Tree Nut Allergens

Allergies to tree nuts (TNs) are becoming more and more prevalent with reactions to hazelnut (*Corylus avellana*) being the most common one in Europe and walnut (*Juglans regia*) allergies being the most prominent allergic reaction in the US (Geiselhart *et al.* 2018).

TN components can cause mild oral to severe systemic allergic reactions with even life threating symptoms including anaphylactic shock (Weinberger and Sicherer 2018). Oral allergy syndrome (OAS) is often caused by secondary reactions due to cross-reactivity, while the more severe systemic reactions occur with the manifestation of a primary TN allergy (Dodig and Cepelak 2018). Therefore, component-resolved diagnostics (CRDs) can help to better categorize the severity of a patient's allergy in order to provide a more individualized therapeutic approach (Sastre 2010; Weinberger and Sicherer 2018).

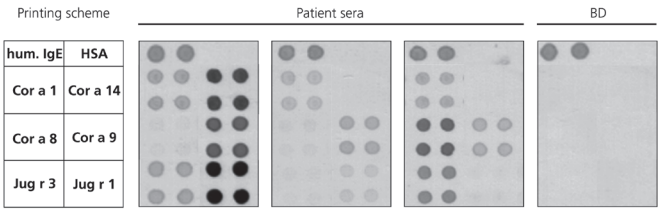

Figure: Immunodot analyses of a blood donor (BD) and sera from patients allergic to hazelnut and walnut. The presence of IgE antibodies was determined by spotting quadruplicates of DIARECTS's recombinant allergens Cor a 1.0401, Cor a 14.0101, Cor a 8.0101, Jug r 3.0101 and Jug r 1.0101 as well as DIARECT's non-recombinant allergen Cor a 9 on nitrocellulose membrane. Positive (human IgE) and negative controls (human serum albumin; HSA) are displayed in duplicates in the top line.

Cor a 1 (PR10) is a homolog of Bet v 1 (major birch pollen allergen) and is mainly involved in cross-reactive allergy (Hofmann *et al.* 2013; Flinterman *et al.* 2006; De Knop *et al.* 2011). Cor a 1 has been identified as the major hazelnut allergen in patients in Europe (Schocker *et al.* 2004). Patients only sensitized to Cor a 1 often tolerate roasted or heated hazelnuts as Cor a 1 is heat- and digestion-labile (Hansen *et al.* 2003).

Cor a 8 is a lipid transfer protein (LTP) that is structurally similar to LTPs found in fruits (Egger *et al.* 2010). It is often involved in cross-reactivity, for example in peach-allergic patients (Weinberger and Sicherer 2018). Since Cor a 8 is heat-stable it is known to be a risk factor for systemic reactions (Schocker *et al.* 2004).

Cor a 9 belongs to the family of seed storage proteins and antibodies to this allergen are detected in 86% of patients with a hazelnut allergy. As a heat-stable protein, it has a history of systemic reactions (Weinberger and Sicherer 2018). Cor a 9 has been shown to be a pollen-independent hazelnut allergen in the US and major pollen-unrelated TN allergen in Europe (Schocker *et al.* 2004).

Sensitization to the hazelnut storage protein Cor a 14 usually indicates a primary nut allergy and involves systemic reactions (Masthoff *et al.* 2013).

Jug r 1 is the major component allergen in patients with a primary walnut allergy (Lee *et al.* 2019). It is a heat- and digestion-stable protein which explains its involvement in systemic reactions (Sastre 2010).

Jug r 3 belongs to the family of non-specific lipid transfer proteins (nsLTP) and is often involved in cross-reactivity when there is a food allergy to other LTP proteins such as in a primary peach allergy. Jug r 3 is a heat- and digestion-stable protein and can therefore also be involved in severe allergic reactions (Pastorello *et al.* 2004).

DIARECT's recombinant TN allergens are produced in the baculovirus/insect cell expression system. Non-recombinant Cor a 9 is purified from hazelnut by protein-chemical methods.

Ordering Information

51800	Cor a 1.0401	0.1 mg
51801		1.0 mg
54200	Cor a 8.0101	0.1 mg
54201		1.0 mg
54300	Cor a 9 (non recombinant)	0.1 mg
54301		1.0 mg
54400	Cor a 14.0101	0.1 mg
54401		1.0 mg
54600	Jug r 1.0101	0.1 mg
54601		1.0 mg
54700	Jug r 3.0101	0.1 mg
54701		1.0 mg

References:
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Egger *et al.* (2010) Curr Allergy Asthma Rep. 10 (5): 326-335
Flinterman *et al.* (2006) J Allergy Clin Immunol. 118 (5): 1186-1189
Geiselhart *et al.* (2018) Mol Immunol. 100: 71-81
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Hofmann *et al.* (2013) J Allergy Clin Immunol. 131 (5): 1384-1392.e6
Lee *et al.* (2019) Asian Pac J Allergy Immunol. DOI: 10.12932/AP-161118-0443
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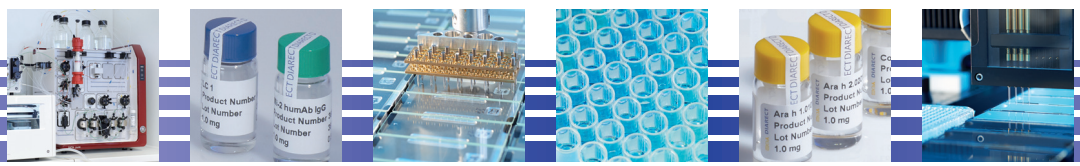

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