

## f352 rAra h 8

rAra h 8 from peanut (*Arachis hypogaea*)



### **Possible Clinical Utility**

Presence of specific IgE antibodies to Ara h 8 is a marker for birch pollen related reactions to peanut. It is probably the Bet v 1 component in birch which is the primary sensitizer in these patients. Bet v 1 specific IgE antibodies can then cause allergic reactions to peanut through cross-reaction with the related peanut component Ara h 8. Such cross-reactions are often associated with local symptoms like oral allergy syndrome (OAS).

### **Allergen Description**

Peanuts are the seeds of an annual legume, which grows close to the ground and produces its fruit below the soil surface. This is in contrast to tree nuts like walnuts and almonds. Peanut is a member of the Fabaceae or legume family, whereas tree nuts are not.

Peanut contains more than 30 different proteins, of which at least 18 have been identified as being capable of binding specific IgE antibodies (1, 2).

Ara h 8 is a Bet v 1-homologous (3, 4). It appears to have a low stability to roasting and no stability to gastric digestion (3).

Ara h 8 belongs to the PR-10 protein family. Pathogenesis-related (PR) proteins of class 10 are abundant in higher plants. Some of these proteins are induced under stress conditions as part of the plant's defence mechanism.

The PR-10 proteins are encoded by multigene families, have a weight of about 17 kDa, and are found in the cytosol (5). They are common allergens in Fagales pollens (alder, hornbeam, beech, chestnut) and may be present in a number of vegetables and fruits, e.g., apple, pear, hazelnut and lupine (4, 6, 7).

Gly m 4 from soya bean (*Glycine max*) is also homologous to Bet v 1 (8).

### **Potential Cross-Reactivity**

Due to cross-reactivity between Bet v 1 and Ara h 8, sensitisation to other PR-10 proteins might be evaluated to some extent using rAra h 8. In a study that evaluated whether Fagales sensitisation occurred within a population not exposed to birch pollen, reactivity to Bet v 1 was recorded in 84% of the birch/hazel/oak co-reactivity group. Bet v 1 prevalence ranged between 48% and 21% among subgroups of patients coming from different areas (9).

Lupine is an emerging cause of food allergy, as a result of recent large-scale introduction into processed foods and frequent cross-reactions with other members of the legume family. Significant sequence homology and molecular similarity were found between Ara h 8 and the pathogenesis-related protein PR-10 of white lupine (10).

Ara h 8 is also cross-reactive with Gly m 4 from soya bean and Pru av 1 from cherry (4). Nonetheless, although common binding epitopes do occur for this allergen, patient-specific IgE epitope patterns also exist (6).

### **Clinical Experience**

A study was done of 20 patients with peanut and birch pollen allergy, and with positive double-blind, placebo-controlled food challenges to peanut. All patients experienced symptoms of the oral cavity on exposure to peanut. These progressed to more severe symptoms in 40% of patients. IgE antibodies to recombinant Ara h 8 was detected in 85%. The study concluded that peanut allergy maybe mediated in a subgroup of patients by means of cross-reaction of Bet v 1 induced antibodies with the homologous peanut allergen Ara h 8 (3).

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