

ALEX® allergen list (extracts and components)

POLLEN			
TREE POLLEN			
Code	Allergen Source	Component	Protein Name
t19	Acacia		
t100	Alder	<i>Aln g 1</i>	PR-10 protein ¹
t101	Alder	<i>Aln g 4</i>	Polcalcin ⁴
t226	Arizona cypress	<i>nCup a 1</i>	Pectate lyase ⁵
t25	Ash		
t103	Ash	<i>rFra e 1</i>	Ole e 1-family ²
t300	Beech	<i>rFag s 1</i>	PR-10 protein ¹
t215	Birch	<i>rBet v 1</i>	PR-10 protein ¹
t216	Birch	<i>rBet v 2</i>	Profilin
t225	Birch	<i>rBet v 6</i>	Isoflavon reductase
t222	Cypress		
t105	Date tree	<i>nPho d 2</i>	Profilin ³
t8	Elm		
t4	Hazel		
t102	Hazel	<i>rCor a 1.0103</i>	PR-10 protein ¹
t303	Sugi	<i>rCry j 1</i>	Pectate Lyase
t6	Mountain cedar		
t71	Mulberry		
t224	Olive	<i>nOle e 1</i>	Ole e 1-family ²
t240	Olive	<i>rOle e 9</i>	1,3 β Glucanase
t305	Paper mulberry		
t241	Plane tree	<i>rPla a 1</i>	Plant invertase
t301	Plane tree	<i>nPla a 2</i>	Polygalacturonase
t302	Plane tree	<i>rPla a 3</i>	nsLTP ⁶
t14	Poplar		
t304	Tree of heaven		
t10	Walnut		
GRASS POLLEN			
g17	Bahia grass		
g2	Bermuda grass		
g216	Bermuda grass	<i>rCyn d 1</i>	Beta-expansin
g7	Reed		
g12	Rye		
g100	Rye grass	<i>nLol p 1</i>	Beta-expansin
g205	Timothy grass	<i>rPhl p 1</i>	Beta-expansin
g206	Timothy grass	<i>rPhl p 2</i>	Expansin
g215	Timothy grass	<i>rPhl p 5.0101</i>	Grass group 5/6
g209	Timothy grass	<i>rPhl p 6</i>	Grass group 5/6
g210	Timothy grass	<i>rPhl p 7</i>	Polcalcin ⁴
g212	Timothy grass	<i>rPhl p 12</i>	Profilin ³
WEED POLLEN			
w14	Amarant		
w9	Buckhorn		
w234	Buckhorn	<i>rPla l 1</i>	Ole e 1-family ²
w301	Herb mercury	<i>rMer a 1</i>	Profilin ³
w303	Hemp (CBD)		
w302	Hemp	<i>rCan s 3</i>	nsLTP ⁶
w6	Mugwort		
w231	Mugwort	<i>rArt v 1.0101</i>	Plant's defensin
w233	Mugwort	<i>rArt v 3.0201</i>	nsLTP ⁶
w1	Ragweed		
w230	Ragweed	<i>rAmb a 1</i>	Pectate lyase ⁵
w300	Ragweed	<i>rAmb a 4</i>	Plantdefensin
w18	Sorrel		
w20	Stinging nettle		
w11	Russian thistle		
w232	Russian thistle	<i>rSal k 1</i>	Pectin Methyl-esterase
w21	Wall pellitory		

w211	Wall pellitory	<i>rPar j 2</i>	nsLTP ⁶
w10	White goosefoot		
w100	White goosefoot	<i>rChe a 1</i>	Ole e 1-family ²

MOULD AND YEAST FUNGI			
m229	Alternaria alternata	<i>rAlt a 1</i>	Alt a 1-family
m230	Alternaria alternata	<i>rAlt a 6</i>	Enolase
m218	Aspergillus fumigatus	<i>rAsp f 1</i>	Mitogillin Family
m220	Aspergillus fumigatus	<i>rAsp f 3</i>	Peroxisomales protein
m221	Aspergillus fumigatus	<i>rAsp f 4</i>	unknown
m222	Aspergillus fumigatus	<i>rAsp f 6</i>	Mn superoxide dismutase
m2	Cladosporium herbarum		
m100	Cladosporium herbarum	<i>rCla h 8</i>	Short-chain dehydrogenase
y2	Malassezia sympodialis	<i>rMala s 5</i>	unknown
y3	Malassezia sympodialis	<i>rMala s 6</i>	Cyclophilin
y5	Malassezia sympodialis	<i>rMala s 11</i>	Mn superoxide dismutase
m1	Penicilium chrysogenum		

MITES AND COCKROACHES			
d70	Acarus siro		
i100	Blatella germanica	<i>rBla g 1</i>	Cockroach group 1
i101	Blatella germanica	<i>rBla g 2</i>	Aspartate protease
i102	Blatella germanica	<i>rBla g 4</i>	Lipocalin ⁷
i103	Blatella germanica	<i>rBla g 5</i>	Glutathione S-transferase
i301	Blomia germanica	<i>rBla g 9</i>	Arginin Kinase
d300	Blomia tropicalis	<i>rBlo t 5</i>	Mite, group 5
d301	Blomia tropicalis	<i>rBlo t 10</i>	Tropomyosin
d302	Blomia tropicalis	<i>rBlo t 21</i>	unknown
d100	Dermatophagoides farinae	<i>rDer f 1</i>	Cysteine protease
d101	Dermatophagoides farinae	<i>rDer f 2</i>	NPC2 family
d202	Dermatophagoides pteronyssinus	<i>rDer p 1</i>	Cysteine protease
d203	Dermatophagoides pteronyssinus	<i>rDer p 2</i>	NPC2 family
d103	Dermatophagoides pteronyssinus	<i>rDer p 5</i>	unknown
d104	Dermatophagoides pteronyssinus	<i>rDer p 7</i>	Mite group 7
d205	Dermatophagoides pteronyssinus	<i>rDer p 10</i>	Tropomyosin ¹²
d102	Dermatophagoides pteronyssinus	<i>rDer p 11</i>	Myosin, heavy chain
d303	Dermatophagoides pteronyssinus	<i>rDer p 20</i>	Arginine Kinase
d304	Dermatophagoides pteronyssinus	<i>rDer p 21</i>	unknown
d209	Dermatophagoides pteronyssinus	<i>rDer p 23</i>	Chitinase, class III, peritrophin domain
d105	Glycyphagus domesticus	<i>rGly d 2</i>	NPC2 family

INFORMATION REGARDING THE MOST IMPORTANT ALLERGEN FAMILIES

PR-10 proteins (Bet v 1 homologues) ¹

- Most important tree pollen allergen within the beech family, can also be found in vegetarian foods (pip and stone fruits, tree nuts, vegetables, legumes)
- Cross-reactive
- Usually sensitive to heat and digestion
- Associated with allergic rhinitis and oral allergy syndrome (such as hazelnut, apple)

Ole e 1 family ²

- Marker for sensitisations regarding olives, ash tree, lilac, and privet pollen
- Associated with allergic rhinitis

Profilins ³

- Cross-reactive, pan-allergen in all pollen and vegetarian foods
- Sensitive to heat and digestion
- Rarely associated with clinical symptoms, oral allergy syndrome possible (such as melon)

Polcalcins ⁴

- Cross-reactive, pan-allergen in all pollen, however not in vegetarian foods

Pectate lyase (Cup a 1) ⁵

- Marker allergen for cypress allergy (prevalence 100%)
- Cross-reactive within the cypress family

Non-specific lipid transfer proteins (nsLTP) ⁶

- Pan-allergen in pollen and vegetarian foods
- Stable regarding heat and digestion
- Associated with both oral allergy syndrome and systemic reactions (such as grapes, blueberries)
- Prevalence comparably low in northern and middle Europe

ALEX® allergen list (extracts and components)

d305	Lepidoglyphus destructor	<i>rLep d 2</i>	NPC2 family
i206	Periplaneta americana		
i300	Periplaneta americana	<i>rPer a 7</i>	Tropomyosin ¹²
d72	Tyrophagus putrescentiae		
d306	Tyrophagus putrescentiae	<i>rTyr p 2</i>	NPC2 family
ANIMAL EPITHELIA			
e94	Cat	<i>rFel d 1</i>	Uteroglobulin
e220	Cat	<i>nFel d 2</i>	Serum albumin ⁸
e228	Cat	<i>rFel d 4</i>	Lipocalin ⁷
e300	Cat	<i>rFel d 7</i>	Lipocalin ⁷
e100	Cow	<i>rBos d 2</i>	Lipocalin ⁷
e101	Dog	<i>rCan f 1</i>	Lipocalin ⁷
e102	Dog	<i>rCan f 2</i>	Lipocalin ⁷
e221	Dog	<i>nCan f 3</i>	Serum albumin ⁸
e302	Dog	<i>rCan f 4</i>	Lipocalin ⁷
e308	Dog, male urine (incl. Can f 5)		
e303	Dog	<i>rCan f 6</i>	Lipocalin ⁷
e304	Dog	<i>rCan f Fel d 1 like</i>	Uteroglobulin
e80	Goat		
e305	Guinea Pig	<i>rCap c 1</i>	Lipocalin ⁷
e301	Djungarian hamster	<i>rPhod s 1</i>	Lipocalin ⁷
e227	Horse	<i>rEqu c 1</i>	Lipocalin ⁷
e306	Horse	<i>rEqu c 3</i>	Serum albumin ⁸
e307	Horse	<i>rEqu c 4</i>	Latherin
e103	Mouse	<i>nMus m 1</i>	Lipocalin ⁷
e83	Pig		
e309	Rabbit	<i>rOry c 1</i>	Lipocalin ⁷
e310	Rabbit	<i>rOry c 2</i>	Lipocalin ⁷
e311	Rabbit	<i>rOry c 3</i>	Uteroglobulin
e73	Rat		
e81	Sheep		
INSECT VENOM			
i3	Common Wasp		
i211	Common Wasp	<i>rVes v 1</i>	Phospholipase A1
i209	Common Wasp	<i>rVes v 5</i>	Antigen 5
i1	Honey Bee		
i208	Honey Bee	<i>n/r Api m 1</i>	Phospholipase A2
i217	Honey Bee	<i>rApi m 10</i>	Icarapin variant 2
i70	Fire ant		
i25	Long-headed wasp		
i4	Paper Wasp		
i210	Paper Wasp	<i>rPol d 5</i>	Antigen 5
FOOD			
EGG AND MILK			
f506	Camel's milk		
f1	Chicken's egg white		
f233	Chicken's egg white	<i>nGal d 1</i>	Ovomucoid
f232	Chicken's egg white	<i>nGal d 2</i>	Ovalbumin
f323	Chicken's egg white	<i>nGal d 3</i>	Ovotransferrin
k208	Chicken's egg white	<i>nGal d 4</i>	Lysozyme C
f75	Chicken's egg yolk		
f510	Chicken's egg yolk	<i>nGal d 5</i>	Serum albumin ⁸
f2	Cow's milk		
f76	Cow's milk	<i>nBos d 4</i>	a-Lactalbumin
f77	Cow's milk	<i>nBos d 5</i>	b-Lactalbumin
f78	Cow's milk	<i>nBos d 8</i>	Casein
f300	Goat's milk		
f286	Mare's milk		
f352	Sheep's milk		

MEAT			
f27	Beef		
e204	Beef	<i>nBos d 6</i>	Serum albumin ⁸
f83	Chicken		
f321	Horse		
f526	House cricket		
f88	Lamb		
f527	Mealworm		
f553	Migratory locust		
f26	Pork		
f530	Pork	<i>rSus d 1</i>	Serum albumin ⁸
f213	Rabbit		
f284	Turkey		
FISH AND SEAFOOD			
p10	Anisakis simplex	<i>rAni s 1</i>	Kunitz serine protease inhibitor
p11	Anisakis simplex	<i>rAni s 3</i>	Tropomyosin ¹²
f517	Black Tiger Shrimp	<i>nPen m 1</i>	Tropomyosin ¹²
f545	Black Tiger Shrimp	<i>nPen m 2</i>	Arginine Kinase
f552	Black Tiger Shrimp	<i>nPen m 3</i>	Myosin light chain
f524	Black Tiger Shrimp	<i>rPen m 4</i>	Sarcoplasmic Calcium Binding Protein
f529	Brown Shrimp	<i>rCra c 6</i>	Troponin c
f37	Blue mussel		
f207	Clam		
f355	Carp	<i>rCyp c 1</i>	β-Parvalbumin ¹¹
f23	Crab		
f3	Cod		
f509	Cod	<i>nGad m 1</i>	β-Parvalbumin ¹¹
f805	Cod	<i>nGad m 2&3</i>	β-Enolase & Aldolase
f515	Coldwater prawn		
f205	Herring		
f525	Herring	<i>rClu h 1</i>	β-Parvalbumin ¹¹
f80	Lobster		
f206	Mackerel		
f551	Mackerel	<i>rSco s 1</i>	β-Parvalbumin ¹¹
f290	Oyster		
f338	Scallop		
f41	Salmon		
f534	Salmon	<i>rSal s 1</i>	β-Parvalbumin ¹¹
f24	Shrimp mix		
f258	Squid		
f537	Swordfish	<i>rXip g 1</i>	β-Parvalbumin ¹¹
f535	Thornback ray		
f536	Thornback ray	<i>rRaj c Parvalbumin</i>	α-Parvalbumin
f40	Tuna		
f538	Tuna	<i>Thu a 1</i>	β-Parvalbumin ¹¹
CEREALS AND SEEDS			
f6	Barley		
f11	Buckwheat		
f508	Buckwheat	<i>nFag e 2</i>	2S albumin ⁹
f8	Corn, grains		
f523	Corn, grains	<i>rZea m 14</i>	nsLTP ⁶
f305	Fenugreek seeds		
f335	Lupin seed		
f55	Millet		
f7	Oat		
f226	Pumpkin seed		
f224	Poppy seed		
f516	Poppy seed	<i>nPap s 2S Albumin</i>	2S albumin ⁹
f347	Quinoa		

INFORMATION REGARDING THE MOST IMPORTANT ALLERGEN FAMILIES

Lipocalins ⁷

- Major allergens in mammals
- Stable air-borne pollutants
- Associated with respiratory system symptoms and increased risk of asthma
- Cross-reactivity limited, however possible across different animal species (such as cat, dog, and horse)

Serumalbumins ⁸

- Minor inhalation allergen from animal fur
- Food allergen in milk, egg, meat
- Sensitive to heat and digestion
- Cross-reactive (such as bird-egg, or pig-cat-syndrome)

Storage Proteins (2S albumins, 11S globulins, 7/8 globulins) ⁹

- Stable regarding heat and digestion
- Usually associated with severe reactions (risk of anaphylaxis)

Gliadins ¹⁰

- In children: marker of wheat allergy
- In adults: risk marker of wheat-dependent exercise-induced anaphylaxis (WDEIA)

ALEX® allergen list (extracts and components)

f9	Rice		
f5	Rye, grains		
f10	Sesame		
f518	Sesame	<i>nSes i 1</i>	2S albumin ⁹
f124	Spelt		
k84	Sunflower seeds		
f542	Wheat	<i>rTri a 14</i>	nsLTP ⁶
f543	Wheat	<i>rTri a 19</i>	Omega-5-Gliadin
f544	Wheat	<i>nTri a aA_Tl</i>	Alpha-Amylase Trypsin-Inhibitor
SPICES			
f271	Anise		
f265	Caraway		
f89	Mustard		
f519	Mustard	<i>nSin a 1</i>	2S albumin ⁹
f283	Oregano		
f218	Paprika		
f86	Parsley		
LEGUMES AND NUTS			
f20	Almond		
f18	Brazil nut		
f354	Brazil nut	<i>nBer e 1</i>	2S albumin ⁹
f202	Cashew nut		
f550	Cashew nut	<i>rAna o 2</i>	11S globulin ⁹
f443	Cashew nut	<i>rAna o 3</i>	2S albumin ⁹
f309	Chickpea		
f315	Green bean		
f428	Hazelnut	<i>rCor a 1.0401</i>	PR-10 protein ¹
f425	Hazelnut	<i>rCor a 8</i>	nsLTP ⁶
f440	Hazelnut	<i>nCor a 9</i>	11S globulin ⁹
f522	Hazelnut	<i>nCor a 11</i>	7/8S globulin ⁹
f439	Hazelnut	<i>nCor 14</i>	2S albumin ⁹
f235	Lentil		
f345	Macadamia		
f513	Macadamia	<i>nMac i</i>	2S albumin ⁹
f12	Pea		
f422	Peanut	<i>nAra h 1</i>	7/8S globulin ⁹
f423	Peanut	<i>rAra h 2</i>	2S albumin ⁹
f424	Peanut	<i>rAra h 3</i>	11S globulin ⁹
f447	Peanut	<i>nAra h 6</i>	2S albumin ⁹
f352	Peanut	<i>rAra h 8</i>	PR-10 protein ¹
f427	Peanut	<i>rAra h 9</i>	nsLTP ⁶
f803	Peanut	<i>rAra h 15</i>	Oleolin
f201	Pecan		
f531	Pistachio	<i>rPis v 1</i>	2S albumin ⁹
f532	Pistachio	<i>rPis v 2</i>	11S globulin ⁹ subunit
f533	Pistachio	<i>rPis v 3</i>	7/8S globulin ⁹
f353	Soy bean	<i>rGly m 4</i>	PR-10 protein ¹
f431	Soy bean	<i>rGly m 5</i>	7/8S globulin ⁹
f432	Soy bean	<i>nGly m 6</i>	11S globulin ⁹
f511	Soy bean	<i>nGly m 8</i>	2S albumin ⁹
f441	Walnut	<i>nJug r 1</i>	2S albumin ⁹
f512	Walnut	<i>nJug r 2</i>	7/8S globulin ⁹
f539	Walnut	<i>nJug r 3</i>	nsLTP ⁶
f540	Walnut	<i>nJug r 4</i>	11S globulin ⁹
f541	Walnut	<i>nJug r 6</i>	7/8S globulin ⁹

VEGETABLES			
f96	Avocado		
f31	Carrot		
f507	Carrot	<i>rDau c 1</i>	PR-10 protein ¹
f417	Celery	<i>rApi g 1</i>	PR-10 protein ¹
f504	Celery	<i>rApi g 2</i>	nsLTP ⁶
f505	Celery	<i>rApi g 6</i>	nsLTP ⁶
f47	Garlic		
f48	Onion		
f35	Potato		
f25	Tomato		
f520	Tomato	<i>nSola l 6</i>	nsLTP ⁶
FRUITS			
f434	Apple	<i>rMal d 1</i>	PR-10 protein ¹
f514	Apple	<i>rMal d 2</i>	TLP
f435	Apple	<i>rMal d 3</i>	nsLTP ⁶
f92	Banana		
f288	Blueberry		
f242	Cherry		
f328	Fig		
f521	Grape	<i>nVit v 1</i>	nsLTP ⁶
f500	Kiwi	<i>nAct d 1</i>	Cystein protease
f503	Kiwi	<i>nAct d 2</i>	TLP
f501	Kiwi	<i>nAct d 5</i>	Kiwellin
f502	Kiwi	<i>nAct d 10</i>	nsLTP ⁶
f91	Mango		
f528	Melon	<i>rCuc m 2</i>	Profilin
f33	Orange		
f293	Papaya		
f420	Peach	<i>rPru p 3</i>	nsLTP ⁶
f94	Pear		
f44	Strawberry	<i>Fra a 1 + Fra a 3</i>	PR-10 protein ¹ + nsLTP ⁶
OTHER			
f45	Baker's yeast		
ADDITIONAL			
k81	Ficus benjamina		
k215	Latex	<i>rHev b 1</i>	Rubber elongation factor
k217	Latex	<i>rHev b 3</i>	small rubber particle protein
k218	Latex	<i>rHev b 5</i>	unknown
k220	Latex	<i>rHev b 6.02</i>	Pro-hevein
k221	Latex	<i>rHev b 8</i>	Profilin ³
k224	Latex	<i>rHev b 11</i>	Class 1 chitinase
o100	Pigeon tick	<i>rArg r 1</i>	Lipocalin
CCD			
o214	Hom s Lactoferrin	<i>rHom s LF</i>	CCD ¹³

INFORMATION REGARDING THE MOST IMPORTANT ALLERGEN FAMILIES

Parvalbumins ¹¹

- Proteins that are stable to heat and digestion, characteristics of air-born pollutants and thus both food and inhalation allergen
- Cross-reactive, pan-allergen in fish

Tropomyosins ¹²

- Proteins with high allergenic potential that are stable to heat and digestion
- Cross-reactive, pan-allergen in seafood, mites, cockroaches, and parasites

Cross-reactive Carbohydrate Determinants (CCD) ¹³

- Sensitisation marker regarding carbohydrate determinants
- Cross-reactive, included in pollen allergens, vegetarian foods and insect (venom)
- Low clinical relevance