







ImmunoCAP ISAC® Immuno Solid-phase Allergen Chip

VBC Genomics and Phadia have combined innovative biochip technology with cutting-edge research in molecular allergology to develop ImmunoCAP ISAC[®]the most advanced in vitro diagnostic test for measurement of specific IgE antibodies to allergen components.

Component resolved diagnostics

ImmunoCAP ISAC[®] is the first multiplex *in vitro* diagnostic tool for the allergy specialist that is based exclusively on allergen components.

Currently available standard products for in vivo allergy testing are based on allergen extracts prepared from biological raw materials. They represent natural mixtures of allergenic and non-allergenic molecules that are generally not fully standardized referring to their content of major or minor allergen components.

Today, the increasing availability of allergen components, purified from their natural source or biotechnologically produced as recombinant proteins, marks the beginning of a revolution in allergy diagnosis and leads to a gradual transition toward component resolved diagnostics (CRD).

Many biological sources contain highly cross-reactive allergen components, for example profilin, which is present in a broad variety of plant pollen and plant-derived food. A sensitization toward such a panallergen creates positive test results against numerous allergen extracts. Consequently, when using extract-based specific IgE testing it is difficult to identify the correct allergen source when only cross-reactive allergen components are involved.

A decision on whether a patient should undergo specific immunotherapy should not only be based on currently available allergenic extract preparations but should preferably be verified by testing with both specific and cross-reactive marker allergen components.

Availability of specific and cross-reactive marker components creates the platform for more informative diagnostics.



Based on modern biochip technology, ImmunoCAP ISAC[®] is a miniaturized immunoassay platform that allows for multiplex measurement of specific IgE antibodies to many allergen components using only 20 µl of serum or plasma. Capillary blood sampling can be used, enabling a less invasive procedure for testing young children.

Purified natural or recombinant allergen components are immobilized on a solid support (biochip).













In a two step assay, IgE antibodies from the patient serum bind to the immobilized allergen components. After a short washing step, allergen-bound IgE antibodies are detected by a fluorescence-labeled anti-IgE antibody.

Test results are measured with a biochip scanner and evaluated using proprietary software. ImmunoCAP ISAC® is a semiquantitative test and results are reported in ISAC Standardized Units (ISU).

1 mm		ISU	Class
	rBet v 1	78.4	
	rAln g 1	53.7	
	rCor a 1.0101	10.6	
	rCor a 1.0401	17.8	
	rMal d 1	13.4	
	rPru p 1	0	
	rGly m 4	16.6	
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	rApi g 1	3.1	
	rDau c 1	1.4	

ImmunoCAP ISAC[®] allergen components

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Allergen component	Allergen source COMMON NAME
Non-Plants	
nBos d 4 nBos d 5 nBos d 6 nBos d 8 nBos d lactoferrin nGal d 1 nGal d 2 nGal d 3 nGal d 5 rCyp c 1 rGad c 1	Cow's milk Cow's milk BSA Cow's milk Cow's milk Egg Egg Egg CSA (Livetin) Carp Cod
rDer f 1 rDer f 2 nDer p 1 nDer p 2 rEur m 2	House dust mite House dust mite House dust mite House dust mite Storage mite
rCan f 1 rCan f 2 nCan f 3 nEqu c 3 rFel d 1 nFel d 2 rFel d 4 nMus m 1	Dog Dog Horse Cat Cat Cat Mouse
rAlt a 1 rAlt a 6 rAsp f 1 rAsp f 2 rAsp f 3 rAsp f 4 rAsp f 6 rCla h 8	Alternaria Alternaria Aspergillus Aspergillus Aspergillus Aspergillus Aspergillus Cladosporium
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rBla g 1 rBla g 2 rBla g 4 rBla g 5	Cockroach Cockroach Cockroach Cockroach
rAni s 1	Anisakis
Cross-reactive markers, n	-
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nPen m 1	Shrimp

The above tests are laboratory-developed tests. Interpretation of the results is the responsibility of the healthcare provider.

ImmunoCAP ISAC[®] allergen components

LATIN NAME

$\begin{array}{l} \alpha \text{-lactalbumin} \\ \beta \text{-lactoglobulin} \\ \text{Serum albumin} \\ \text{Caseins} \\ \text{Lactoferrin} \\ \text{Ovomucoid} \\ \text{Ovalbumin} \\ \text{Conalbumin} \\ \text{Serum albumin} \\ \text{Parvalbumin} \\ \text{Parvalbumin} \end{array}$
Lipocalin Lipocalin Serum albumin Serum albumin Uteroglobin Serum albumin Lipocalin Lipocalin
Phospholipase A2 Melittin
Tropomyosin Tropomyosin Tropomyosin Tropomyosin Tropomyosin Tropomyosin

PROTEIN GROUP

ImmunoCAP ISAC[®] allergen components

PR-10 protein, Bet v 1 homologue

- □ A heat-labile protein, cooked foods are often tolerated
- □ Often associated with local symptoms such as oral allergy syndrome (OAS)
- Often associated with allergic reactions to fruit and vegetables in northern Europe

LTP (non-specific Lipid Transfer Protein, nsLTP)

- A protein stable to heat and digestion causing reactions also to cooked foods
- Often associated with systemic and more severe reactions in addition to OAS
- Often associated with allergic reactions to fruit and vegetables in southern Europe

Profilin

Seldom associated with clinical symptoms but may cause demonstrable or even severe reactions in a small minority of patients

Storage protein

- Protein found in seeds serving as source material during the growth of a new plant
- Often stable and heat-resistant proteins causing reactions also to cooked foods

CCD

- A marker for sensitization to cross-reactive carbohydrate determinants
- □ Seldom associated with clinical symptoms but may cause demonstrable or even severe reactions in a small minority of patients

Lipocalin

- Very stable proteins
- Allergen components displaying limited cross-reactivity between species

Parvalbumin

- A major allergen in fish
- A marker for cross-reactivity among different species of fish and amphibians
- A protein stable to heat and digestion causing reactions also to cooked foods

Serum albumin

- A common protein present in different biological fluids and solids e.g., cow's milk and beef, egg and chicken
- Cross-reactions between albumins from different animal species are well known, for example between cat and dog and cat and pork

Tropomyosin

- □ An actin-binding protein in muscle fibers
- A marker for cross-reactivity between crustaceans, mites, and cockroach

Advantages of ImmunoCAP ISAC[®] technology

- Multiplex specific IgE measurement to allergen components from over 40 common allergen sources in a single test
- Component resolved diagnostics (CRD) using only purified natural or recombinant allergen components
- Marker allergen components specific and indicating cross-reactivity
- Semi-guantitative results based on fluorescence measurements
- High reliability by intrinsic replicate testing and quality controls

The above tests are laboratory-developed tests. Interpretation of the results is the responsibility of the healthcare provider.

The tool for the future in allergy diagnostics – available today!



Multiplex specific IgE measurement provides new opportunities— ImmunoCAP ISAC®



Specialized testing for specialists

www.phadia.us

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Phadia US Inc 4169 Commercial Avenue Portage, MI 49002 800.346.4364