

Study Title

**Bioinformatics Evaluation of DNA Sequences Flanking the 5' and 3' Junctions of
the Inserted DNA in Soy MON 87769: Assessment of Putative Polypeptides**

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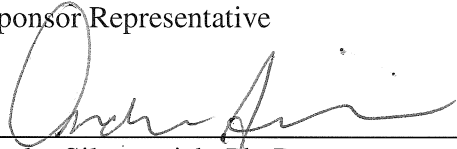
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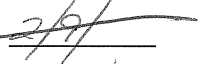

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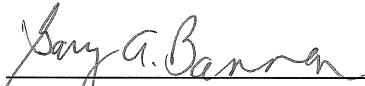
This report is an accurate and complete representation of the study/project activities.

Signatures of Final Report Approval:



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Study Information

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Abbreviations and Definitions

aa	Amino acid
AD8	Allergen, gliadin, and glutenin protein sequence database
BLOCKS	A database of amino acid motifs found in protein families
BLOSUM	BLOcks SUBstitution Matrix, used to score similarities between pairs of distantly related protein or nucleotide sequences
<i>E</i> -score	Expectation score
FASTA	Algorithm used to find local high scoring alignments between a pair of protein or nucleotide sequences
GenBank	A public genetic database maintained by the National Center for Biotechnology Information at the National Institutes of Health, Bethesda, MD, USA.
NCBI	National Center of Biotechnology Information at the National Institutes of Health, Bethesda, MD, USA.
ORF	Open reading frame
PROTEIN	GenBank protein database, release 163.0 (December 15, 2007).
TOXIN6	Toxin protein sequence database

1.0 Summary

Monsanto has developed genetically derived soybean MON 87769, which produces stearidonic acid (SDA), an omega-3 fatty acid. Production of SDA in soybean seed was achieved through the introduction of genes encoding *Neurospora crassa* $\Delta 15$ desaturase (*Nc.Fad3* or *Nc $\Delta 15D$*) and *Primula juliae* $\Delta 6$ desaturase (*Pj $\Delta 6D$*) via *Agrobacterium* mediated transformation.

As part of a comprehensive safety assessment, bioinformatic analyses were performed to assess the potential for allergenicity, toxicity, or biological activity of putative polypeptides encoded by the 5' and 3' inserted DNA-soybean genomic DNA junctions. Sequences spanning the 5' soybean genomic DNA-inserted DNA junction and the 3' inserted DNA-soybean genomic DNA junction were translated from stop codon to stop codon in all six reading frames. Putative polypeptides from each reading frame, eight amino acids or greater in length were compared to allergen (AD8), toxin (TOXIN6), and public domain (PROTEIN) database sequences using bioinformatic tools.

The FASTA sequence alignment tool was used to assess structural relatedness between the query sequences and any protein sequences in the AD8, TOXIN6, and PROTEIN databases. Structural similarities shared between each putative polypeptide with each sequence in the database were examined. The extent of structural relatedness was evaluated by detailed visual inspection of the alignment, the calculated percent identity, and the *E*-score. In addition to structural similarity, each putative polypeptide was screened for short polypeptide matches using a pair-wise comparison algorithm. In these analyses, eight contiguous and identical amino acids were defined as immunologically relevant, where eight represents the typical minimum sequence length likely to represent an immunological epitope.

No biologically relevant structural similarity to allergens, toxins, or biologically active proteins was observed for any of the putative polypeptides. Furthermore, no short (eight amino acid) polypeptide matches were shared between any of the putative polypeptides and proteins in the allergen database. These data demonstrate the lack of both structurally and immunologically relevant similarity to known allergens for all of the putative polypeptides analyzed. These data also demonstrate the lack of structurally relevant correlates to toxins or other biologically active proteins for all of the putative polypeptides analyzed.

This bioinformatics analysis is theoretical. No empirical evidence exists to suggest that transcription of DNA sequence at the 5' or 3' junctions of the DNA inserted in MON 87769 occurs. Rather, the results of these bioinformatic analyses indicate that in the highly unlikely event that any of the junction sequences were to be transcribed and that a transcript were to be translated, the translation product would not share a sufficient

degree of sequence similarity or identity to indicate that it would be potentially allergenic, toxic, or have other safety implications.

2.0 Introduction

Monsanto has developed genetically derived soybean MON 87769, which produces stearidonic acid (SDA), an omega-3 fatty acid. Production of SDA in soybean seed was achieved through the introduction of genes encoding *Neurospora crassa* $\Delta 15$ desaturase (*Nc.Fad3* or *Nc $\Delta 15D$*) and *Primula juliae* $\Delta 6$ desaturase (*Pj $\Delta 6D$*) via *Agrobacterium* mediated transformation.

As part of a comprehensive safety assessment, bioinformatic analyses were performed to assess the potential for allergenicity, toxicity, or biological activity of putative polypeptides encoded by the 5' and 3' inserted DNA-soybean genomic DNA junctions. Sequences spanning the 5' soybean genomic DNA-inserted DNA junction and the 3' inserted DNA-soybean genomic DNA junction were translated from stop codon to stop codon in all six reading frames. Putative peptides from each reading frame were compared to allergen (AD8), toxin (TOXIN6), and public domain (PROTEIN) database sequences using bioinformatic tools.

Exposure to allergens in foods may cause sudden, medically significant reactions in susceptible individuals. Gliadins and glutenins are suspected to cause celiac disease, a non-IgE mediated disorder (gluten-sensitive enteropathy), and are also considered important immunologically active proteins. Screening the amino acid sequences of proteins introduced into plants by modern biotechnology for similarity to sequences of known allergens, gliadins, and glutenins is one of many assessments performed to support product safety. Similarly, the amino acid sequences of introduced proteins are also screened against known toxins as well as all known proteins in publicly available genetic databases.

The FASTA algorithm can be used to evaluate the extent of sequence alignment between a query protein sequence and a database sequence. In principle, if two proteins share sufficient linear sequence similarity and identity, they will likely share three-dimensional structure and, therefore, functional homology. By definition, homologous proteins share secondary structure and common three-dimensional folds (Pearson, 2000). Because the degree of relatedness between homologs varies widely, the data need to be carefully evaluated in order to maximize their potential predictive value. The allergenicity assessment is used to identify known allergens or potentially cross-reactive proteins. While related (homologous) proteins may share 25% amino acid identity in a 200 amino acid overlap (Pearson, 2000), this is not generally sufficient to indicate IgE mediated cross-reactivity (Aalberse et al., 2001). Indeed, allergenic cross-reactivity caused by proteins is rare at 50% identity and typically requires >70% amino acid identity across

the full length of the protein sequences (Aalberse, 2000). A conservative approach is currently applied by which related protein sequences are identified as potentially cross-reactive if linear identity is 35% or greater in an 80 amino acid overlap (Thomas et al, 2005). Such levels of identity are readily detected using FASTA. Additionally, proteins closely related to gliadins or glutenins, the proteins that trigger celiac disease, can be easily identified using FASTA.

A second bioinformatics tool, an eight amino acid sliding window search, is used to specifically identify short linear polypeptide matches to known or suspected allergens. It is possible that proteins structurally unrelated to allergens, gliadins, and glutenins may still contain smaller immunologically significant epitopes. A query sequence may be considered allergenic if it has an exact sequence identity of at least eight contiguous amino acids with a potential allergen epitope (Metcalf et al., 1996; Hileman et al., 2002; Goodman et al., 2002). However, most allergen epitopes have not been confirmed and the amino acid length for those that have been identified can vary widely, thus the relevance of an exact match of eight amino acids may have limited immunological relevance (Thomas et al., 2005). The eight amino acid bioinformatic strategy is currently an *in silico* search that can produce matches containing significant uncertainty depending on the length of the query sequence (Silvanovich et al., 2006).

This report describes the bioinformatics assessment of putative polypeptides encoded at the soybean genomic DNA-inserted DNA 5' junction and the inserted DNA-soybean genomic DNA 3' junction of MON 87769. Inspection of the bioinformatic analysis data can be used to indicate whether the putative polypeptides have biologically relevant sequence similarity to known allergens, toxins, or other biologically active proteins.

3.0 Purpose

The purpose of this study was to evaluate the amino acid sequences of putative polypeptides obtained from all reading frames that span the soybean genomic DNA inserted DNA T-DNA 5' junction and the T-DNA inserted DNA soybean genomic DNA 3' junction in MON 87769 to sequences in established databases. Sequences spanning these two junctions were translated from stop codon to stop codon in all reading frames. Structural relatedness between the putative polypeptides and known allergens, toxins, and biologically active proteins was assessed using the FASTA sequence alignment tool. Using each putative polypeptide as a query sequence that was eight amino acids or greater in length and that spanned the soybean genomic DNA-inserted DNA 5' junction and the inserted DNA-soybean genomic DNA 3' junction, FASTA searches were performed on allergen (AD8), toxin (TOXIN6), and public domain (PROTEIN) sequence databases. Immunologically relevant correlates were assessed using the pairwise comparison algorithm using the putative polypeptide as a query sequence to search against the AD8 database.

4.0 Methods

4.1 *4.1 Sequence Database Preparation.* The allergen, gliadin, and glutenin sequence database (AD8) was assembled from sequences obtained from the FARRP allergen database¹ (FARRP, 2008). The protein sequences in the FARRP allergen database were assembled and evaluated for evidence of allergenicity by an international panel of allergy experts. Gene identification (GI) numbers for each of the 1,311 sequences found in the FARRP database were used to assemble a list, and this list was used to batch query the NCBI protein sequence database². For obsolete GI numbers found using the batch search, the GenPept format flat file associated with each obsolete GI number was examined and an up-to-date GI number was used to replace the obsolete GI number. Due to the removal of obsolete GI numbers, collation of short peptide sequences into larger proteins, and removal of duplicates derived from the same species, a total of 1,250 GI numbers were found to be valid. These 1,250 GI numbers were used to assemble a searchable database AD8 (Appendix 1, release date; January 11, 2008).

GenBank protein database, release 163.0 (December 15, 2007), was downloaded from NCBI and formatted for use in these bioinformatic analyses and is referred to as the PROTEIN database.

The toxin database is a subset of 7176 sequences derived from the PROTEIN database that was selected using a keyword search and filtered to remove non-toxin proteins (TOXIN6 was assembled in April 2008). Initially all header lines and the associated protein sequence in PROTEIN database were screened using all possible combinations of upper and lower case characters spelling the words “toxic” and “toxin”. The resulting 9082 header lines and associated sequences were then filtered to exclude the following terms used in combination with “toxic” or “toxin” resulting in 7176 sequences; these terms were “synthetic”, “anti”, “putative”, “like”, “insect”, “Cry”, “Thuringiensis” and “toxin-reductase”.

4.2 *Translation of Putative Polypeptides.* DNA sequence spanning the 5’ and 3’ junctions of the MON 87769 insertion site (Girault et al, 2008) was analyzed for translational stop codons (TGA, TAG, TAA). All six possible reading frames

¹ located at <http://www.allergenonline.com>

² located at <http://www.ncbi.nlm.nih.gov/entrez/batchentrez.cgi>

originating or terminating within the MON 87769 insertion were translated using the standard genetic code from stop codon to stop codon.

- 4.3** *Sequence Database Searches.* FASTA analyses using the AD8, TOXIN6 and PROTEIN databases were performed on a desktop computer loaded with a SUSE LINUX version 10.1 operating system and FASTA version 3.4t26 July 7, 2006. The DNA sequence was contained in Girault et al. (2008) and translated to the amino acid sequence with DNASTar, version 7.2.1 (1), 410 (Appendices 2-10). Only those sequences of 8 amino acids or greater from stop codon to stop codon and that spanned the genomic DNA-insert DNA or insert DNA-genomic DNA junctions were considered for analysis. As a result of these selection criteria, one potential peptide was excluded from the analysis. Putative peptide 5_2.pep was fewer than 8 amino acids in length. The structural similarity of the translated protein sequences to sequences in each database (AD8, TOXIN6, and PROTEIN) was assessed using the FASTA algorithm (Lipman and Pearson, 1985; Pearson and Lipman, 1988).

FASTA comparisons are initiated by aligning the first match of a specific wordsize. The alignment is then extended based on the chosen scoring matrix. Default FASTA comparison parameters for wordsize (*k-tuple*), gap creation penalty and gap extension penalty were used. The expectation threshold (*E*-score) limit was set to one. The *E*-score (expectation score) is a statistical measure of the likelihood that the observed similarity score could have occurred by chance in a search. A larger *E*-score indicates a lower degree of similarity between the query sequence and the sequence from the database. Typically, alignments between two sequences will need to have an *E*-score of less than 1×10^{-5} or smaller to be considered to have significant homology. FASTA comparisons were performed using the BLOSUM50 scoring matrix (Henikoff and Henikoff, 1992). Multiple alignments are made between the query sequence and each sequence in the database with a score calculated for each alignment. Only the top scoring alignment is extensively analyzed for each database sequence. The BLOSUM matrix series (Henikoff and Henikoff, 1992) was derived from a set of aligned, ungapped regions from protein families, called the BLOCKS database. Sequences from each block were clustered based on the percent of identical residues in the alignments (Henikoff and Henikoff, 1996). The BLOSUM50 matrix will identify blocks of conserved residues that are at least 50% identical. BLOSUM50 works well for identifying sequence similarities that include gaps, and thus recognizes distant evolutionary relationships (Pearson, 2000).

If two proteins share sufficient linear sequence similarity and identity, they will also share three-dimensional structure and, therefore, functional homology. By definition, homologous proteins share secondary structure and common three-

dimensional folds (Pearson, 2000). Because the degree of relatedness between homologs varies widely, the data need to be carefully evaluated in order to maximize their potential predictive value. The allergenicity assessment is used to identify known allergens or potentially cross-reactive proteins. While related (homologous) proteins may share 25% amino acid identity in a 200 amino acid overlap (Pearson, 2000), this is not generally sufficient to indicate IgE mediated cross-reactivity (Aalberse et al., 2001). Indeed, allergenic cross-reactivity caused by proteins is rare at 50% identity and typically requires >70% amino acid identity across the full length of the protein sequences (Aalberse, 2000). A conservative approach is currently applied by which related protein sequences are identified as potentially cross-reactive if linear identity is 35% or greater in an 80 amino acid overlap (Thomas et al, 2005). Such levels of identity are readily detected using FASTA. Additionally, proteins closely related to gliadins or glutenins, the proteins that trigger celiac disease, can be easily identified using FASTA.

In addition to the FASTA comparisons of each putative polypeptide to known allergens (to assess overall structural similarity), an eight amino acid sliding window search was performed. An algorithm was developed to identify whether or not a linearly contiguous match of eight amino acids existed between the query sequence and sequences within the allergen database (AD8). This program compares the query sequence to each protein sequence in the allergen database using a sliding-window of eight amino acids; that is, with a seven amino acid overlap relative to the preceding window. While there have been recommendations for using a shorter scanning window (Gendel, 1998; Kleter and Peijnenburg, 2002), only a few studies have actually investigated the ability of six, seven, or eight amino acid search windows to identify allergens (Hileman et al., 2002; Goodman et al., 2002; Stadler and Stadler, 2003). In these studies, randomly or specifically selected protein sequences were used as query sequences in FASTA and six, seven, and eight amino acid window searches against allergen databases. The results demonstrated that searches with six and seven amino acid windows led to high rates of false positive matches between non-allergenic query sequences and allergen database sequences. Additionally, searches with a six or seven amino acid window identified apparently random matches between totally unrelated proteins, such that the matched proteins were not likely to share any structural or sequence similarities that could act as cross-reactive epitopes. These studies concluded that six or seven amino acid sliding-window searches yielded such a high rate of false positive hits that they were of no predictive value. Furthermore, Silvanovich et al. (2006) recently demonstrated the lack of value of six or seven amino acid sliding-window searches in a comprehensive analysis of short peptide match frequencies by analyzing the match frequencies of peptides derived from ~1.95 million published protein sequences. In order to provide the best predictive capability to identify potentially cross-reactive proteins, a window of eight contiguous amino

acids is used to represent the smallest immunologically significant sequential, or linear IgE binding epitope (Metcalf et al., 1996).

- 4.4** *Significance of the Alignment.* An *E*-score of 1×10^{-5} was set as an initial high cut-off value for alignment significance. Although all alignments were inspected visually, any aligned sequence that yielded an *E*-score less than 1×10^{-5} was analyzed further to determine if such an alignment represented significant sequence homology.

5.0 Results and Discussion

Bioinformatics analyses were performed on putative polypeptides deduced from DNA sequence spanning the 5' and 3' T-DNA inserted DNA genomic DNA junctions of MON 87769 to assess the potential for similarity towards known allergens, toxins, or other biologically active proteins. DNA sequence flanking the 5' (Figure 1) and 3' (Figure 2) junctions of the insertion site in MON 87769 (Girault et al., 2008) were translated from stop codon to stop codon in all possible reading frames. Polypeptide sequence from each reading frame was then inspected to confirm that the sequence was both encoded by DNA spanning the T-DNA inserted DNA genomic DNA junctions and was greater than or equal to eight amino acids in length. At the 5' flank, five deduced putative polypeptides spanned the genomic DNA inserted DNA T-DNA junction, while at the 3' flank, six putative polypeptides spanned the inserted DNA-genomic DNA junction (see Figure 3 and Table 1). Each putative polypeptide was designated as 5 or 3 (representing the 5' or 3' end, respectively), separated with an underscore by a numerical value 1 to 6 representing the respective reading frame (see Figures 1 and 2 for reading frame assignment). The putative polypeptide 5_2.pep was not analyzed because it did not meet the aforementioned criteria. Supporting dataset output files for each putative 5' polypeptide are contained in Appendices 2-6, while dataset output files for each putative 3' polypeptide are contained in Appendices 7-12.

- 5.1** *Assessment of Potential Allergenicity:* The results of the allergenicity assessment are shown in Tables 2 and 5. Potential allergenicity of the eleven putative polypeptides was assessed using the FASTA and eight amino acid sliding window search algorithms. Using the FASTA algorithm to search the AD8 database, no alignments with any of the eleven query sequences generated an *E*-score of less than 1×10^{-5} . Likewise, no alignment met or exceeded the Codex Alimentarius (2003) FASTA alignment threshold for potential allergenicity of 35% identity over 80 amino acids. Finally, no alignments of eight or more consecutive identical amino acids with were found between any query sequence and the AD8 database.

As a result, these eleven putative polypeptides are unlikely to contain any cross-reactive IgE binding epitopes with known allergens.

5.2 *Assessment of Potential Toxicity:* The results of the toxicity assessment are shown in Tables 3 and 6. Potential toxicity of the eleven putative polypeptides was assessed using the FASTA algorithm. Using the FASTA algorithm to search the TOXIN6 database, no alignments with any of the eleven query sequences generated an *E*-score of less than 1×10^{-5} .

5.3 *Assessment of Potential Adverse Biological Activity:* The results of this assessment are shown in Tables 4 and 7. Potential untoward biological activity of the eleven putative polypeptides was assessed using the FASTA algorithm. Using the FASTA algorithm to search the PROTEIN database, no alignments with any of the eleven query sequences generated an *E*-score of less than 1×10^{-5} .

6.0 Conclusions

Analyses of putative polypeptides encoded by DNA spanning the 5' and 3' junctions of the MON 87769 inserted DNA were performed using bioinformatic tools. Results of the FASTA sequence alignments demonstrated a lack of structurally relevant similarity between any known allergenic, toxic, or biologically active proteins and the eleven putative polypeptides. Moreover, results from eight amino acid sliding window search demonstrated the lack of potential immunologically relevant sequence matches between any of the putative polypeptides and the AD8 database. The results of these bioinformatic analyses demonstrate that even in the highly unlikely event that any of the junction polypeptides were translated, they would not share a sufficient degree of sequence similarity with other proteins to indicate that they would be potentially allergenic, toxic, or have other safety implications.

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[CBI Cross Reference Number 1]

Deleted Figures 1, 2 and 3 and Table 1

Deleted pages 21 – 24 are found in the Confidential Attachment, pages 4 – 7.

Table 2. Summary of alignments for the eight amino acid sliding window and FASTA searches of the allergen sequence database (AD8) using putative polypeptide sequences encoded by the genomic DNA inserted DNA T-DNA 5' junction in MON 87769.

Appendix	Polypeptide	AD8 Sequence Database						
		Sliding window	FASTA search					
		# Hits	# Hits	GI #	Description	E score	% Identity	aa Overlap
2	5_1.pep	No	0	-	-	-	-	-
3	5_3.pep	No	0	-	-	-	-	-
4	5_4.pep	No	0	-	-	-	-	-
5	5_5.pep	No	0	-	-	-	-	-
6	5_6.pep	No	1	21930	LMW glutenin [Triticum tu	0.76	44.444%	18

Table 3. Summary of alignments for the FASTA searches of the toxin sequence database (TOXIN6) using putative polypeptide sequences encoded by the genomic DNA inserted DNA T-DNA 5' junction in MON 87769.

Appendix	Polypeptide	FASTA search of TOXIN6 Sequence Database					
		# Hits	GI #	Description	E score	% Identity	aa Overlap
2	5_1.pep	0	-	-	-	-	-
3	5_3.pep	0	-	-	-	-	-
4	5_4.pep	0	-	-	-	-	-
5	5_5.pep	0	-	-	-	-	-
6	5_6.pep	0	-	-	-	-	-

Table 4. Summary of alignments for the FASTA searches of the PROTEIN database using putative polypeptide sequences encoded by the genomic DNA inserted DNA T-DNA 5' junction in MON 87769.

Appendix	Polypeptide	FASTA search of PROTEIN Sequence Database					
		# Hits	GI #	Description	E score	% Identity	aa Overlap
2	5_1.pep	0	-	-	-	-	-
3	5_3.pep	0	-	-	-	-	-
4	5_4.pep	0	-	-	-	-	-
5	5_5.pep	0	-	-	-	-	-
6	5_6.pep	0	-	-	-	-	-

Table 5. Summary of alignments for the eight amino acid sliding window and FASTA searches of the allergen sequence database (AD8) using putative polypeptide sequences encoded by the T-DNA inserted DNA genomic DNA 3' junction in MON 87769.

Appendix	Polypeptide	AD8 Sequence Database						
		Sliding window	FASTA search					
		# Hits	# Hits	GI #	Description	E score	% Identity	aa Overlap
7	3_1.pep	No	0	-	-	-	-	-
8	3_2.pep	No	0	-	-	-	-	-
9	3_3.pep	No	0	-	-	-	-	-
10	3_4.pep	No	0	-	-	-	-	-
11	3_5.pep	No	2	256429	Kunitz trypsin inhibitor; KTi	0.52	31.915%	47
12	3_6.pep	No	14	24898906	allergen Cry j 2 [Cryp	0.33	53.846%	13

Table 6. Summary of alignments for the FASTA searches of the toxin sequence database (TOXIN6) using putative polypeptide sequences encoded by the inserted T-DNA inserted DNA genomic DNA 3' junction in MON 87769.

Appendix	Polypeptide	TOXIN6 Sequence Database					
		# Hits	GI #	Description	E score	% Identity	aa Overlap
7	3_1.pep	0	-	-	-	-	-
8	3_2.pep	0	-	-	-	-	-
9	3_3.pep	0	-	-	-	-	-
10	3_4.pep	0	-	-	-	-	-
11	3_5.pep	2	158635887	cytotoxic polypeptide	0.47	31.250%	48
12	3_6.pep	0	-	-	-	-	-

Table 7. Summary of alignments for the FASTA searches of the PROTEIN database using putative polypeptide sequences encoded by the inserted T-DNA inserted DNA genomic DNA 3' junction in MON 87769.

Appendix	Polypeptide	PROTEIN Sequence Database					
		# Hits	GI #	Description	E score	% Identity	aa Overlap
7	3_1.pep	0	-	-	-	-	-
8	3_2.pep	0	-	-	-	-	-
9	3_3.pep	0	-	-	-	-	-
10	3_4.pep	0	-	-	-	-	-
11	3_5.pep	0	-	-	-	-	-
12	3_6.pep	0	-	-	-	-	-

Appendix 1 (AD8 Database Sequence Names)

Aeroallergens Animals

Species	Comments	GI #	AA
Canis lupus familiaris	precursor Can f II [Canis familiaris].	29292272	177
Canis lupus familiaris	precursor Can f II [Canis familiaris].	29292274	179
Canis lupus familiaris	Major allergen Can f 1 precursor (Allergen Dog 1).	3121745	174
Canis lupus familiaris	Minor allergen Can f 2 precursor (Allergen Dog 2).	3121746	180
Canis lupus familiaris	albumin [Canis familiaris].	3319897	585
Canis lupus familiaris	albumin [Canis familiaris].	633938	265
Canis lupus familiaris	albumin [Canis familiaris].	6687188	608
Cavia porcellus	Major allergen Cav p 2.	32363133	15
Cavia porcellus	Major urinary protein (MUP) (Allergen Cav p 1).	32469617	15
Felis catus	Major allergen I polypeptide chain 1 precursor (Allergen Fel d 1-A)	1169665	92
Felis catus	fel d I chain 1 precursor with leader B [Felis catus].	1364212	88
Felis catus	fel d I chain 1 precursor with leader A [Felis catus].	1364213	92
Felis catus	major allergen I.	163825	92
Felis catus	major allergen I.	163827	88
Felis catus	cystatin [Felis catus].	17939981	98
Felis catus	Major allergen I polypeptide chain 2 precursor (Allergen Fel d 1-B)	232086	109
Felis catus	fel d I chain 2 precursor [Felis catus].	395407	107
Felis catus	Fel d 4 allergen [Felis catus].	45775300	186
Felis catus	albumin precursor [Felis catus].	886485	608
Mus musculus	Major urinary protein 6 precursor (MUP 6) (Alpha-2U-globulin)	20178291	180
Rattus norvegicus	PREDICTED: similar to Major urinary protein precursor (MUP)	109474987	181
Rattus norvegicus	Major urinary protein precursor (MUP) (Alpha-2u-globulin)	127533	181
Rattus norvegicus	Alpha-2u globulin.	81890324	181
Thaumetopoea pityocampa	Tha p 1.	74798355	18

Aeroallergens Fungi

Species	Comments	GI #	AA
Alternaria alternata	60S acidic ribosomal protein P1 (Allergen Alt a 12) (Alt a XII).	1350779	110
Alternaria alternata	Enolase (2-phosphoglycerate dehydratase) (2-phospho-D-glycerate	14423684	438
Alternaria alternata	Heat shock 70 kDa protein (Allergen Alt a 3).	14423730	152
Alternaria alternata	major allergen Alt a 1 subunit [Alternaria alternata].	1842045	157
Alternaria alternata	ribosomal P2 phosphoprotein [Alternaria alternata].	1850540	113
Alternaria alternata	putative nuclear transport factor 2 [Alternaria alternata].	21748153	124
Alternaria alternata	major allergen alt a1 [Alternaria alternata].	21913174	115
Alternaria alternata	glutathione-S-transferase [Alternaria alternata].	41057621	231
Alternaria alternata	major allergen Alt a 1 subunit [Alternaria alternata].	45680856	157
Alternaria alternata	minor allergen, ribosomal protein [Alternaria alternata].	467617	113
Alternaria alternata	minor allergen [Alternaria alternata].	467619	204
Alternaria alternata	aldehyde dehydrogenase (NAD+) [Alternaria alternata].	76666767	497
Alternaria alternata	Protein disulfide-isomerase (PDI) (Allergen Alt a 4).	85701160	436
Arthroderma benhamiae	tri m 4 allergen [Arthroderma benhamiae].	23894232	726
Arthroderma benhamiae	tri m 2 allergen [Arthroderma benhamiae].	23894240	292
Arthroderma benhamiae	tri m 2 allergen [Arthroderma benhamiae].	23894244	404
Aspergillus oryzae	Oryzin precursor (Alkaline proteinase) (ALP) (Aspergillus	129235	403
Aspergillus fumigatus	enolase [Aspergillus fumigatus].	13925873	438
Aspergillus fumigatus	manganese superoxide dismutase [Aspergillus fumigatus].	1648970	221
Aspergillus fumigatus	large subunit ribosomal protein L3 [Aspergillus fumigatus].	21215170	392
Aspergillus fumigatus	cellular serine proteinase [Aspergillus fumigatus].	2143220	495
Aspergillus niger	xylosidase [Aspergillus niger].	2181180	804
Aspergillus fumigatus	rAsp f 9 [Aspergillus fumigatus].	2879890	302
Aspergillus niger	serine protease.	289172	533
Aspergillus fumigatus	rAsp f 4 [Aspergillus fumigatus].	3005839	286
Aspergillus fumigatus	Aspf1 allergen [Aspergillus fumigatus].	3021324	125
Aspergillus fumigatus	allergen [Aspergillus fumigatus].	3643813	427
Aspergillus niger	beta-xylosidase [Aspergillus niger].	4235093	804
Aspergillus fumigatus	PPase [Aspergillus fumigatus].	5019414	178
Aspergillus fumigatus	Ribonuclease mitogillin precursor (Major allergen Asp f 1) (Asp f	54039254	176

Aspergillus fumigatus	Asp FII [Aspergillus fumigatus].	664852	250
Aspergillus fumigatus Af293	allergen Asp F3 [Aspergillus fumigatus Af293].	66845476	168
Aspergillus fumigatus Af293	major allergen Asp F2 [Aspergillus fumigatus Af293].	66849502	304
Aspergillus fumigatus	rAsp f 8 [Aspergillus fumigatus].	6686524	111
Aspergillus flavus	Allergen Asp fl 1.	74665726	403
Aspergillus fumigatus	Enolase (2-phosphoglycerate dehydratase) (2-phospho-D-glycerate	83288046	438
Aspergillus fumigatus	Major allergen Asp f 2 precursor (Asp f II).	83300352	310
Aspergillus fumigatus	Allergen Asp f 4 precursor.	83300369	322
Aspergillus fumigatus	Allergen Asp f 7 precursor.	83300389	270
Aspergillus fumigatus	Heat shock protein 90 (Heat shock protein hsp1) (65 kDa IgE-binding	83303658	706
Aspergillus fumigatus	60S ribosomal protein L3 (Allergen Asp f 23).	83305621	392
Aspergillus fumigatus	60S acidic ribosomal protein P2 (Allergen Asp f 8) (AfP2).	83305635	111
Aspergillus fumigatus	Superoxide dismutase [Mn], mitochondrial precursor (Allergen Asp f	83305645	210
Aspergillus fumigatus	Probable glycosidase crf1 precursor (Crh-like protein 1) (Allergen	85540942	395
Aspergillus fumigatus	major allergen I 18kDa antigen [Aspergillus fumigatus].	9280360	150
Aspergillus oryzae	Alpha-amylase A type-1/2 precursor (Taka-amylase A) (TAA)	94706935	499
Aspergillus fumigatus	aspergillopepsin i [Aspergillus fumigatus].	963013	395
Candida albicans	Enolase 1 (2-phosphoglycerate dehydratase) (2-phospho-D-glycerate	232054	440
Candida albicans	29 kDa IgE-binding protein [Candida albicans].	37548637	236
Cochliobolus lunatus	enolase [Curvularia lunata].	14585753	440
Coprinus comatus	Cop c1 allergen [Coprinus comatus].	4538529	81
Davidiella tassiana	Minor allergen Cla h 7 (Cla h 5) (Cla h V).	1168970	204
Davidiella tassiana	60S acidic ribosomal protein P2 (Allergen Cla h 3) (Cla h III).	1173074	111
Davidiella tassiana	60S acidic ribosomal protein P2 (Minor allergen Cla h 4) (Cla h	21542440	111
Davidiella tassiana	putative nuclear transport factor 2 [Davidiella tassiana].	21748151	125
Davidiella tassiana	hydrophobin [Davidiella tassiana].	22796153	105
Davidiella tassiana	enolase; phosphopyruvate hydratase [Davidiella tassiana].	467660	440
Davidiella tassiana	Enolase (2-phosphoglycerate dehydratase) (2-phospho-D-glycerate	6015094	440
Davidiella tassiana	Heat shock 70 kDa protein (Allergen Cla h 4) (Cla h IV).	729764	643
Davidiella tassiana	aldehyde dehydrogenase (NAD+) [Davidiella tassiana].	76666769	496
Davidiella tassiana	Probable NADP-dependent mannitol dehydrogenase (MtDH) (Mannitol	85701146	267
Epicoccum nigrum	Major allergen Epi p 1 (Epi n I4625*).	24636820	18
Fusarium culmorum	thioredoxin-like protein [Fusarium culmorum].	19879659	121
Fusarium culmorum	helix-loop-helix protein [Fusarium culmorum].	25361513	450
Gibberella zeae PH-1	RLA2_ALTAL 60S acidic ribosomal protein P2 (Minor allergen Alt a 6)	46122455	109
Malassezia sympodialis	Chain B, Cross-Reactivity And Crystal Structure Of Malassezia	119390336	121
Malassezia furfur	Major allergen Mal f 1 precursor (Pit o 1).	13959403	350
Malassezia sympodialis	allergen [Malassezia sympodialis].	19069920	342
Malassezia sympodialis	manganese superoxide dismutase [Malassezia sympodialis].	28569698	237
Malassezia furfur	MF1 [Malassezia furfur].	3445490	177
Malassezia furfur	Putative peroxiredoxin (Thioredoxin reductase) (Allergen Mal f 3)	3914387	166
Malassezia sympodialis	allergen [Malassezia sympodialis].	4138171	172
Malassezia sympodialis	allergen [Malassezia sympodialis].	4138173	162
Malassezia sympodialis	allergen [Malassezia sympodialis].	4138175	187
Malassezia furfur	major allergenic protein Mal f4 [Malassezia furfur].	4587985	342
Malassezia sympodialis	allergen [Malassezia sympodialis].	7271239	179
Malassezia sympodialis	mala s 12 allergen precursor [Malassezia sympodialis].	78038796	618
Penicillium oxalicum	vacuolar serine protease [Penicillium oxalicum].	12005497	503
Penicillium citrinum	vacuolar serine protease [Penicillium citrinum].	12005501	358
Penicillium citrinum	enolase [Penicillium citrinum].	13991101	438
Penicillium chrysogenum	vacuolar serine protease [Penicillium chrysogenum].	14215732	494
Penicillium citrinum	Heat shock 70 kDa protein (Allergen Pen c 19).	14423733	503
Penicillium chrysogenum	alkaline serine protease [Penicillium chrysogenum].	21069093	398
Penicillium citrinum	unknown [Penicillium citrinum].	38326693	228
Penicillium citrinum	Pen c 1; alkaline serine protease [Penicillium citrinum].	4587983	397
Penicillium citrinum	alkaline serine protease Pen c2 [Penicillium citrinum].	4588118	457
Penicillium citrinum	peroxisomal membrane protein [Penicillium citrinum].	5326864	167
Penicillium brevicompactum	60S acidic ribosomal P1 phosphoprotein Pen b 26 [Penicillium	59894749	107
Penicillium chrysogenum	allergen Pen n 13 [Penicillium chrysogenum].	6684758	397
Penicillium chrysogenum	allergen Pen n 18 [Penicillium chrysogenum].	7963902	494
Penicillium chrysogenum	68 kDa allergen [Penicillium chrysogenum].	999009	117
Rhodotorula mucilaginosa	Enolase (2-phosphoglycerate dehydratase) (2-phospho-D-glycerate	37078092	439
Rhodotorula mucilaginosa	vacuolar serine protease [Rhodotorula mucilaginosa].	54654335	342

Scomber japonicus	parvalbumin [Scomber japonicus].	29420793	109
Trichophyton schoenleinii	tri s 4 allergen [Trichophyton schoenleinii].	23894227	726
Trichophyton schoenleinii	tri m 2 allergen [Trichophyton schoenleinii].	23894260	405
Trichophyton rubrum	Tri r 4 allergen [Trichophyton rubrum].	5813788	726
Trichophyton rubrum	Tri r 2 allergen [Trichophyton rubrum].	5813790	412

Aeroallergens Insects

Species	Comments	GI #	AA
Argas reflexus	Arg r 1 precursor [Argas reflexus].	58371884	159
Blattella germanica	allergen Bla g 4.	1166573	182
Blattella germanica	Aspartic protease Bla g 2 precursor (Allergen Bla g II).	1703445	352
Blattella germanica	major allergen Bla g 1.02 [Blattella germanica].	4240395	492
Blattella germanica	major allergen Bla g 1.0101 [Blattella germanica].	4572592	412
Blattella germanica	36 kda allergen {peptide 143-111} [Blattella germanica=German	544618	20
Blattella germanica	36 kda allergen {peptide 143-115} [Blattella germanica=German	544619	25
Blattella germanica	Glutathione S-transferase (GST class-sigma) (Major allergen Bla g	6225491	204
Blattella germanica	Chain A, The Structure Of Mutant (N93q) Of Bla G 2.	62738637	330
Blattella germanica	tropomyosin [Blattella germanica].	8101069	284
Lepisma saccharina	tropomyosin [Lepisma saccharina].	20387027	284
Lepisma saccharina	tropomyosin [Lepisma saccharina].	20387029	243
Periplaneta americana	allergen [Periplaneta americana].	1531589	631
Periplaneta americana	allergen [Periplaneta americana].	1580792	685
Periplaneta americana	allergen [Periplaneta americana].	1580794	470
Periplaneta americana	allergen [Periplaneta americana].	1580797	393
Periplaneta fuliginosa	tropomyosin [Periplaneta fuliginosa].	19310971	284
Periplaneta americana	Cr-P11 allergen [Periplaneta americana].	2231297	446
Periplaneta americana	Cr-P11 allergen [Periplaneta americana].	2253610	274
Periplaneta americana	Cr-P11 [Periplaneta americana].	2580504	395
Periplaneta americana	allergen [Periplaneta americana].	2897849	228
Periplaneta americana	major allergen Per a 1.0105 [Periplaneta americana].	30144660	124
Periplaneta americana	major allergen Per a 1.0101 [Periplaneta americana].	4240399	231
Periplaneta americana	tropomyosin [Periplaneta americana].	4378573	284
Periplaneta americana	tropomyosin [Periplaneta americana].	4468639	284
Plodia interpunctella	arginine kinase [Plodia interpunctella].	15886861	355
Suidasia medanensis	group 2 allergen Sui m 2 [Suidasia medanensis].	45738062	141

Aeroallergens Mites

Species	Comments	GI #	AA
Acarus siro	lipid binding protein [Acarus siro].	4049356	64
Blomia tropicalis	Blo t 21 allergen [Blomia tropicalis].	111120420	129
Blomia tropicalis	Blo t 21 allergen [Blomia tropicalis].	111120424	129
Blomia tropicalis	Blo t 21 allergen [Blomia tropicalis].	111120428	129
Blomia tropicalis	Blo t 21 allergen [Blomia tropicalis].	111120432	129
Blomia tropicalis	Blo t 21 allergen [Blomia tropicalis].	111494253	129
Blomia tropicalis	allergen [Blomia tropicalis].	1377859	130
Blomia tropicalis	cysteine protease precursor [Blomia tropicalis].	14276828	221
Blomia tropicalis	paramyosin allergen [Blomia tropicalis].	21954740	875
Blomia tropicalis	trypsin [Blomia tropicalis].	25989482	266
Blomia tropicalis	Blo t 1 allergen [Blomia tropicalis].	33667928	333
Blomia tropicalis	Blo t 3 allergen [Blomia tropicalis].	33667930	266
Blomia tropicalis	Blo t 13 allergen [Blomia tropicalis].	37958153	130
Blomia tropicalis	major IgE-binding protein Blo t 5 [Blomia tropicalis].	4204917	134
Chironomus thummi thummi	Globin CTT-III precursor (Erythrocrutorin III).	121219	151
Chironomus thummi thummi	Globin CTT-IV precursor.	121227	151
Chironomus thummi thummi	Globin CTT-VIII.	121237	151
Chironomus thummi thummi	Globin CTT-VIIB-3 precursor.	121244	161
Chironomus thummi thummi	Globin CTT-VIIB-6 precursor.	121248	161
Chironomus thummi thummi	Globin CTT-VIIB-7 precursor.	121249	162
Chironomus thummi thummi	Globin CTT-IIIA.	121256	151
Chironomus thummi thummi	Globin CTT-X.	121259	151
Chironomus thummi thummi	Globin CTT-II beta precursor.	1707908	160

Chironomus thummi thummi	Globin CTT-I/CTT-IA precursor (Erythrocrutorin).	2506460	158
Chironomus thummi thummi	Globin CTT-VI precursor.	2506461	162
Chironomus thummi thummi	Globin CTT-VIIB-4 precursor (Erythrocrutorin).	56405052	161
Chironomus thummi thummi	Globin CTT-VIIB-5/CTT-VIIB-9 precursor.	56405054	161
Chironomus kiensis	tropomyosin [Chironomus kiensis].	7321108	285
Dermatophagoides pteronyssinus	unnamed protein product [Dermatophagoides pteronyssinus].	10189811	215
Dermatophagoides pteronyssinus	Der p 7 allergen polypeptide.	1045602	215
Dermatophagoides micraceras	Peptidase 1 (Major mite fecal allergen Der m 1) (Allrgen Der m I).	127205	30
Dermatophagoides farinae	Der f 3 mite allergen.	1314736	232
Dermatophagoides pteronyssinus	Alpha-amylase (Allergen Der p 4) (Der p IV).	1351935	19
Dermatophagoides pteronyssinus	Mite group 2 allergen Der p 2 precursor (Der p II) (DPX).	1352237	146
Dermatophagoides pteronyssinus	Mite allergen Der p 5 (Der P V) (IgE-binding allergen).	1352238	132
Dermatophagoides pteronyssinus	Mite allergen Der p 6 (Der p VI) (DP5).	1352239	20
Dermatophagoides farinae	Mag44 [Dermatophagoides farinae].	1359436	299
Dermatophagoides farinae	paramyosin-like allergen [Dermatophagoides farinae].	13785807	692
Dermatophagoides farinae	Mite allergen Der f 6 precursor (Der f VI) (DF5).	14424450	279
Dermatophagoides pteronyssinus	cysteine protease [Dermatophagoides pteronyssinus].	1460058	211
Dermatophagoides farinae	Mag3 [Dermatophagoides farinae].	1545803	349
Dermatophagoides farinae	major Der f 2 isoform [Dermatophagoides farinae].	17978844	129
Dermatophagoides pteronyssinus	group 14 allergen protein [Dermatophagoides pteronyssinus].	20385544	1662
Dermatophagoides pteronyssinus	Chain A, X-Ray Structure Of Der P 2, The Major House Dust Mite	21465915	129
Dermatophagoides farinae	gelsolin-like allergen Der f 16 [Dermatophagoides farinae].	21591547	480
Dermatophagoides pteronyssinus	unnamed protein product [Dermatophagoides pteronyssinus].	21725560	222
Dermatophagoides pteronyssinus	unnamed protein product [Dermatophagoides pteronyssinus].	21725562	222
Dermatophagoides pteronyssinus	unnamed protein product [Dermatophagoides pteronyssinus].	21725564	222
Dermatophagoides pteronyssinus	unnamed protein product [Dermatophagoides pteronyssinus].	21725566	222
Dermatophagoides pteronyssinus	unnamed protein product [Dermatophagoides pteronyssinus].	21725568	222
Dermatophagoides pteronyssinus	unnamed protein product [Dermatophagoides pteronyssinus].	21725570	222
Dermatophagoides pteronyssinus	unnamed protein product [Dermatophagoides pteronyssinus].	21725572	222
Dermatophagoides pteronyssinus	unnamed protein product [Dermatophagoides pteronyssinus].	21725574	222
Dermatophagoides pteronyssinus	unnamed protein product [Dermatophagoides pteronyssinus].	21725576	222
Dermatophagoides pteronyssinus	unnamed protein product [Dermatophagoides pteronyssinus].	21725578	222
Dermatophagoides pteronyssinus	unnamed protein product [Dermatophagoides pteronyssinus].	21725580	222
Dermatophagoides pteronyssinus	unnamed protein product [Dermatophagoides pteronyssinus].	21725582	129
Dermatophagoides pteronyssinus	unnamed protein product [Dermatophagoides pteronyssinus].	21725584	129
Dermatophagoides pteronyssinus	unnamed protein product [Dermatophagoides pteronyssinus].	21725586	129
Dermatophagoides pteronyssinus	unnamed protein product [Dermatophagoides pteronyssinus].	21725588	129
Dermatophagoides pteronyssinus	unnamed protein product [Dermatophagoides pteronyssinus].	21725590	129
Dermatophagoides pteronyssinus	unnamed protein product [Dermatophagoides pteronyssinus].	21725592	129
Dermatophagoides pteronyssinus	unnamed protein product [Dermatophagoides pteronyssinus].	21725594	129
Dermatophagoides pteronyssinus	unnamed protein product [Dermatophagoides pteronyssinus].	21725596	129
Dermatophagoides pteronyssinus	unnamed protein product [Dermatophagoides pteronyssinus].	21725600	129
Dermatophagoides pteronyssinus	unnamed protein product [Dermatophagoides pteronyssinus].	21725602	129
Dermatophagoides pteronyssinus	unnamed protein product [Dermatophagoides pteronyssinus].	21725604	129
Dermatophagoides farinae	mite allergen Der f II precursor [Dermatophagoides farinae].	217306	146
Dermatophagoides farinae	mite allergen Der f II precursor [Dermatophagoides farinae].	217308	138
Dermatophagoides pteronyssinus	serine protease [Dermatophagoides pteronyssinus].	22595342	244
Dermatophagoides pteronyssinus	tropomyosin [Dermatophagoides pteronyssinus].	2353266	284
Dermatophagoides pteronyssinus	tropomyosin [Dermatophagoides pteronyssinus].	2440053	284
Dermatophagoides farinae	Mite allergen Der f 7 precursor (Der f VII).	2498299	213
Dermatophagoides farinae	Mite allergen Der f 3 precursor (Der f III).	2507248	259
Dermatophagoides farinae	Der f 1 allergen preproenzyme [Dermatophagoides farinae].	27530349	321
Dermatophagoides farinae	60 kDa allergen Der f 18p [Dermatophagoides farinae].	27550039	462
Dermatophagoides pteronyssinus	unnamed protein product [Dermatophagoides pteronyssinus].	28798085	132
Dermatophagoides pteronyssinus	HDM allergen [Dermatophagoides pteronyssinus].	37778944	875
Dermatophagoides farinae	Der f 7 allergen [Dermatophagoides farinae].	37958165	213
Dermatophagoides pteronyssinus	Tertiary Structure Of The Major House Dust Mite Allergen Der P 2,	3891991	129
Dermatophagoides farinae	DF5=allergen {N-terminal} [Dermatophagoides farinae=mites, Peptide	404371	20
Dermatophagoides pteronyssinus	alpha-amylase [Dermatophagoides pteronyssinus].	5059162	496
Dermatophagoides pteronyssinus	Der p 3 allergen.	511476	261
Dermatophagoides farinae	Der f II [Dermatophagoides farinae].	546852	142
Dermatophagoides farinae	mite allergen Der f 2 [Dermatophagoides farinae].	55859466	146
Dermatophagoides farinae	Der f 2 [Dermatophagoides farinae].	55859468	146

Dermatophagoides farinae	mite allergen Der f 2 [Dermatophagoides farinae].	55859470	146
Dermatophagoides farinae	group 2 allergen [Dermatophagoides farinae].	56378069	146
Dermatophagoides pteronyssinus	glutathione transferase mu class Dp7019C10 [Dermatophagoides	60920878	219
Dermatophagoides pteronyssinus	Der p 1 allergen [Dermatophagoides pteronyssinus].	61608445	216
Dermatophagoides pteronyssinus	group 18 allergen protein [Dermatophagoides pteronyssinus].	67975085	462
Dermatophagoides farinae	Allergen Mag.	729979	341
Dermatophagoides farinae	Peptidase 1 precursor (Major mite fecal allergen Der f 1) (Allergen	730035	321
Dermatophagoides pteronyssinus	Peptidase 1 precursor (Major mite fecal allergen Der p 1) (Allergen	730036	320
Dermatophagoides farinae	Der f 1 allergen precursor [Dermatophagoides farinae].	76097507	276
Dermatophagoides pteronyssinus	Der p 2 allergen precursor [Dermatophagoides pteronyssinus].	76097509	129
Dermatophagoides farinae	Der f 2 allergen precursor [Dermatophagoides farinae].	76097511	129
Dermatophagoides pteronyssinus	tropomyosin [Dermatophagoides pteronyssinus].	80553470	281
Dermatophagoides pteronyssinus	major allergen p Dp 15 [Dermatophagoides pteronyssinus].	807138	219
Dermatophagoides pteronyssinus	Chain B, Crystal Structure Of Mature And Fully Active Der P 1	83754033	222
Dermatophagoides siboney	Der s 2 a allergen [Dermatophagoides siboney].	86450747	146
Dermatophagoides pteronyssinus	Der p V allergen [Dermatophagoides pteronyssinus].	913285	132
Dermatophagoides farinae	Chain A, Solution Structure Of Der F 13, Group 13 Allergen From	99031759	131
Dermatophagoides pteronyssinus	Der p 2 allergen precursor [Dermatophagoides pteronyssinus].	99644635	146
Euroglyphus maynei	Mite group 2 allergen Eur m 2 precursor.	14423649	145
Euroglyphus maynei	group 2 allergen Eur m 2 102 [Euroglyphus maynei].	3941386	135
Glycyphagus domesticus	Gly d 2.03 [Glycyphagus domesticus].	33772588	141
Glycyphagus domesticus	Gly d 2 [Glycyphagus domesticus].	6179520	128
Glycyphagus domesticus	gly d 2.02 isoform [Glycyphagus domesticus].	7160811	125
Lepidoglyphus destructor	Mite allergen Lep d 7 precursor.	14423650	216
Lepidoglyphus destructor	Mite allergen Lep d 5.	14423651	110
Lepidoglyphus destructor	Fatty acid-binding protein (Allergen Lep d 13).	14423714	131
Lepidoglyphus destructor	Tropomyosin (Allergen Lep d 10).	14423956	284
Lepidoglyphus destructor	allergen Lep d 1.01.	1582222	141
Lepidoglyphus destructor	allergen Lep d 1.02.	1582223	141
Lepidoglyphus destructor	Lep D 2 precursor [Lepidoglyphus destructor].	21213898	141
Lepidoglyphus destructor	Lep D 2 precursor [Lepidoglyphus destructor].	21213900	141
Lepidoglyphus destructor	type 2 allergen Lep d 2.013 [Lepidoglyphus destructor].	34495274	141
Lepidoglyphus destructor	type 2 allergen Lep d 2.023 [Lepidoglyphus destructor].	34495278	141
Lepidoglyphus destructor	type 2 allergen Lep d 2.024 [Lepidoglyphus destructor].	34495280	140
Lepidoglyphus destructor	type 2 allergen Lep d 2.025 [Lepidoglyphus destructor].	34495282	141
Lepidoglyphus destructor	type 2 allergen Lep d 2.031 [Lepidoglyphus destructor].	34495284	141
Lepidoglyphus destructor	type 2 allergen Lep d 2.035 [Lepidoglyphus destructor].	34495286	141
Lepidoglyphus destructor	type 2 allergen Lep d 2.039 [Lepidoglyphus destructor].	34495288	141
Lepidoglyphus destructor	type 2 allergen Lep d 2.042 [Lepidoglyphus destructor].	34495290	141
Lepidoglyphus destructor	type 2 allergen Lep d 5.02 [Lepidoglyphus destructor].	34495292	171
Lepidoglyphus destructor	type 2 allergen Lep d 5.04 [Lepidoglyphus destructor].	34495294	169
Lepidoglyphus destructor	Lep D 2 allergen [Lepidoglyphus destructor].	999462	141
Tyrophagus putrescentiae	group 2 allergen [Tyrophagus putrescentiae].	2182106	141
Tyrophagus putrescentiae	fatty acid-biding protein [Tyrophagus putrescentiae].	51860756	131

Aeroallergens Pollen

Species	Comments	GI #	AA
Agrostis alba	pollen allergen Agr a I - bent grass (fragment).	320606	26
Agrostis alba	Group I allergen Agr a I (Form 2), pollen.	75139987	35
Agrostis alba	Group I allergen Agr a I (Form 1), pollen.	75139989	35
Alnus glutinosa	Aln g I [Alnus glutinosa].	261407	160
Alnus glutinosa	pollen allergen Aln g 4 [Alnus glutinosa].	3319651	85
Ambrosia artemisiifolia	Pollen allergen Amb a 1.1 precursor (Antigen E) (AgE) (Antigen Amb	113475	396
Ambrosia artemisiifolia	Pollen allergen Amb a 1.2 precursor (Antigen E) (Antigen Amb a I)	113476	398
Ambrosia artemisiifolia	Pollen allergen Amb a 1.3 precursor (Antigen E) (Antigen Amb a I).	113477	397
Ambrosia artemisiifolia	Pollen allergen Amb a 1.4 precursor (Antigen E) (Antigen Amb a I).	113478	392
Ambrosia artemisiifolia	Pollen allergen Amb a 2 precursor (Antigen K) (Antigen Amb a II).	113479	397
Ambrosia elatior	Pollen allergen Amb a 5 (Amb a V) (Allergen Ra5).	114090	45
Ambrosia trifida	Pollen allergen Amb t 5 precursor (Amb t V) (Allergen Ra5G).	114091	73
Ambrosia artemisiifolia	Non-specific lipid-transfer protein precursor (LTP) (Pollen	14285595	118
Ambrosia artemisiifolia	antigen E.	166443	397
Ambrosia artemisiifolia	profilin-like protein [Ambrosia artemisiifolia].	34851178	131

Ambrosia artemisiifolia	profilin-like protein [Ambrosia artemisiifolia].	34851180	131
Ambrosia artemisiifolia	profilin-like protein [Ambrosia artemisiifolia].	34851182	133
Ambrosia elatior	Pollen allergen Amb a 3 (Amb a III) (Allergen Ra3).	416636	101
Ambrosia psilostachya	Amb p V allergen.	515953	77
Ambrosia psilostachya	Amb p V allergen.	515954	77
Ambrosia psilostachya	Amb p V allergen.	515955	77
Ambrosia psilostachya	Amb p V allergen.	515956	77
Ambrosia psilostachya	Amb p V allergen.	515957	77
Ambrosia artemisiifolia	profilin isoallergen 1 [Ambrosia artemisiifolia].	62249502	133
Ambrosia artemisiifolia	profilin isoallergen 2 [Ambrosia artemisiifolia].	62249512	133
Anthoxanthum odoratum	pollen allergen Ant o I - sweet vernal grass (fragment).	320607	26
Anthoxanthum odoratum	Group I allergen Ant o I (Form 1), pollen.	75139986	32
Anthoxanthum odoratum	Group I allergen Ant o I (Form 2), pollen.	75139990	32
Artemisia vulgaris	major pollen allergen Art v 1 precursor [Artemisia vulgaris].	27818335	132
Artemisia vulgaris	Amb a 1-like protein [Artemisia vulgaris].	62530263	396
Artemisia vulgaris	Non-specific lipid-transfer protein (LTP) (Pollen allergen Art v	73621307	37
Artemisia vulgaris	Profilin-1 (Pollen allergen Art v 4.01).	73621415	133
Artemisia vulgaris	Profilin-2 (Pollen allergen Art v 4.02).	73621416	133
Artemisia vulgaris	Allergen Art v 2 (Art v II) (Allergen Ag7).	73622184	71
Betula pendula	allergenic isoflavone reductase-like protein Bet v 6.0102 [Betula	10764491	308
Betula pendula	Major pollen allergen Bet v 1-A (Allergen Bet v I-A).	114922	160
Betula pendula	Chain A, Birch Pollen Allergen Bet V 1 Mutant N28t, K32q, E45s,	11514622	159
Betula pendula	Calcium-binding allergen Bet v 3 (Allergen Bet v III).	1168696	205
Betula pendula	Major pollen allergen Bet v 1-B (Allergen Bet v I-B).	1168701	160
Betula pendula	Major pollen allergen Bet v 1-C (Allergen Bet v I-C).	1168702	160
Betula pendula	Major pollen allergen Bet v 1-D/H (Allergen Bet v I-D/H).	1168703	160
Betula pendula	Major pollen allergen Bet v 1-E (Allergen Bet v I-E).	1168704	160
Betula pendula	Major pollen allergen Bet v 1-F/I (Allergen Bet v I-F/I).	1168705	160
Betula pendula	Major pollen allergen Bet v 1-G (Allergen Bet v I-G).	1168706	160
Betula pendula	Major pollen allergen Bet v 1-J (Allergen Bet v I-J).	1168707	160
Betula pendula	Major pollen allergen Bet v 1-K (Allergen Bet v I-K).	1168708	160
Betula pendula	Major pollen allergen Bet v 1-L (Allergen Bet v I-L).	1168709	160
Betula pendula	Major pollen allergen Bet v 1-M/N (Allergen Bet v I-M/N).	1168710	160
Betula platyphylla var. japonica	Bet vI jap1 [Betula platyphylla var. japonica].	12583681	160
Betula platyphylla var. japonica	Bet vI jap2 [Betula platyphylla var. japonica].	12583683	160
Betula platyphylla var. japonica	Bet vI jap3 [Betula platyphylla var. japonica].	12583685	160
Betula pendula	Profilin (Pollen allergen Bet v 2) (Bet v II).	130975	133
Betula pendula	major allergen Bet v 1 [Betula pendula].	1321714	160
Betula pendula	major allergen Bet v 1 [Betula pendula].	1321716	160
Betula pendula	major allergen Bet v 1 [Betula pendula].	1321718	160
Betula pendula	major allergen Bet v 1 [Betula pendula].	1321720	160
Betula pendula	major allergen Bet v 1 [Betula pendula].	1321722	160
Betula pendula	major allergen Bet v 1 [Betula pendula].	1321724	160
Betula pendula	major allergen Bet v 1 [Betula pendula].	1321726	160
Betula pendula	major allergen Bet v 1 [Betula pendula].	1321728	160
Betula pendula	Polcalcin Bet v 4 (Calcium-binding pollen allergen Bet v 4).	14423850	85
Betula pendula	pollen allergen Bet v 1 [Betula pendula].	1542861	160
Betula pendula	pollen allergen Bet v 1 [Betula pendula].	1542863	160
Betula pendula	pollen allergen Bet v 1 [Betula pendula].	1542865	160
Betula pendula	pollen allergen Bet v 1 [Betula pendula].	1542867	160
Betula pendula	pollen allergen Bet v 1 [Betula pendula].	1542869	160
Betula pendula	pollen allergen Bet v 1 [Betula pendula].	1542871	160
Betula pendula	pollen allergen Bet v 1 [Betula pendula].	1542873	160
Betula pendula	Chain A, Birch Pollen Allergen Bet V 1.	159162097	159
Betula pendula	Birch Pollen Profilin.	1942360	133
Betula pendula	peptidylprolyl isomerase (cyclophilin) [Betula pendula].	21886603	173
Betula pendula	major allergen Bet v 1 [Betula pendula].	2414158	160
Betula pendula	pollen allergen Betv1 [Betula pendula].	2564220	160
Betula pendula	pollen allergen Betv1 [Betula pendula].	2564222	160
Betula pendula	pollen allergen Betv1 [Betula pendula].	2564224	160
Betula pendula	pollen allergen Betv1 [Betula pendula].	2564228	160
Betula	isoallergen {N-terminal} [birch, pollen, Peptide Partial, 51 aa].	298736	51
Betula	isoallergen {N-terminal} [birch, pollen, Peptide Partial, 51 aa].	298737	51

Betula pendula	allergen Bet v 1x [Betula pendula].	30908931	21
Betula pendula	major pollen allergen Bet v I - European white birch (fragment).	320545	51
Betula pendula	major pollen allergen Bet v II - European white birch (fragment).	320546	51
Betula pendula	Chain A, Birch Pollen Allergen Bet V 1 Mutant E45s.	38492423	159
Betula pendula	pollen allergen Betv1, isoform at8 [Betula pendula].	4006928	160
Betula pendula	pollen allergen Betv1, isoform at10 [Betula pendula].	4006945	160
Betula pendula	pollen allergen Betv1, isoform at14 [Betula pendula].	4006947	120
Betula pendula	pollen allergen Betv1, isoform at37 [Betula pendula].	4006953	160
Betula pendula	pollen allergen Betv1, isoform at42 [Betula pendula].	4006955	160
Betula pendula	pollen allergen Betv1, isoform at45 [Betula pendula].	4006957	160
Betula pendula	pollen allergen Betv1, isoform at50 [Betula pendula].	4006959	160
Betula pendula	pollen allergen Betv1, isoform at59 [Betula pendula].	4006961	160
Betula pendula	pollen allergen Betv1, isoform at87 [Betula pendula].	4006963	120
Betula pendula	pollen allergen Betv1, isoform at5 [Betula pendula].	4006965	160
Betula pendula	pollen allergen Betv1, isoform at7 [Betula pendula].	4006967	160
Betula pendula	pollen allergen, Betv1 [Betula pendula].	4376216	159
Betula pendula	pollen allergen, Betv1 [Betula pendula].	4376219	159
Betula pendula	pollen allergen, Betv1 [Betula pendula].	4376220	159
Betula pendula	pollen allergen, Betv1 [Betula pendula].	4376221	159
Betula pendula	pollen allergen, Betv1 [Betula pendula].	4376222	159
Betula pendula	isoallergen bet v 1 b1 [Betula pendula].	4590392	160
Betula pendula	isoallergen Bet v 1 b2 [Betula pendula].	4590394	160
Betula pendula	isoallergen bet v 1 b3 [Betula pendula].	4590396	160
Betula pendula	1 Sc-3 [Betula pendula].	534898	160
Betula pendula	1 Sc2 [Betula pendula].	534900	159
Betula pendula	1-Sc1 [Betula pendula].	534910	160
Carpinus betulus	pollen allergen Car b 1 [Carpinus betulus].	1545875	160
Carpinus betulus	pollen allergen Car b 1 [Carpinus betulus].	1545877	160
Carpinus betulus	pollen allergen Car b 1 [Carpinus betulus].	1545879	160
Carpinus betulus	pollen allergen Car b 1 [Carpinus betulus].	1545887	160
Carpinus betulus	pollen allergen Car b 1 [Carpinus betulus].	1545891	160
Carpinus betulus	pollen allergen Car b 1 [Carpinus betulus].	1545893	160
Carpinus betulus	pollen allergen Car b 1 [Carpinus betulus].	1545895	161
Carpinus betulus	pollen allergen Car b 1 [Carpinus betulus].	1545897	161
Carpinus betulus	Car b I=major allergen [Carpinus betulus=hornbeam trees, pollen,	239735	40
Carpinus betulus	Car b I [Carpinus betulus].	402745	159
Carpinus betulus	Major pollen allergen Car b 1 isoforms 1A and 1B (Allergen Car b	730048	160
Carpinus betulus	Major pollen allergen Car b 1 isoform 2 (Allergen Car b I).	730049	160
Chamaecyparis obtusa	pollen allergen [Chamaecyparis obtusa].	114841683	419
Chamaecyparis obtusa	Chao1 [Chamaecyparis obtusa].	1514943	375
Chamaecyparis obtusa	Polygalacturonase precursor (PG) (Pectinase) (Major pollen allergen	47606004	514
Chenopodium album	Che a 1 allergen precursor [Chenopodium album].	22074346	168
Chenopodium album	pollen allergen Che a 2 [Chenopodium album].	29465666	131
Chenopodium album	pollen allergen Che a 3 [Chenopodium album].	29465668	86
Crocus sativus	profilin [Crocus sativus].	58700651	131
Cryptomeria japonica	pollen allergen [Cryptomeria japonica].	114841607	514
Cryptomeria japonica	pollen allergen [Cryptomeria japonica].	114841617	514
Cryptomeria japonica	pollen allergen [Cryptomeria japonica].	114841629	514
Cryptomeria japonica	pollen allergen [Cryptomeria japonica].	114841635	514
Cryptomeria japonica	pollen allergen [Cryptomeria japonica].	114841641	514
Cryptomeria japonica	pollen allergen [Cryptomeria japonica].	114841653	514
Cryptomeria japonica	pollen allergen [Cryptomeria japonica].	114841657	514
Cryptomeria japonica	pollen allergen [Cryptomeria japonica].	114841663	514
Cryptomeria japonica	pollen allergen [Cryptomeria japonica].	114841665	514
Cryptomeria japonica	pollen allergen [Cryptomeria japonica].	114841671	514
Cryptomeria japonica	Polygalacturonase precursor (PG) (Pectinase) (Major pollen allergen	1171004	514
Cryptomeria japonica	Sugi basic protein precursor (SBP) (Major allergen Cry j 1) (Cry j	1173367	374
Cryptomeria japonica	thaumatin-like protein [Cryptomeria japonica].	139002766	225
Cryptomeria japonica	Cry j 1 precursor [Cryptomeria japonica].	19570315	374
Cryptomeria japonica	isoflavone reductase-like protein CJP-6 [Cryptomeria japonica].	19847822	306
Cryptomeria japonica	allergen Cry j 2 [Cryptomeria japonica].	24898904	514
Cryptomeria japonica	allergen Cry j 2 [Cryptomeria japonica].	24898906	514
Cryptomeria japonica	allergen Cry j 2 [Cryptomeria japonica].	24898908	514

Cryptomeria japonica	Cry j IB precursor [Cryptomeria japonica].	493634	374
Cryptomeria japonica	class IV chitinase [Cryptomeria japonica].	56550550	281
Cupressus arizonica	major allergen Cup a 1 [Cupressus arizonica].	118197955	347
Cupressus arizonica	putative allergen Cup a 1 [Cupressus arizonica].	19069497	367
Cupressus sempervirens	PR5 allergen Cup s 3.2 precursor [Cupressus sempervirens].	38456228	225
Cupressus sempervirens	PR5 allergen Cup s 3.3 precursor [Cupressus sempervirens].	38456230	225
Cupressus arizonica	cup a 1 protein [Cupressus arizonica].	6562326	346
Cupressus sempervirens	Cup s 1 pollen allergen precursor [Cupressus sempervirens].	8101711	367
Cupressus sempervirens	Cup s 1 pollen allergen precursor [Cupressus sempervirens].	8101713	367
Cupressus sempervirens	Cup s 1 pollen allergen precursor [Cupressus sempervirens].	8101715	367
Cupressus sempervirens	Cup s 1 pollen allergen precursor [Cupressus sempervirens].	8101717	367
Cupressus sempervirens	Cup s 1 pollen allergen precursor [Cupressus sempervirens].	8101719	367
Cupressus arizonica	Cup a 3 protein [Cupressus arizonica].	9929163	199
Cynodon dactylon	acidic Cyn d 1 isoallergen isoform 1 precursor [Cynodon dactylon].	10314021	244
Cynodon dactylon	B1 protein allergen [Cynodon dactylon].	1247373	71
Cynodon dactylon	B4 protein allergen [Cynodon dactylon].	1247375	73
Cynodon dactylon	Major pollen allergen Cyn d 1.	14423757	246
Cynodon dactylon	acidic allergen Cyn d 1 precursor [Cynodon dactylon].	15384338	244
Cynodon dactylon	acidic Cyn d 1 isoallergen isoform 2 precursor [Cynodon dactylon].	16076693	262
Cynodon dactylon	acidic Cyn d 1 isoallergen isoform 3 precursor [Cynodon dactylon].	16076695	262
Cynodon dactylon	acidic Cyn d 1 isoallergen isoform 4 precursor [Cynodon dactylon].	16076697	262
Cynodon dactylon	calcium-binding pollen allergen [Cynodon dactylon].	1871507	82
Cynodon dactylon	profilin 1 [Cynodon dactylon].	2154730	131
Cynodon dactylon	major allergen Cyn d I=34 kda polypeptide {N-terminal} [Cynodon	451274	25
Cynodon dactylon	major allergen Cyn d I=29 kda polypeptide {N-terminal} [Cynodon	451275	38
Cynodon dactylon	Cyn d Ib isoallergen {N-terminal} [Cynodon dactylon=Bermuda grass,	691726	34
Dactylis glomerata	allergen Dac g II.	1093120	196
Dactylis glomerata	group 5 allergen precursor [Dactylis glomerata].	14423124	290
Dactylis glomerata	unnamed protein product [Dactylis glomerata].	18093971	265
Dactylis glomerata	unnamed protein product [Dactylis glomerata].	18093991	264
Dactylis glomerata	Dac gIII allergen.	1825459	96
Dactylis glomerata	Major pollen allergen Dac g 4.	32363463	55
Dactylis glomerata	group 1 allergen Dac g 1.01 precursor [Dactylis glomerata].	33149333	240
Dactylis glomerata	pollen allergen (group II) [Dactylis glomerata].	4007040	122
Festuca arundinacea	pollen allergen Fes e I type A - reed fescue (fragment).	320610	17
Festuca arundinacea	pollen allergen Fes e I type B - reed fescue (fragment).	320611	20
Festuca arundinacea	Group I allergen FeS e I, pollen.	75139991	35
Fraxinus excelsior	allergen Fra e 1.0101 [Fraxinus excelsior].	33327133	145
Fraxinus excelsior	allergen Fra e 1 [Fraxinus excelsior].	34978692	146
Fraxinus excelsior	Fra e 1.0102 major allergen [Fraxinus excelsior].	56122438	145
Holcus lanatus	protein with incomplete signal sequence [Holcus lanatus].	1167836	248
Holcus lanatus	pollen allergen Hol l 5b [Holcus lanatus].	11991229	296
Holcus lanatus	group V grass pollen allergen [Holcus lanatus].	2266623	240
Holcus lanatus	group V allergen [Holcus lanatus].	2266625	264
Holcus lanatus	major group I allergen Hol l 1 [Holcus lanatus].	3860384	263
Holcus lanatus	allergen Hol-II [Holcus lanatus].	414703	265
Humulus japonicus	Humj1 [Humulus japonicus].	33113263	155
Humulus scandens	profilin-like protein [Humulus scandens].	34851174	131
Humulus scandens	profilin-like protein [Humulus scandens].	34851176	131
Juniperus oxycedrus	putative allergen jun o 1 [Juniperus oxycedrus].	15139849	367
Juniperus rigida	PR5 allergen Jun r 3.1 precursor [Juniperus rigida].	38456222	225
Juniperus rigida	PR5 allergen Jun r 3.2 precursor [Juniperus rigida].	38456224	225
Juniperus ashei	pollen major allergen 1-1 [Juniperus ashei].	4138877	367
Juniperus virginiana	Pathogenesis-related protein precursor [Putative major pollen	51316532	110
Juniperus oxycedrus	pollen allergen Jun o 4 [Juniperus oxycedrus].	5391446	165
Juniperus ashei	allergen Jun a 3 [Juniperus ashei].	6940772	225
Juniperus virginiana	pollen major allergen 1-2 [Juniperus virginiana].	8843917	367
Juniperus virginiana	pollen major allergen 1-1 [Juniperus virginiana].	8843921	367
Juniperus ashei	pollen major allergen 2 protein [Juniperus ashei].	9955725	507
Ligustrum vulgare	major allergen [Ligustrum vulgare].	3256210	145
Ligustrum vulgare	major allergen [Ligustrum vulgare].	3256212	145
Lilium longiflorum	polygalacturonase [Lilium longiflorum].	73913442	413
Lolium perenne	Pollen allergen Lol p 1 precursor (Lol p I) (Allergen R7).	126385	263

Lolium perenne	Pollen allergen Lol p 2-A (Lol p II-A).	126386	97
Lolium perenne	Pollen allergen Lol p 3 (Lol p III).	126387	97
Lolium perenne	pollen allergen.	168314	252
Lolium perenne	Major pollen allergen Lol p 5a precursor (Lol p Va) (Lol p Ib).	2498581	308
Lolium perenne	Major pollen allergen Lol p 5b precursor (Lol p Vb).	2498582	339
Lolium italicum	pollen allergen (group II) [Lolium italicum].	4007636	122
Lolium perenne	pollen allergen Lol p VA precursor; major allergen [Lolium	4416516	301
Lolium perenne	Major pollen allergen Lol p 11 (Lol p XI).	47605808	134
Lolium perenne	pollen allergen Lol p 4 [Lolium perenne].	55859464	423
Lolium perenne	pollen allergen [Lolium perenne].	6634467	301
Lolium perenne	Pollen allergen.	75274600	263
Lolium perenne	allergen Lol p II [Lolium perenne].	939932	88
Mercurialis annua	Profilin [Mercurialis annua].	2959898	133
Olea europaea	Superoxide dismutase [Cu-Zn] (Allergen Ole e 5) (Ole e V).	122064581	30
Olea europaea	main olive allergen [Olea europaea].	13195753	130
Olea europaea	major allergen OLE16 - common olive (fragment).	1362128	137
Olea europaea	major allergen OLE17 - common olive (fragment).	1362129	136
Olea europaea	major allergen OLE19 - common olive (fragment).	1362130	136
Olea europaea	major allergen OLE1c - common olive (fragment).	1362131	145
Olea europaea	major allergen OLE20 - common olive (fragment).	1362132	137
Olea europaea	major allergen OLE26 - common olive (fragment).	1362133	136
Olea europaea	major allergen OLE5c - common olive.	1362136	145
Olea europaea	major allergen OLE6 - common olive (fragment).	1362137	136
Olea europaea	beta-1,3-glucanase-like protein [Olea europaea].	14279169	460
Olea europaea	Pollen allergen Ole e 6.	14423643	50
Olea europaea	Calcium-binding allergen Ole e 8 (PCA18/PCA23).	14423648	171
Olea europaea	Major pollen allergen (Allergen Ole e 1) (Ole e I).	14424429	145
Olea europaea	Pollen allergen Ole e 7 (Ole e VII).	22002032	21
Olea europaea	Ole e 1.0102 protein [Olea europaea].	2465127	146
Olea europaea	Ole e 1.0103 protein [Olea europaea].	2465129	146
Olea europaea	Ole e 1 protein [Olea europaea].	2465131	146
Olea europaea	allergen Ole e 10 [Olea europaea].	29465664	123
Olea europaea	Major pollen allergen Ole e 4 (Ole e IV).	32363447	24
Olea europaea	major pollen allergen Ole e 1 [Olea europaea].	33325111	132
Olea europaea	major pollen allergen Ole e 1 [Olea europaea].	33325115	132
Olea europaea	major pollen allergen Ole e 1 [Olea europaea].	33329732	132
Olea europaea	major pollen allergen Ole e 1 [Olea europaea].	33329738	132
Olea europaea	major pollen allergen Ole e 1 [Olea europaea].	33329744	131
Olea europaea	major pollen allergen Ole e 1 [Olea europaea].	33329748	129
Olea europaea	major pollen allergen Ole e 1 [Olea europaea].	33329750	131
Olea europaea	major pollen allergen Ole e 1 [Olea europaea].	33329752	131
Olea europaea	major pollen allergen Ole e 1 [Olea europaea].	33329754	132
Olea europaea	major pollen allergen Ole e 1 [Olea europaea].	33329756	132
Olea europaea	major pollen allergen Ole e 1 [Olea europaea].	33329758	131
Olea europaea	calcium-binding pollen allergen [Olea europaea].	3337403	84
Olea europaea	major pollen allergen Ole e 1 [Olea europaea].	37548753	132
Olea europaea	major pollen allergen Ole e 1 [Olea europaea].	37724593	135
Olea europaea	major pollen allergen Ole e 1 [Olea europaea].	37724597	134
Olea europaea	Ole e 3 allergen [Olea europaea].	37725377	52
Olea europaea	Profilin-1 (Pollen allergen Ole e 2).	3914426	134
Olea europaea	Profilin-2 (Pollen allergen Ole e 2).	3914427	134
Olea europaea	Profilin-3 (Pollen allergen Ole e 2).	3914428	134
Olea europaea	Cu /Zn super-oxide dismutase [Olea europaea].	39840779	152
Olea europaea	calcium-binding protein [Olea europaea].	6901654	171
Parietaria officinalis	mAb 2F9-reactive major allergen {N-terminal} [Parietaria	1311509	17
Parietaria officinalis	mAb 8C7-reactive major allergen {N-terminal, band 1} [Parietaria	1311510	15
Parietaria officinalis	mAb 8C7-reactive major allergen {N-terminal, band 2} [Parietaria	1311511	15
Parietaria officinalis	mAb 3F8-reactive major allergen {N-terminal} [Parietaria	1311512	15
Parietaria officinalis	mAb 8B6-reactive major allergen {N-terminal} [Parietaria	1311513	30
Parietaria judaica	Profilin-2 (Pollen allergen Par j 3.0102).	14423869	131
Parietaria judaica	Profilin-1 (Pollen allergen Par j 3.0101).	14423876	132
Parietaria judaica	P8 protein [Parietaria judaica].	1532056	133
Parietaria judaica	P9 protein [Parietaria judaica].	1532058	176

Parietaria officinalis	Par o 1a=acidic allergen isoform {N-terminal} [Parietaria	1836010	25
Parietaria officinalis	Par o 1b=basic allergen isoform {N-terminal} [Parietaria	1836011	24
Parietaria judaica	Probable non-specific lipid-transfer protein 1 precursor (LTP)	2497749	138
Parietaria judaica	Probable non-specific lipid-transfer protein 2 precursor (LTP 2)	2497750	133
Parietaria judaica	Probable non-specific lipid-transfer protein (LTP) (Major pollen	3915783	139
Parietaria judaica	major allergen Par j I.	741844	143
Parietaria officinalis	Pollen major allergen Par o I.	75139847	12
Phalaris aquatica	Major pollen allergen Pha a 1 precursor (Pha a I).	2498576	269
Phalaris aquatica	Major pollen allergen Pha a 5.1 precursor (Pha A 5) (Clone 28).	2498577	320
Phalaris aquatica	Major pollen allergen Pha a 5.2 precursor (Pha a 5) (Clone 14).	2498578	305
Phalaris aquatica	Major pollen allergen Pha a 5.3 precursor (Pha a 5) (Clone 29).	2498579	294
Phalaris aquatica	Major pollen allergen Pha a 5.4 (Pha a 5) (Clone 5).	2498580	175
Phalaris aquatica	Pha a I=34 kda pollen allergen {N-terminal} [Phalaris	409328	20
Phleum pratense	major allergen Phl p Va.	1092249	285
Phleum pratense	group V allergen Phl p 5 precursor [Phleum pratense].	13430402	275
Phleum pratense	Polcalcin Phl p 7 (Calcium-binding pollen allergen Phl p 7) (P7).	14423846	78
Phleum pratense	major allergen Phl p 5 [Phleum pratense].	1684718	281
Phleum pratense	major allergen Phl p 5 [Phleum pratense].	1684720	276
Phleum pratense	unnamed protein product [Phleum pratense].	21725606	287
Phleum pratense	unnamed protein product [Phleum pratense].	21725608	287
Phleum pratense	unnamed protein product [Phleum pratense].	21725610	287
Phleum pratense	unnamed protein product [Phleum pratense].	21725612	287
Phleum pratense	unnamed protein product [Phleum pratense].	21725614	287
Phleum pratense	unnamed protein product [Phleum pratense].	21725616	287
Phleum pratense	unnamed protein product [Phleum pratense].	21725618	287
Phleum pratense	unnamed protein product [Phleum pratense].	21725620	287
Phleum pratense	unnamed protein product [Phleum pratense].	21725622	287
Phleum pratense	unnamed protein product [Phleum pratense].	21725624	287
Phleum pratense	unnamed protein product [Phleum pratense].	21725626	287
Phleum pratense	unnamed protein product [Phleum pratense].	21725628	287
Phleum pratense	unnamed protein product [Phleum pratense].	21725630	287
Phleum pratense	unnamed protein product [Phleum pratense].	21725632	287
Phleum pratense	pollen allergen Phl p 11 [Phleum pratense].	23452313	143
Phleum pratense	Major Pollen Allergen Phl p Va [Phleum pratense].	2398757	286
Phleum pratense	profilin 3 [Phleum pratense].	2415700	131
Phleum pratense	profilin 4 [Phleum pratense].	2415702	131
Phleum pratense	Chain A, Crystal Structure Of Phl P 1, A Major Timothy Grass Pollen	28373838	241
Phleum pratense	Chain N, Crystal Structure Of Phl P 6, A Major Timothy Grass Pollen	28374072	111
Phleum pratense	Pollen allergen Phl p 5b precursor (Phl p Vb).	2851457	284
Phleum pratense	Chain A, Crystal Structure Of The Functional Domain Of The Major	28948464	102
Phleum pratense	phl p5a allergen precursor [Phleum pratense].	29500897	284
Phleum pratense	Phl p6 allergen [Phleum pratense].	3004465	138
Phleum pratense	Phl p6 allergen [Phleum pratense].	3004467	138
Phleum pratense	Phl p6 IgE binding fragment [Phleum pratense].	3004469	106
Phleum pratense	major allergen Phl p 5 [Phleum pratense].	3135497	276
Phleum pratense	major allergen Phl p 5 [Phleum pratense].	3135499	276
Phleum pratense	major allergen Phl p 5 [Phleum pratense].	3135501	276
Phleum pratense	major allergen Phl p 5 [Phleum pratense].	3135503	276
Phleum pratense	group V allergen Phl p 5.0103 precursor [Phleum pratense].	3309039	312
Phleum pratense	group V allergen Phl p 5.0203 precursor [Phleum pratense].	3309041	295
Phleum pratense	group V allergen Phl p 5.0206 precursor [Phleum pratense].	3309045	290
Phleum pratense	group V allergen Phl p 5.0207 precursor [Phleum pratense].	3309047	287
Phleum pratense	pollen allergen Phl pI [Phleum pratense].	3901094	263
Phleum pratense	Phlp5 [Phleum pratense].	398830	312
Phleum pratense	PHL PII, pollen allergen [Phleum pratense].	415896	122
Phleum pratense	PHLP5A protein - common timothy (fragment).	422005	257
Phleum pratense	unnamed protein product [Phleum pratense].	45108967	500
Phleum pratense	unnamed protein product [Phleum pratense].	45108973	500
Phleum pratense	unnamed protein product [Phleum pratense].	45823012	240
Phleum pratense	Profilin-1 (Pollen allergen Phl p 12) (Phl p 11).	464471	131
Phleum pratense	Phl p I allergen [Phleum pratense].	473360	263
Phleum pratense	allergen Phl p Vb - common timothy.	481397	280
Phleum pratense	polygalacturonase [Phleum pratense].	4826572	394

Phleum pratense	pollen allergen Phl p 4 [Phleum pratense].	54144332	508
Phleum pratense	Pollen allergen Phl p V.	75139900	24
Phleum pratense	major pollen allergen Phl p 4 precursor [Phleum pratense].	82492267	525
Phoenix dactylifera	profilin [Phoenix dactylifera].	21322677	131
Platanus x acerifolia	putative invertase inhibitor precursor [Platanus x acerifolia].	26190140	179
Platanus x acerifolia	polygalacturonase [Platanus x acerifolia].	49523394	377
Poa pratensis	Pollen allergen KBG 31 precursor (Pollen allergen Poa p 9) (Poa p	113560	373
Poa pratensis	Pollen allergen KBG 41 precursor (Pollen allergen Poa p 9) (Poa p	113561	333
Poa pratensis	Pollen allergen KBG 60 precursor (Pollen allergen Poa p 9) (Poa p	113562	307
Poa pratensis	pollen allergen Poa p 5 [Poa pratensis].	11991227	303
Poa pratensis	pollen allergen Poa-pI - Kentucky bluegrass (fragment).	280414	20
Poa pratensis	pollen allergen Poa p I - Kentucky bluegrass (fragment).	320620	26
Poa pratensis	pollen allergen (group II) [Poa pratensis].	4007655	122
Poa pratensis	group I pollen allergen [Poa pratensis].	4090265	263
Poa pratensis	pollen allergen (clone 7.2) - Kentucky bluegrass (fragment).	539056	131
Quercus alba	major pollen allergen Que a I - white oak (fragment).	543675	24
Salsola kali	Pollen allergen Sal k 1.	25090947	42
Salsola kali	pectin-methyltransferase precursor [Salsola kali].	51242679	362
Salsola kali	pectin methylesterase allergenic protein [Salsola kali].	59895728	339
Salsola kali	pectin methylesterase allergenic protein [Salsola kali].	59895730	339
Syringa vulgaris	allergen-like protein Syr v I isoform 1 - Syringa vulgaris.	631911	145
Syringa vulgaris	allergen-like protein Syr v I isoform 2 - Syringa vulgaris.	631912	145
Syringa vulgaris	allergen-like protein Syr v I isoform 3 - Syringa vulgaris.	631913	145

Food Allergens Animals

Species	Comments	GI #	AA
Batillus cornutus	Tropomyosin (Major allergen Tur c 1).	47117349	146
Bos taurus	kappa-casein [Bos taurus].	1228078	190
Bos taurus	alpha-lactalbumin precursor (EC 2.4.1.22).	162644	142
Bos taurus	albumin [Bos taurus].	162648	607
Bos taurus	alpha-s1-casein.	162650	93
Bos taurus	beta-lactoglobulin.	162748	151
Bos taurus	beta-lactoglobulin.	162750	14
Bos taurus	alpha-s1-casein precursor.	162792	214
Bos taurus	alpha-S1-casein.	162794	214
Bos taurus	beta-casein precursor.	162797	224
Bos taurus	beta-casein.	162805	224
Bos taurus	kappa-casein precursor.	162811	190
Bos taurus	alpha-s1-casein.	162927	76
Bos taurus	alpha-s2-like casein precursor.	162929	222
Bos taurus	beta-casein precursor.	162931	224
Bos taurus	Protein S100-A7 (S100 calcium-binding protein A7) (Allergen Bos d	2493414	101
Bos taurus	alpha-lactalbumin [Bos taurus].	295774	142
Bos taurus	lactotransferrin [Bos taurus].	30794292	708
Bos taurus	bovine serum albumin [Bos taurus].	3336842	607
Bos taurus	beta-casein A3 [Bos taurus].	459292	224
Bos taurus	beta-lactoglobulin [Bos taurus].	520	178
Bos taurus	beta-lactoglobulin variant B precursor [Bos taurus].	669061	178
Bos taurus	major allergen BDA20 [Bos taurus].	886215	172
Charybdis feriatus	heat stable allergen tropomyosin [Charybdis feriatus].	7024506	264
Chionoecetes opilio	tropomyosin slow-tonic isoform [Chionoecetes opilio].	125995167	284
Crassostrea gigas	tropomyosin [Crassostrea gigas].	15419048	233
Cyprinus carpio	parvalbumin [Cyprinus carpio].	17977825	109
Cyprinus carpio	parvalbumin [Cyprinus carpio].	17977827	109
Erimacrus isenbeckii	tropomyosin slow-twitch isoform [Erimacrus isenbeckii].	125995169	284
Erimacrus isenbeckii	tropomyosin slow-tonic isoform [Erimacrus isenbeckii].	125995171	284
Farfantepenaeus aztecus	Pen a 1 allergen [Farfantepenaeus aztecus].	73532979	284
Gadus callarias	Parvalbumin beta (Allergen Gad c 1) (Gad c I) (Allergen M).	131112	113
Gadus morhua	parvalbumin beta [Gadus morhua].	14531014	109
Gadus morhua	parvalbumin beta [Gadus morhua].	14531016	109
Gallus gallus	PREDICTED: similar to Ovomucoid precursor (Allergen Gal d 1) (Gal d	118097409	208
Gallus gallus	Ovomucoid precursor (Allergen Gal d 1) (Allergen Gal d I).	124757	210

Gallus gallus	Lysozyme C precursor (1,4-beta-N-acetylmuramidase C) (Allergen Gal	126608	147
Gallus gallus	Ovalbumin (Egg albumin) (Plakalbumin) (Allergen Gal d 2) (Allergen	129293	386
Gallus gallus	Ovotransferrin precursor (Conalbumin) (Serum transferrin) (Allergen	1351295	705
Gallus gallus	Chain A, Loop-Inserted Structure Of P1-P1' Cleaved Ovalbumin Mutant	15826578	385
Gallus gallus	lysozyme protein.	212279	24
Gallus gallus	Chain D, Crystal Structure Of S-Ovalbumin At 1.9 Angstrom	34811333	385
Gallus gallus	unnamed protein product [Gallus gallus].	63052	155
Gallus gallus	preproalbumin (serum albumin) [Gallus gallus].	63748	615
Gallus gallus	ovotransferrin [Gallus gallus].	757851	705
Gallus gallus	unnamed protein product [Gallus gallus].	808969	386
Helix aspersa	tropomyosin [Helix aspersa].	4468224	284
Homarus americanus	Tropomyosin (Allergen Hom a 1).	14285796	284
Homarus americanus	fast tropomyosin isoform [Homarus americanus].	2660868	284
Litopenaeus vannamei	arginine kinase [Litopenaeus vannamei].	115492980	356
Marsupenaeus japonicus	tropomyosin fast isoform [Marsupenaeus japonicus].	125995159	284
Metapenaeus ensis	tropomyosin.	607633	274
Mimachlamys nobilis	tropomyosin [Mimachlamys nobilis].	9954253	284
Octopus vulgaris	tropomyosin [Octopus vulgaris].	83715936	284
Ommastrephes bartramii	tropomyosin [Ommastrephes bartramii].	83715934	284
Pandalus eous	tropomyosin fast isoform [Pandalus eous].	125995161	284
Panulirus stimpsoni	Tropomyosin (Allergen Pan s 1) (Pan s I).	14285797	274
Paralithodes camtschaticus	tropomyosin fast isoform [Paralithodes camtschaticus].	125995163	284
Paralithodes camtschaticus	tropomyosin slow-tonic isoform [Paralithodes camtschaticus].	125995165	284
Penaeus monodon	tropomyosin fast isoform [Penaeus monodon].	125995157	284
Penaeus monodon	allergen Pen m 2 [Penaeus monodon].	27463265	356
Perna viridis	tropomyosin [Perna viridis].	9954251	284
Rana esculenta	parvalbumin alpha [Rana esculenta].	20796729	110
Rana sp. CH-2001	parvalbumin alpha [Rana sp. CH-2001].	20796733	110
Rana esculenta	parvalbumin beta protein [Rana esculenta].	20797081	109
Rana sp. CH-2001	parvalbumin beta protein [Rana sp. CH-2001].	20797085	109
Salmo salar	Parvalbumin beta 2 (Major allergen Sal s 1).	18281421	108
Salmo salar	Parvalbumin beta 1 (Major allergen Sal s 1).	2493445	109
Sepia esculenta	tropomyosin [Sepia esculenta].	83715928	284
Sepioteuthis lessoniana	tropomyosin [Sepioteuthis lessoniana].	83715930	284
Theragra chalcogramma	parvalbumin [Theragra chalcogramma].	14531018	109
Theragra chalcogramma	parvalbumin [Theragra chalcogramma].	14531020	109
Todarodes pacificus	tropomyosin [Todarodes pacificus].	83715932	284
Trachurus japonicus	dark muscle parvalbumin [Trachurus japonicus].	77799800	107

Food Allergens Plants

Species	Comments	GI #	AA
Actinidia deliciosa	unnamed protein product [Actinidia deliciosa].	15984	380
Actinidia deliciosa	actinidin.	166317	380
Actinidia deliciosa	phytoecystatin [Actinidia deliciosa].	40807635	116
Actinidia chinensis	Thaumatococin-like protein (Allergen Act c 2).	68064399	20
Actinidia deliciosa	thaumatococin-like protein [Actinidia deliciosa].	71057064	225
Actinidia deliciosa	Kiwifruitin (Allergen Act d 5).	85701136	189
Anacardium occidentale	vicilin-like protein [Anacardium occidentale].	21666498	536
Anacardium occidentale	vicilin-like protein [Anacardium occidentale].	21914823	538
Anacardium occidentale	2s albumin [Anacardium occidentale].	24473800	138
Anacardium occidentale	allergen Ana o 2 [Anacardium occidentale].	25991543	457
Ananas comosus	profilin [Ananas comosus].	14161637	131
Ananas comosus	Fruit bromelain precursor (Allergen Ana c 2).	75277440	351
Apium graveolens	Major allergen Api g 1 (Api g 1.0101) (Allergen Api g I).	1346568	154
Apium graveolens	Api g 1.0201 allergen [Apium graveolens].	1769847	159
Apium graveolens	Allergen Api g 5.	33300920	86
Apium graveolens	profilin [Apium graveolens].	4761578	134
Arachis hypogaea	iso-Ara h3 [Arachis hypogaea].	112380623	512
Arachis hypogaea	Allergen Ara h 1, clone P17 precursor (Ara h I).	1168390	614
Arachis hypogaea	Allergen Ara h 1, clone P41B precursor (Ara h I).	1168391	626
Arachis hypogaea	unnamed protein product [Arachis hypogaea].	14347293	207
Arachis hypogaea	Chain A, Allergen Ara h6 From Peanut (Arachis Hypogaea).	159163254	127

Arachis hypogaea	conglutin [Arachis hypogaea].	17225991	144
Arachis hypogaea	allergen Ara h 3/Ara h 4 [Arachis hypogaea].	21314465	538
Arachis hypogaea	trypsin inhibitor [Arachis hypogaea].	22135348	219
Arachis hypogaea	peanut agglutinin precursor; prePNA [Arachis hypogaea].	253289	273
Arachis hypogaea	allergen Ara h 2.02 [Arachis hypogaea].	26245447	172
Arachis hypogaea	allergen Ara h 2 isoform [Arachis hypogaea].	31322017	169
Arachis hypogaea	glycinin [Arachis hypogaea].	3703107	507
Arachis hypogaea	Ara h 8 allergen [Arachis hypogaea].	37499626	157
Arachis hypogaea	conarachin [Arachis hypogaea].	46560472	303
Arachis hypogaea	conarachin [Arachis hypogaea].	46560474	299
Arachis hypogaea	conarachin [Arachis hypogaea].	46560476	428
Arachis hypogaea	glycinin [Arachis hypogaea].	5712199	530
Arachis hypogaea	profilin [Arachis hypogaea].	5902968	131
Arachis hypogaea	allergen Ara h 6 [Arachis hypogaea].	5923742	129
Arachis hypogaea	allergen [Arachis hypogaea].	5931948	160
Bertholletia excelsa	2S sulfur-rich seed storage protein precursor (Allergen Ber e 1)	112754	146
Bertholletia excelsa	2S albumin [Bertholletia excelsa].	17713	154
Bertholletia excelsa	11S globulin [Bertholletia excelsa].	30313867	465
Brassica napus	pollen allergen group II (clone 42) - rape.	2129801	83
Brassica napus	pollen allergen group II (clone 44) - rape.	2129802	83
Brassica rapa	pollen allergen group II (clone 4) - turnip (fragment).	2129805	80
Brassica napus	recombinant 1b pronapin precursor [Brassica napus].	26985163	109
Brassica rapa subsp. rapa	Chitin-binding allergen Bra r 2.	32363456	91
Brassica juncea	Bra j 1E small chain=allergen [Brassica juncea=oriental-mustard,	407609	37
Brassica juncea	Bra j 1E large chain=allergen [Brassica juncea=oriental-mustard,	407610	92
Brassica rapa subsp. rapa	Polcalcine Bra r 1 (Calcium-binding pollen allergen Bra r 1).	59800144	79
Brassica rapa subsp. rapa	Polcalcine Bra r 2 (Calcium-binding pollen allergen Bra r 2).	59800146	83
Capsicum annuum	profilin [Capsicum annuum].	16555785	131
Carica papaya	papain precursor.	167391	345
Castanea sativa	chitinase 1b [Castanea sativa].	1359600	316
Castanea sativa	ypr10 [Castanea sativa].	16555781	160
Castanea sativa	CAS S 1 major allergen.	75199059	24
Citrus sinensis	lipid transfer protein [Citrus sinensis].	50199132	91
Citrus sinensis	Germin-like protein (Allergen Cit s 1).	52782810	25
Citrus limon	Non-specific lipid-transfer protein (LTP) (Allergen Cit s 3).	52783176	20
Citrus sinensis	Non-specific lipid-transfer protein (LTP) (Allergen Cit s 3.0101).	52783177	20
Citrus sinensis	Profilin (Allergen Cit s 2).	54036219	10
Citrus sinensis	profilin [Citrus sinensis].	56000996	131
Corylus avellana	putative luminal binding protein [Corylus avellana].	10944737	668
Corylus avellana	major allergen variant Cor a 1.0402 [Corylus avellana].	11762102	161
Corylus avellana	major allergen variant Cor a 1.0403 [Corylus avellana].	11762104	161
Corylus avellana	major allergen variant Cor a 1.0404 [Corylus avellana].	11762106	161
Corylus avellana	minor allergen hazelnut profilin [Corylus avellana].	12659206	131
Corylus avellana	minor allergen hazelnut profilin [Corylus avellana].	12659208	131
Corylus avellana	major allergen Cor a 1 [Corylus avellana].	1321731	160
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Corylus avellana	48-kDa glycoprotein precursor [Corylus avellana].	19338630	448
Corylus avellana	major allergen [Corylus avellana].	22684	160
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Corylus avellana	major allergen [Corylus avellana].	22690	160
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Triticum aestivum	gamma-gliadin B-I precursor [Triticum aestivum].	170730	304
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Triticum turgidum subsp. durum	CM2 protein [Triticum turgidum subsp. durum].	21920	145
Triticum turgidum subsp. durum	unnamed protein product [Triticum turgidum subsp. durum].	21926	295
Triticum turgidum subsp. durum	LMW glutenin [Triticum turgidum subsp. durum].	21930	285
Triticum aestivum	HMW glutenin subunit 1By9 [Triticum aestivum].	22090	705
Triticum aestivum	Allergen C-C.	3913017	27
Triticum aestivum	alpha-gliadin.	473876	287
Triticum aestivum	putative gamma-gliadin [Triticum aestivum].	62484809	285
Triticum aestivum	putative LMW-glutenin subunit [Triticum aestivum].	62550933	326
Triticum aestivum	serine carboxypeptidase II [Triticum aestivum].	66840994	260
Triticum aestivum	putative leucine-rich repeat protein [Triticum aestivum].	66840996	137
Triticum aestivum	5a2 protein [Triticum aestivum].	66840998	94
Triticum aestivum	glutenin [Triticum aestivum].	736319	838
Triticum aestivum	omega-5 gliadin [Triticum aestivum].	73912496	439
Triticum aestivum	LMM glutenin 1.	75219081	285
Triticum aestivum	LMM glutenin 3.	75317968	373
Triticum aestivum	low molecular weight glutenin [Triticum aestivum].	886963	229
Triticum aestivum	low molecular weight glutenin [Triticum aestivum].	886965	261
Triticum aestivum	low molecular weight glutenin [Triticum aestivum].	886967	276
Triticum aestivum	unnamed protein product [Triticum aestivum].	897811	101
Vigna radiata	pathogenesis-related protein 10 [Vigna radiata].	60418924	155
Vitis sp.	Non-specific lipid-transfer protein P3 (LTP P3).	145559502	91
Vitis sp.	Non-specific lipid-transfer protein P2 (LTP P2).	462717	38
Vitis sp.	Non-specific lipid-transfer protein P4 (LTP P4).	462719	37
Zea mays	EXPB10 [Zea mays].	105969543	99
Zea mays	EXPB10 [Zea mays].	105969545	269
Zea mays	pollen profilin variant 1 [Zea mays].	110644952	131
Zea mays	pollen profilin variant 2 [Zea mays].	110644954	131
Zea mays	pollen profilin variant 3 [Zea mays].	110644956	131
Zea mays	pollen profilin variant 4 [Zea mays].	110644958	131
Zea mays	pollen profilin variant 5 [Zea mays].	110644960	131
Zea mays	pollen profilin variant 6 [Zea mays].	110644962	131
Zea mays	pollen profilin variant 7 [Zea mays].	110644964	130
Zea mays	Chain X, Crystal Structure Of Expb1 (Zea M 1), A Beta-Expansin And	114794319	245
Zea mays	Non-specific lipid-transfer protein precursor (LTP) (Phospholipid	128388	120
Zea mays	beta-expansin 1 [Zea mays].	14193761	269
Zea mays	Zm13.	1588669	170
Zea mays	profilin [Zea mays].	2642324	131
Zea mays	beta-expansin 9 protein [Zea mays].	28630919	269
Zea mays	beta-expansin 1 protein [Zea mays].	28630923	269
Zea mays	thioredoxin h1 protein [Zea mays].	66841002	128
Zea mays	Zea m 1 allergen [Zea mays].	89892721	263
Zea mays	Zea m 1 allergen [Zea mays].	89892723	252
Zea mays	Zea m 13 allergen [Zea mays].	89892725	410
Zea mays	Zea m 13 allergen [Zea mays].	89892727	404
Zea mays	Zea m 13 allergen [Zea mays].	89892729	411
Ziziphus mauritiana	allergen Ziz m 1 [Ziziphus mauritiana].	61225281	330

Nematodes and Worms

Species	Comments	GI #	AA
Ancylostoma caninum	secreted protein ASP-2 precursor [Ancylostoma caninum].	3608493	218
Ancylostoma duodenale	ancylostoma-secreted protein 1 precursor [Ancylostoma duodenale].	3719257	425
Ancylostoma caninum	ancylostoma-secreted protein 1 precursor; ASP-1 [Ancylostoma	4884851	424
Ancylostoma caninum	Aspartic protease.	74936004	442
Anisakis simplex	ani s 4 allergen [Anisakis simplex].	110346534	115
Anisakis simplex	SXP/RAL-2 family protein [Anisakis simplex].	121308878	152
Anisakis simplex	protease inhibitor [Anisakis simplex].	121308880	84
Anisakis simplex	Allergen Ani s 4.	47605398	14
Anisakis simplex	Major allergen Ani s 1 precursor (Excretory gland allergen Ans1)	47605452	194
Anisakis simplex	troponin-like protein [Anisakis simplex].	6065738	161
Anisakis simplex	paramyosin [Anisakis simplex].	8117843	869
Anisakis simplex	paramyosin isoform [Anisakis simplex].	8453086	473
Ascaris lumbricoides	ABA-1 allergen [Ascaris lumbricoides].	2735096	134
Ascaris lumbricoides	ABA-1 allergen [Ascaris lumbricoides].	2735098	134
Ascaris lumbricoides	ABA-1 allergen [Ascaris lumbricoides].	2735102	133
Ascaris lumbricoides	ABA-1 allergen [Ascaris lumbricoides].	2735106	133
Ascaris lumbricoides	ABA-1 allergen [Ascaris lumbricoides].	2735108	267
Ascaris lumbricoides	ABA-1 allergen [Ascaris lumbricoides].	2735110	267
Ascaris lumbricoides	ABA-1 allergen [Ascaris lumbricoides].	2735112	267
Ascaris lumbricoides	ABA-1 allergen [Ascaris lumbricoides].	2735114	134
Ascaris lumbricoides	ABA-1 allergen [Ascaris lumbricoides].	2735118	134
Ascaris suum	major allergen ABA-1=TBA-1 allergen homolog {N-terminal} [Ascaris	299550	68
Ascaris suum	Polyprotein ABA-1 precursor (Body fluid allergen 1) (Allergen Asc s	77416849	1365
Schistosoma japonicum	22.6 kDa tegumental antigen [Schistosoma japonicum].	2739154	191
Schistosoma japonicum	hypothetical protein, putative Profilin/allergen [Schistosoma	29841461	129

Other Contact Allergens

Species	Comments	GI #	AA
Equus caballus	Latherin precursor (Dander allergen Equ c 4/Equ c 5).	152031631	228
Equus caballus	Dander allergen Equ c 2.0101.	3121755	29
Equus caballus	Dander allergen Equ c 2.0102.	3121756	19
Equus caballus	Major allergen Equ c 1 precursor.	3121758	187
Equus caballus	preproalbumin [Equus caballus].	399672	607
Hevea brasiliensis	IgE-binding protein MnSOD [Hevea brasiliensis].	10862818	205
Hevea brasiliensis	Chain A, Latex Profilin Hevb8.	11513601	131
Hevea brasiliensis	beta-1,3-glucanase.	1184668	374
Hevea brasiliensis	Pro-hevein precursor (Major hevein) [Contains: Hevein (Allergen Hev	123062	204
Hevea brasiliensis	beta-1,3-glucanase [Hevea brasiliensis].	124294783	374
Hevea brasiliensis	beta-1,3-glucanase [Hevea brasiliensis].	124294785	374
Hevea brasiliensis	beta-1,3-glucanase [Hevea brasiliensis].	124365249	374
Hevea brasiliensis	beta-1,3-glucanase [Hevea brasiliensis].	124365251	374
Hevea brasiliensis	beta-1,3-glucanase [Hevea brasiliensis].	124365253	374
Hevea brasiliensis	Rubber elongation factor protein (REF) (Allergen Hev b 1).	132270	138
Hevea brasiliensis	Profilin-6 (Pollen allergen Hev b 8.0204).	14423856	131
Hevea brasiliensis	Profilin-5 (Pollen allergen Hev b 8.0203).	14423858	131
Hevea brasiliensis	Profilin-4 (Pollen allergen Hev b 8.0202).	14423859	131
Hevea brasiliensis	Profilin-3 (Pollen allergen Hev b 8.0201).	14423860	131
Hevea brasiliensis	Profilin-2 (Pollen allergen Hev b 8.0102).	14423868	131
Hevea brasiliensis	Small rubber particle protein (SRPP) (22 kDa rubber particle	14423933	204
Hevea brasiliensis	putative class I chitinase [Hevea brasiliensis].	14575525	295
Hevea brasiliensis	latex allergen.	1480457	151
Hevea brasiliensis	latex patatin homolog [Hevea brasiliensis].	1916805	388
Hevea brasiliensis	lipid transfer precursor protein [Hevea brasiliensis].	20135538	116
Hevea brasiliensis subsp. brasiliensis	class I chitinase [Hevea brasiliensis subsp. brasiliensis].	27526732	295
Hevea brasiliensis	prohevein [Hevea brasiliensis].	2832430	187
Hevea brasiliensis	latex allergen [Hevea brasiliensis].	3087805	388
Hevea brasiliensis	ENSP-like protein [Hevea brasiliensis].	30909057	391
Hevea brasiliensis	profilin [Hevea brasiliensis].	3183706	131
Hevea brasiliensis	beta-1,3-glucanase [Hevea brasiliensis].	32765543	374
Hevea brasiliensis	latex allergen [Hevea brasiliensis].	3288200	388
Hevea brasiliensis	superoxide dismutase (manganese).	348137	233

Hevea brasiliensis	putative latex allergen hev b 7.02 [Hevea brasiliensis].	41581137	387
Hevea brasiliensis	major latex allergen Hev b 4 [Hevea brasiliensis].	46410859	366
Hevea brasiliensis	MnSOD [Hevea brasiliensis].	5777414	205
Hevea brasiliensis	latex protein allergen Hev b 7 [Hevea brasiliensis].	6707018	388
Hevea brasiliensis	Chain A, Crystal Structure Of A Hev B 6.02 Isoallergen.	73535415	43
Hevea brasiliensis	enolase, isoform 1 [Hevea brasiliensis].	9581744	445
Hevea brasiliensis	enolase, isoform 2 [Hevea brasiliensis].	9581746	445
Nicotiana tabacum	villin 1 [Nicotiana tabacum].	57283137	559
Nicotiana tabacum	villin 2 [Nicotiana tabacum].	57283139	520

Venoms

Species	Comments	GI #	AA
Aedes aegypti	D7 protein precursor (Allergen Aed a 2).	118216	321
Aedes aegypti	30 kDa salivary gland allergen Aed a 3 [Aedes aegypti].	2114497	253
Aedes aegypti	apyrase.	556272	562
Aedes albopictus	30 kDa salivary gland allergen 30k-3 [Aedes albopictus].	56417504	271
Aedes albopictus	GE-rich salivary protein 30k-4 [Aedes albopictus].	56417506	266
Aedes aegypti	30 kDa salivary gland allergen variant 2 [Aedes aegypti].	94468546	273
Aedes aegypti	30 kDa salivary gland allergen variant 3 [Aedes aegypti].	94468552	258
Apis mellifera	Melittin precursor (Allergen Api m 3) (Api m III).	126949	70
Apis dorsata	Melittin.	126955	26
Apis mellifera	Phospholipase A2 precursor (Phosphatidylcholine 2-acylhydrolase)	24418862	167
Apis cerana cerana	Phospholipase A2 (Phosphatidylcholine 2-acylhydrolase).	24638082	134
Apis dorsata	Phospholipase A2 (Phosphatidylcholine 2-acylhydrolase).	47117012	134
Apis mellifera	Hyaluronoglucosaminidase precursor (Hyaluronidase) (Hya) (Allergen	585279	382
Apis mellifera	melittin, minor - honeybee.	69552	27
Apis cerana	phospholipase A2 (EC 3.1.1.4), venom - Indian honeybee.	7435005	134
Apis mellifera	allergen Api m 6 precursor [Apis mellifera].	94400875	94
Apis mellifera	allergen Api m 6 variant 1 [Apis mellifera].	94400907	92
Apis mellifera	icarapin variant 1 precursor [Apis mellifera].	94471622	223
Apis mellifera	icarapin variant 2 precursor [Apis mellifera].	94471624	175
Bombus terrestris	Phospholipase A2 (Phosphatidylcholine 2-acylhydrolase) (Allergen	14423832	136
Dolichovespula maculata	Hyaluronoglucosaminidase (Hyaluronidase) (Allergen Dol m 2) (Dol m	1346322	331
Dolichovespula maculata	Venom allergen 5.01 precursor (Antigen 5 form 2) (Ag5-2) (Allergen	137395	227
Dolichovespula maculata	Phospholipase A1 2 (Allergen Dol m 1.02) (Dol m I).	1709542	303
Dolichovespula arenaria	Venom allergen 5 (Antigen 5) (Ag5) (Allergen Dol a 5) (Dol a V).	465052	203
Dolichovespula maculata	Phospholipase A1 1 precursor (Allergen Dol m 1.01) (Dol m I).	548449	317
Dolichovespula maculata	Venom allergen 5.02 precursor (Antigen 5 form 3) (Ag5-3) (Allergen	549186	215
Myrmecia pilosula	major allergen Myr p II.	1587177	75
Myrmecia pilosula	Myr p I=allergenic polypeptide {N-terminal} [Myrmecia	1911819	112
Myrmecia pilosula	Pilosulin-2 precursor (Allergen Myr p 2) (Myr p II).	2498604	75
Myrmecia pilosula	Pilosulin-1 precursor (Major allergen Myr p 1) (Myr p I) [Contains:	730091	112
Polistes annularis	Hyaluronoglucosaminidase precursor (Hyaluronidase) (Allergen Pol a	14423735	367
Polistes annularis	Phospholipase A1 (Allergen Pol a 1).	14423833	301
Polistes annularis	allergen 5.	160780	209
Polistes gallicus	Venom allergen 5 (Antigen 5) (Ag5) (Allergen Pol g 5).	25091511	206
Polistes dominulus	venom serine protease precursor [Polistes dominulus].	30909091	277
Polistes gallicus	Phospholipase A1 (Allergen Pol g 1).	41017429	42
Polistes dominulus	venom phospholipase A1 1 precursor [Polistes dominulus].	45510887	337
Polistes dominulus	venom phospholipase A1 2 precursor [Polistes dominulus].	45510889	316
Polistes dominulus	venom phospholipase A1 3 precursor [Polistes dominulus].	45510891	316
Polistes dominulus	venom phospholipase A1 4 precursor [Polistes dominulus].	45510893	316
Polistes exclamans	allergen Pol e 5 precursor [Polistes exclamans].	51093375	226
Polistes dominulus	allergen Pol d 5 precursor [Polistes dominulus].	51093377	227
Polistes exclamans	Venom allergen 5 (Antigen 5) (Ag5) (Allergen Pol e 5) (Pol e V).	549187	205
Polistes fuscatus	Venom allergen 5 (Antigen 5) (Ag5) (Allergen Pol f 5) (Pol f V).	549188	205
Sarcoptes scabiei type hominis	glutathione S-transferase [Sarcoptes scabiei type hominis].	27462836	219
Sarcoptes scabiei type hominis	glutathione transferase mu class Yv5004H11 [Sarcoptes scabiei type	60920770	219
Solenopsis invicta	Sol i 1=antigen {N-terminal} [Solenopsis invicta=imported fire	1336809	58
Solenopsis invicta	Sol i 1=antigen {N-terminal} [Solenopsis invicta=imported fire	1336811	25
Solenopsis invicta	Sol i 1=antigen {N-terminal} [Solenopsis invicta=imported fire	1336812	26
Solenopsis invicta	Sol i 1=antigen {N-terminal} [Solenopsis invicta=imported fire	1336813	26

Solenopsis invicta	Venom allergen 4 precursor (Venom allergen IV) (Allergen Sol i 4)	14424465	137
Solenopsis invicta	Venom allergen 3 precursor (Venom allergen III) (Allergen Sol i 3)	14424466	234
Solenopsis invicta	venom allergen Sol i 4.02 precursor [Solenopsis invicta].	4038411	137
Solenopsis invicta	allergen Sol i 1 precursor [Solenopsis invicta].	51093373	346
Solenopsis invicta	Venom allergen 2 precursor (Venom allergen II) (Allergen Sol i 2)	549179	138
Solenopsis richteri	Venom allergen 2 (Venom allergen II) (Allergen Sol r 2) (Sol r II).	6136162	119
Solenopsis richteri	Venom allergen 3 (Venom allergen III) (Allergen Sol r 3) (Sol r	6136163	211
Solenopsis geminata	venom allergen Sol g 4.01 precursor [Solenopsis geminata].	7638028	137
Solenopsis geminata	venom allergen Sol g 4.02 precursor [Solenopsis geminata].	7638030	137
Triatoma protracta	procalin [Triatoma protracta].	15426413	169
Vespa crabro	Venom allergen 5.01 (Antigen 5-1) (Ag5-1) (Allergen Vesp c 5.01)	549184	202
Vespa crabro	Venom allergen 5.02 (Antigen 5-2) (Ag5-2) (Allergen Vesp c 5.02)	549185	202
Vespa mandarinia	Venom allergen 5 (Antigen 5) (Ag5) (Allergen Vesp m 5).	6136165	202
Vespula vulgaris	Chain A, Ves V 5, An Allergen From Vespula Vulgaris Venom.	11514279	209
Vespula germanica	hyaluronidase [Vespula germanica].	116174180	331
Vespula germanica	hyaluronidase homologue [Vespula germanica].	116174182	323
Vespula vulgaris	Hyaluronoglucosaminidase A (Hyaluronidase A) (Allergen Ves v 2a)	1346323	331
Vespula vulgaris	allergen 5.	162551	227
Vespula maculifrons	Phospholipase A1 (Allergen Ves m 1) (Ves m I).	1709545	300
Vespula vulgaris	allergen 5; antigen 5 [Vespula vulgaris].	4826574	204
Vespula flavopilosa	Venom allergen 5 (Antigen 5) (Ag5) (Allergen Ves f 5) (Ves f V).	549189	204
Vespula germanica	Venom allergen 5 (Antigen 5) (Ag5) (Allergen Ves g 5) (Ves g V).	549190	204
Vespula maculifrons	Venom allergen 5 (Antigen 5) (Ag5) (Allergen Ves m 5) (Ves m V).	549191	204
Vespula pensylvanica	Venom allergen 5 (Antigen 5) (Ag5) (Allergen Ves p 5) (Ves p V).	549192	204
Vespula squamosa	Venom allergen 5 (Antigen 5) (Ag5) (Allergen Ves s 5) (Ves s V).	549193	205
Vespula vidua	Venom allergen 5 (Antigen 5) (Ag5) (Allergen Ves vi 5) (Ves vi V).	549194	206
Vespula vulgaris	hyaluronidase b [Vespula vulgaris].	62147665	340
Vespula germanica	Ves g 5 allergen precursor [Vespula germanica].	74035841	204
Vespula germanica	Ves g 1 allergen precursor [Vespula germanica].	74035843	300
Vespula maculifrons	venom allergen 5 [Vespula maculifrons].	85681830	227
Vespula vulgaris	allergen and phospholipase A1.	897647	336

[CBI Cross Reference Number 2]

Deleted Appendices 2-12

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