

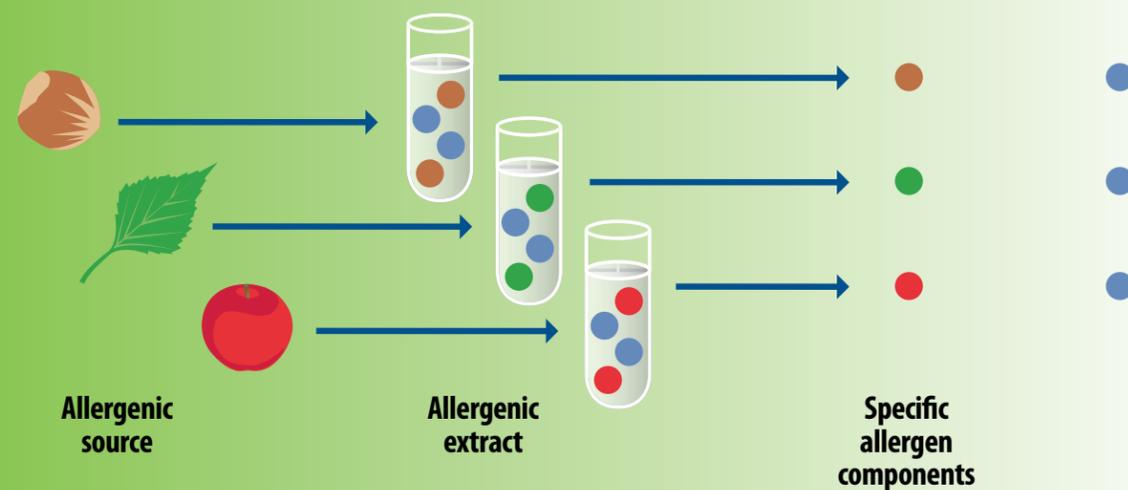
*Join the future of allergy diagnostics today
with advanced allergen component testing*

Now emerging: A deeper understanding of allergic sensitivities

Both skin prick testing and specific IgE blood testing employ heterogeneous protein preparations. As a result, these methods are not always the best indicators of clinical reactivity.¹ Now, clinicians have the new option of component testing, which is designed to pinpoint the allergen source when cross-reactive allergen components are present.

Data from two recent European studies underscore the need for more precise allergy testing.^{1,2} Both found that the majority of children who had previously tested positive for peanut allergy were not truly allergic to peanut. Using the new science of component diagnostics, the researchers in both studies found that while a person may test positive for peanut allergy through traditional testing methods, he or she may actually be allergic to cross-reactive pollen allergens sharing homologous component proteins.

Component diagnostics: The molecular view of sensitization.



Key allergen components identified for a wide array of allergens

Research into allergic sensitization has identified the key allergen components primarily responsible for severe allergic reactions within a wide array of whole inhalant and foodborne allergens. These include ovomucoid (Gal d 1) in hen's egg, Bet v 1 in birch, Phl p 1 and Phl p 5 in Timothy grass, and Ara h 1, 2, and 3 in peanut. At the same time, key cross-reactive allergen components have also been identified.¹⁻⁴

The recent study of peanut sensitization from Nicolaou et al revealed not only a clear pattern of allergy in those highly reactive to Ara h 1, 2, and 3, but also a high cross-reactive response to grass components in those deemed to be peanut-sensitized but not peanut-allergic.¹

In addition to allergen components, many proteins have been identified as key indicators of allergic sensitization and cross-reactivity, including⁵

- PR-10 protein, Bet v 1 homologue
- Non-specific lipid transfer protein (LTP)
- Profilin
- Storage protein
- Cross-reactive carbohydrate determinants (CCD)
- Lipocalins
- Parvalbumin
- Serum albumin
- Tropomyosin

You can go deeper in understanding potentially severe allergic reactions

Component diagnostics employs recombinant and highly purified native protein molecules to aid in

- **Quantifying** IgE antibodies to a single allergen protein component rather than a heterogeneous allergen preparation
- **Providing** a unique component-specific IgE antibody profile of the patient for personalized medical care
- **Supporting** a molecular-level understanding of the patient's individual constellation of symptoms

Component diagnostics can help the specialist

- **Better characterize** the patient's sensitization patterns
- **Better understand** the clinical risk for reactions in a patient
- **Determine** the presence of cross-reactivity between allergens
- **Facilitate** food challenge testing with increased knowledge of what to expect
- **Select** appropriate patients for specific immunotherapy and customize treatment

Case study in component diagnostics

7-year-old girl: Consultation for eczema, rhinitis, and food allergy

Personal history

- Eczema since childhood and uses steroid ointments
- Allergic rhinitis (birch [t3])
- Oral itching when eating peanuts and tree nuts
- The parents want to know if it is okay if their daughter eats peanuts and tree nuts, because recently she has had no reactions to small amounts of these foods

Specific IgE blood test results

- Peanut (f13): 0.40 kU_A/L
- Hazelnut (f17): 78 kU_A/L
- Birch (t3): >100 kU_A/L

Allergen component testing was conducted, with the following results.

Component Test Results	
Peanut f13	0.40 kU _A /L
Ara h 2	0.02 kU _A /L
Ara h 8	21.5 kU _A /L
Hazelnut f17	78 kU _A /L
Cor a 1	69.2 kU _A /L
Cor a 8	0.02 kU _A /L
Birch t3	>100 kU _A /L

Markers of primary sensitization (Ara h 2, Ara h 8, Cor a 1, Cor a 8) and Markers of cross-reactivity PR-10 (Ara h 2, Ara h 8, Cor a 1, Cor a 8) are indicated by arrows pointing to the corresponding test results.

Conclusions

Based on component test results and symptoms, this girl was diagnosed with oral allergy syndrome to birch. The doctor performed an oral food challenge to the nuts, which proved negative so the foods were reintroduced. Component test results provided the doctor with the confidence and clarity to perform the challenge. The high cross-reactivity with birch was deemed responsible for the girl's high whole allergen test results for peanut and hazelnut.

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Specialized testing for specialists

References

1. Nicolaou N, Poorafshar M, Murray C, et al. Allergy or tolerance in children sensitized to peanut: prevalence and differentiation using component-resolved diagnostics. *J Allergy Clin Immunol*. 2010;125(1):191-197. 2. Asarnoj A, Movérare R, Östblom E, et al. IgE to peanut allergen components: relation to peanut symptoms and pollen sensitization in 8-year-olds [published online ahead of print February 8, 2010]. *Allergy*. doi:10.1111/j.1398-9995.2010.02334.x. 3. Kondo M, Suzuki K, Inoue R, et al. Characterization of T-cell clones specific to ovomucoid from patients with egg-white allergy. *J Invest Allergol Clin Immunol*. 2005;15(2):107-111. 4. Valenta R, Twaroch T, Swoboda I. Component-resolved diagnosis to optimize allergen-specific immunotherapy in the Mediterranean area. *J Invest Allergol Clin Immunol*. 2007;17(suppl 1):36-40. 5. Data on file. Phadia AB.

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