Allergies and Allergen Antigens

About Allergy

Allergies occur when a person's immune system identifies a harmless substance as a threat. Normally, the immune system—which includes antibodies, white blood cells, mast cells, complement proteins, and other substances—defends the body against foreign substances (called antigens). However, in susceptible people, the immune system can overreact when exposed to certain substances (allergens) in the environment, foods, or medications, leading to an allergic reaction. Allergy symptoms can be mild or life-threatening. Some people are allergic to only one substance. Others are allergic to many.

Causes of Allergies

Genetic and environmental factors work together to contribute to the development of allergies.

Genes are thought to be involved because specific mutations are common among people with allergies and allergies tend to run in families.

Environmental factors also increase the risk of developing allergies. These factors include: repeated exposure to foreign substances (allergens), diet, pollutants (such as tobacco smoke and exhaust fumes).

Allergens are the substances that trigger allergies. In principle, any substance can be an allergen. In practice, some substances are known for being particularly likely to cause allergic reactions. Common allergy triggers include:

- Airborne allergens, such as pollen, animal dander, dust mites and mold.
- Certain foods, especially peanuts, tree nuts, wheat, soy, fish, shellfish, eggs and milk.
- Insect stings, such as from a bee or wasp.
- Medicines, especially penicillin or penicillin-based antibiotics.
- Latex or other substances you touch, which can cause allergic skin reactions.

Types of Allergic Reactions

Allergic reactions are classified into 4 different categories: Type I, II, III, and IV. Types I, II, and III are immediate allergic reactions, occurring within 24 hours of exposure to the allergen. Type IV reactions, also called delayed allergic reactions, usually appear after 24 hours of exposure.

Type I or anaphylactic reactions: Type I reactions are mediated by proteins called IgE antibodies produced by the immune system. These are produced in response to allergens such as pollen, animal dander or dust mites, or even certain foods. This leads to the release of histamine and other chemicals causing inflammation and swelling.

Type II or cytotoxic reactions: Type II reactions are mediated by IgG and IgM antibodies. The antibodies involved in type II reactions damage cells by activating the complement system. Type II allergic reactions can be seen in certain conditions like autoimmune hemolytic anemia, immune thrombocytopenia and autoimmune neutropenia.

Type III or immunocomplex reactions: Type III reactions are mediated by IgM, IgA and IgG antibodies. These antibodies react with the allergen and form immunocomplexes (antigen-antibody complexes) that settle on tissues and organs. The body's attempt to remove these complexes damages the underlying tissue. Symptoms appear after several hours of exposure. Type III allergic reactions can be seen in lupus, serum sickness and Arthus reaction.

Type IV or cell-mediated reactions: Type IV allergic reactions are also called the delayed type of hypersensitivity or allergic reactions as they occur after at least 24 hours of exposure to the allergen. These reactions typically take 48-72 hours or longer to appear after contact with the allergen. Many long-term infectious diseases, such as tuberculosis and fungal infections, show cell-mediated reactions. Certain skin sensitivity reactions esp. to metals may also belong to this type.

Diagnosis of Allergic Reactions

- ### Skin testing

Skin tests are the most useful way to identify specific allergens. An allergen applied to or injected into the skin should cause a skin reaction in people who are allergic to it. There are 2 types of skin tests: skin prick tests and intradermal tests.

To help ensure that the results of these skin tests are reliable, the doctor gives the patient 2 control solutions in addition to the test solution (which contains the suspected allergen). The control substances are a drop of a histamine solution, which should trigger an allergic reaction in anyone and a drop of diluting solution that contains no allergens and thus should not trigger an allergic reaction.

Allergies and Allergen Antigens

Allergen-specific serum IgE tests

The allergen-specific serum IgE test, a blood test, is used when skin tests cannot be used—for example, when a rash is widespread. This test determines whether IgE in the person's blood binds to the specific allergen used for the test. If binding occurs, the person has an allergy to that allergen.

Provocative testing

Provocation testing involves direct exposure to a small amount of the suspected allergen. This test is usually done when people must document their allergic reaction—for example, for a disability claim. It is sometimes used to diagnose a food allergy. If doctors suspect an exercise-induced allergy, they may ask the person to exercise. If doctors suspect a cold-induced allergy, they may place an ice cube on the person's skin to see if a rash develops.

Recombinant Allergen Antigens

A selective allergy test prior to the specific immunotherapy requires the usage of highly purified allergens. In contrast to allergen extracts that contain a mixture of different allergens, recombinant allergens consist of only one protein. Using recombinant allergens helps identify the protein to which specific immunoglobulins are present and cause the allergic reaction.

The development of recombinant allergens also provides new opportunities to improve the diagnosis of IgE-mediated allergies, as they have the ability to bind these antibodies in a comparable way to natural allergens and generally show good reactivity in *in-vitro* diagnostic tests. Recombinant antigens are used increasingly over native allergen extracts in the diagnosis of allergies. For this reason, recombinant allergens are of great interest both for research and for the development of new diagnostic tests for IgE quantification in the clinical routine.

To support allergen-related research, Creative Diagnostics has launched a number of allergen antigens, covering common allergens including animal allergens, food allergens, fungal allergens and plant allergens. These antigens can be used for *in vitro* diagnosis of allergies (Type I reactions).

CD Creative Diagnostics®

Tel: 1-631-624-4882 (USA) / 44-161-818-6441 (Europe) Fax: 1-631-938-8221

www.creative-diagnostics.com

info@creative-diagnostics.com

Product List

Allergen	Analyte	Cat. No.	Expression System
	Animal allergens		
Blattella germanica	Bla g 1	DAG-WT1828	E. coli
Blattella germanica	Bla g 4	DAG-WT1829	Yeast
Blattella germanica	Bla g 4	DAG-WT3436	Insect cells
Blattella germanica	Bla g 4	DAG-WT277	E. coli
Blattella germanica	Bla g 5	DAG-WT278	E. coli
Blattella germanica	Bla g 7	DAG-WT3435	E. coli
Blomia tropicalis	Blo t 1	DAG-WT1790	Yeast
Blomia tropicalis	Blo t 2	DAG-WT1806	HEK293 cells
Blomia tropicalis	Blo t 5	DAG-WT1807	Yeast
Blomia tropicalis	Blo t 21	DAG-WT1791	E. coli
Blomia tropicalis	Blo t 21	DAG-WT1808	HEK293 cells
Bos domesticus	Bos d 2	DAG-WT292	E. coli
Bos domesticus	Bos d 4	DAG-WT214	Mammalian cells
Bos domesticus	Bos d 8	DAG-WT217	E. coli
Bos domesticus	Bos d 8	DAG-WT216	Mammalian cells
Bos domesticus	Bos d 11	DAG-WT215	E. coli
Canis familiaris	Can f 1	DAGA-3088	E. coli
Canis familiaris	Can f 1	DAG-WT1795	HEK293 cells
Canis familiaris	Can f 2	DAG-WT2183	E. coli
Canis familiaris	Can f 3	DAG-WT2184	E. coli
Canis familiaris	Can f 4	DAG-WT1810	E. coli
Canis familiaris	Can f 4	DAG-WT3437	HEK293 cells
Canis familiaris	Can f 5	DAGA-3086	Yeast

Canis familiaris	Can f 6	DAG-WT3438	HEK293 cells
Crangon crangon	Cra c 8	DAG-WT2189	E. coli
Dermatophagoides farinae	Der f 1	DAG-WT1792	HEK293 cells
Dermatophagoides farinae	Der f 2	DAG-WT1793	E. coli
Dermatophagoides farinae	Der f 2	DAG-WT2246	Mammalian cells
Dermatophagoides farinae	Der f 2	DAGA-3090	Yeast
Dermatophagoides pteronyssinus	Der p 1	DAG-WT611	E. coli
Dermatophagoides pteronyssinus	Der p 1	DAG-WT1794	HEK293 cells
Dermatophagoides pteronyssinus	Der p 2	DAG-WT593	E. coli
Dermatophagoides pteronyssinus	Der p 2	DAG-WT594	E. coli
Dermatophagoides pteronyssinus	Der p 2	DAG-WT261	E. coli
Dermatophagoides pteronyssinus	Der p 2	DAG-WT2242	Mammalian cells
Dermatophagoides pteronyssinus	Der p 5	DAG-WT1809	E. coli
Dermatophagoides pteronyssinus	Der p 6	DAG-WT259	E. coli
Dermatophagoides pteronyssinus	Der p 10	DAGA-3089	E. coli
Dermatophagoides pteronyssinus	Der p 21	DAG-WT3433	E. coli
Dermatophagoides pteronyssinus	Der p 21	DAG-WT3434	Yeast
Dermatophagoides pteronyssinus	Der p 23	DAG-WT260	Mammalian cells
Dermatophagoides pteronyssinus	Der p 23	DAG-WT2180	E. coli
Dermatophagoides pteronyssinus	Der p 23	DAG-WT2181	E. coli
Equus caballus	Equ c 1	DAG-WT3463	Yeast
Equus caballus	Equ c 1	DAGA-3087	E. coli
Felis domesticus	Fel d 1	DAG-WT1796	E. coli
Felis domesticus	Fel d 1	DAGA-3085	Yeast
Felis domesticus	Fel d 4	DAG-WT274	E. coli
Litopenaeus vannamei	Lit v 2	DAG-WT2185	E. coli
Litopenaeus vannamei	Lit v 3	DAG-WT2186	E. coli

Litopenaeus vannamei	Lit v 4	DAG-WT2187	E. coli
Mus musculus	Mus m 1	DAG-WT279	E. coli
Oryctolagus cuniculus	Ory c 3	DAG-WT3464	Yeast
Pandalus borealis	Pan b 1	DAG-WT2188	E. coli
Periplaneta americana	Per a 1	DAG-WT1830	E. coli
Rattus norvegicus	Rat n 1	DAG-WT3465	E. coli
Rattus norvegicus	Rat n 1	DAG-WT3466	Yeast
Salmo salar	Sal s 1	DAG-WT3538	E. coli
Scylla paramamosain	Scy p 2	DAG-WT2190	E. coli
	Food allergens		
Actinidia deliciosa	Act d 8	DAG-WT1819	Yeast
Ananas comosus	Ana c 1	DAG-WT2191	E. coli
Arachis hypogaea	Ara h 1	DAG-WT3453	Insect cells
Arachis hypogaea	Ara h 1	DAGA-093H	E. coli
Arachis hypogaea	Ara h 3	DAG-WT161	E. coli
Arachis hypogaea	Ara h 6	DAG-WT1821	Yeast
Arachis hypogaea	Ara h 6	DAG-WT159	Insect cells
Arachis hypogaea	Ara h 8	DAG-WT162	E. coli
Arachis hypogaea	Ara h 9	DAG-WT1820	Yeast
Arachis hypogaea	Ara h 9	DAG-WT3452	Yeast
Arachis hypogaea	Ara h 9	DAG-WT160	Insect cells
Bertholletia excelsa	Ber e 1	DAG-WT3456	E. coli
Carya illinoinensis	Car i 1	DAG-WT1822	E. coli
Charybdis feriatus	Cha f 1	DAG-WT213	E. coli
Citrus sinensis	Cit s 2	DAG-WT3540	E. coli
Common carp	Cyp c 1	DAG-WT3458	E. coli
Corylus avellana	Cor a 1	DAG-WT158	Insect cells

Corylus avellana	Cor a 1	DAGK-012	Insect cells
Corylus avellana	Cor a 1	DAG-WT1823	E. coli
Corylus avellana	Cor a 1	DAG-WT3455	Yeast
Corylus avellana	Cor a 8	DAG-WT166	Insect cells
Corylus avellana	Cor a 8	DAG-WT1824	Yeast
Corylus avellana	Cor a 9	DAG-WT167	Hazelnut
Corylus avellana	Cor a 14	DAG-WT1825	Yeast
Corylus avellana	Cor a 14	DAG-WT168	Insect cells
Daucus carota	Dau c 1	DAG-WT3545	E. coli
Fragaria ananassa	Fra a 1	DAG-WT1826	Yeast
Gadus callarias	Gad c 1	DAG-WT294	E. coli
Gadus morhua	Gad m 1	DAG-WT3457	E. coli
Gallus domesticus	Gal d 1	DAG-WT221	Mammalian cells
Gallus domesticus	Gal d 2	DAG-WT219	E. coli
Gallus domesticus	Gal d 3	DAG-WT223	Mammalian cells
Gallus domesticus	Gal d 4	DAG-WT218	Mammalian cells
Gallus domesticus	Gal d 5	DAG-WT220	Mammalian cells
Gallus domesticus	Gal d 6	DAG-WT222	Mammalian cells
Glycine max	Gly m 3	DAG-WT3539	E. coli
Glycine max	Gly m 4	DAG-WT1802	E. coli
Glycine max	Gly m 4	DAG-WT289	E. coli
Glycine max	Gly m 5	DAG-WT290	E. coli
Hordeum vulgare	Hor v 1	DAG-WT3544	E. coli
Juglans regia	Jug r 1	DAG-WT3454	E. coli
Malus domestica	Mal d 1	DAG-WT263	E. coli
Malus domestica	Mal d 1	DAG-WT163	E. coli
Malus domestica	Mal d 1	DAG-WT3460	Yeast

Malus domestica	Mal d 3	DAG-WT165	Insect cells
Malus domestica	Mal d 4	DAG-WT264	E. coli
Mangifera indica	Man i 1	DAG-WT295	E. coli
Mangifera indica	Man i 3	DAG-WT296	E. coli
Metapenaeus ensis	Met e 1	DAG-WT1803	E. coli
Musa velutina	Mus xp 1	DAG-WT3542	E. coli
Penaeus aztecus	Pen a 1	DAG-WT164	Insect cells
Penaeus aztecus	Pen a 1	DAG-WT1804	E. coli
Phaseolus vulgaris	Pha v 3	DAG-WT3541	E. coli
Polistes dominulus	Pol d 5	DAG-WT3461	E. coli
Polistes dominulus	Pol d 5	DAG-WT3462	Yeast
Prunus persica	Pru p 1	DAG-WT288	E. coli
Prunus persica	Pru p 4	DAG-WT2192	E. coli
Prunus persica	Pru ar 1	DAG-WT3546	E. coli
Pyrus communis	Pyr c 1	DAG-WT3543	E. coli
Scylla paramamosain	Scy p 1	DAG-WT3459	E. coli
Sesamum indicum	Ses I 1	DAG-WT291	E. coli
Sesamum indicum	Ses I 1	DAG-WT3470	Yeast
Solanum lycopersicum	Sola l 4	DAG-WT2193	E. coli
Triticum aestivum	Tri a 12	DAG-WT266	E. coli
Triticum aestivum	Tri a 14	DAG-WT169	Insect cells
Triticum aestivum	Tri a 14	DAG-WT1805	E. coli
Triticum aestivum	Tri a 19	DAG-WT211	E. coli
Triticum aestivum	Tri a 19	DAG-WT212	E. coli
Vespula vulgaris	Ves v 5	DAG-WT1827	E. coli
	Fungal allergens		
Alternaria alternata	Alt a 1	DAG-WT1799	E. coli

Aspergillus fumigatus	Asp f 1	DAG-WT1801	HEK293 cells
Aspergillus fumigatus	Asp f 1	DAG-WT275	E. coli
Aspergillus fumigatus	Asp f 3	DAG-WT276	E. coli
Aspergillus fumigatus	Asp f 5	DAG-WT2178	E. coli
Aspergillus fumigatus	Asp f 6	DAG-WT1817	E. coli
Aspergillus fumigatus	Asp f 9	DAG-WT1818	HEK293 cells
Aspergillus fumigatus	Asp f 15	DAG-WT1800	E. coli
Aspergillus fumigatus	Asp f 22	DAG-WT3439	E. coli
Aspergillus fumigatus	Asp f 24	DAG-WT3440	E. coli
Aspergillus fumigatus	Asp f 28	DAG-WT3441	E. coli
Cladosporium herbarum	Cla h 8	DAG-WT3547	E. coli
Penicillium chrysogenum	Pen ch 18	DAG-WT2179	E. coli
	Plant allergens		
Alnus glutinosa	Aln g 1	DAG-WT282	E. coli
Alnus glutinosa	Aln g 1	DAGK-009	Insect cells
Ambrosia artemisiifolia	Amb a 1	DAG-WT280	E. coli
Ambrosia artemisiifolia	Amb a 2	DAG-WT281	E. coli
Ambrosia artemisiifolia	Amb a 11	DAG-WT3446	E. coli
Amaranthus retroflexus	Ama r 2	DAG-WT3447	E. coli
Arpinus betulus	Car b 1	DAG-WT283	E. coli
Arpinus betulus	Car b 1	DAGK-013	E. coli
Artemisia vulgaris	Art v 1	DAGA-3099	Yeast
Artemisia vulgaris	Art v 1	DAG-WT1797	HEK293 cells
Artemisia vulgaris	Art v 3	DAG-WT2182	E. coli
Artemisia vulgaris	Art v 4	DAG-WT1812	E. coli
Betula verrucosa	Bet v 1	DAG-WT1798	E. coli
Betula verrucosa	Bet v 1	DAGK-007	Insect cells

Betula verrucosa	Bet v 2	DAGK-008	E. coli
Betula verrucosa	Bet v 2	DAG-WT3442	Yeast
Betula verrucosa	Bet v 4	DAG-WT1811	E. coli
Betula verrucosa	Bet v 4	DAG-WT173	Insect cells
Betula verrucosa	Bet v 6	DAG-WT174	E. coli
Chenopodium album	Che a 1	DAG-WT3451	Yeast
Chenopodium album	Che a 1	DAG-WT284	Mammalian cells
Chenopodium album	Che a 2	DAG-WT285	E. coli
Chenopodium album	Che a 3	DAG-WT286	E. coli
Cupressus arizonica	Cup a 1	DAG-WT3445	E. coli
Cynodon dactylon	Cyn d 12	DAG-WT3551	E. coli
Fraxinus excelsior	Fra e 1	DAG-WT3443	Yeast
Fraxinus excelsior	Fra e 1	DAGK-011	Insect cells
Humulus japonicus	Hum j 1	DAG-WT287	E. coli
Humulus scandens	Hum s 1	DAG-WT3449	E. coli
Humulus scandens	Hum s 3	DAG-WT3450	Yeast
Juniperus ashei	Jun a 1	DAG-WT3444	E. coli
Parietaria judaica	Par j 2	DAG-WT1813	HEK293 cells
Parietaria judaica	Par j 2	DAG-WT3448	E. coli
Paspalum notatum	Pas n 1	DAG-WT3550	E. coli
Phleum pratense	Phl p 1	DAGK-003	Insect cells
Phleum pratense	Phl p 1	DAGA-3092	E. coli
Phleum pratense	Phl p 2	DAG-WT1814	HEK293 cells
Phleum pratense	Phl p 2	DAGK-004	Insect cells
Phleum pratense	Phl p 5	DAG-WT1815	HEK293 cells
Phleum pratense	Phl p 5	DAG-WT1816	E. coli
Phleum pratense	Phl p 5	DAGA-3093	E. coli

Phleum pratense	Phl p 5	DAGA-3094	E. coli
Phleum pratense	Phl p 5	DAGK-005	Insect cells
Phleum pratense	Phl p 5	DAG-WT332	E. coli
Phleum pratense	Phl p 6	DAGK-006	Insect cells
Phleum pratense	Phl p 7	DAGA-3095	E. coli
Phleum pratense	Phl p 12	DAG-WT171	Insect cells
Phleum pratense	Phl p 12	DAGA-3096	E. coli
Platanus acerifolia	Pla a 1	DAGA-3097	Yeast
Platanus acerifolia	Pla a 2	DAG-WT265	Mammalian cells
Platanus acerifolia	Pla a 3	DAGA-3098	E. coli
Quercus alba	Que a 1	DAG-WT3549	E. coli

CREATIVE DIAGNOSTICS

Allergies and Allergen Antigens

Contact Us:

Tel: 1-631-624-4882 (USA) / 44-161-818-6441 (Europe)

Fax: 1-631-938-8221

Email: info@creative-diagnostics.com

www.creative-diagnostics.com

CD Creative Diagnostics®