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Improving Lives

PINPOINT TRUE ALLERGY TRIGGERS WITH ALLERGEN COMPONENT TESTING

TEST YOUR ALLERGEN COMPONENT ON NOVEOS®

Allergen component information can help you better diagnose allergies/sensitizations and prepare personalized management plans.

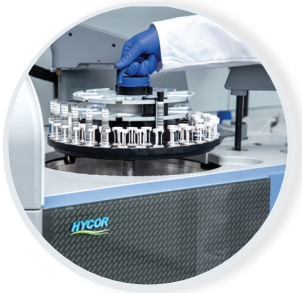
Noveos

THE DIAGNOSTIC ALGORITHM FOR ALLERGIC DISEASE

Clinical History

The first step is a good patient account of their medical history

- Family history
- Symptoms
- Exposure
- Risk factors
- Other



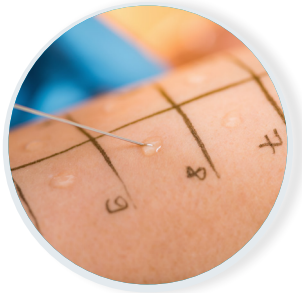
Laboratory Tests

Specific IgE testing to define sensitization:

- Screening / Mixes

Whole allergen testing:

- Inhalant allergens (Regional panels)
- Food allergens



Additional Tests

Confirmation testing

- Skin Prick Test (SPT) Inhalant allergens
- Tryptase
- Histamine provocation
- Pulmonary function tests (PFTs)

INFORMATION NEEDED TO FURTHER COMPLETE THE DIAGNOSIS

Are the findings clinically relevant?

Do the allergens Cross-react?

Information of exposure or provocation needed?

TESTING ALLERGEN COMPONENTS IS THE ANSWER

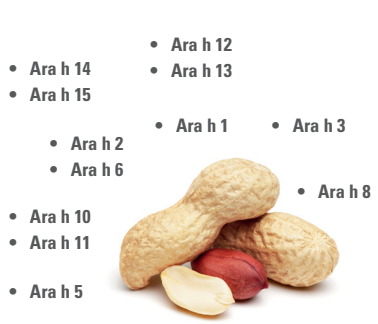
A test with allergen components gets into the details.

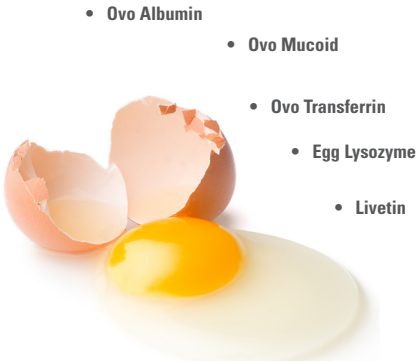
Components help determine what is causing allergy symptoms and which proteins trigger the allergic reaction. It can predict the severity of a reaction.

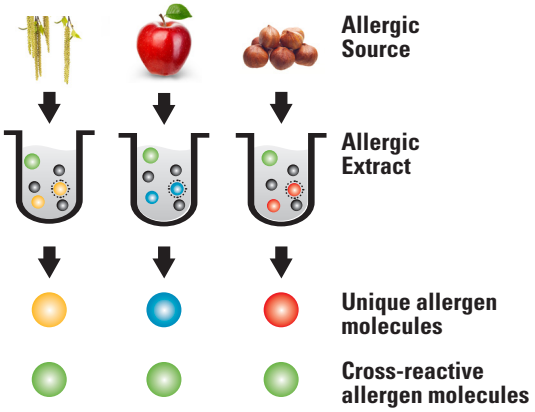
WHAT ARE COMPONENTS?

A Specific Protein Isolated From The Whole Allergen Extract

Components allow you to determine the allergen source as well as the allergy-triggering protein. Allergen sources, such as species of pollen, mites or food contain several proteins that may cause sensitization. There is not just one peanut, or birch pollen allergen. Moreover, not all allergens have the same importance for the patients. Patients are often only sensitized against a few of the proteins present in an extract.







Allergenic proteins can be specific for an allergen or similar in different allergens which can explain cross-reactivity between certain allergens or families of allergen protein groups.

Based on patient reactivity patterns, one can distinguish major and minor allergens. Major allergens are allergens against which more than 50% of all patients are sensitized. With minor allergens less than 50% of the examined patients respond[1].

Component-resolved diagnosis (CRD) is performed with recombinant or purified allergens.

COMPONENT RESOLVED DIAGNOSTICS HELPS TO:

1. Assess the clinical risk for a reaction
2. Explain symptoms due to cross-reactivity
3. Identify the right patients for successful specific immunotherapy

1. RISK ASSESSMENT FOR SEVERE ALLERGIC REACTION

Components are proteins; protein families are based on homology. Protein families share typical characteristics and can be highly cross-reactive or very specific and vary in stability when heating.

These characteristics can be used in allergy risk assessment when testing for components. Heat stable proteins are indicative of a high risk for a severe **systemic allergic reaction**, whereas heat-labile proteins primarily show **local reactions**.

LOCAL REACTION
When a reaction stays with an area of one organ (like the throat)

SYSTEMIC REACTION
When inflammation spreads to other organ systems in the body

INCREASING RISK OF SYSTEMIC REACTION INCLUDING ANAPHYLAXIS

	PLANT PROTEIN GROUPS			SEED STORAGE PROTEINS
STRUCTURAL PROTEINS:	**PROFILINS**	**PR-10 Bet v 1 CLUSTER**	**NON-SPECIFIC LIPID TRANSFER PROTEINS (LTP)**	**STORAGE PROTEINS**
CHARACTERISTICS:	• Heat Labile • Possible panallergen • Highly conserved structure • Strong crossreactive • Seldom associated with clinical symptoms	• Heat Labile, tolerance after boiling food • Associated with local oral symptoms (OAS) for fruits and vegetables	• Heat Stabile, persistence reaction after boiling • Associated with systemic and more severe clinical reactions to fruits and nuts • In most classes but not grass pollens	• Often stable and heat resistant • Associated with systemic and severe reactions • Proteins often found in seeds, legumes and nuts

IGE ANTIBODIES:	• Birch: Bet v 2
	• Peach: Pru p 4
	• Timothy Grass: Phl p 12
		• Birch: Bet v 1
		• Peanut: Ara h 8
		• Soy: Gly m 4
		• Hazelnut: Cor a 1
			• Peanut: Ara h 9
			• Peach: Pru p 3
			• Ragweed: Art v 3
			• Hazelnut: Cor a 8
				Storage Protein Families:
				• 2S Albumins
				  • Peanut: Ara h 2, 6
				• 7S Globulins
				  • Peanut: Ara h 1
				  • Soy: Gly m 5
				• 11S Globulins
				  • Peanut: Ara h 3
				  • Soy: Gly m 6

Figure 1: Reference 2, 3, 4, 5, 6, 7

POLCALCIN

- Allergenic proteins are found only in pollen

CROSS-REACTIVE CARBOHYDRATES DETERMINANTS (CCD)

- Possible pan-allergens, often not clinically significant

PREDOMINANTLY MILD REACTIONS | MILD REACTIONS | SYSTEMIC AND MORE SEVERE REACTIONS | PREDOMINANTLY SEVERE REACTIONS

As in all diagnostic testing, a diagnosis must be made by the physician based on test results, individual patient history, the physician's knowledge of the patient, and the physician's clinical judgement.

2. CROSS-REACTIVITY BETWEEN ALLERGENS EXPLAINED

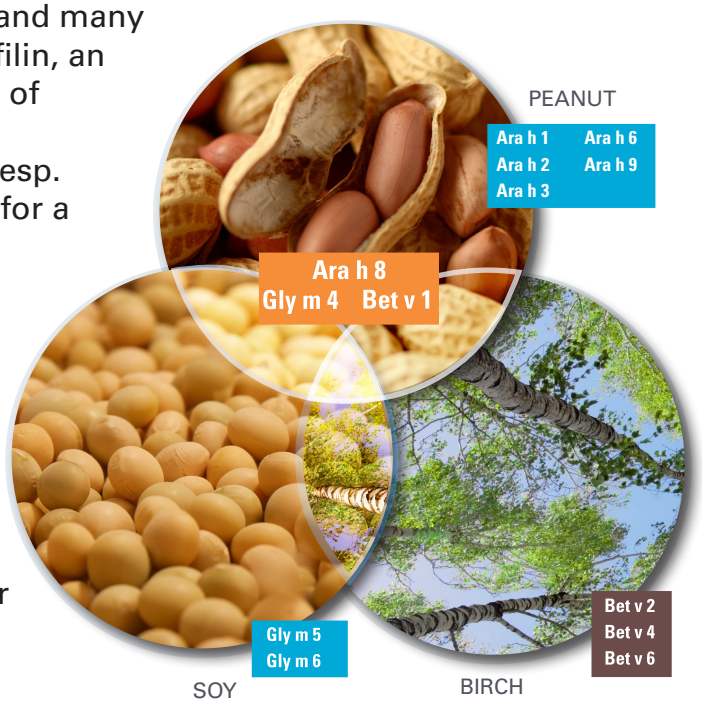
Component resolved diagnostics can help in the individual determination of the patient sensitization pattern. Allergy triggers in a patient may have two main causes:

(1) Reaction on individual molecules that are separately present in different sources. In this case a real polysensitization exists.

(2) Reaction on only one allergen molecule that is present in different sources. Here we speak about an immunological cross-reactivity.

Example: The PR-10 family of proteins, like Bet v1, share a high similarity in sequence and are highly similar in tertiary structure. The amino acid sequences of the molecules cross-react with the Bet v 1 related food proteins like peanut (Ara h 8), hazelnut (Cor a 1), peach (Pru p1) and many more foods. Birch component Bet v2, is profilin, an actin-binding protein, that is found in pollen of different plant families as well as in fruits, vegetables, nuts, spices and latex. Profilin, resp. Bet v2, is consequently a diagnostic marker for a polysensitization based on cross-reactivity.

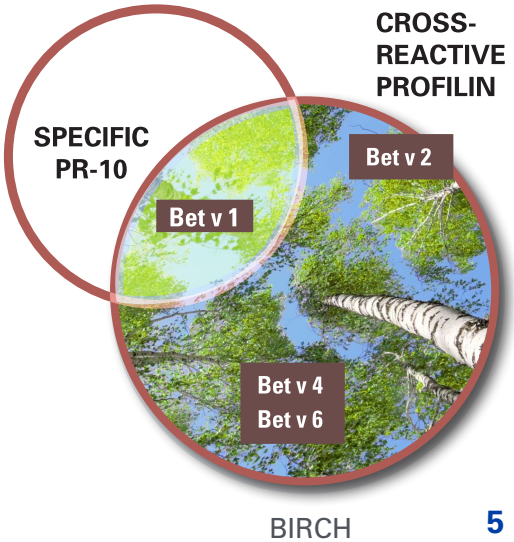
Therefore, it is possible to determine the exact sensitization pattern of an allergic reaction by detection of specific IgE antibodies on components and discover whether it concerns a real sensitization or a cross-reactivity. It also gives more information for the allergy management of a sensitized individual, indicating whether symptoms are likely to be severe.



3. ALLERGEN-SPECIFIC IMMUNOTHERAPY PATIENT SELECTION

Since the actual immunotherapy solutions are standardized for the major allergens of an allergen extract, patients with minor allergen-sensitization are profiting less from an immunotherapy than patients with a major allergen-sensitization.

Testing for allergen components and knowing the exact information of the allergy-triggering protein helps in the diagnosis and management of allergic patients as well as in the selection of a suitable immunotherapy treatment.



NOVEOS Specific IgE Allergens
Recombinant and Native Allergen Components

MENU AS OF JANUARY 2022 • r = RECOMBINANT • n = NATIVE • * MENU IN DEVELOPMENT

FOOD	
nBos d 4 α-lactalbumin, Milk	F076
nBos d 5 β-lactoglobulin, Milk	F077
nBos d 8 Casein, Milk	F078
Gluten, Wheat	F079
*Gliadin	*F098
* Tri a 14 LTP, Wheat	*F433
* Tri a 19 Omega-5 Gliadin, Wheat	*F416
nGal d 1 Ovomucoid, Egg	F233
nGal d 2 Ovalbumin, Egg	F232
rPen a 1 Tropomyosin, Shrimp	F351
rMal d 1 PR-10, Apple	F434
rPru p 1 PR-10, Peach	F419
* Pru p 3 LTP, Peach	*F420
* Pru p 7 Peach	*F454
nAra h 1, Peanut	F422
rAra h 2, Peanut	F423
nAra h 3, Peanut	F424
rAra h 6, Peanut	F447
rAra h 8 PR-10, Peanut	F352
rAra h 9 LTP, Peanut	F427
rCor a 1 PR-10, Hazelnut	F428
rCor a 8 LTP, Hazelnut	F425
* Cor a 9, Hazelnut	* F440
rCor a 14, Hazelnut	F439
* rJug r 1, Walnut	*F441
* rJug r 3 LTP, Walnut	*F442
rAna o 3, Cashew Nut	F443
*rGly m 4 Soy	*F353
*nGly m 5 β-conglycinin, Soy	*F431
*nGly m 6 Glycinin, Soy	*F432

EPIDERMAL & ANIMAL PROTEINS	
rFel d 1, Cat	E094
nFel d 2 Cat Serum Albumin, Cat	E220
rFel d 4, Cat	E228
rCan f 1, Dog	E101
rCan f 2, Dog	E102
nCan f 3 Dog Serum Albumin, Dog	E221
rCan f 5, Dog	E226
nBos d 6 BSA, Cow	E204
rEqu c 1, Horse	E227

MITES, INSECTS & PARASITES	
nDer p 1, House Dust Mite	D202
rDer p 2, House Dust Mite	D203
rDer p 10, House Dust Mite	D205
rDer p 23, House Dust Mite	D209
rVes v 5, Common Wasp	I209
rVes v 1, Common Wasp	I211

GRASS/WEEDS	
rPhl p 1, Timothy	G205
rPhl p 2, Timothy	G206
rPhl p 5b, Timothy	G215
rPhl p 6, Timothy	G209
rPhl p 7, Timothy	G210
rPhl p 11, Timothy	G211
rPhl p 12, Timothy	G212
nAmb a 1, Ragweed	W230
rArt v 1 Mugwort	W231

MOLD	
rAlt a 1	M229

OCCUPATIONAL	
nGal d 4 Lysozyme, Egg	K208

TREES	
rBet v 1 PR-10, Birch	T215
rBet v 2 Profilin, Birch	T216
rBet v 4, Birch	T220
rBet v 6, Birch	T225
rBet v 2, rBet v 4, Birch	T221
rOle e 1, Olive	T224

EC REP Advena Ltd. Tower Business Centre, 2nd Floor Tower Street, Swatar, BKR 4013 Malta

CE These products are not currently available in the United States and in some regions outside of Europe.

REFERENCES

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Improving the health, well-being and quality of life of individuals with allergic conditions.

HYCOR Biomedical
7272 Chapman Avenue
Garden Grove, California 92841, USA
+1 714 933 3000
CustomerServices-US@hycorbiomedical.com

HYCOR Europe B.V.
Mercuriusplein 19b,
2132 HA Hoofddorp, Netherlands
+31 (0)20 899 4280
CSEurope@hycorbiomedical.com

HYCOR FRANCE
5 rue de Castiglione
75001 Paris, France
+33 1 30 46 75 21
AllergieActualite@hycorbiomedical.com

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www.HycorBiomedical.com