

## Recombinant Food Allergens

Food allergies are abnormal immunological responses to a particular food or food component, usually a naturally occurring protein. Two types of abnormal immunological responses can occur - immediate hypersensitivity reactions and delayed hypersensitivity reactions, and both occur upon ingestion of specific foods.

The detection of specific IgE has been incorporated into current guidelines for the identification of allergy inducing agents (Boyce *et al.* 2010; Soares-Weiser *et al.* 2014) and has been significantly improved by the availability of recombinant allergens. This molecular allergy diagnosis or component resolved diagnosis (CRD) allows for the detection of specific and cross-reactive IgE antibodies (Canonica *et al.* 2013; van Gasse *et al.* 2015; Werfel *et al.* 2015). Research shows that the potential of an allergen to trigger an IgE response, as well as cross reactivity is connected to its structure. IgE antibodies bind to certain epitopes on individual allergen components that can be grouped into a few relevant protein families like heat resistant storage proteins, lipid transfer proteins and PR-10 proteins (Renz *et al.* 2010).

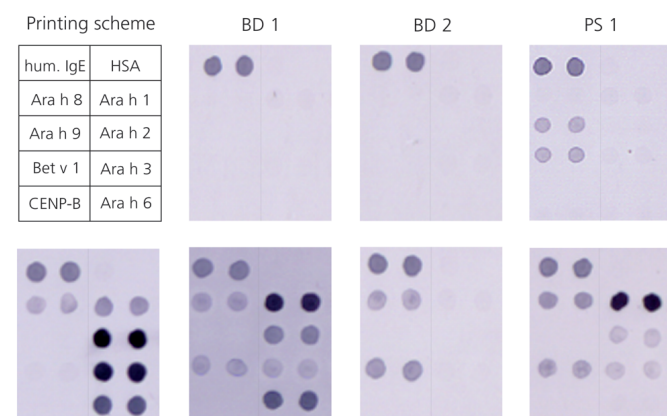


Figure: Immunodot analyses of blood donors (BD 1-2) and samples from patients allergic to peanut (PS 1-3, 5) or birch pollen (PS 4). The presence of IgE antibodies was determined by spotting duplicates of DIARECT's recombinant allergens Ara h 1.0101, Ara h 2.0201, Ara h 3.0101, Ara h 6.0101, Ara h 8.0101 and Ara h 9.0101 on nitrocellulose membrane. Positive (human IgE) and negative controls (HSA, CENP-B) were spotted in the top and bottom line.

In peanut, two related allergens, Ara h 2 and Ara h 6, both conglutinin storage proteins, account for the majority of the IgE immune response and are considered the main elicitors of anaphylaxis. Food and pollen usually comprise more than one allergenic component that may share various degrees of identity and might induce cross-sensitivity due to cross specific IgE antibodies (Turnbull *et al.* 2015; Werfel *et al.* 2015). A high percentage of patients allergic to birch pollen have been reported to also be allergic to soybean.

Besides IgE antibodies against Bet v 1, a major birch allergen, IgE antibodies to Gly m 4, a major soybean allergen and belonging to the same protein family as Bet v 1, were also detected in the sera of these patients (Berkner *et al.* 2009; Mittag *et al.* 2004; Werfel *et al.* 2015).

In 2009, Holzhauser *et al.* described another soybean allergen, Gly m 5. When analyzing patient sera, the authors found IgE antibodies against Gly m 5 preferentially in those sera from patients that suffer from anaphylaxis upon exposure to soybean. IgE antibodies against Gly m 4, however, appeared to be present preferentially in the serum of patients suffering only from mild symptoms. DIARECT's recombinant allergens are produced in either *E. coli* or the baculovirus/insect cell expression system.

### Ordering Information

52500	Ara h 1.0101	0.1 mg
52501		1.0 mg
50100	Ara h 2.0201	0.1 mg
50101		1.0 mg
52600	Ara h 3.0101	<b>NEW!</b> 0.1 mg
52601		1.0 mg
51900	Ara h 6.0101	0.1 mg
51901		1.0 mg
52700	Ara h 8.0101	<b>NEW!</b> 0.1 mg
52701		1.0 mg
52000	Ara h 9.0101	0.1 mg
52001		1.0 mg
51800	Cor a 1.0401	0.1 mg
51801		1.0 mg
50500	Gly m 4.0101	0.1 mg
50501		1.0 mg
50600	Gly m 5.0101	0.1 mg
50601		1.0 mg
52800	Mal d 1.0108	<b>NEW!</b> 0.1 mg
52801		1.0 mg

### References:

- Berkner *et al.* (2009) Bioscience Report 29: 183-192
- Boyce *et al.* (2010) Journal Allergy Clinical Immunology 126: 1-58
- Canonica *et al.* (2013) World Allergy Organization Journal 6: 17
- Holzhauser *et al.* (2009) J. Allergy Clinical Immunology 132: 452-458
- Mittag *et al.* (2004) J. Allergy Clinical Immunology 113: 148-154
- Renz *et al.* (2010) Allergo Journal 19: 110-128
- Soares-Weiser *et al.* (2014) Allergy 69: 76-86
- Turnbull *et al.* (2015) Alimentary Pharmacology Therapeutics 41: 3-25
- van Gasse *et al.* (2015) Clinica Chimica Acta 444: 54-61
- Werfel *et al.* (2015) Allergy 70: 1079-1090

In some countries the use of certain allergens in diagnostic tests may be protected by patents. DIARECT is not responsible for the determination of these issues and suggests clarification prior to use.

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