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		chnok	ogy												ı	Possi	ible c	ross-	react	tivity								
	ImmunoCAP ISAC _{E172/} multiplexing test	ImmunoCAP test	Allergen Code	Source	Component	Protein family or function	Primarly species- specific proteins	Fruits	Vegetables	Nuts, seeds	Legumes	Cereals	Spices	Grass pollen	Tree pollen	Weed pollen	Latex	Milk	Meat	Fish	Egg	Seafood	Animals	Moulds	Mites	Insects	Venoms	200100700
	n r	n r	g216 g205 g206	Bermuda Timothy Timothy	Cyn d 1 Phl p 1 Phl p 2	Grass group 1 Grass group 1 Grass group 2								•														
	n r	n r	g208 g215 g209	Timothy Timothy Timothy	Phl p 4 Phl p 5 Phl p 6	Berberine bridge enzyme Grass group 5 Grass group 6								•														
	r	r r	g210 g211 g212	Timothy Timothy Timothy	Phi p 7 Phi p 11 Phi p 12	Polcalcin Trypsin inhibitor Profilin				•	•	•	•	•		•	•											
	r r r	r	t215	Alder Birch	Aln g 1 Bet v 1	PR-10 PR-10		•	•	•	•				•													
	r	r r	t216 t220 t225	Birch Birch	Bet v 2 Bet v 4 Bet v 6	Profilin Polcalcin Isoflavone reductases		•	•	•	•			•	•	•	•											_
	r n			Hazel Japanese cedar	Cor a 1.0101 Cry j 1	PR-10 Pectate lyase	•	•	•	•	•			-	•													
	n r n	n r n	t226 t224 t227	Cypress Olive Olive	Cup a 1 Ole e 1 Ole e 7	Pectate lyase Trypsin inhibitor LTP	•	•	•	•	•	•	•		•	•												
	r r	r	t240 t241	Olive Plane Plane	Ole e 9 Pla a 1 Pla a 3	Glucanase Invertase Inhibitor LTP	•			•	•		•			•												
	n n	n n	w230 w231	Ragweed Mugwort	Amb a 1 Art v 1	Pectate lyase Defensin	•																					
	n r	n	w233	Mugwort Goosefoot Mercury	Art v 3 Che a 1 Mer a 1	LTP Trypsin Inhibitor Profilin	•		•	•	•	•				•	•											-
	r	r	w211 w234	Wall pellitory Plantain	Par j 2 Pla l 1	LTP Trypsin Inhibitor	•																					
	n r	n r	e101 e102	Saltwort Dog Dog	Sal k 1 Can f 1 Can f 2	Pectin methylesterase Lipocalin Lipocalin	•																•					
	n r	n r	e221 e229 e226	Dog Dog Dog	Can f 3 Can f 4 Can f 5	Serum Albumin Lipocalin Arginine esterase/kallikrein	•											•	•				•					
	r r r	r r r	e226 e230 e227	Dog Dog Horse	Can f 6 Equ c 1	Lipocalin Lipocalin																	•					
	n r r	r	e94 e220	Horse Cat	Equic 3 Felid 1 Felid 2	Serum Albumin Uteroglobin Serum Albumin	•											•	•				•					
	r	r	e228 e231	Cat Cat	Fel d 4 Fel d 7	Lipocalin Lipocalin													_				•					
	n r	n	e222 m229	Mouse Swine Alternaria	Mus m 1 Sus s PSA Alt a 1	Lipocalin Serum Albumin Acidic glycoprotein	•											•	•				•					
	r	r	m218	Alternaria Aspergillus	Alt a 6 Asp f 1	Enolase Mitogillin family	•																	•				
F	r	r r r	m219 m220 m221	Aspergillus fumigatus Aspergillus Aspergillus fumigatus	Aspf2 Aspf3 Aspf4	Fibrinogen Binding Proteins Peroxysomal protein Unknown																		•				-
	r	r n	m222 k87	Aspergillus Aspergillus oryzae	Asp f 6 Asp o 21	Mn superoxide dismutase Alpha-amylase																		•				
	r r n			Blomia Cladosporium Dermatophagoides	Blo t 5 Cla h 8 Der f 1	Group 5 mite allergen Mannitol dehydrogenase Cysteine protease	•																	•	•			_
	r n	r	d202	Dermatophagoides Dermatophagoides	Der f 2 Der p 1	NPC2 family Cysteine protease																			•			
	r r	r r	d203 d205 d209	Dermatophagoides Dermatophagoides Dermatophagoides	Der p 2 Der p 10 Der p 23	NPC2 family Tropomyosin Peritrophin-like protein																•			•	•		-
	r r			Lepidoglyphus Cockroach Cockroach	Lep d 2 Bla g 1	NPC2 family Cockroach group 1	•																					
	r n			Cockroach Cockroach	Bla g 2 Bla g 5 Bla g 7	Aspartic protease Glutathione S-transferase Tropomyosin																•			•	•		(
	n	n	f233	Egg white	Gal d 1	Ovomucoid															•							
	n n	n n n	f232 f323 k208	Egg white Egg white Egg	Gal d 2 Gal d 3 Gal d 4	Ovalbumin Conalbumin/Ovotransferrin Lysozyme															•							
ŀ	n n	n n	f76	Egg yolk/chicken Cow's milk Cow's milk	Gal d 5 Bos d 4 Bos d 5	Livetin/Serum Albumin Alpha-lactalbumin Beta-lactoglobulin												•	•		•							
	n n	n n	e204 f78	Cow's milk and meat Cow's milk	Bos d 6 Bos d 8	Serum Albumin Casein												•	•				•					
ŀ	n r	r	f355 f426	Cow's milk Carp Cod	Bos d Lactoferrin Cyp c 1 Gad c 1	Transferrin Parvalbumin Parvalbumin												•		•								
	n	r	f351	Shrimp Shrimp	Pen a 1 Pen m 1	Tropomyosin Tropomyosin																•			•	•		(
ŀ	n n r			Shrimp Shrimp Cashew nut	Pen m 2 Pen m 4 Ana o 2	Arginine kinase Sarcoplasmic Calcium binding protein Storage protein, 11S globulin	•															•				•		-
	r r	r	f443 f354	Cashew nut Brazil nut	Ana o 3 Ber e 1	Storage protein, 2S albumin Storage protein, 2S albumin	•																					
	r r n	r r n	f428 f425 f440	Hazelnut Hazelnut Hazelnut	Cor a 1.0401 Cor a 8 Cor a 9	PR-10 LTP Storage protein, 11S globulin	•	•	•	•	•	•	•		•	•												
	r r	r	f439 f441	Hazelnut Walnut	Cor a 14 Jug r 1	Storage protein, 2S albumin Storage protein, 2S albumin LTP	•	•		•	•	•	•		•	•												
	n r r	r	f442 f422	Walnut Sesame Peanut	Jug r 3 Ses i 1 Ara h 1	Storage protein, 2S albumin Storage protein, 7S globulin	•						_															
F	r r n	r r	f423 f424 f447	Peanut Peanut Peanut	Ara h 2 Ara h 3 Ara h 6	Storage protein, 2S albumin Storage protein, 11S globulin Storage protein, 2S albumin	•																					
	n r r	r r	f352 f427	Peanut Peanut	Ara h 8 Ara h 9	PR-10 LTP		•	•	•	•	•	•		_	•												
	r n n	r n n	f353 f431 f432	Soy bean Soy bean Soy bean	Gly m 4 Gly m 5 Gly m 6	PR-10 Storage protein, Beta-conglycinin Storage protein, Glycinin	•		•	•	•				•													
	n r	r	f433	Buckwheat Wheat	Fag e 2 Tri a 14	Storage protein, 2S albumin LTP	•	•	•	•	•	•	•															
	n n	r	f416	Wheat Wheat Kiwi	Tri a 19 Tri a aA_TI Act d 1	Omega-5 gliadin Alpha-Amylase / Trypsin Inhibitor Cysteine protease	•					•																
	n n			Kiwi Kiwi	Act d 2 Act d 5	Thaumatin-like protein Kiwellin	•	•																•	•			
	r r	r r	f430 f417 f434	Kiwi Celery Apple	Act d 8 Api g 1 Mal d 1	PR-10 PR-10 PR-10		•	•	•	•				•													
	r	r	f435 f419	Apple Peach	Mal d 3 Pru p 1	LTP PR-10		•	•	•	•	•	•		•	•												
	r	r r	f420 f421 f454	Peach Peach Peach	Pru p 3 Pru p 4 Pru p 7	LTP Profilin Gibberellin-Regulating Protein		•	•	•	•	•	•	•	_	•	•											
		r	i208	Honey bee	Api m 1	Phospholipase A2	•																					
		r r r	i214 i215 i216	Honey bee Honey bee Honey bee	Api m 2 Api m 3 Api m 5	Hyaluronidase Acid phosphatase Dipeptidyl peptidase	•																				•	
		r	i217 i210	Honey bee Paper wasp	Api m 10 Pol d 5	Icarapin Antigen 5	•																					
	r	r	i211	Common wasp Common wasp Anisakis	Ves v 1 Ves v 5 Ani s 1	Phospholipase A1 Antigen 5 Serine protease inhibitor	•																					
E	r	r	k215	Anisakis Latex	Ani s 3 Hev b 1	Tropomyosin Rubber elongation factor	•															•			•	•		-
	r r	r	k217 k218	Latex Latex	Hev b 3 Hev b 5	Small rubber particle protein Acidic protein Probevein	•																					

k220

k224

0214

o215 Bovine Thyroglobulin

Hev b 6.02

Hev b 11

MUXF3

Alpha-Gal

CCD-marker

Gal-alpha-1,3-Gal (alpha-Gal)

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• •

Important protein families

Storage protein (1)

- Proteins stable to heat and digestion causing reactions also to cooked foods.
- Often associated with systemic and more severe reactions in addition to OAS.
- Proteins in nuts and seeds serving as source material during growth of new plants.

LTP (non-specific Lipid Transfer Protein, nsLTP) (1)

- also to cooked foods.
- · Often associated with systemic and more severe reactions in addition to OAS.
- Associated with allergic reactions to fruit and vegetables especially in regions where peach and closely related fruits are cultivated.

GRP (Gibberellin Regulated Protein) (2, 3)

- Proteins stable to heat and digestion causing reactions also to cooked foods.
- · Often associated with systemic and more severe reactions in addition to PFS.
- Associated with allergic reactions to stone fruits, citrus and pomegranate and pollen from trees in the cypress

PR-10 protein, Bet v 1 homologue (1)

- Most PR-10 proteins are sensitive to heat and digestion
- and cooked foods are often tolerated. Often associated with local symptoms such as oral
- allergy syndrome (OAS).

 Associated with allergic reactions to pollens, fruits and vegetables

Polcalcin (Calcium-binding proteins) (4)

A marker for cross-reactivity between pollen, which is not present in plant foods.

Profilin (1)

- Proteins sensitive to heat and digestion and cooked foods are often tolerated.
- Seldom associated with clinical symptoms but may
- cause local and even severe reactions in some patients.
- Profilins are present in all pollen and plant foods.

- A marker for sensitization to cross-reactive carbohydrate determinants.

 Rarely causes allergic reactions, but may produce
- positive in-vitro test results to CCD-containing allergens from pollen, plant foods, insects and venoms.

Lipocalin (5,6,7)

- Stable proteins (and important allergens) in animals.
 Certain lipocalins from different animal species may
- cross-react;
- Oan f 1- Fel d 7
- Can f 6 Fel d 4 Equ c 1 Mus m 1 The highest slgE levels may indicate the primary

Parvalbumin (5)

- Proteins stable to heat and digestion causing reactions also to cooked foods.
- Often associated with systemic and more severe reactions in addition to OAS.
- Major allergen in fish and a marker for cross-reactivity among different species of fish and amphibians.

Tropomyosin (5)

- Proteins stable to heat and digestion causing reactions also to cooked foods.
- As food allergen often associated with systemic and more severe reactions in addition to OAS.
- Actin-binding proteins in muscle fibres and a marker for cross-reactivity between crustaceans, mites and cockroach.

Serum albumin (5, 8)

- Proteins fairly sensitive to heat and digestion.
- Proteins present in different biological fluids and solids in all animals e.g, cow's milk, blood, beef and epithelia.
- Cross-reactions between albumins from different mammalian species are well known, for example between cat and dog.

Important Allergens

Gal d 1, Ovomucoid (egg white) (5)

IgE abs to ovomucoid are associated with persistent egg allergy and usually neither raw or cooked is tolerated.

Ara h 1, 2, 3, 6, 8 and 9 (peanut) (5)

- IgE abs to Ara h 1, 2, 3, 6 and 9 (LTP) are associated
- with systemic peanut reaction in addition to OAS.

 IgE abs to Ara h 8 (PR-10) are usually associated with milder, local symptoms such as OAS, and often originating from birch sensitization.

Gly m 4, 5 and 6 (soy) (5)

- Soy bean allergic patients often have IgE abs to Gly m 5 and Gly m 6. Gly m 5 & Ara h 1 and Gly m 6 & Ara h 3, respectively, show high degree of similarity, also with corresponding proteins in other legumes such as lentils. IgE to these legume storage proteins may cross react and may be associated with clinical reactivity.
- IgE abs to Gly m 4 (PR-10) are usually associated with local symptoms such as OAS, originating from birch sensitization. However, a few cases of severe allergic reactions to Gly m 4 have been reported to occur, e.g. during birch pollen season and often in combination with exercise and intake of low-processed soy drinks.

Tri a 19, Omega-5 gliadin (wheat) (9, 10, 11)

- IgE abs to omega-5 gliadin (Tri a 19) in adults are associated with a risk of exercise- or NSAIDs-induced reactions in connection with wheat ingestion.
- IgE abs to omega-5 gliadin in children are associated with a risk of immediate reactions to wheat.

Alt a 1 (Alternaria) (5)

- Alt a 1, the major allergen in alternaria is associated with asthma development.
- Primarily species-specific allergen
- Possible cross reactivity
- Can f 1 Fel d 7 possible cross-reactivity between lipocalins
 - Can f 6 Fel d 4 Equ c 1 Mus m 1 possible cross reactivity between lipocalins

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