



Allergy

Setting the standard

ImmunoCAP™ Specific IgE Tree Nut Allergen Components*

Use this guide to interpret ImmunoCAP Allergen Component test results and unlock a broader understanding of a patient's allergic sensitization, allowing for a more comprehensive management plan.¹





Testing with tree nut allergen components can help to:^{1,7,11-25}

-  Assess risk for systemic allergic reactions
-  Identify cross-reactivity
-  Optimize diagnosis and management

50%

of children that are allergic to one tree nut are allergic to another tree nut²

Pinpointing exactly which protein an individual is sensitized to may help determine the risk of severe reaction.¹⁻¹²

	Risk stratification ^{1,5-8,10-25}				
	Cross-reactivity				Risk
	CCD	Profilin	PR-10	LTP	Storage Protein
 Hazelnut	MUFX3	Bet v 2 [†]	Cor a 1	Cor a 8	Cor a 9, 14
 Walnut	MUFX3	Bet v 2 [†]		Jug r 3	Jug r 1
 Brazil nut	MUFX3	Bet v 2 [†]			Ber e 1
 Cashew	MUFX3	Bet v 2 [†]			Ana o 3

Characteristics of individual proteins²²⁻²⁵

CCD	Profilin	PR-10	LTP	Storage Protein
Does not usually provoke clinical reactions	Sensitization is usually asymptomatic	Labile to heat and digestion	Stable to heat and digestion	Stable to heat and digestion
Highly cross-reactive (pollen, plant food, venoms)	Abundant in nature	Mainly local reactions	Local and systemic reactions	Associated with systemic reactions
	Cross-reactive with pollen	Cross-reactive with birch pollen	Cross-reactive with plant foods and pollens	Indicates primary sensitization

Management considerations⁴⁻²⁵

CCD, Profilin, PR-10 MUXF3, Bet v 2 [†] , Cor a 1	LTP Cor a 8, Jug r 3	Storage Proteins Cor a 9, Cor a 14, Jug r 1, Ber e 1, Ana o 3	
+/-	+/-	+	<p>If clinical symptoms are present with exposure to tree nuts, high probability of clinical tree nut allergy and possibility for severe, systemic reactions. Consider the following:</p> <ul style="list-style-type: none"> • Patient likely to react to oral food challenge (OFC) • Other potential co-sensitizations (e.g. peanuts, tree nuts, and seeds) • Prescribing epinephrine auto-injector • Inform family, colleagues, and teachers of the allergy and have a plan
+/-	+	-	<p>If clinical symptoms are present with exposure to tree nuts, consider the following:</p> <ul style="list-style-type: none"> • Systemic and local reaction such as oral allergy syndrome (OAS) are possible • Potential cross-reactivity to other LTP containing foods (e.g. peach, tree nuts, wheat) and pollens (e.g. weed and tree) • Prescribing epinephrine auto-injector
+	-	-	<p>If there are no symptoms with tree nut exposure, or if symptoms are localized to only the oral cavity, primary tree nut allergy and severe reactions are less likely. Consider the following:</p> <ul style="list-style-type: none"> • OFC with a specialist may be recommended

Note: As in all diagnostic testing, any diagnosis or treatment plan must be made by the clinician based on test results, individual patient history, the clinician's knowledge of the patient, as well as their clinical judgment. Patients can be sensitized to more than one allergen component.¹

Whole allergens consist of numerous allergen components. A positive whole allergen sensitization with negative allergen component sensitization may mean a patient is sensitized to a component that is not yet available for testing. Consider a patient's clinical history and if an OFC with a specialist may be warranted.

* Official product names of allergen components mentioned within this document: ImmunoCAP Allergen f17, Hazelnut; ImmunoCAP Allergen f428, Allergen component rCor a 1 PR-10 Hazelnut; ImmunoCAP Allergen f425, Allergen component rCor a 8 Hazelnut; ImmunoCAP Allergen f440, Allergen component nCor a 9 Hazelnut; ImmunoCAP Allergen f439, Allergen component rCor a 14 Hazelnut; ImmunoCAP Allergen f256, Walnut; ImmunoCAP Allergen f441, Allergen component rJug r 1 Walnut; ImmunoCAP Allergen f442, Allergen component rJug r 3 LTP, Walnut; ImmunoCAP Allergen f18, Brazil nut; ImmunoCAP Allergen f354, Allergen component rBer e 1 Brazil nut; ImmunoCAP Allergen f202, Cashew nut; ImmunoCAP Allergen f443, Allergen component rAna o 3, Cashew nut; ImmunoCAP Allergen o214, Allergen component MUXF3 CCD, Bromelain; ImmunoCAP Allergen t216, Allergen component rBet v 2 Profilin, Birch

[†] Surrogate markers for profilin Phl p 12, Bet v 2, Pru p 4

References

- Kleine-Tebbe J, Jappe U. Molecular allergy diagnostic tests: development and relevance in clinical practice. *Allergologie select.* 2017;1 (2):169-1893.
- Food Allergy Research and Education. (n.d.). Tree Nut. <https://www.foodallergy.org/living-food-allergies/food-allergy-essentials/common-allergens/tree-nut>
- Geiselhart S et al. Tree nut allergens. *Mol Immunology* 2018 Aug;100:71-81.
- Pastorello E et al. Lipid transfer protein and vicilin are important walnut allergens in patients not allergic to pollen. *J Allergy Clin Immunol* 2004; 114(4): 908-14.
- Rosenfeld L et al. Walnut Allergy in Peanut-Allergic Patients: Significance of Sequential Epitopes of Walnut Homologous to Linear Epitopes of Ara h 1, 2 and 3 in Relation to Clinical Reactivity. *Int Arch Allergy Immunol.* 2012; 157:238-245.
- Masthoff L et al. A systematic review of the effect of thermal processing on the allergenicity of tree nuts. *Allergy* 2013; 68: 983-993.
- Egger M et al. The Role of Lipid Transfer Proteins in Allergic Diseases. *Curr Allergy Asthma Rep* 2010; 10:326-335.
- www.allergen.org.
- Davoren M et al. Cashew nut allergy is associated with a high risk of anaphylaxis. *Arch Dis Child* 2005; 90(10): 1084-5.
- Robotham J et al. Ana o 3, an important cashew nut (Anacardium occidentale L.) allergen of the 2S albumin family. *J Allergy Clin Immunol.* 2005; 115(6): 1284-90.
- Clark A et al. Cashew nut causes more severe reactions than peanut: case-matched comparison in 141 children. *Allergy* 2007; 62(8): 913-6.
- Borja J et al. Anaphylaxis from Brazil nut. *Allergy* 54, 1999 / 1004-1013.
- Masthoff L et al. Sensitization to Cor a 9 and Cor a 14 is highly specific for a severe hazelnut allergy in Dutch children and adults. *J Allergy Clin Immunol.* 2013(In press).
- Flinterman AE et al. Hazelnut allergy: from pollen-associated mild allergy to severe anaphylactic reactions. *Curr Opin Allergy Clin Immunol.* 2008 Jun; 8(3): 261-5.
- De Knop K. J. et al. Age-related sensitization profiles for hazelnut (Corylus avellana) in a birch-endemic region. *Pediatr Allergy Immunol.* 2011 Feb; 22(1Pt 2): e139-49.
- Hansen K. S. et al. Roasted hazelnuts-allergenic activity evaluated by double-blind, placebo-controlled food challenge. *Allergy.* 2003 Feb; 58(2): 132-8.
- Pastorello EA et al. Identification of hazelnut major allergens in sensitive patients with positive double-blind, placebo-controlled food challenge results. *J Allergy Clin Immunol.* 2002; 109(3): 563-70.
- Schocker F. et al. Recombinant lipid transfer protein Cor a 8 from hazelnut: A new tool for in vitro diagnosis of potentially severe hazelnut allergy. *J Allergy Clin Immunol.* 2004;113:141-7.
- Hansen K. S. et al. Component-resolved in vitro diagnosis of hazelnut allergy in Europe. *J Allergy Clin Immunol.* 2009 Apr 1; 123(5): 1134-41.
- Garino C et al. Isolation, cloning, and characterization of the 2S albumin: A new allergen from hazelnut. *Mol. Nutr. Food Res.* 2010; 54: 1257-1265.
- Matricardi PM, et al EAACI Molecular Allergy User's Guide. *Pediatr Allergy Immunol* 2016; 27: (suppl23): p156 2016
- Bradshaw N. A Clinical Reference Guide to Molecular Allergy. *Go Molecular! Molecular Allergy—The Basics.* 2014
- Katellaris CH: Food allergy and oral allergy or pollen-food syndrome. *Curr Opin Allergy Clin Immunol* 2010, 10:246-251.
- Sastre J: Molecular diagnosis in allergy. *Clin Exp Allergy* 2010, 40:1442-1460.
- Nucera E, et al. Hypersensitivity to major panallergens in a population of 120 patients. *Postepy Dermatol Allergol.* 2015 Aug; 32(4): 255-261.

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