Recombinant Peanut Allergens

Food allergies are abnormal immunological responses to a particular food or food component, usually a naturally occuring protein. Two types of abnormal immunological responses can occur - immediate hypersensitivity reactions and delayed hypersensitivity reactions, and both occur predominantly 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 diagnostics or component resolved diagnostics (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).

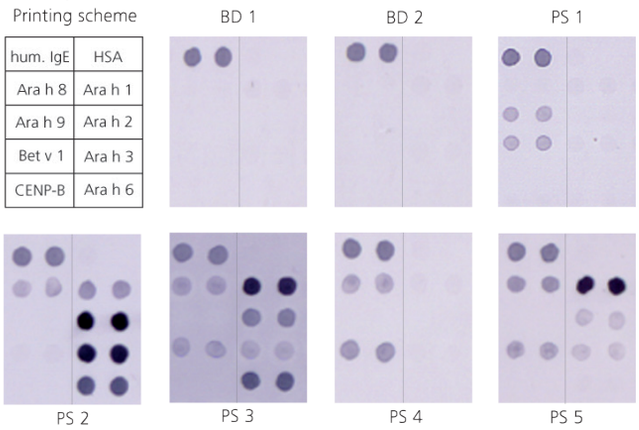

Figure: Immunodot analyses of blood donors (BD 1-2) and samples from patients allergic to peanut (PS 1-3, 5) or birch pollen (PS 4). The presence of IgE antibodies was determined by spotting duplicates of DIARECT's recombinant allergens Ara h 1.0101, Ara h 2.0201, Ara h 3.0101, Ara h 6.0101, Ara h 8.0101 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.

Peanut (*Arachis hypogaea*) allergy accounts for the majority of severe food-related allergic reactions. Symptoms usually develop within minutes after contact with even a trace amount of peanut and may involve cutaneous, cardiovascular, gastrointestinal, genitourinary, and/or respiratory systems and can even lead to anaphylaxis.

A number of peanut allergens have been identified. Of these, Ara h 2 and the related allergen, Ara h 6, have been determined to be considerably more potent than Ara h 1 and Ara h 3, other peanut allergens that bind IgE from a large percentage of peanut allergic individuals. Ara h 2 and Ara h 6 belong to the family of conglutins. Both are related to the 2S albumins and function as seed storage proteins. They 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).

In peanut, clinical reactions are associated with individual peanut allergens with specific characteristics. Seed storage proteins are the major allergens in primary peanut allergy, meaning that sensitization occurs to the allergen itself. In contrast, pollen-associated allergies are usually caused by cross-reactions towards inhaled allergens such as Ara h 8, a Bet v 1 homologue. In regions where birch tree pollen exposure is prevalent, such as Northern Europe, patients with an Ara h 8 sensitization and no IgE towards Ara h 1, 2, 3 and 6, typically do not show systemic reactions (Mittag *et al.* 2004; Werfel *et al.* 2015).

DIARECT's recombinant peanut 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	0.1 mg
52601		1.0 mg
51900	Ara h 6.0101	0.1 mg
51901		1.0 mg
52700	Ara h 8.0101	0.1 mg
52701		1.0 mg
52000	Ara h 9.0101	0.1 mg
52001		1.0 mg

References:
Boyce *et al.* (2010) J Allergy Clin Immunol. 126: 1-58
Canonica *et al.* (2013) World Allergy Organ. J 6: 17
Mittag *et al.* (2004) J Allergy Clin Immunol. 113: 148-154
Lange *et al.* (2014) Allergo J Int. 23:158-63
Renz *et al.* (2010) Allergo Journal. 19: 110-128
Soares-Weiser *et al.* (2014) Allergy. 69: 76-86
Turnbull *et al.* (2015) Aliment Pharmacol Ther. 41: 3–25
van Gasse *et al.* (2015) Clin Chim Acta. 444: 54-61
Werfel *et al.* (2015) Allergy. 70: 1079-1090

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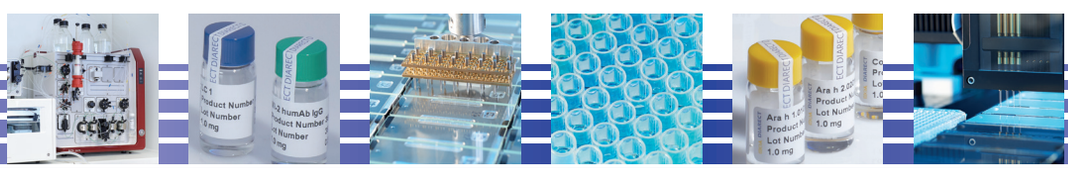

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