  | -  | -    | -  | -  |
| <hr/>                  |   |   |   |    |    |      |    |    |
| LARYNX                 | - | - | - | -  | -  | -    | -  | -  |
| <hr/>                  |   |   |   |    |    |      |    |    |
| TRACHEA                | - | - | - | -  | -  | -    | -  | -  |
| <hr/>                  |   |   |   |    |    |      |    |    |
| LUNG                   | - | - | - | -  | -  | -    | +  | -  |
| - Inflam cells focal   | . | . | . | .  | .  | .    | 1. | .  |
| <hr/>                  |   |   |   |    |    |      |    |    |
| TONGUE                 | - | - | - | -  | 0  | -    | +  | +  |
| - Haemorrhage/Inflam   | . | . | . | .  | .  | .    | P. | P. |
| <hr/>                  |   |   |   |    |    |      |    |    |
| ESOPHAGUS              | - | - | - | -  | -  | -    | -  | -  |
| <hr/>                  |   |   |   |    |    |      |    |    |
| STOMACH NONGLANDULAR   | - | - | - | -  | -  | -    | -  | -  |
| <hr/>                  |   |   |   |    |    |      |    |    |
| STOMACH GLANDULAR      | - | - | - | -  | -  | -    | -  | +  |
| - Glands cystic dilat  | . | . | . | .  | .  | .    | .  | 1. |
| <hr/>                  |   |   |   |    |    |      |    |    |
| DUODENUM               | - | - | - | -  | -  | -    | -  | -  |
| <hr/>                  |   |   |   |    |    |      |    |    |
| JEJUNUM                | - | - | - | -  | -  | -    | -  | -  |
| <hr/>                  |   |   |   |    |    |      |    |    |
| ILEUM                  | - | - | - | -  | -  | -    | -  | -  |
| <hr/>                  |   |   |   |    |    |      |    |    |

Study No: 74826  
Sponsor Ref No: 20126001

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PATHOLOGY REPORT PAGE : 15/ 72  
INDIVIDUAL ANIMAL DATA REF NO : 20126001

TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

TABLE OF INDIVIDUAL MICROSCOPIC FINDINGS (AOFT)  
DOSE GROUP : 04, 100% PPV33595

ANIMAL NUMBER :

|                          | 61      | 62  | 63  | 64  | 65  | 66   | 67  | 68  | 69      | 70  |
|--------------------------|---------|-----|-----|-----|-----|------|-----|-----|---------|-----|
|                          | MK0     | MK0 | MK0 | MK0 | MK0 | MK0  | MK0 | MK0 | MK0     | MK0 |
| CECUM                    | -       | -   | -   | -   | -   | -    | -   | -   | -       | -   |
| COLON                    | -       | -   | -   | -   | -   | -    | -   | -   | -       | -   |
| RECTUM                   | -       | -   | -   | -   | -   | -    | -   | -   | -       | -   |
| LIVER                    | -       | -   | +   | +   | +   | -    | +   | +   | +       | +   |
| - EMH/Mononuc cells      | .       | .   | 1.  | 1.  | 1.  | .    | 1.  | 1.  | 1.      | .   |
| - Vacuolation hepat`s    | .       | .   | .   | .   | .   | .    | .   | .   | .       | 1.  |
| PANCREAS                 | -       | -   | -   | -   | -   | -    | -   | -   | -       | -   |
| KIDNEYS                  | +       | +   | -   | -   | -   | +    | -   | -   | +       | +   |
| - Hyaline cast tub foc   | 1. ( 1. | .   | .   | .   | .   | 1.   | .   | .   | 1.      | .   |
| - Basophilia tub focal ( | 1.      | .   | .   | .   | .   | ( 1. | .   | .   | 1. ( 1. | .   |
| URETERS                  | -       | -   | -   | ( - | ( - | ( -  | -   | -   | -       | -   |
| URINARY BLADDER          | -       | -   | -   | -   | 0   | -    | -   | -   | -       | -   |
| TESTES                   | -       | -   | -   | -   | -   | -    | -   | -   | -       | -   |
| EPIDIDYMIDES             | -       | -   | -   | -   | -   | -    | -   | -   | -       | -   |
| PROSTATE GLAND           | -       | -   | -   | -   | -   | -    | -   | -   | +       | -   |
| - Mononuc cells focal    | .       | .   | .   | .   | .   | .    | .   | .   | 1.      | .   |
| SEMIN.VESICLE            | -       | -   | -   | -   | -   | -    | -   | -   | -       | -   |
| PITUITARY GLAND          | -       | -   | -   | -   | 0   | -    | -   | -   | -       | -   |
| THYROID GLAND            | -       | -   | -   | -   | -   | -    | +   | -   | -       | -   |
| - Ultimobranchial cyst   | .       | .   | .   | .   | .   | .    | P.  | .   | .       | .   |
| PARATHYROID GLANDS       | -       | 0   | 0   | -   | -   | -    | -   | -   | 0       | -   |
| ADRENAL GLANDS           | -       | +   | -   | -   | +   | +    | -   | -   | +       | -   |
| - Vacuolation diffuse    | .       | 1.  | .   | .   | 1.  | 1.   | .   | .   | 1.      | .   |

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| TEST ARTICLE | : Asparaginase PPV33595 | PATHOL. NO.:    | 74826 LIM   |
| TEST SYSTEM  | : RAT, 90-DAYS, ORAL    | DATE            | : 09-OCT-12 |
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|--------------|-------------------------|-----------------|-------------|
| TEST ARTICLE | : Asparaginase PPV33595 | PATHOL. NO.:    | 74826 LIM   |
| TEST SYSTEM  | : RAT, 90-DAYS, ORAL    | DATE            | : 09-OCT-12 |
| SPONSOR      | : Novozymes A/S         | PathData®System | V6.2a2      |

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|--------------|-------------------------|-----------------|-------------|
| TEST ARTICLE | : Asparaginase PPV33595 | PATHOL. NO.:    | 74826 LIM   |
| TEST SYSTEM  | : RAT, 90-DAYS, ORAL    | DATE            | : 09-OCT-12 |
| SPONSOR      | : Novozymes A/S         | PathData®System | V6.2a2      |

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| TEST ARTICLE | : Asparaginase PPV33595 | PATHOL. NO.:    | 74826 LIM   |
| TEST SYSTEM  | : RAT, 90-DAYS, ORAL    | DATE            | : 09-OCT-12 |
| SPONSOR      | : Novozymes A/S         | PathData®System | V6.2a2      |

## DOSE GROUP : 04, 100% PPV33595

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Study No: 74826  
Sponsor Ref No: 20126001

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PATHOLOGY REPORT PAGE : 20/ 72  
INDIVIDUAL ANIMAL DATA REF NO : 20126001

TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

ANIMAL HEADING DATA  
DOSE GROUP : 01, 0% PPV33595

| ANIMAL<br>NUMBER | SEX<br>M/F | DEFINED AND FINAL<br>STATE OF NECROPSY | TEST<br>DAYS | FIRST AND LAST<br>DAY UNDER TEST | DATE OF<br>NECROPSY |           |
|------------------|------------|--|--------------|----------------------------------|---------------------|-----------|
| 1                | M          | K0                                     | K0           | 91                               | 18-APR-12 17-JUL-12 | 17-JUL-12 |
| 2                | M          | K0                                     | K0           | 91                               | 18-APR-12 17-JUL-12 | 17-JUL-12 |
| 3                | M          | K0                                     | K0           | 91                               | 18-APR-12 17-JUL-12 | 17-JUL-12 |
| 4                | M          | K0                                     | K0           | 91                               | 18-APR-12 17-JUL-12 | 17-JUL-12 |
| 5                | M          | K0                                     | K0           | 91                               | 18-APR-12 17-JUL-12 | 17-JUL-12 |
| 6                | M          | K0                                     | K0           | 91                               | 18-APR-12 17-JUL-12 | 17-JUL-12 |
| 7                | M          | K0                                     | K0           | 91                               | 18-APR-12 17-JUL-12 | 17-JUL-12 |
| 8                | M          | K0                                     | K0           | 91                               | 18-APR-12 17-JUL-12 | 17-JUL-12 |
| 9                | M          | K0                                     | K0           | 91                               | 18-APR-12 17-JUL-12 | 17-JUL-12 |
| 10               | M          | K0                                     | K0           | 91                               | 18-APR-12 17-JUL-12 | 17-JUL-12 |
| 11               | F          | K0                                     | K0           | 92                               | 18-APR-12 18-JUL-12 | 18-JUL-12 |
| 12               | F          | K0                                     | K0           | 92                               | 18-APR-12 18-JUL-12 | 18-JUL-12 |
| 13               | F          | K0                                     | K0           | 92                               | 18-APR-12 18-JUL-12 | 18-JUL-12 |
| 14               | F          | K0                                     | K0           | 92                               | 18-APR-12 18-JUL-12 | 18-JUL-12 |
| 15               | F          | K0                                     | K0           | 92                               | 18-APR-12 18-JUL-12 | 18-JUL-12 |
| 16               | F          | K0                                     | K0           | 92                               | 18-APR-12 18-JUL-12 | 18-JUL-12 |
| 17               | F          | K0                                     | K0           | 92                               | 18-APR-12 18-JUL-12 | 18-JUL-12 |
| 18               | F          | K0                                     | K0           | 92                               | 18-APR-12 18-JUL-12 | 18-JUL-12 |
| 19               | F          | K0                                     | K0           | 92                               | 18-APR-12 18-JUL-12 | 18-JUL-12 |
| 20               | F          | K0                                     | K0           | 92                               | 18-APR-12 18-JUL-12 | 18-JUL-12 |



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TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 01, 0% PPV33595 MALE

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 1  
.....

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS

LIVER:  
-EMH/Mononuc cells, focal,occ granulopoiesis/s.cell necros.,  
grade 1  
KIDNEYS:  
-Tubular basophilia,focal, occ.a.w. mononuc. infiltration,  
unilateral, grade 1  
ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 2  
.....

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS

HEART:  
-Mononuc cell infiltration, myorcardium, focal, grade 2  
LIVER:  
-Necrosis focal, few necrotic cells, grade 1  
PANCREAS:  
-Fibrosis interstitial, few mononuc infiltration, grade 1  
-Atrophy acinar focal, small focus, grade 1

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PATHOLOGY REPORT PAGE : 22/ 72  
INDIVIDUAL ANIMAL DATA REF NO : 20126001

TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 01, 0% PPV33595 MALE

CONT./FF. ANIMAL NO. : 2

KIDNEYS:

-Hyaline cast tubular, focal,occ associated w. basophilia,  
unilateral, grade 1  
-Tubular basophilia,focal, occ.a.w. mononuc. infiltration,  
bilateral, grade 1

ADRENAL GLANDS:

-Vacuolation diffusemainly Z fasc, mainly macrovesicular,  
bilateral, grade 1

ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 3

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS

RECTUM:

Tissue not present for histologic examination

LIVER:

-EMH/Mononuc cells, focal,occ granulopoiesis/s.cell necros.,  
grade 1

URETERS:

Tissue not present for histologic examination

ADRENAL GLANDS:

-Vacuolation diffusemainly Z fasc, mainly macrovesicular,  
bilateral, grade 1

ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

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SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 01, 0% PPV33595 MALE

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 4  
.....

\* NECROPSY FINDINGS

SEMINAL VESICLE:  
01: Left, Diminished in size.  
NO OTHER NECROPSY OBSERVATIONS NOTED

\* MICROSCOPIC FINDINGS

TONGUE:  
-Haemorrhage/Inflammation, focal, occ.necrotic myofibers  
KIDNEYS:  
-Tubular basophilia, focal, occ.a.w. mononuc.infil/fibrosis,  
unilateral, grade 1  
ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 5  
.....

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS

KIDNEYS:  
-Tubular basophilia, focal, occ.a.w. mononuc. infiltration,  
unilateral, grade 1  
ADRENAL GLANDS:  
-Vacuolation diffuse mainly Z fasc, mainly macrovesicular,  
bilateral, grade 1

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PATHOLOGY REPORT PAGE : 24/ 72  
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TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 01, 0% PPV33595 MALE

CONT./FF. ANIMAL NO. : 5

ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 6

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS

LIVER:  
-EMH/Mononuc cells, focal,occ granulopoiesis/s.cell necros.,  
grade 1

URETERS:  
Tissue not present for histologic examination

MESENTERIC LYMPH NODE:  
Tissue not present for histologic examination

ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

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PATHOLOGY REPORT PAGE : 25/ 72  
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TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 01, 0% PPV33595 MALE

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 7  
.....

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS

LUNG:  
-Mononucleated cells focal, subpleural, mainly lymphoplasmacytic,  
grade 1  
KIDNEYS:  
-Vacuolation tubular, focal, epithelial cells, unilateral,  
grade 1  
URETERS:  
Only one of paired organs examined/present  
EPIDIDYMIDES:  
-Vacuolation tubular epithelium, focal, bilateral, grade 1  
ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 8  
.....

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

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PATHOLOGY REPORT PAGE : 26/ 72  
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TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
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SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 01, 0% PPV33595 MALE

CONT./FF. ANIMAL NO. : 8

\* MICROSCOPIC FINDINGS

KIDNEYS:  
-Tubular basophilia, focal, occ.a.w. mononuc. infiltration,  
bilateral, grade 1  
ADRENAL GLANDS:  
-Vacuolation diffuse mainly Z fasc, mainly macrovesicular,  
bilateral, grade 1  
ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 9

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS

HEART:  
-Mononuc cell infiltration, pericardium, focal, grade 1  
TONGUE:  
-Haemorrhage/Inflammation, focal, occ.necrotic myofibers  
KIDNEYS:  
-Hyaline cast tubular, focal, occ associated w. basophilia,  
bilateral, grade 1  
URETERS:  
Only one of paired organs examined/present  
PROSTATE GLAND:  
-Mononuclear cell infiltration, lymphoplasmo. interstitial,  
grade 1

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PATHOLOGY REPORT PAGE : 27/ 72  
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TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 01, 0% PPV33595 MALE

CONT./FF. ANIMAL NO. : 9

ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 10

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS

HEART:  
-Mononuc cell infiltration, myorcardium/subendocardial,foc,  
grade 1  
ADRENAL GLANDS:  
-Vacuolation diffuse mainly Z fasc, mainly macrovesicular,  
bilateral, grade 1  
ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

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PATHOLOGY REPORT PAGE : 28/ 72  
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TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 01, 0% PPV33595 FEMALE

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 11  
.....

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS

URETERS:  
Only one of paired organs examined/present  
UTERUS:  
-Estrus, stage  
ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 12  
.....

\* NECROPSY FINDINGS

OVARIES:  
01: Right: Cyst: hemorrhagic, Single, Up to 3 mm in diameter.  
NO OTHER NECROPSY OBSERVATIONS NOTED

\* MICROSCOPIC FINDINGS

LUNG:  
-Mononuc cells focal, subpleural, mainly lymphoplasmocytic,  
grade 1  
KIDNEYS:  
-Tubular basophilia, focal, occ.a.w. mononuc. infiltration,  
unilateral, grade 1



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TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 01, 0% PPV33595 FEMALE

CONT./FF. ANIMAL NO. : 12

UTERUS:  
-Metestrus. stage  
ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 13

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS

UTERUS:  
-Metestrus. stage  
ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 14

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

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TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 01, 0% PPV33595 FEMALE

CONT./FF. ANIMAL NO. : 14

\* MICROSCOPIC FINDINGS

STOMACH GLANDULAR PART:  
-Glands cystic dilatation, multifocal, grade 1  
URETERS:  
Only one of paired organs examined/present  
UTERUS:  
-Estrus, stage  
ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 15

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS

UTERUS:  
-Proestrus, stage  
PARATHYROID GLANDS:  
Tissue not present for histologic examination  
ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

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PATHOLOGY REPORT PAGE : 31/ 72  
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TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 01, 0% PPV33595 FEMALE

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 16  
.....

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS

LIVER:  
-EMH/Mononuc cells, focal,occ granulopoiesis/s.cell necros.,  
grade 1  
KIDNEYS:  
-Dilatation tubular, focal, cortex, unilateral, grade 1  
UTERUS:  
-Estrus, stage  
PARATHYROID GLANDS:  
Tissue not present for histologic examination  
ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 17  
.....

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

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PATHOLOGY REPORT PAGE : 32/ 72  
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TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
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SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 01, 0% PPV33595 FEMALE

CONT./FF. ANIMAL NO. : 17

\* MICROSCOPIC FINDINGS

UTERUS:  
-Diestrus, stage  
MAMMARY GLAND:  
Tissue not present for histologic examination  
SKIN/SUBCUTIS:  
Tissue not present for histologic examination  
ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 18

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS

UTERUS:  
-Metestrus. stage  
ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

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SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 01, 0% PPV33595 FEMALE

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 19  
.....

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS

TONGUE:  
-Haemorrhage/Inflammation, focal,occ.necrotic myofibers  
LIVER:  
-EMH/Mononuc cells, focal,occ granulopoiesis/s.cell necros.,  
grade 1  
-Granulocyte infiltration, focal, portal/parenchyma, grade 1  
URETERS:  
Only one of paired organs examined/present  
UTERUS:  
-Proestrus, stage  
PARATHYROID GLANDS:  
Tissue not present for histologic examination  
ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 20  
.....

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

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-----

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 01, 0% PPV33595 FEMALE  
-----

CONT./FF. ANIMAL NO. : 20  
.....

\* MICROSCOPIC FINDINGS

TONGUE:  
Tissue not present for histologic examination  
LIVER:  
-EMH/Mononuc cells, focal,occ granulopoiesis/s.cell necros.,  
grade 2  
KIDNEYS:  
-Tubular basophilia, focal, occ.a.w. mononuc. infiltration,  
unilateral, grade 1  
URETERS:  
Only one of paired organs examined/present  
UTERUS:  
-Proestrus, stage  
ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

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TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

ANIMAL HEADING DATA  
DOSE GROUP : 02, 10% PPV33595

| ANIMAL<br>NUMBER | SEX<br>M/F | DEFINED AND FINAL<br>STATE OF NECROPSY | TEST<br>DAYS | FIRST AND LAST<br>DAY UNDER TEST | DATE OF<br>NECROPSY |           |
|------------------|------------|--|--------------|----------------------------------|---------------------|-----------|
| 21               | M          | K0                                     | K0           | 91                               | 18-APR-12 17-JUL-12 | 17-JUL-12 |
| 22               | M          | K0                                     | K0           | 91                               | 18-APR-12 17-JUL-12 | 17-JUL-12 |
| 23               | M          | K0                                     | K0           | 91                               | 18-APR-12 17-JUL-12 | 17-JUL-12 |
| 24               | M          | K0                                     | K0           | 91                               | 18-APR-12 17-JUL-12 | 17-JUL-12 |
| 25               | M          | K0                                     | K0           | 91                               | 18-APR-12 17-JUL-12 | 17-JUL-12 |
| 26               | M          | K0                                     | K0           | 91                               | 18-APR-12 17-JUL-12 | 17-JUL-12 |
| 27               | M          | K0                                     | K0           | 91                               | 18-APR-12 17-JUL-12 | 17-JUL-12 |
| 28               | M          | K0                                     | K0           | 91                               | 18-APR-12 17-JUL-12 | 17-JUL-12 |
| 29               | M          | K0                                     | K0           | 91                               | 18-APR-12 17-JUL-12 | 17-JUL-12 |
| 30               | M          | K0                                     | K0           | 91                               | 18-APR-12 17-JUL-12 | 17-JUL-12 |
| 31               | F          | K0                                     | K0           | 92                               | 18-APR-12 18-JUL-12 | 18-JUL-12 |
| 32               | F          | K0                                     | K0           | 92                               | 18-APR-12 18-JUL-12 | 18-JUL-12 |
| 33               | F          | K0                                     | K0           | 92                               | 18-APR-12 18-JUL-12 | 18-JUL-12 |
| 34               | F          | K0                                     | K0           | 92                               | 18-APR-12 18-JUL-12 | 18-JUL-12 |
| 35               | F          | K0                                     | K0           | 92                               | 18-APR-12 18-JUL-12 | 18-JUL-12 |
| 36               | F          | K0                                     | K0           | 92                               | 18-APR-12 18-JUL-12 | 18-JUL-12 |
| 37               | F          | K0                                     | K0           | 92                               | 18-APR-12 18-JUL-12 | 18-JUL-12 |
| 38               | F          | K0                                     | K0           | 92                               | 18-APR-12 18-JUL-12 | 18-JUL-12 |
| 39               | F          | K0                                     | K0           | 92                               | 18-APR-12 18-JUL-12 | 18-JUL-12 |
| 40               | F          | K0                                     | K0           | 92                               | 18-APR-12 18-JUL-12 | 18-JUL-12 |

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SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 02, 10% PPV33595 MALE

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 21  
.....

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS

NO EXAMINATION REQUIRED.

-----  
\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 22  
.....

\* NECROPSY FINDINGS

LIVER:  
01: Hernia, right medial lobe:  
through the diaphragm.  
SEMINAL VESICLE:  
01: Left, Diminished in size.  
NO OTHER NECROPSY OBSERVATIONS NOTED

\* MICROSCOPIC FINDINGS

LIVER:  
-Fibrosis, focal, grade 1  
This finding corresponds to necropsy observation no: 01.  
SEMINAL VESICLE:  
Organ examined, no pathologic findings noted



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INDIVIDUAL ANIMAL DATA REF NO : 20126001

TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 02, 10% PPV33595 MALE

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 23  
.....

\* NECROPSY FINDINGS  
NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS  
NO EXAMINATION REQUIRED.

-----  
\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 24  
.....

\* NECROPSY FINDINGS  
NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS  
NO EXAMINATION REQUIRED.

-----

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INDIVIDUAL ANIMAL DATA REF NO : 20126001

TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 02, 10% PPV33595 MALE

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 25  
.....

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS

NO EXAMINATION REQUIRED.

.....  
\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 26  
.....

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS

NO EXAMINATION REQUIRED.

.....

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PATHOLOGY REPORT PAGE : 39/ 72  
INDIVIDUAL ANIMAL DATA REF NO : 20126001

TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 02, 10% PPV33595 MALE

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 27  
.....

\* NECROPSY FINDINGS  
NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS  
NO EXAMINATION REQUIRED.

-----  
\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 28  
.....

\* NECROPSY FINDINGS  
NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS  
NO EXAMINATION REQUIRED.

-----

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INDIVIDUAL ANIMAL DATA REF NO : 20126001

TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 02, 10% PPV33595 MALE

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 29  
.....

\* NECROPSY FINDINGS  
NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS  
NO EXAMINATION REQUIRED.

-----  
\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 30  
.....

\* NECROPSY FINDINGS  
NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS  
NO EXAMINATION REQUIRED.

-----

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PATHOLOGY REPORT PAGE : 41/ 72  
INDIVIDUAL ANIMAL DATA REF NO : 20126001

TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 02, 10% PPV33595 FEMALE

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 31  
.....

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS

NO EXAMINATION REQUIRED.

.....  
\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 32  
.....

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS

NO EXAMINATION REQUIRED.

.....

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PATHOLOGY REPORT PAGE : 42/ 72  
INDIVIDUAL ANIMAL DATA REF NO : 20126001

TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 02, 10% PPV33595 FEMALE

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 33  
.....

\* NECROPSY FINDINGS  
NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS  
NO EXAMINATION REQUIRED.

-----  
\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 34  
.....

\* NECROPSY FINDINGS  
NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS  
NO EXAMINATION REQUIRED.

-----

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INDIVIDUAL ANIMAL DATA REF NO : 20126001

TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 02, 10% PPV33595 FEMALE

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 35  
.....

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS

NO EXAMINATION REQUIRED.

.....  
\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 36  
.....

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS

NO EXAMINATION REQUIRED.

.....

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INDIVIDUAL ANIMAL DATA REF NO : 20126001

TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 02, 10% PPV33595 FEMALE

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 37  
.....

\* NECROPSY FINDINGS  
NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS  
NO EXAMINATION REQUIRED.

-----  
\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 38  
.....

\* NECROPSY FINDINGS  
NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS  
NO EXAMINATION REQUIRED.

-----



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INDIVIDUAL ANIMAL DATA REF NO : 20126001

TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 02, 10% PPV33595 FEMALE

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 39  
.....

\* NECROPSY FINDINGS  
NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS  
NO EXAMINATION REQUIRED.

-----  
\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 40  
.....

\* NECROPSY FINDINGS  
NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS  
NO EXAMINATION REQUIRED.

-----

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INDIVIDUAL ANIMAL DATA REF NO : 20126001

TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

ANIMAL HEADING DATA  
DOSE GROUP : 03, 33% PPV33595

| ANIMAL<br>NUMBER | SEX<br>M/F | DEFINED AND FINAL<br>STATE OF NECROPSY | TEST<br>DAYS | FIRST AND LAST<br>DAY UNDER TEST | DATE OF<br>NECROPSY |
|------------------|------------|--|--------------|----------------------------------|---------------------|
| 41               | M          | K0 K0                                  | 91           | 18-APR-12 17-JUL-12              | 17-JUL-12           |
| 42               | M          | K0 K0                                  | 91           | 18-APR-12 17-JUL-12              | 17-JUL-12           |
| 43               | M          | K0 K0                                  | 91           | 18-APR-12 17-JUL-12              | 17-JUL-12           |
| 44               | M          | K0 K0                                  | 91           | 18-APR-12 17-JUL-12              | 17-JUL-12           |
| 45               | M          | K0 K0                                  | 91           | 18-APR-12 17-JUL-12              | 17-JUL-12           |
| 46               | M          | K0 K0                                  | 91           | 18-APR-12 17-JUL-12              | 17-JUL-12           |
| 47               | M          | K0 K0                                  | 91           | 18-APR-12 17-JUL-12              | 17-JUL-12           |
| 48               | M          | K0 K0                                  | 91           | 18-APR-12 17-JUL-12              | 17-JUL-12           |
| 49               | M          | K0 K0                                  | 91           | 18-APR-12 17-JUL-12              | 17-JUL-12           |
| 50               | M          | K0 K0                                  | 91           | 18-APR-12 17-JUL-12              | 17-JUL-12           |
| 51               | F          | K0 K0                                  | 92           | 18-APR-12 18-JUL-12              | 18-JUL-12           |
| 52               | F          | K0 K0                                  | 92           | 18-APR-12 18-JUL-12              | 18-JUL-12           |
| 53               | F          | K0 K0                                  | 92           | 18-APR-12 18-JUL-12              | 18-JUL-12           |
| 54               | F          | K0 K0                                  | 92           | 18-APR-12 18-JUL-12              | 18-JUL-12           |
| 55               | F          | K0 K0                                  | 92           | 18-APR-12 18-JUL-12              | 18-JUL-12           |
| 56               | F          | K0 K0                                  | 92           | 18-APR-12 18-JUL-12              | 18-JUL-12           |
| 57               | F          | K0 K0                                  | 92           | 18-APR-12 18-JUL-12              | 18-JUL-12           |
| 58               | F          | K0 K0                                  | 92           | 18-APR-12 18-JUL-12              | 18-JUL-12           |
| 59               | F          | K0 K0                                  | 92           | 18-APR-12 18-JUL-12              | 18-JUL-12           |
| 60               | F          | K0 K0                                  | 92           | 18-APR-12 18-JUL-12              | 18-JUL-12           |

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TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 03, 33% PPV33595 MALE

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 41  
.....

\* NECROPSY FINDINGS  
NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS  
NO EXAMINATION REQUIRED.

-----  
\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 42  
.....

\* NECROPSY FINDINGS  
NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS  
NO EXAMINATION REQUIRED.

-----

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TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 03, 33% PPV33595 MALE

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 43  
.....

\* NECROPSY FINDINGS  
NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS  
NO EXAMINATION REQUIRED.

-----  
\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 44  
.....

\* NECROPSY FINDINGS  
NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS  
NO EXAMINATION REQUIRED.

-----

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INDIVIDUAL ANIMAL DATA REF NO : 20126001

TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 03, 33% PPV33595 MALE

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 45  
.....

\* NECROPSY FINDINGS  
NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS  
NO EXAMINATION REQUIRED.

-----  
\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 46  
.....

\* NECROPSY FINDINGS  
NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS  
NO EXAMINATION REQUIRED.

-----

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PATHOLOGY REPORT PAGE : 50/ 72  
INDIVIDUAL ANIMAL DATA REF NO : 20126001

TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 03, 33% PPV33595 MALE

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 47  
.....

\* NECROPSY FINDINGS  
NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS  
NO EXAMINATION REQUIRED.

-----  
\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 48  
.....

\* NECROPSY FINDINGS  
NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS  
NO EXAMINATION REQUIRED.

-----

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INDIVIDUAL ANIMAL DATA REF NO : 20126001

TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 03, 33% PPV33595 MALE

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 49  
.....

\* NECROPSY FINDINGS  
NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS  
NO EXAMINATION REQUIRED.

-----  
\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 50  
.....

\* NECROPSY FINDINGS  
NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS  
NO EXAMINATION REQUIRED.

-----

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INDIVIDUAL ANIMAL DATA REF NO : 20126001

TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 03, 33% PPV33595 FEMALE

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 51  
.....

\* NECROPSY FINDINGS  
NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS  
NO EXAMINATION REQUIRED.

-----  
\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 52  
.....

\* NECROPSY FINDINGS  
NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS  
NO EXAMINATION REQUIRED.

-----



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PATHOLOGY REPORT PAGE : 53/ 72  
INDIVIDUAL ANIMAL DATA REF NO : 20126001

TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 03, 33% PPV33595 FEMALE

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 53  
.....

\* NECROPSY FINDINGS  
NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS  
NO EXAMINATION REQUIRED.

-----  
\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 54  
.....

\* NECROPSY FINDINGS  
NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS  
NO EXAMINATION REQUIRED.

-----

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PATHOLOGY REPORT PAGE : 54/ 72  
INDIVIDUAL ANIMAL DATA REF NO : 20126001

TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 03, 33% PPV33595 FEMALE

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 55  
.....

\* NECROPSY FINDINGS  
NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS  
NO EXAMINATION REQUIRED.

-----  
\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 56  
.....

\* NECROPSY FINDINGS  
NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS  
NO EXAMINATION REQUIRED.

-----

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PATHOLOGY REPORT PAGE : 55/ 72  
INDIVIDUAL ANIMAL DATA REF NO : 20126001

TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 03, 33% PPV33595 FEMALE

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 57  
.....

\* NECROPSY FINDINGS  
NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS  
NO EXAMINATION REQUIRED.

-----  
\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 58  
.....

\* NECROPSY FINDINGS  
NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS  
NO EXAMINATION REQUIRED.

-----

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INDIVIDUAL ANIMAL DATA REF NO : 20126001

TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 03, 33% PPV33595 FEMALE

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 59  
.....

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS

NO EXAMINATION REQUIRED.

-----  
\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 60  
.....

\* NECROPSY FINDINGS

THYMUS:  
01: Discoloration: Red.  
NO OTHER NECROPSY OBSERVATIONS NOTED

\* MICROSCOPIC FINDINGS

THYMUS:  
-Haemorrhage/congestion, diffuse, grade 1  
This finding corresponds to necropsy observation no: 01.

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INDIVIDUAL ANIMAL DATA REF NO : 20126001

TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

ANIMAL HEADING DATA  
DOSE GROUP : 04, 100% PPV33595

| ANIMAL<br>NUMBER | SEX<br>M/F | DEFINED AND FINAL<br>STATE OF NECROPSY | TEST<br>DAYS | FIRST AND LAST<br>DAY UNDER TEST | DATE OF<br>NECROPSY |           |
|------------------|------------|--|--------------|----------------------------------|---------------------|-----------|
| 61               | M          | K0                                     | K0           | 91                               | 18-APR-12 17-JUL-12 | 17-JUL-12 |
| 62               | M          | K0                                     | K0           | 91                               | 18-APR-12 17-JUL-12 | 17-JUL-12 |
| 63               | M          | K0                                     | K0           | 91                               | 18-APR-12 17-JUL-12 | 17-JUL-12 |
| 64               | M          | K0                                     | K0           | 91                               | 18-APR-12 17-JUL-12 | 17-JUL-12 |
| 65               | M          | K0                                     | K0           | 91                               | 18-APR-12 17-JUL-12 | 17-JUL-12 |
| 66               | M          | K0                                     | K0           | 91                               | 18-APR-12 17-JUL-12 | 17-JUL-12 |
| 67               | M          | K0                                     | K0           | 91                               | 18-APR-12 17-JUL-12 | 17-JUL-12 |
| 68               | M          | K0                                     | K0           | 91                               | 18-APR-12 17-JUL-12 | 17-JUL-12 |
| 69               | M          | K0                                     | K0           | 91                               | 18-APR-12 17-JUL-12 | 17-JUL-12 |
| 70               | M          | K0                                     | K0           | 91                               | 18-APR-12 17-JUL-12 | 17-JUL-12 |
| 71               | F          | K0                                     | K0           | 92                               | 18-APR-12 18-JUL-12 | 18-JUL-12 |
| 72               | F          | K0                                     | K0           | 92                               | 18-APR-12 18-JUL-12 | 18-JUL-12 |
| 73               | F          | K0                                     | K0           | 92                               | 18-APR-12 18-JUL-12 | 18-JUL-12 |
| 74               | F          | K0                                     | K0           | 92                               | 18-APR-12 18-JUL-12 | 18-JUL-12 |
| 75               | F          | K0                                     | K0           | 92                               | 18-APR-12 18-JUL-12 | 18-JUL-12 |
| 76               | F          | K0                                     | K0           | 92                               | 18-APR-12 18-JUL-12 | 18-JUL-12 |
| 77               | F          | K0                                     | K0           | 92                               | 18-APR-12 18-JUL-12 | 18-JUL-12 |
| 78               | F          | K0                                     | K0           | 92                               | 18-APR-12 18-JUL-12 | 18-JUL-12 |
| 79               | F          | K0                                     | K0           | 92                               | 18-APR-12 18-JUL-12 | 18-JUL-12 |
| 80               | F          | K0                                     | K0           | 92                               | 18-APR-12 18-JUL-12 | 18-JUL-12 |

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TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
TEST SYSTEM : RAT, 90-DAYS, ORAL DATE : 09-OCT-12  
SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 04, 100% PPV33595 MALE

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 61  
.....

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS

KIDNEYS:  
-Hyaline cast tubular, focal,occ associated w. basophilia,  
bilateral, grade 1  
-Tubular basophilia, focal, occ.a.w. mononuc. infiltration,  
unilateral, grade 1  
ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 62  
.....

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS

KIDNEYS:  
-Hyaline cast tubular, focal,occ associated w. basophilia,  
unilateral, grade 1  
PARATHYROID GLANDS:  
Tissue not present for histologic examination  
ADRENAL GLANDS:  
-Vacuolation diffusemainly Z fasc, mainly macrovesicular,  
bilateral, grade 1

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SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 04, 100% PPV33595 MALE

CONT./FF. ANIMAL NO. : 62

ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 63

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS

LIVER:  
-EMH/Mononuc cells, focal,occ granulopoiesis/s.cell necros.,  
grade 1  
PARATHYROID GLANDS:  
Tissue not present for histologic examination  
ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 64

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

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SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 04, 100% PPV33595 MALE

CONT./FF. ANIMAL NO. : 64

\* MICROSCOPIC FINDINGS

HEART:

- Neutrophil infiltration, focal, endocardium/luminal, grade 1
- Mononuc cell infiltration, myorcardium/endocardium, focal, grade 2

LIVER:

- EMH/Mononuc cells, focal,occ granulopoiesis/s.cell necros., grade 1

URETERS:

Only one of paired organs examined/present

MAMMARY GLAND:

Tissue not present for histologic examination

SKIN/SUBCUTIS:

Tissue not present for histologic examination

OPTIC NERVES:

Tissue not present for histologic examination

ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

\* STATE AT NECROPSY: K0

DAYS ON TEST : 91

\* ANIMAL NO. : 65

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.



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SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 04, 100% PPV33595 MALE

CONT./FF. ANIMAL NO. : 65

\* MICROSCOPIC FINDINGS

HEART:  
-Mononuc cell infiltration, myorcardium/endocrdium, focal,  
grade 1  
TONGUE:  
Tissue not present for histologic examination  
LIVER:  
-EMH/Mononuc cells, focal,occ granulopoiesis/s.cell necros.,  
grade 1  
URETERS:  
Only one of paired organs examined/present  
URINARY BLADDER:  
Tissue not present for histologic examination  
PITUITARY GLAND:  
Tissue not present for histologic examination  
ADRENAL GLANDS:  
-Vacuolation diffusemainly Z fasc, mainly macrovesicular,  
bilateral, grade 1  
ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 66

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

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SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 04, 100% PPV33595 MALE

CONT./FF. ANIMAL NO. : 66

\* MICROSCOPIC FINDINGS

HEART:

-Mononuc cell infiltration, myorcardium, focal, grade 1

KIDNEYS:

-Hyaline cast tubular, focal,occ associated w. basophilia,  
bilateral, grade 1

-Tubular basophilia, focal, occ.a.w. mononuc. infiltration,  
unilateral, grade 1

URETERS:

Only one of paired organs examined/present

ADRENAL GLANDS:

-Vacuolation diffusemainly Z fasc, mainly macrovesicular,  
bilateral, grade 1

ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

\* STATE AT NECROPSY: K0

DAYS ON TEST : 91

\* ANIMAL NO. : 67

\* NECROPSY FINDINGS

THYMUS:

01: Discoloration: Red.

NO OTHER NECROPSY OBSERVATIONS NOTED

\* MICROSCOPIC FINDINGS

HEART:

-Neutrophil infiltration, focal, endocardium/luminal, grade 1

LIVER:

-EMH/Mononuc cells, focal,occ granulopoiesis/s.cell necros.,  
grade 1

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PATHOLOGY REPORT PAGE : 63/ 72  
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TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
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SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 04, 100% PPV33595 MALE

CONT./FF. ANIMAL NO. : 67

THYROID GLAND (BOTH LOBES):  
-Ultimobranchial cyst, focal, bilateral  
THYMUS:  
-Haemorrhage/congestion, diffuse, grade 1  
This finding corresponds to necropsy observation no: 01.  
ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 68

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS

LUNG:  
-Inflam cell infiltration, alv/perivasc, m. neutrophils,  
grade 1  
TONGUE:  
-Haemorrhage/Inflammation, focal,occ.necrotic myofibers  
LIVER:  
-EMH/Mononuc cells, focal,occ granulopoiesis/s.cell necros.,  
grade 1  
ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

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SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 04, 100% PPV33595 MALE

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 69  
.....

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS

HEART:

-Mononuc cell infiltration, myorcardium,/endocardium, focal,  
grade 2

TONGUE:

-Haemorrhage/Inflammation, focal,occ.necrotic myofibers

STOMACH GLANDULAR PART:

-Glands cystic dilatation, multifocal, grade 1

LIVER:

-EMH/Mononuc cells, focal,occ granulopoiesis/s.cell necros.,  
grade 1

KIDNEYS:

-Hyaline cast tubular, focal,occ associated w. basophilia,  
bilateral, grade 1

-Tubular basophilia, focal, occ.a.w. mononuc. infiltration,  
bilateral, grade 1

PROSTATE GLAND:

-Mononuclear cell infiltration, lymphoplasmo. interstitial,  
grade 1

PARATHYROID GLANDS:

Tissue not present for histologic examination

ADRENAL GLANDS:

-Vacuolation diffusemainly Z fasc, mainly macrovesicular,  
bilateral, grade 1

ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

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TEST ARTICLE : Asparaginase PPV33595 PATHOL. NO.: 74826 LIM  
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SPONSOR : Novozymes A/S PathData®System V6.2a2  
-----

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 04, 100% PPV33595 MALE  
-----

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 91 \* ANIMAL NO. : 70  
.....

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS

TONGUE:  
-Haemorrhage/Inflammation, focal,occ.necrotic myofibers  
LIVER:  
-Vacuolation hepatoc`s, m.focal,increased, macro/microves.,  
grade 1  
KIDNEYS:  
-Tubular basophilia, focal, occ.a.w. mononuc. /interst fibr,  
unilateral, grade 1  
ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

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SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 04, 100% PPV33595 FEMALE

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 71  
.....

\* NECROPSY FINDINGS

OVARIES:  
01: Right: Cyst: hemorrhagic, Single, Up to 3 mm in diameter.  
NO OTHER NECROPSY OBSERVATIONS NOTED

\* MICROSCOPIC FINDINGS

LUNG:  
-Alv macrophages, focal, foamy, alveolar lumen, grade 1  
KIDNEYS:  
-Tubular basophilia, focal, occ.a.w. mononuc. infiltration,  
unilateral, grade 1  
URETERS:  
Only one of paired organs examined/present  
UTERUS:  
-Proestrus, stage  
ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

.....  
\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 72  
.....

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

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SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 04, 100% PPV33595 FEMALE

CONT./FF. ANIMAL NO. : 72

\* MICROSCOPIC FINDINGS

TONGUE:  
-Haemorrhage/Inflammation, focal,occ.necrotic myofibers  
UTERUS:  
-Proestrus, stage  
ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

\* STATE AT NECROPSY: K0

DAYS ON TEST : 92 \* ANIMAL NO. : 73

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS

LUNG:  
-Alv macrophages, focal, foamy, alveolar lumen, grade 1  
UTERUS:  
-Proestrus, stage  
late  
PARATHYROID GLANDS:  
Tissue not present for histologic examination  
ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

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SPONSOR : Novozymes A/S PathData®System V6.2a2

TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 04, 100% PPV33595 FEMALE

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 74  
.....

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS

TONGUE:  
-Haemorrhage/Inflammation, focal,occ.necrotic myofibers  
UTERUS:  
-Metestrus. stage  
ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 75  
.....

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS

TONGUE:  
-Haemorrhage/Inflammation, focal,occ.necrotic myofibers  
LIVER:  
-EMH/Mononuc cells, focal,occ granulopoiesis/s.cell necros.,  
grade 1  
UTERUS:  
-Metestrus. stage



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TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 04, 100% PPV33595 FEMALE

CONT./FF. ANIMAL NO. : 75

ADRENAL GLANDS:  
-Haemorrhage focal, cortex, bilateral, grade 1  
ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 76

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS

LIVER:  
-EMH/Mononuc cells, focal,occ granulopoiesis/s.cell necros.,  
grade 1  
UTERUS:  
-Proestrus, stage  
ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

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TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 04, 100% PPV33595 FEMALE

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 77  
.....

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS

UTERUS:  
-Estrus, stage  
late  
ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 78  
.....

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

\* MICROSCOPIC FINDINGS

STOMACH GLANDULAR PART:  
-Glands cystic dilatation, multifocal, grade 1  
KIDNEYS:  
-Tubular basophilia, focal, occ.a.w. mononuc. infiltration,  
unilateral, grade 1  
UTERUS:  
-Proestrus, stage  
ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

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TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 04, 100% PPV33595 FEMALE

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 79  
.....

\* NECROPSY FINDINGS

THYMUS:  
01: Discoloration: Red.  
NO OTHER NECROPSY OBSERVATIONS NOTED

\* MICROSCOPIC FINDINGS

STOMACH GLANDULAR PART:  
-Glands cystic dilatation, multifocal, grade 1  
UTERUS:  
-Proestrus, stage  
THYMUS:  
-Haemorrhage/congestion, diffuse, grade 1  
This finding corresponds to necropsy observation no: 01.  
SKELETAL MUSCLE:  
-Mononuc cells focal, interstitial, grade 1  
ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

\* STATE AT NECROPSY: K0  
DAYS ON TEST : 92 \* ANIMAL NO. : 80  
.....

\* NECROPSY FINDINGS

NO NECROPSY OBSERVATIONS NOTED.

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TEXT OF GROSS AND MICROSCOPIC FINDINGS  
DOSE GROUP : 04, 100% PPV33595 FEMALE  
-----

CONT./FF. ANIMAL NO. : 80

.....  
\* MICROSCOPIC FINDINGS

TONGUE:  
-Haemorrhage/Inflammation, focal,occ.necrotic myofibers  
LIVER:  
-EMH/Mononuc cells, focal,occ granulopoiesis/s.cell necros.,  
grade 1  
UTERUS:  
-Proestrus, stage  
ALL OTHER PROTOCOL TISSUES WITHOUT PATHOLOGIC FINDINGS.

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## **Appendix III   Historical data – Haematology (3 pages, excl. this cover page)**

CiToxLAB Scantox A/S historical data

Rat toxicity 12-14 weeks studies

Haematology

breed = Ntac:SD

| SEX    | PARAMETER | NUMBER<br>OF<br>STUDIES | NUMBER<br>OF<br>ANIMALS | MEAN  | MIN   | MAX   | 95%<br>CONFIDENCE INTERVALS |                |
|--------|-----------|-------------------------|-------------------------|-------|-------|-------|-----------------------------|----------------|
|        |           |                         |                         |       |       |       | LOWER<br>LIMIT              | UPPER<br>LIMIT |
| male   | Hb        | 21                      | 234                     | 9.76  | 9.12  | 10.31 | 8.85                        | 10.67          |
| female | Hb        | 21                      | 238                     | 9.41  | 8.82  | 10.18 | 8.59                        | 10.23          |
| male   | RBC       | 21                      | 234                     | 9.08  | 8.44  | 9.63  | 8.06                        | 10.10          |
| female | RBC       | 21                      | 238                     | 8.36  | 7.92  | 8.77  | 7.49                        | 9.24           |
| male   | HT        | 21                      | 234                     | 46.76 | 44.33 | 49.40 | 41.78                       | 51.74          |
| female | HT        | 21                      | 238                     | 44.31 | 41.30 | 47.10 | 40.06                       | 48.57          |
| male   | % RETIC   | 6                       | 57                      | 2.32  | 2.05  | 2.48  | 1.67                        | 2.96           |
| female | % RETIC   | 6                       | 60                      | 2.39  | 2.00  | 2.87  | 1.50                        | 3.29           |
| male   | RETIC     | 6                       | 57                      | 0.21  | 0.20  | 0.23  | 0.16                        | 0.27           |
| female | RETIC     | 6                       | 60                      | 0.20  | 0.17  | 0.23  | 0.13                        | 0.27           |
| male   | MCV       | 21                      | 234                     | 51.43 | 50.10 | 56.00 | 48.13                       | 54.74          |
| female | MCV       | 21                      | 238                     | 52.93 | 51.90 | 55.20 | 50.05                       | 55.80          |
| male   | MCH       | 21                      | 234                     | 1.09  | 1.04  | 1.20  | 0.99                        | 1.18           |
| female | MCH       | 21                      | 238                     | 1.13  | 1.10  | 1.20  | 1.05                        | 1.21           |
| male   | MCHC      | 21                      | 234                     | 20.91 | 20.19 | 21.95 | 19.92                       | 21.90          |
| female | MCHC      | 21                      | 238                     | 21.27 | 20.30 | 22.42 | 20.38                       | 22.16          |
| male   | WBC       | 21                      | 231                     | 13.63 | 10.28 | 18.21 | 8.43                        | 18.83          |
| female | WBC       | 21                      | 233                     | 11.15 | 8.65  | 16.14 | 6.11                        | 16.19          |
| male   | % NEUTRO  | 21                      | 234                     | 8.07  | 3.78  | 13.10 | 2.01                        | 14.14          |
| female | % NEUTRO  | 21                      | 238                     | 7.82  | 4.80  | 13.10 | 1.92                        | 13.72          |
| male   | NEUTRO    | 21                      | 231                     | 1.08  | 0.52  | 1.73  | 0.09                        | 2.07           |
| female | NEUTRO    | 21                      | 233                     | 0.87  | 0.47  | 1.36  | 0.08                        | 1.67           |

CiToxLAB Scantox A/S historical data

Rat toxicity 12-14 weeks studies

Haematology

breed = Ntac:SD

| SEX    | PARAMETER | NUMBER<br>OF<br>STUDIES | NUMBER<br>OF<br>ANIMALS | MEAN   | MIN    | MAX    | 95%<br>CONFIDENCE INTERVALS |                |
|--------|-----------|-------------------------|-------------------------|--------|--------|--------|-----------------------------|----------------|
|        |           |                         |                         |        |        |        | LOWER<br>LIMIT              | UPPER<br>LIMIT |
| male   | % LYMPHO  | 21                      | 234                     | 90.53  | 84.90  | 95.00  | 83.71                       | 97.36          |
| female | % LYMPHO  | 21                      | 238                     | 90.48  | 84.60  | 94.10  | 83.63                       | 97.33          |
| male   | LYMPHO    | 21                      | 231                     | 12.36  | 9.17   | 17.01  | 7.75                        | 16.97          |
| female | LYMPHO    | 21                      | 233                     | 10.10  | 7.57   | 14.87  | 5.48                        | 14.72          |
| male   | % EOS     | 21                      | 234                     | 0.88   | 0.30   | 1.80   | 0.00                        | 2.19           |
| female | % EOS     | 21                      | 238                     | 1.24   | 0.70   | 2.00   | 0.00                        | 3.03           |
| male   | EOS       | 21                      | 231                     | 0.11   | 0.04   | 0.20   | 0.00                        | 0.32           |
| female | EOS       | 21                      | 233                     | 0.13   | 0.05   | 0.23   | 0.00                        | 0.32           |
| male   | % BASO    | 21                      | 234                     | 0.00   | 0.00   | 0.00   | 0.00                        | 0.00           |
| female | % BASO    | 21                      | 238                     | 0.02   | 0.00   | 0.30   | 0.00                        | 0.25           |
| male   | BASO      | 21                      | 231                     | 0.00   | 0.00   | 0.00   | 0.00                        | 0.01           |
| female | BASO      | 21                      | 233                     | 0.00   | 0.00   | 0.03   | 0.00                        | 0.04           |
| male   | % MONO    | 21                      | 234                     | 0.57   | 0.10   | 2.66   | 0.00                        | 2.31           |
| female | % MONO    | 21                      | 238                     | 0.42   | 0.00   | 2.58   | 0.00                        | 1.83           |
| male   | MONO      | 21                      | 231                     | 0.08   | 0.02   | 0.29   | 0.00                        | 0.30           |
| female | MONO      | 21                      | 233                     | 0.04   | 0.00   | 0.25   | 0.00                        | 0.21           |
| male   | Plt       | 9                       | 115                     | 598.52 | 483.70 | 784.26 | 348.12                      | 848.92         |
| female | Plt       | 9                       | 118                     | 646.75 | 534.40 | 807.95 | 379.14                      | 914.35         |
| male   | APTT      | 16                      | 185                     | 19.23  | 16.02  | 30.55  | 8.20                        | 30.25          |
| female | APTT      | 16                      | 188                     | 16.40  | 13.27  | 25.05  | 8.14                        | 24.66          |
| male   | Pt        | 21                      | 230                     | 14.40  | 11.59  | 17.25  | 13.12                       | 15.67          |
| female | Pt        | 21                      | 235                     | 14.52  | 12.02  | 16.91  | 13.27                       | 15.77          |
| male   | Fib       | 21                      | 231                     | 3.12   | 2.79   | 3.67   | 2.11                        | 4.14           |
| female | Fib       | 21                      | 235                     | 2.42   | 2.11   | 2.82   | 1.53                        | 3.30           |

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## **Appendix IV    Historical data – Clinical chemistry (3 pages, excl. this cover page)**



CiToxLAB Scantox A/S historical data

Rat toxicity 12-14 weeks studies

Clinical chemistry

breed = Ntac:SD

| SEX    | PARAMETER | NUMBER<br>OF<br>STUDIES | NUMBER<br>OF<br>ANIMALS | MEAN   | MIN    | MAX    | 95%<br>CONFIDENCE INTERVALS |                |
|--------|-----------|-------------------------|-------------------------|--------|--------|--------|-----------------------------|----------------|
|        |           |                         |                         |        |        |        | LOWER<br>LIMIT              | UPPER<br>LIMIT |
| male   | ALAT      | 21                      | 234                     | 1.53   | 0.83   | 2.58   | 0.64                        | 2.41           |
| female | ALAT      | 21                      | 238                     | 1.19   | 0.72   | 1.65   | 0.55                        | 1.83           |
| male   | ASAT      | 21                      | 234                     | 1.85   | 1.45   | 2.98   | 0.88                        | 2.82           |
| female | ASAT      | 21                      | 238                     | 1.70   | 1.31   | 2.38   | 0.65                        | 2.76           |
| male   | ALKPH     | 21                      | 234                     | 2.82   | 2.43   | 5.11   | 1.96                        | 3.68           |
| female | ALKPH     | 21                      | 238                     | 2.24   | 1.82   | 3.29   | 0.02                        | 4.47           |
| male   | TBILI     | 21                      | 234                     | 2.92   | 1.35   | 3.00   | 2.79                        | 3.06           |
| female | TBILI     | 21                      | 238                     | 2.93   | 1.49   | 3.02   | 2.65                        | 3.21           |
| male   | GGT       | 21                      | 234                     | 0.03   | 0.03   | 0.04   | 0.03                        | 0.04           |
| female | GGT       | 21                      | 238                     | 0.03   | 0.03   | 0.04   | 0.02                        | 0.05           |
| male   | CHOL      | 21                      | 234                     | 2.62   | 2.32   | 3.05   | 1.64                        | 3.61           |
| female | CHOL      | 21                      | 238                     | 2.77   | 2.31   | 3.13   | 1.85                        | 3.69           |
| male   | TRIG      | 21                      | 234                     | 1.88   | 1.39   | 2.71   | 0.76                        | 3.00           |
| female | TRIG      | 21                      | 238                     | 1.14   | 0.58   | 2.10   | 0.22                        | 2.07           |
| male   | UREA      | 21                      | 234                     | 7.37   | 6.35   | 8.68   | 5.47                        | 9.27           |
| female | UREA      | 21                      | 238                     | 6.86   | 6.18   | 7.67   | 4.77                        | 8.94           |
| male   | CREAT     | 21                      | 234                     | 25.37  | 20.10  | 33.70  | 19.85                       | 30.89          |
| female | CREAT     | 21                      | 238                     | 26.03  | 21.90  | 37.00  | 20.79                       | 31.28          |
| male   | GLUC      | 21                      | 233                     | 7.07   | 6.11   | 8.29   | 4.09                        | 10.05          |
| female | GLUC      | 21                      | 238                     | 7.12   | 6.27   | 8.76   | 5.01                        | 9.24           |
| male   | Na        | 21                      | 234                     | 146.97 | 142.98 | 159.13 | 141.58                      | 152.36         |
| female | Na        | 21                      | 238                     | 145.95 | 140.75 | 158.64 | 140.73                      | 151.17         |

CiToxLAB Scantox A/S historical data

Rat toxicity 12-14 weeks studies

Clinical chemistry

breed = Ntac:SD

| SEX    | PARAMETER   | NUMBER<br>OF<br>STUDIES | NUMBER<br>OF<br>ANIMALS | MEAN   | MIN   | MAX    | 95%<br>CONFIDENCE INTERVALS |                |
|--------|-------------|-------------------------|-------------------------|--------|-------|--------|-----------------------------|----------------|
|        |             |                         |                         |        |       |        | LOWER<br>LIMIT              | UPPER<br>LIMIT |
| male   | K           | 21                      | 234                     | 6.54   | 5.86  | 8.66   | 4.54                        | 8.55           |
| female | K           | 21                      | 238                     | 6.32   | 5.50  | 7.32   | 4.91                        | 7.73           |
| male   | Ca          | 21                      | 234                     | 2.88   | 2.74  | 3.15   | 2.66                        | 3.10           |
| female | Ca          | 21                      | 238                     | 2.88   | 2.72  | 3.18   | 2.66                        | 3.11           |
| male   | Mg          | 21                      | 234                     | 1.07   | 0.92  | 1.22   | 0.89                        | 1.25           |
| female | Mg          | 21                      | 238                     | 1.12   | 0.90  | 1.25   | 0.95                        | 1.30           |
| male   | P           | 21                      | 234                     | 2.68   | 2.16  | 3.16   | 2.15                        | 3.20           |
| female | P           | 21                      | 238                     | 2.36   | 1.80  | 3.04   | 1.66                        | 3.07           |
| male   | Cl          | 21                      | 234                     | 101.30 | 95.68 | 106.63 | 97.22                       | 105.38         |
| female | Cl          | 21                      | 238                     | 102.18 | 95.52 | 107.69 | 98.43                       | 105.93         |
| male   | PROTEIN     | 21                      | 234                     | 70.46  | 66.70 | 74.91  | 64.40                       | 76.53          |
| female | PROTEIN     | 21                      | 238                     | 71.14  | 67.23 | 76.53  | 64.40                       | 77.88          |
| male   | ALB         | 21                      | 234                     | 44.30  | 41.00 | 46.67  | 40.59                       | 48.00          |
| female | ALB         | 21                      | 238                     | 48.51  | 45.50 | 52.00  | 43.31                       | 53.70          |
| male   | GLOBULIN    | 21                      | 234                     | 26.17  | 21.23 | 30.04  | 21.86                       | 30.47          |
| female | GLOBULIN    | 21                      | 238                     | 22.64  | 17.78 | 25.67  | 18.73                       | 26.54          |
| male   | ALB/G Ratio | 21                      | 234                     | 1.72   | 1.48  | 2.21   | 1.43                        | 2.01           |
| female | ALB/G Ratio | 21                      | 238                     | 2.18   | 1.89  | 2.91   | 1.75                        | 2.6            |

## Appendix 6

### non-CCI version

*Elements in Appendix 6 that are to be treated as confidential commercial information (CCI) are marked in highlighted text in the CCI version and the corresponding text as [REDACTED] in the non-CCI version.*

### Documentation regarding the production strain

1. Detailed description of the construction of the genetically modified production strain
2. Introduced DNA sequences in the production strain
3. DNA sequence of the *asnPfu* gene and the amino acid sequence of the asparaginase produced by *Bacillus subtilis*, strain MOL2940
4. Genetic stability of the production strain (Southern blot). Novozymes Report No.: 2014-01

## Appendix 6.1

### Detailed description of the construction of the genetically modified production strain

#### 6.1.1. The host organism

##### Taxonomy

The recipient strain, *Bacillus subtilis* PP2982 was derived from strain A164, which is identical to strain ATCC 6051a, the deposited type strain of *Bacillus subtilis*. The taxonomic classification is as follows:

|          |                          |
|----------|--------------------------|
| Name:    | <i>Bacillus subtilis</i> |
| Class:   | Bacilli                  |
| Order:   | <i>Bacillales</i>        |
| Genus    | <i>Bacillus</i>          |
| Species: | <i>subtilis</i>          |

Information on ATCC 6051a describing the taxonomy as *B. subtilis* is obtainable from The Global Bioresource Center (ATCC).

##### Genetic modifications

The recipient strain, *Bacillus subtilis* PP2982 was derived from strain A164 by modifications at several chromosomal loci to cause deletion of genes encoding a number of proteases. Also a gene essential for sporulation was deleted, eliminating the ability to sporulate, together with a gene essential for formation of surfactin.

### 6.1.2. Origin and donor of vector and inserts

#### The enzyme gene

The product gene, designated *asnPfu*, was chemically synthesized based on sequence data from a public database. According to Maeder *et al.*, 1999<sup>2</sup>, the gene codes for an L-asparaginase and is derived from the extremophile *Pyrococcus furiosus* (ATCC 43587) from thermal marine sediments.

#### Promoter

The *asnPfu* gene is transcribed using a promoter composed of promoter elements

from *Bacillus licheniformis*

*Bacillus amyloliquefaciens*

*Bacillus thuringiensis*

#### Terminator

The transcriptional terminator from the *B. licheniformis amyL* gene.

#### Vector/insert

Vectors used are composed of elements from plasmids pUB110 (Gryczan *et al.*, 1978<sup>4</sup>), pE194 (Horinouchi, S. and Weisblum, B., 1982<sup>5</sup>)

### 6.1.3. Introduced genetic sequence

The *asnPfu* gene was inserted at three different loci, by means of the integration plasmid pMOL2930. The plasmid map of pMOL2930, and a table showing the position of all the genetic elements and genes, is shown below.



**Figure 2.1.** Plasmid map of pMOL2930

**Table 2.1.** Detailed description of pMOL2930

|   |  |
|---|--|
| A large gray rectangular area representing a redacted table. The table is intended to provide a detailed description of pMOL2930. |  |
|---|--|

#### 6.1.4. Construction of the recombinant production organism

The production strain, *B. subtilis* MOL2940, was constructed from the recipient strain PP2982 through the following steps:

- 1) A conjugation donor strain harbouring pMOL2930 was used to mobilize pMOL2930 into the recipient strain.
- 2) Plasmid pMOL2930 was integrated into strain PP2982

3)

4) The resulting three-copy asparaginase strain was named MOL2940.

Sequence confirmation of the inserted expression cassettes and the flanking regions at both of the integration loci was performed in the production strain.

The DNA segments inserted into the chromosome of the final production strain comprise the sequence of the *asnPfu* gene, encoding the asparaginase. The gene is transcribed using the promoter and the *amyL* terminator described in section 6.1.2.

#### 6.1.5. Description of the production organism

The production strain is a *Bacillus subtilis*

The resulting strain is therefore non-sporulating, surfactin negative and protease deficient.

The final strain has three copies of a DNA sequence encoding an asparaginase from *Pyrococcus furiosus* (*asnPfu*) at three different positions on the chromosome:

- One copy is inserted at the chromosomal
- The second copy is inserted at the chromosomal
- The third copy is inserted at the chromosomal

Diagrams of the asparaginase expression cassette, which is integrated into the *B. subtilis* chromosome and tables outlining the introduced genetic elements, as well as the full sequence of the DNA that was introduced as a result of the genetic modifications is given in Appendix 6.2.

The DNA sequence of the *asnPfu* gene and the amino acid sequence of the asparaginase produced by *Bacillus subtilis*, strain MOL2940, is given in Appendix 6.3.



No antibiotic resistance genes were left in the final production strain as a result of the genetic modifications.

#### Identity and taxonomy of production organism

The production strain is a *Bacillus subtilis* carrying three genes coding for an asparaginase from *Pyrococcus furiosus*.

#### Genetic stability and mobilization and conjugation capability

The inserted recombinant DNA is genetically stable during fermentation, as the inserted DNA is integrated into the chromosome.

The genetic stability of the production strain was tested at large-scale fermentation. The strain stability during fermentation was analyzed by Southern blotting. No instability of the strain was observed (Appendix 6.4).

As all inserts are chromosomally integrated and lack a functional origin of replication, they cannot be transferred by conjugation to other organisms, nor can fragments replicate autonomously.

#### Antibiotic resistance gene

No functional antibiotic resistance genes were left in the strain as a result of the genetic modifications.

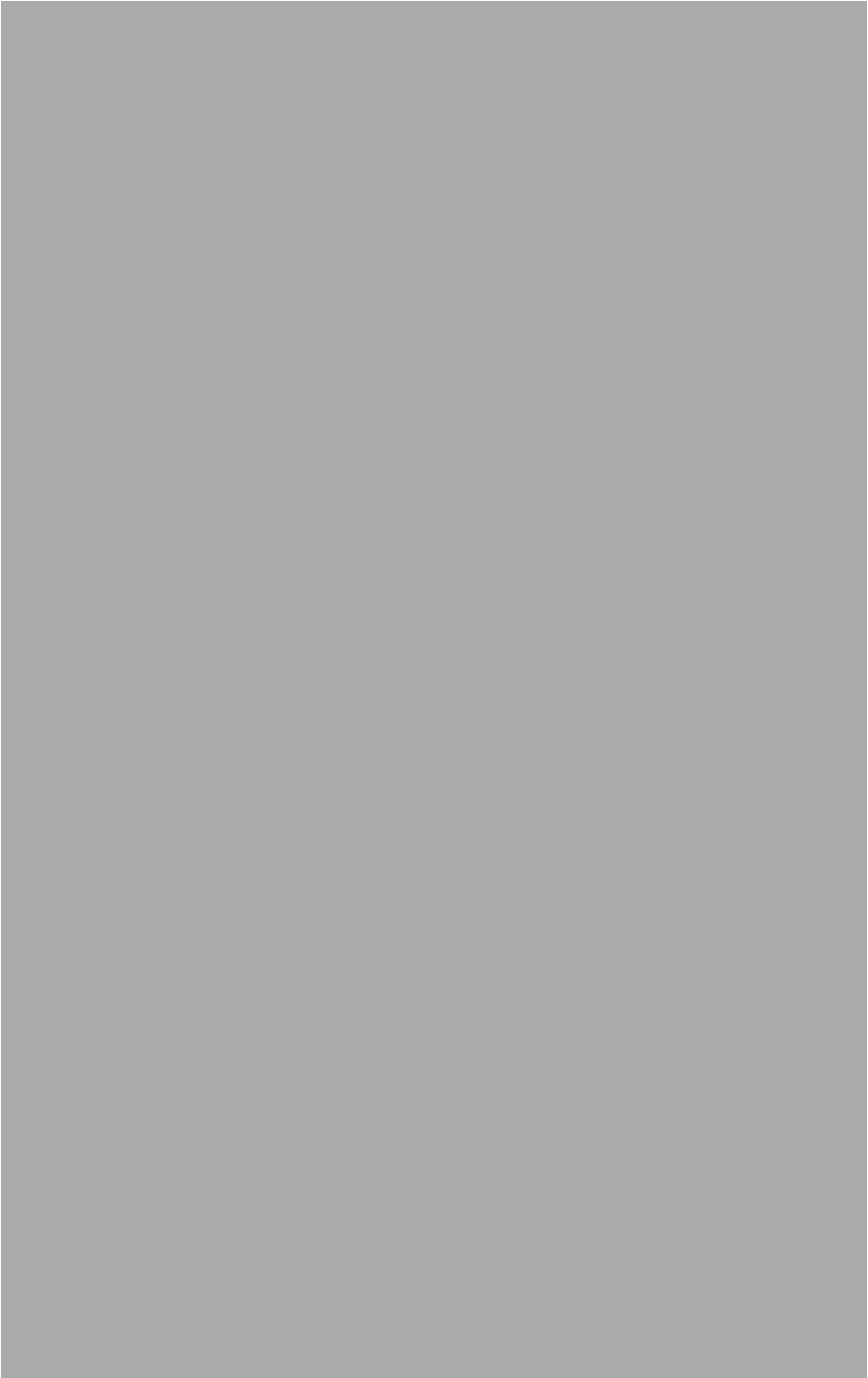
## Appendix 6.2

### Introduced DNA sequences in the production strain

#### Introduced DNA sequences in the production strain

Diagrams of the Asparaginase expression cassette, which is integrated into the *B. subtilis* chromosome and tables outlining the introduced genetic elements, as well as the full sequence of the DNA that was introduced as a result of the genetic modifications is given below.







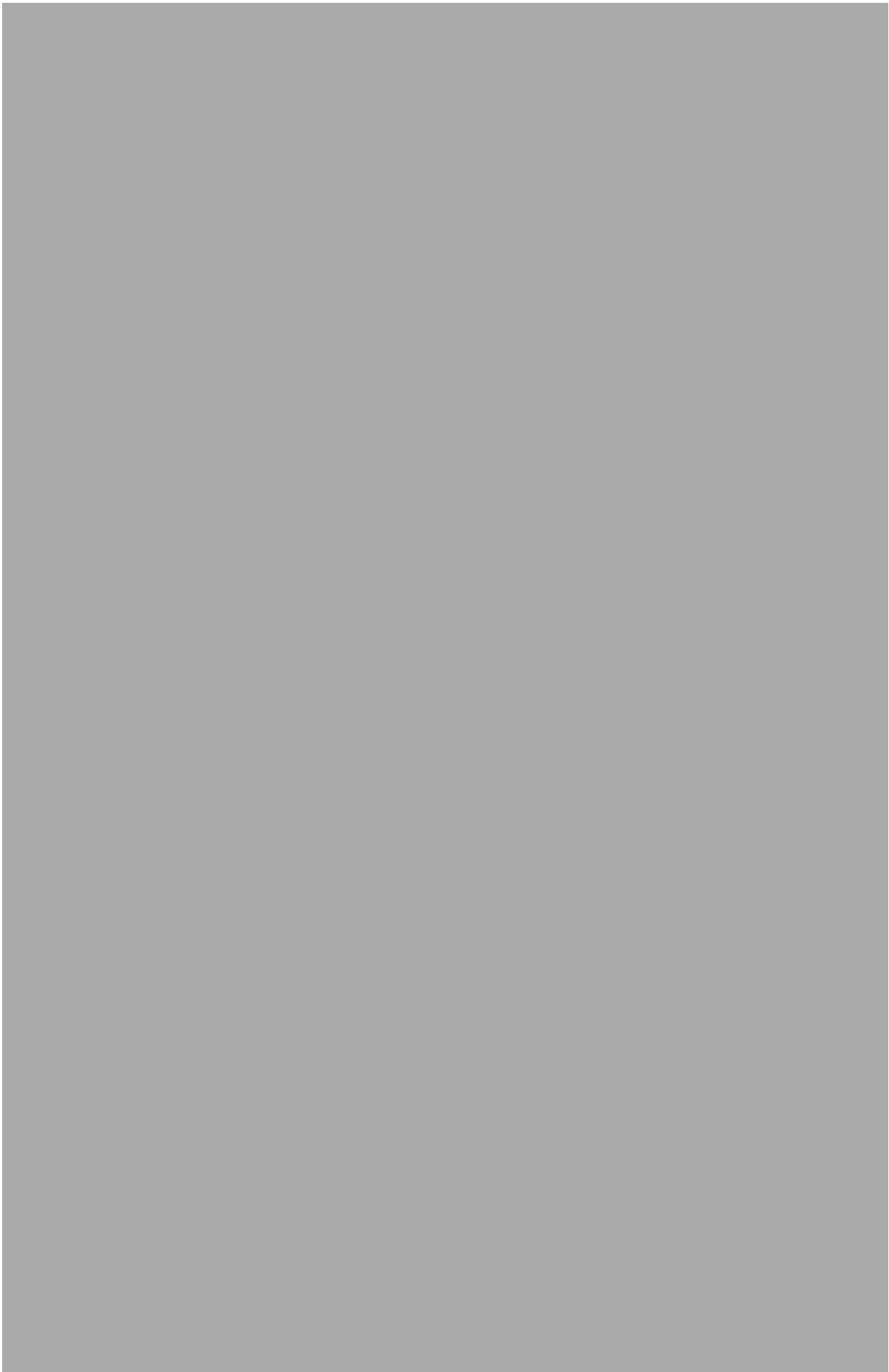


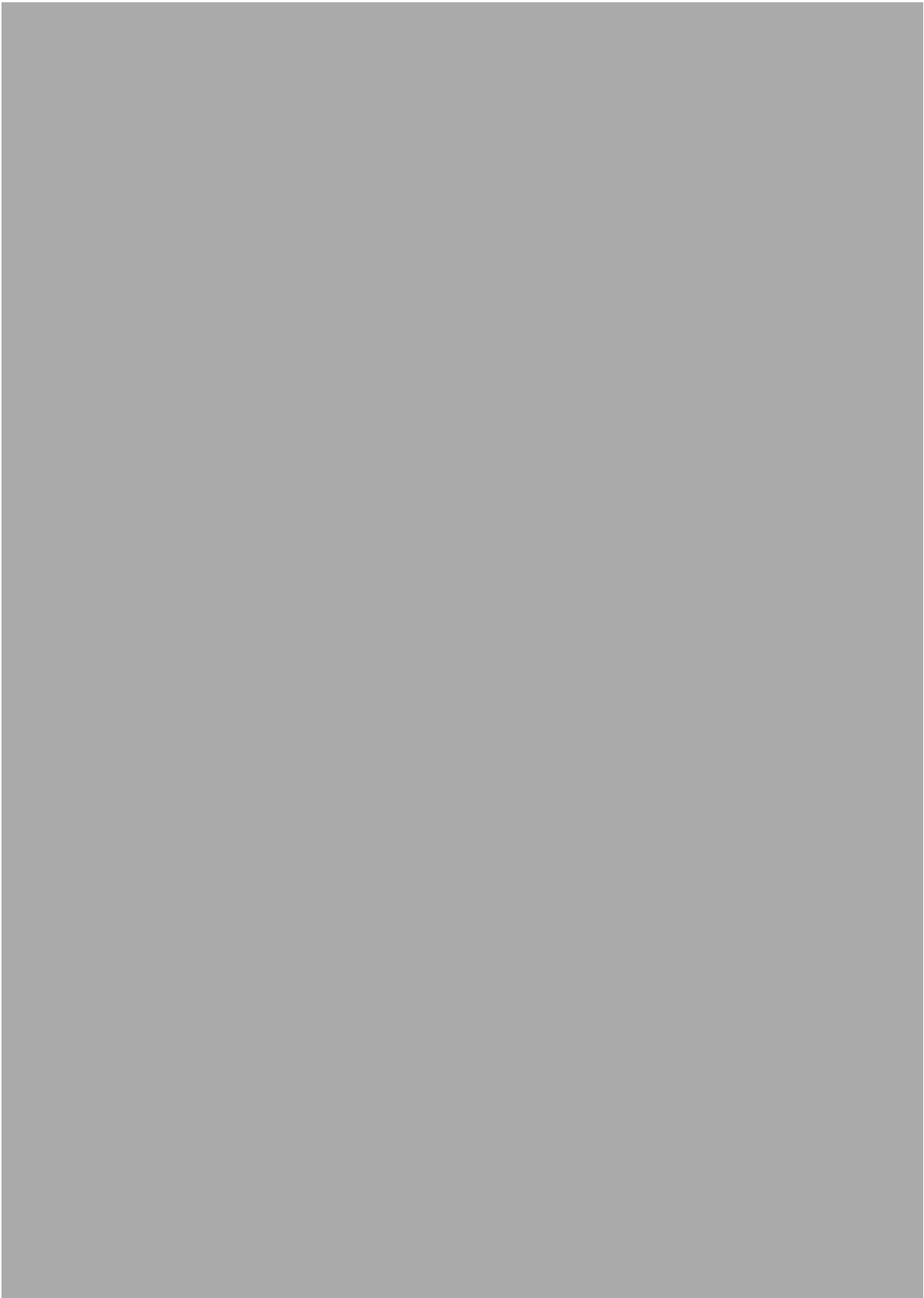












## Appendix 6.3

### DNA sequence of the *asnPfu* gene and the amino acid sequence of the asparaginase produced by *Bacillus subtilis*, strain MOL2940

The DNA sequence of the *asnPfu* gene is the following:



The amino acid sequence of the asparaginase deduced from the DNA sequence shown above is:





## Appendix 6.4

**Genetic stability of the production strain (Southern blot).**  
**Novozymes Report No.: 2014-01162**

### **Genetic stability of the GMM Asparaginase HQ production strain Mol2940 assessed by Southern blot analysis.**

The purpose of this work is to assess the genetic stability of the GMM Asparaginase HQ strain Mol 2940. The approach has been to compare DNA prepared from a vial of the master cell bank of the strain *Bacillus Subtilis* to DNA from cells isolated after a pilot plant fermentation (referred to as EOP cells) by Southern blot analysis. DNA was prepared from this strain material and the integration pattern of three copies of the expression construct for production of the GMM Asparaginase HQ in [REDACTED] *Bacillus subtilis* were investigated by Southern blot analysis using the Asparaginase HQ coding region as a probe.

#### Strain material and Southern blot.

The GMM Asparaginase HQ master cell bank is termed Mol2940. One vial of Mol2940 was obtained from the Laboratory for Production strains.

Cells from four pilot plant fermentations (HQF49, HQF50, HQF51 and HQF52) were obtained from fermentation pilot plant. The pilot batches were the batches used for manufacturing of the tox material and was performed [REDACTED]

[REDACTED] Cells from the pilot and production fermentations are collectively referred to as EOP (End of Production) cells with the batch numbers as identifiers.

Genomic DNA was prepared in the following way:

Cells of Mol2940 and EOP cells from each of the batches were inoculated on TSA agar plates and incubated at 34-38°C for 1 day.

The formed bacteria cells were harvested and DNA was prepared using a standard DNA purification method (Method references PSL-MSM-0300.01 version 8.0, also filed as Luna: 2003-15731-07).

The DNA was digested with and a Southern blot was made by hybridization with a DIG labelled probe and chemi-flouorescent detection using CPD star and autoradiography (using X-ray film Amersham Biosciences

Hyperfilm ECL). (Method reference: PSL-SM-3090.01-D version 5.0).

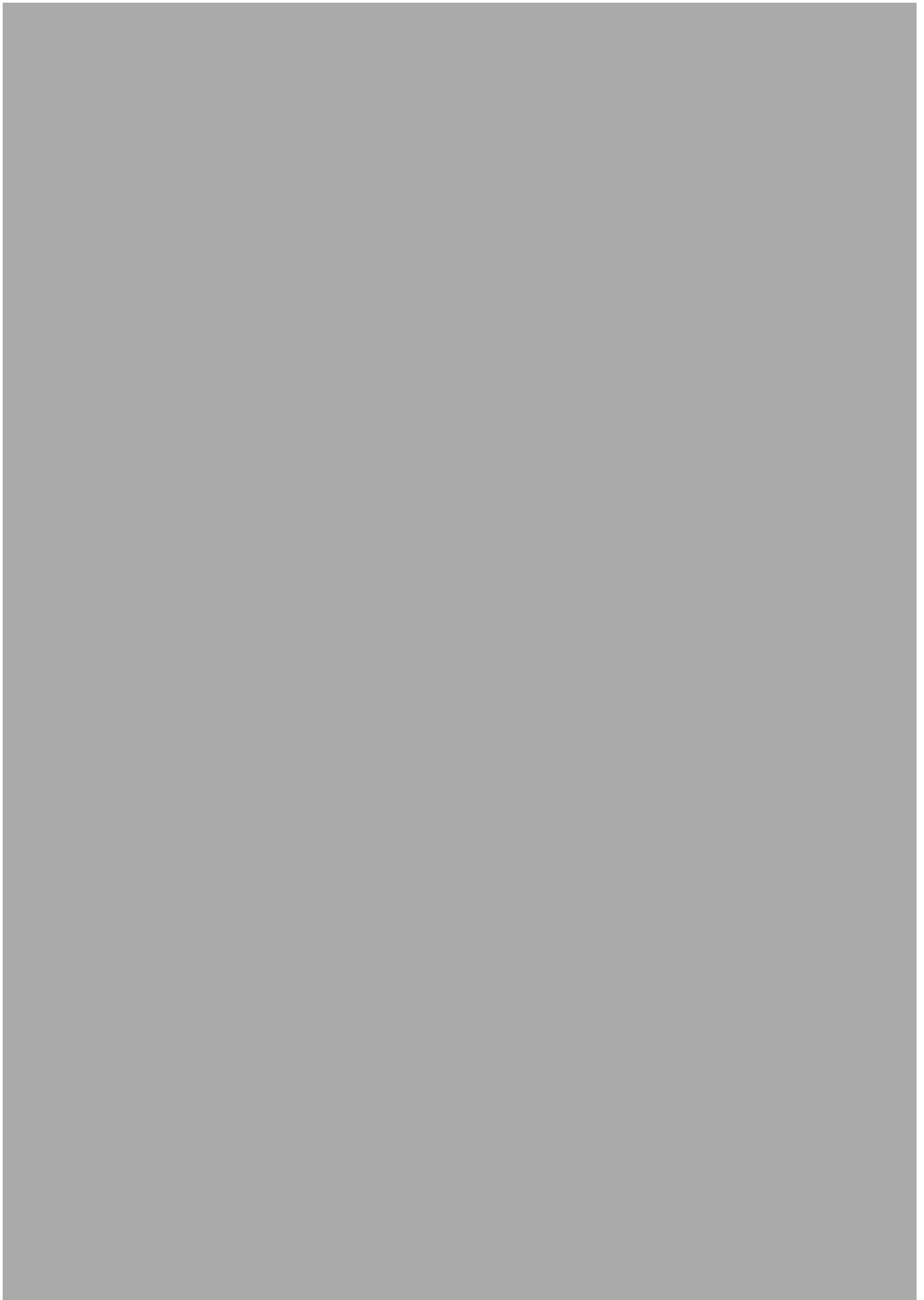
#### Outline of Southern blot.

The genomic DNA of Mol2940 and EOP cells were digested with the restriction enzymes StyI/EcoRI and the DNA was applied to a 0.75% agarose gel for the blot.

The probe used for the Southern blot analysis consisted of a part of the Asparaginase HQ coding region. The probe was amplified by PCR from plasmid pMol2930 (see figure 1) according to the procedure described in PSL-SM-3090.01-D using the following primers:

The size and approximate concentration of the probe was verified by agarose gel electrophoresis (data not shown).

containing the Asparaginase HQ gene (Tabel 1 and Fig. 3a, 3b, and 3d.)



### Conclusion

The expected pattern [REDACTED] from HQF49, HQF50, HQF51, and HQF52 are identical to the band pattern of the master cell bank *Bacillus subtilis* Mo/2940 when digestion genomic DNA using the restriction enzymes *Styl/EcoRI*, in a Southern blot using the Asparaginase HQ gene as probe. This verifies the correct integration

[REDACTED]  
[REDACTED] It can be concluded that the GMM Asparaginase HQ strain mol2940 is genetically stable.



## References for Appendix 6

<sup>2</sup> Maeder, D. L. et al., "Divergence of the hyperthermophilic archaea *Pyrococcus furiosus* and *P. horikoshii* inferred from complete genomic sequences. *Genetics* 152: 1299-1305, 1999.

<sup>4</sup> Gryczan, T. J., Contente, S., and Dubnau, D. (1978). Characterization of *Staphylococcus aureus* plasmids introduced by transformation into *Bacillus subtilis*. *J. Bacteriol.*, 134, 318-329

<sup>5</sup> Horinouchi, S. and Weisblum, B. (1982). Nucleotide sequence and functional map of pE194, a plasmid that specifies inducible resistance to macrolide, lincosamide and streptogramin type-b antibiotics. *J. Bacteriol.*, 150, 804-814