Recombinant Food Allergens

Food and pollen from a species 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). Molecular identification of individual allergens and subsequent establishment of Component Resolved Diagnostics (CRD) allow the detection of specific IgE antibodies (Canonica et al. 2013; Werfel et al. 2015).

Due to similarities between gluten proteins, wheat allergic patients can also react to various other kinds of cereals. Tri a 14, the non-specific lipid transfer protein (nsLTP) of wheat has been shown to not exhibit cross-reactivities to other grass pollen allergens and is therefore used as a specific marker for wheat allergic subjects (Palacin et al. 2010).

Apple (Malus domestica) allergen Mal d 1 belongs to a class of proteins called pathogenesis-related (PR) proteins. Apple is a prime example of pollen-fruit syndrome in which patients with hay fever develop oral allergic symptoms to food allergens (Fritsch et al. 1998). In contrast, lipid transfer proteins (LTPs) are often associated with severe allergic reactions (Palacín et al. 2012). Sensitization to Mal d 3 is a risk factor for systemic reactions (Fernández-Rivas et al. 2006). The 13-kDa protein is heat-stable and retains its allergenicity even after cooking (Asero et al. 2003). Apple-allergic patients sensitized to Mal d 3 may react to other LTP-containing foods, such as peach, nuts, or grapes.

A high percentage of patients allergic to birch pollen have been reported to also be allergic to soybean. Bet v 1, a major birch allergen, and Gly m 4, a major soybean allergen, were 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. IgE antibodies against Gly m 5 were mainly found in sera of patients that suffer from anaphylaxis upon exposure to soybean. IgE antibodies against Gly m 4, however, appeared to be present preferentially in sera of patients that only have mild symptoms.

Tropomyosin of Penaeus aztecus (34-38 kDa), designated Pen a 1 (Daul et al. 1991), is representative of shrimp tropomyosin, used in the investigation of allergies to foods in which tropomyosin is a major determinant (Castillo et al. 1994). Of the thirteen different allergens identified in brown shrimp, it is the best characterized, has been detected in sera of more than 80% of shrimp allergic subjects and binds to 75% of the shrimp-specific IgE (Daul et al. 1994; Jeoung et al. 1997).

DIARECT’s recombinant food allergens are produced in either E. coli or the baculovirus/insect cell expression system.

<table>
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References:

Castillo et al. (1994) Allergol Immunopathol. 22: 83-87
Palacín et al. (2013) eLife 2 (3): e50799
Werfel et al. (2015) Allergy. 70 (9): 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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