

Recombinant Food Allergens

Most allergenic materials such as pollen and foods contain multiple allergenic proteins. Molecular identification of specific allergens and subsequent establishment of Component Resolved Diagnostics (CRD) allow the detection of and distinction between specific and cross-specific IgE antibodies (Canonica *et al.* 2013; van Gasse *et al.* 2015; Werfel *et al.* 2015).

Food allergens in particular are known to manifest in acute allergic reactions such as hives, bronchospasm and systemic 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).

Immediate reactions after apple consumption (*Malus domestica*) are common and often coincide with tree-pollen allergies. Mal d 1 belongs to a class of proteins called pathogenesis-related (PR) proteins which are produced by the plant in the event of a pathogen attack or environmental stress. Apple is a prime example of pollen-fruit syndrome in which patients with hay fever develop oral allergic symptoms to food allergens (Ruth *et al.* 1998).

Cor a 1.0401 represents a major allergen from *Corylus avellana* (hazelnut) and is associated with mild local reactions (as oral allergy syndrome). Like Mal d 1, it is a PR protein (PR-10), and is closely related to hazel pollen allergen Cor a 1.0103 and Bet v 1 homologues (Roehr *et al.* 2004). The prevalence of hazelnut food allergy in Europe has been shown to be between 0.1% and 0.5% (Tariq *et al.* 1996).

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 suffering from anaphylaxis upon exposure to soybean. IgE antibodies against Gly m 4, however, appeared to be present preferentially in sera of patients suffering only from mild symptoms.

Tropomyosin of *Penaeus aztecus* (34-38 kDa), designated Pen a 1 (Daul *et al.* 1991), is representative of shrimp tropomyosin, used as a diagnostic tool 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.

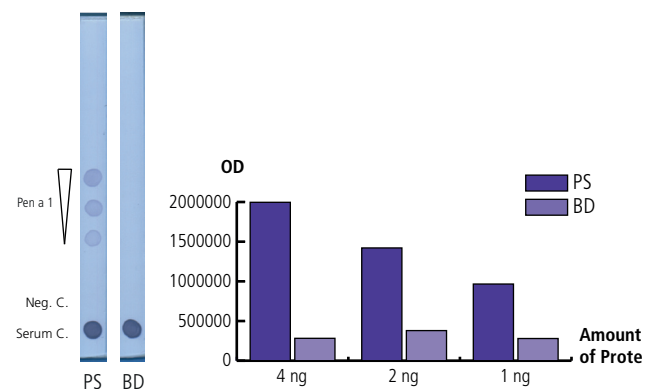


Figure: Dot blot analyses of a shrimp extract positive patient sample (PS) and a blood donor (BD) using DIARECT's Pen a 1.0101 allergen (left). Graph on the right shows the reactivity (OD) of PS versus BD depending on Pen a 1.0101 concentration printed on nitrocellulose membrane.

References:

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- Daul *et al.* (1994) Int Arch Allergy Immunol. 105:49-55
- Holzhauser *et al.* (2009) J Allergy Clin Immunol. 132: 452-458
- Jeoung *et al.* (1997) J Allergy Clin Immunol. 229-234
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- Tariq *et al.* (1996) Br Med J. 313 (7056): 514-517
- 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

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.

Ordering Information

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	0.1 mg
52801		1.0 mg
54100	Pen a 1.0101	0.1 mg
54101		1.0 mg

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