

Final Report Date:	09-25-2018 15:00	Specimen Collected:	09-24-2018 15:00
Accession ID:	1809250257	Specimen Received:	09-25-2018 09:00

LAST NAME	FIRST NAME	MIDDLE NAME	GENDER	DATE OF BIRTH	ACCESSION ID
PEANUT ZOOMER	DEMO		MALE	1996-04-13	1809250257

## PATIENT

Name: DEMO PEANUT ZOOMER  
 Date of Birth: 1996-04-13  
 Gender: Male  
 Age: 22  


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 Telephone #: 666-666-8888  
 Street Address: 1021 HOWARD AVENUE SUITE B  
 City: SAN CARLOS  
 State: CA Zip #: 94070  
 Email: demo@demo.com  


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 Fasting: FASTING

## PROVIDER

Practice Name: Demo Client, MD  
**Provider Name: Demo Client, MD (999994)**  
 Phlebotomist:  
 Street Address: 1021 HOWARD AVENUE  
 City: SAN CARLOS  
 State: CA  
 Zip #: 94070  
 Telephone #: 800-842-7268  
 Fax #: 222-222-2222

Your Vibrant Wellness Food Zoomer results are enclosed. These results are intended to help you make healthy lifestyle and dietary choices in consultation with your healthcare provider. It is intended to be used as a tool to encourage informed nutritional and health changes.

**Vibrant Food Bundle** is an array of corn antigens which offers very specific antibody-to-antigen recognition. The panel is designed to assess an individual's IgG and IgA sensitivity to these antigens at the peptide level.

**Interpretation of Report:** The test results of antibody levels to the individual proteins are calculated by comparing the average intensity of the individual protein antibody to that of a healthy reference population. Reference ranges have been established using 192 healthy individuals. The results are displayed as Positive +, Moderate Sensitivity ✓ or Negative -. A Positive result indicates that you have an increased IgG/IgA reaction to the antigen with respect to the reference range. A Moderate sensitivity result indicates that you have a moderate IgG/IgA reaction to the food antigen with respect to the reference range. A Negative or no sensitivity result indicates that you have a low IgG/IgA reaction to the food antigen with respect to the reference range. Vibrant utilizes proprietary fluorescent analysis which is designed to assay specific total IgG (subclasses 1, 2, 3, 4), and total IgA (subclasses 1, 2) antibodies. The classification of Positive to Moderate to Negative denotes the level of IgG and/or IgA antibodies detected through this analysis.

The Vibrant Wellness platform provides tools for you to track and analyze your general wellness profile. Testing for corn sensitivity offered by Vibrant Wellness is performed by Vibrant America LLC, a CLIA certified lab CLIA#:05D2078809. Vibrant Wellness provides and makes available this report and any related services pursuant to the Terms of Use Agreement (the "Terms") on its website at www.vibrant-wellness.com. By accessing, browsing or otherwise using the report or website or any services, you acknowledge that you have read, understood, and agree to be bound by these terms. If you do not agree to accept these terms, you shall not access, browse or use the report or website. The statements in this report have not been evaluated by the Food and Drug Administration and are only meant to be lifestyle choices for potential risk mitigation. Please consult your physician/dietitian for medication, treatment, or lifestyle management. This product is not intended to diagnose, treat, or cure any disease

**Please Note** - It is important that you discuss any modifications to your diet, exercise and nutritional supplementation with your physician before making any changes. To schedule an appointment with Vibrant Clinical Dietitians please call: Toll-Free **866-364-0963**.



# PEANUT ZOOMER

## Peanut Zoomer

Peptide level identification of peanut sensitivity



1(866) 364-0963  
support@vibrant-wellness.com



[www.vibrant-wellness.com](http://www.vibrant-wellness.com)



1360 Bayport Ave. Ste. B  
San Carlos, CA 94070

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**Vibrant Wellness** is pleased to present to you the Peanut Zoomer, to help you make healthy lifestyle and dietary choices in consultation with your healthcare provider. It is intended to be used as a tool to encourage a general state of health and well-being.

**The Vibrant Peanut Zoomer** is an array of peanut antigens which offers very specific antibody-to-antigen recognition. The panel is designed to assess an individual's IgG and IgA sensitivity to these antigens.

**Interpretation of Report:** The test results of antibody levels to the individual proteins are calculated by comparing the average intensity of the individual protein antibody to that of a healthy reference population. Reference ranges have been established using 192 healthy individuals. The results are displayed as Positive, Moderate Sensitivity or Negative. A Positive result indicates that you have an increased IgG/IgA reaction to the antigen with respect to the reference range. A Moderate sensitive result indicates that you have a moderate IgG/IgA reaction to the food antigen with respect to the reference range. A Negative or no sensitivity result indicates that you have a low IgG/IgA reaction to the food antigen with respect to the reference range. Vibrant utilizes proprietary fluorescent analysis which is designed to assay specific total IgG (subclasses 1, 2, 3, 4), and total IgA (subclasses 1, 2) antibodies. The classification of Positive to Moderate to Negative denotes the level of IgG and/or IgA antibodies detected through this analysis.

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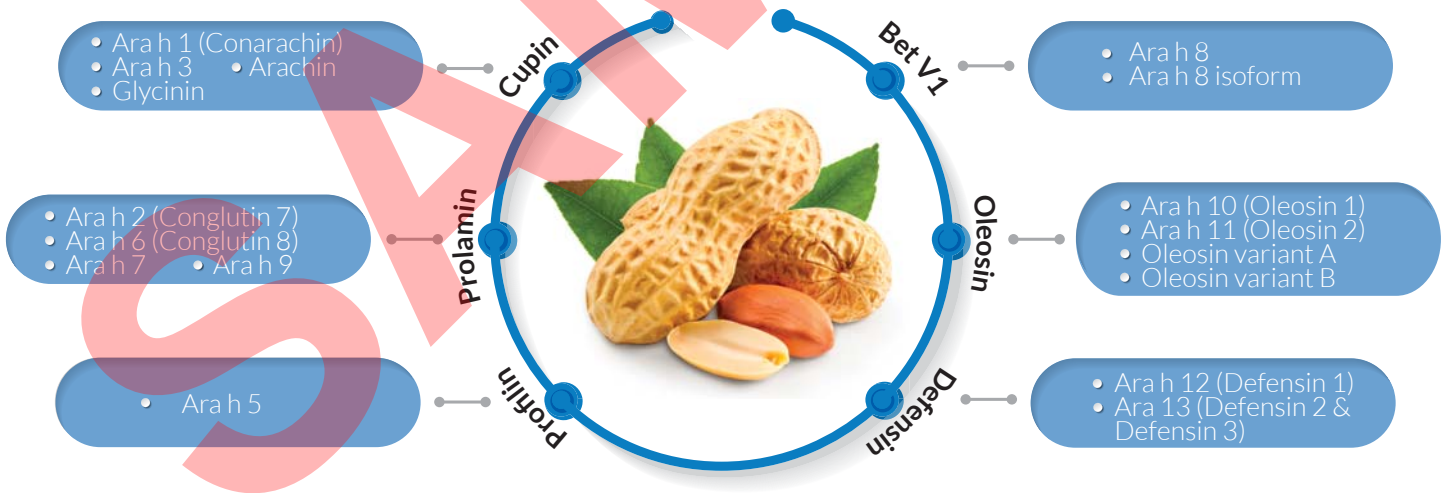
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## INTRODUCTION

**Peanuts** are one of the most widely used nut sources in processed foods, mostly in the US and European countries, due to their high-quality protein and oil content. The most abundant peanut protein is known as Ara h 1 and contributes 12-16% of the total protein content of a peanut. Unfortunately, apart from its high nutritional value, peanut also has been recognized as one of the most prevalent and severe food hypersensitivities in westernized countries, showing a sudden increase from 0.6% in 1997 to 1.1% of the US population in 2002.<sup>1</sup> Unfortunately, it is also highly difficult to follow peanut-free diets, because most processed foods contain peanuts as protein extenders.

Early diagnosis of peanut sensitivity can greatly increase the quality of life of patients and reduce the risk of developing future diseases. Other than oral food challenge, a routine test of peanut sensitivity is to detect the reactivity of IgG and IgA antibodies in the blood to a peanut extract.<sup>2</sup> Unfortunately, often pseudo-positive results are seen that do not correlate with the individual's symptoms. This may be due to the contamination of raw extract of peanuts used in the test with pollens or other allergens that can show cross-reactivity. Our product, the Vibrant™ Peanut Zoomer, addresses this issue by replacing crude peanut extracts with in vitro synthesized peptide sequences immobilized on a microarray. This process can reduce pseudo-positive results and identify peanut-sensitive individuals by evaluating their response to IgG and IgA mediated antigenic peptides. Additionally, our product covers a broad spectrum of the well-established peanut antigens and additional antigenic isoforms that have been recently discovered as potential peanut antigens, which has an added advantage of identifying even minor occult sensitivities toward peanuts.



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## SUMMARY

**Positive for IgG:** Consider eliminating these foods from your diet in consultation with your healthcare provider.  
**Moderate for IgG:** Consider rotation plan/eliminating these foods from your diet in consultation with your healthcare provider.  
**Positive/Moderate for IgA:** Consider eliminating these foods from your diet in consultation with your healthcare provider.

Positive		Moderate		Negative			
IgG	IgA	IgG	IgA				
	Cupin Ara h 3		Cupin Glycinin  Bet V1 Ara h 8, Ara h 8 isoform	Cupin			
				Ara h 1 (Conarachin)	Arachin		
				Ara h 2 (Conglutin 7)	Ara h 6 (Conglutin 8)	Ara h 7	Ara h 9
				Prolamin			
				Ara h 5	Profilin		
				Oleosin			
				Ara h 10 (Oleosin 1)	Ara h 11 (Oleosin 2)	Oleosin variant A	Oleosin variant B
				Defensin			
				Ara h 12 (Defensin 1)	Ara 13 (Defensin 2 & Defensin 3)		

## Peanut IgE

Test name	In Control	Moderate	High Risk	In Control Range	Moderate Range	High Risk Range	Previous
Peanut IgE (kU/L)		0.80		≤0.34	0.35~3.49	≥3.50	0.70 08/25/2018

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## LIFESTYLE CONSIDERATIONS

Peanut sensitivity can greatly affect the quality of life of sensitive individuals, and may lead to increased food-related anxiety. Early detection of peanut sensitivity will help to identify a proper individualized management plan and enable confidence in dietary and social activities. Here are some lifestyle considerations that can be followed when compiling your individualized management plan for peanut sensitivity:

### ➤ Avoid peanut containing foods if you are highly sensitive to peanuts.

The primary and important standard of care management to avoid peanut-related incidents is to strictly adhere to a peanut free diet. Some of the peanut-containing foods/non-foods and potential risk foods are listed below.

Peanut containing food	Foods that may contain peanuts	Other names for peanuts	Non-food sources of peanuts
Mixed nuts with peanuts	Almond and hazelnut pastes	Arachide	Ant baits, bird feed, mouse traps, pet food
Peanut butter	Baked goods (e.g. cakes, muffins, donuts, etc.)	Ground nuts	Stuffing in toys
Peanut flour	Granola bars, energy bars or fruit bars	Arachis oil	Craft materials
Peanut meal	Cereals	Kernels	Sunscreen/suntan lotion (some)
Peanut punch/drink	Marzipan	Nut meats	Lip glosses (some)
	Nougat	Goober nuts, goober peas	Vitamins (some)
	Peanut popcorn		
	Potato chips (may be made with peanut oil)		

➤ Supplemental digestive enzymes are specially formulated to improve digestive health by improving overall enzyme activity and may decrease symptoms associated with food sensitivities. They help augment the body's own pancreatic enzymes in individuals with low pancreatic enzyme output. Specific enzymes digest specific food groups. For example, protease (proteolytic) enzymes digest protein by breaking it down into amino acids.

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## LIFESTYLE CONSIDERATIONS

### Follow a physician recommended rotation diet if you are moderately sensitive to peanut

A rotation diet will help you to avoid high sensitivity foods from your diet and include mild to low sensitive foods once every 4 days. If you are not consuming the food that you are mildly sensitive to on a regular basis, you reduce the stress on the immune system. This will allow you to occasionally consume the food you are mildly sensitive to and reduces the risk of developing sensitivities for new foods.

### Always read advisory labels before consumption

In the US and most other countries, it is a legal requirement that the product labels of pre-packaged foods should clearly and accurately provide information on allergenic food such as peanuts. There are two main places on the label to find this necessary information. The first is the ingredient list which should highlight peanuts, almonds, hazelnuts, walnut, cashew nut, pistachio nut, brazil nut, pecan nut, macadamia nut, or Queensland nut. The second is the precautionary label containing either 'may contain' or 'not suitable for' statements.<sup>10</sup> The second label is not mandatory to highlight. Hence, peanut sensitive individuals are always advised to check the label before consumption. Moreover, the law clearly states that restaurants and cafes are required to provide their customers clear information about nuts in non-packaged foods.

### Educate yourself about cross-reactive foods

It is advisable for individuals with peanut sensitivities to avoid all tree nuts. Studies have shown that a significant number of patients with peanut sensitivity and allergy will also develop sensitivity to one or more tree nuts. Hence, the best practice is to completely avoid all types of tree nuts.

### Boil or fry peanuts without roasting them

Studies have shown that dry roasted peanuts may invoke more immune reactions compared to fried or boiled peanuts. The higher temperature used when roasting increases the antigenic properties of peanut proteins. Hence, it is advised to avoid roasted peanuts even if you have a minor sensitivity to peanuts.<sup>11</sup>



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## Cupin Family:

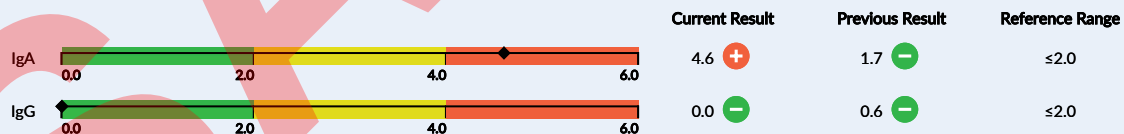
### Ara h 1

Ara h 1 is a major antigen located in the peanut cotyledon. It is a vicilin family seed storage protein and is alternatively known as conarachin. Ara h 1 protein acts as a nitrogen and amino acid source for developing new peanut plants.<sup>5</sup> It is resistant to heat and proteolytic digestion. High concentrations of Ara h 1 are seen in larger kernels compared to smaller seeds; hence, the expression of the protein is associated with the maturity of peanuts.<sup>6</sup> In addition to providing nourishment to the plant, Ara h 1 is considered one of the most important antigens in the etiology of peanut sensitivity. Over 90% of individuals show that Ara h 1 protein is recognized in the serum of peanut sensitive individuals, thus confirming its vital role in peanut sensitivity.<sup>7</sup> Different cooking methods can reduce the antigenicity of peanuts to different levels, while the relative amounts of Ara h 1 are greatly reduced in fried and boiled peanuts compared to roasted peanuts.<sup>8</sup> It has also been shown that Ara h 1 can persist in saliva after peanut ingestion and invoke immune responses in peanut sensitive individuals. Thus, it is advised to take precautions if sharing utensils or kissing.<sup>10</sup> Moreover, lupin, a substitute for wheat or soy has a significant cross-reactivity with Ara h 1.<sup>6</sup>



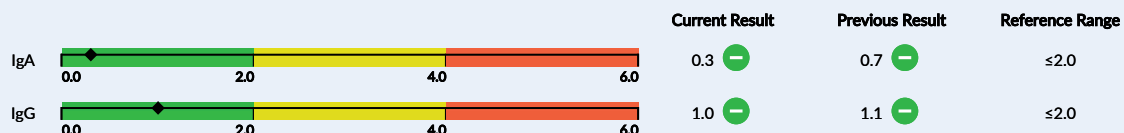
### Ara h 3

Ara h 3 is a major antigen, which belongs to legumin like 11s globulin proteins. It is a seed storage protein located in the peanut cotyledon and acts as a trypsin inhibitor.<sup>6</sup> Previously distinct Ara h 3 and Ara h 4 are now considered to be the same antigens due to their high sequence similarity.<sup>9</sup> Ara h 3 has high sequence similarity to soybean glycinin protein. It also shares some structural similarities with tree nuts that accounts for the cross reactivity between peanut and tree nuts.<sup>6</sup> Moreover, mustard antigen has cross reactivity between 11S globulins from peanuts and tree nuts.<sup>6</sup>



### Arachin and glycinin

Arachin is a member of the legumin-like globulins which accumulates as hexameric complexes consisting of four or six polypeptides. It is a major seed storage globulin protein in peanut. Glycinin accounts for more than 50% of globulin proteins. These globulins contain a high percentage of basic nitrogen when compared with the proteins of other seeds commonly used for food. Ara h 3 (described above) is considered one of the isoforms of glycinin proteins.<sup>9</sup>





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## Prolamin Family:

### Ara h 2

Ara h 2 is one of the major antigens in peanut. It is a member of the conglutin family seed storage protein located in the peanut cotyledon. It serves as a source of amino acids for the growth of seedlings and acts as a defensive agent against pathogens in the plant.<sup>6</sup> Conglutin 7 protein is alternatively known as Ara h 2 antigen.<sup>5</sup> There are two isoforms, Ara h 2.01 and Ara h 2.02. Ara h 2 protects Ara h 1 from degradation by trypsin due to its weak trypsin inhibitor capability.<sup>10</sup> Ara h 2 is considered the biggest culprit of the peanut antigens and the most important predictor of clinical reactivity for peanuts. Some epitopes of Ara h 2 showcase cross reactivity with Ara h 1, Ara h 3, and Ara h 6 in peanuts. Although peanut and tree nuts (e.g., walnut, brazil nuts, pecan) share the common albumin antigens, no cross reaction has been shown between Ara h 2 and these antigens.<sup>6</sup> Similar to Ara h 1, antigenicity of Ara h 2 is increased in roasted peanuts compared to boiled and fried peanuts. Moreover, lupin, a substitute to wheat or soy has a significant cross reactivity with Ara h 2.<sup>6</sup>



### Ara h 6

Ara h 6 (or known as Conglutin 8) is now considered one of the major peanut antigens. It is a seed storage protein that belongs to the 2s albumin family. It is in the peanut cotyledon and provides required amino acids to the seedling. It is resistant to heat and proteolytic digestion with a protease-stable core. Ara h 6 has 59% structural homology to Ara h 2 and has the same secondary and tertiary structural features. Until recently, Ara h 2 was featured as one of the most powerful antigens in peanuts, but now Ara h 6 is also recognized as a main predictor of peanut antigenicity, same as Ara h 2.<sup>9</sup> Ara h 6 shows major cross-reactivity between Ara h 1, 2, and 3.<sup>1</sup> The combination of Ara h 2 and Ara h 6 provides a better clinical diagnosis.



### Ara h 7

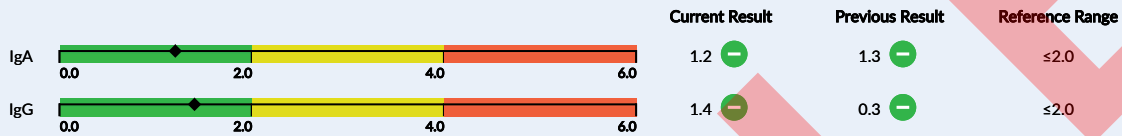
Ara h 7 is a minor antigen, which is a 2s albumin protein that belongs to the conglutin protein family. It functions as a trypsin inhibitor in plants. Two isoforms of Ara h 7.0101 and Ara h 7.0201 were recently discovered, but only Ara h 7.0201 was found as a peanut antigen. Ara h 7 shows structural similarities to Ara h 2 and Ara h 6 but has not shown high antigenicity as in Ara h 2 or 6.<sup>6</sup>



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## Ara h 9

Ara h 9 is a minor antigen that is classified as a non-specific Lipid Transfer Protein (nSLTP), which can transfer various lipid molecules across the lipid bilayer and act as a defensive agent against pathogens.<sup>6</sup> Ara h 9 plays a vital role in the peanut sensitive individuals from the Mediterranean region and some nSLTP sensitized patients from Central Europe.

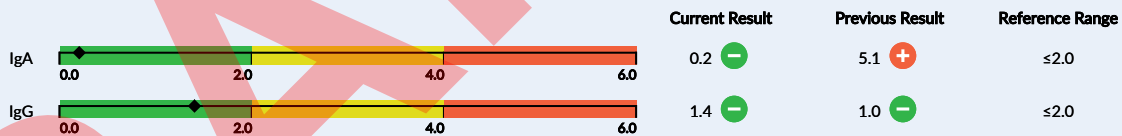


## Profilin Family:



## Ara h 5

Peanut profilin Ara h 5 is considered a minor antigen that is known to regulate polymerization and depolymerization of actin monomers. Ara h 5 is involved in pollen-associated peanut sensitivity.<sup>9</sup> The sensitization to Ara h 5 differs with geographical area where 3.3% of affected individuals in the United States, 9-16% of affected individuals in Northern and Central Europe, and 24% of affected individuals of Spanish descent had immune reactions to Ara h 5. This is due to the cross-reactivity of Ara h 5 with birch pollen profilin and/or grass pollen profilin.<sup>6</sup> Moreover, this cross-reactivity with pollen profilins is one of the reasons for false positive results in routine blood tests using the whole protein extract method, because the extract can often be contaminated with pollen. Our product, the Vibrant™ Peanut Zoomer, uses a peptide microarray that can successfully eliminate the issue with cross-reactive pollens containing Ara h 5.



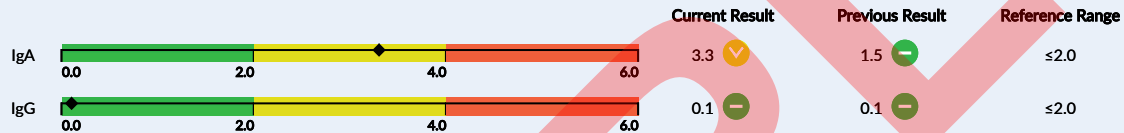
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## Bet V1 family:



### Ara h 8 and Ara h 8 isoform

Ara h 8 is a minor antigen that belongs to the pathogenesis-related protein family (PR-10). PR-10 proteins are involved in plant defense because their genes are usually induced upon the attack of various pathogens and by environmental stresses. These proteins also display several additional functions, including a role in developmental processes and enzymatic activities in secondary metabolism. Ara h 8 has low stability to roasting and no stability to gastric digestion. It reacts against pathogen infections, environmental stress, and antibiotics.<sup>12</sup> Ara h 8 is important because it has cross-reactivity for birch pollen antigens that can cause peanut sensitivity in individuals who are sensitive or allergic to birch pollens.

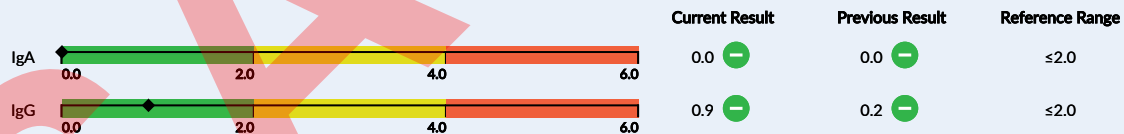


## Oleosin family:



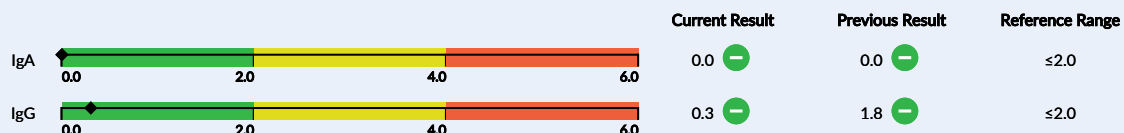
### Ara h 10

Ara h 10 is a minor antigen alternatively known as Oleosin 1<sup>2</sup> with two isoforms, Ara h 10.0101 and Ara h 10.0102. Oleosins, the major protein in oleosome, act as structural proteins of lipid storage organelles. They are only seen in plants and are abundant in seeds. Since Ara h 10 has been found recently as an antigen in peanuts, its precise role in antigenicity is still uncertain. Ara h 10 isoforms have high sequence similarities to hazelnut oleosins and sesame oleosins, hence may trigger cross reactivities.<sup>13</sup>



### Ara h 11

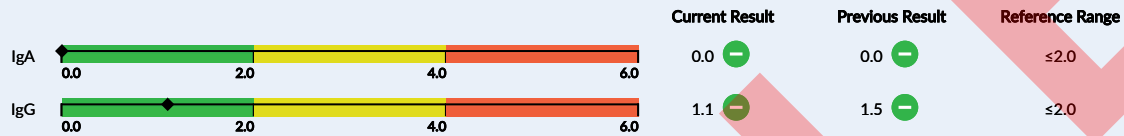
Ara h 11 (known as Oleosin 2<sup>14</sup>) is a minor antigen that acts as a plant structural protein of oil bodies in peanut seeds that stabilize oil bodies in oleosomes. Each oil body contains 1-4% oleosins, hence, in general, seeds and nuts with high lipid content will contain increased amounts of oleosins. They are unique proteins in plants. Ara h 11 has two isoforms, Ara h 11.0101 and Ara h 11.0102. There are different oleosin proteins available in hazelnut and sesame with structural similarities to peanut oleosins, thus peanut may cross react with hazelnut and sesame.<sup>12</sup>



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## Oleosin Variant A and Oleosin B

These minor antigenic peanut oil body proteins were found recently and classified as isoforms of Ara h 14. Isoforms Ara h 14.0101 and Ara h 14.0102 are considered oleosin variant A and oleosin variant B, respectively. Both oleosin variant A and oleosin variant B, are of the same size (176 amino acids,) differing by seven amino acids.<sup>13</sup> Oleosin variant B shows a sequence identity of 96% to variant A.<sup>15</sup>

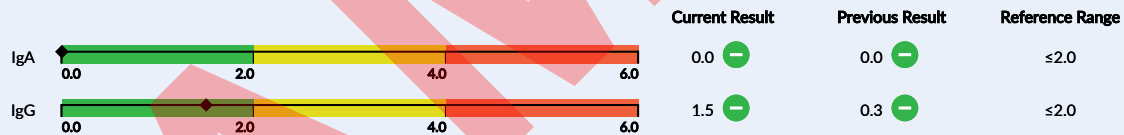


## Defensin family:



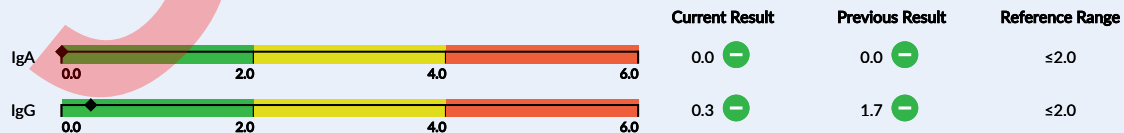
### Ara h 12

Ara h 12 (alternatively known as defensin 1) is a minor antigen acting as a plant defensin protein that has antifungal and antibacterial activity.<sup>12</sup> Because it was discovered recently, its clinical relevance is not yet fully understood. However, it has been shown that Ara h 12 is present in patients with mild to severe peanut sensitivities.



### Ara h 13

Ara h 13 is a minor antigen belonging to plant defensive proteins like Ara h 12 and has antifungal and antibacterial activity. It has two isoforms, Ara h 13.0101 (alternatively known as defensin 2) and Ara h 13.0102 (alternatively known as defensin 3).<sup>12</sup> Little information is available due to its recent discovery as a peanut antigen.



## Key Terms/Glossary

### Allergen

a protein alternatively known as the antigen that can invoke an immune response

### Allergenicity

causing allergic sensitization

### Anaphylaxis

an acute allergic reaction to an antigen (allergenic protein) to which the body has become hypersensitive

### Conformation

structural arrangement

### Cross reactivity

an antibody directed against one specific antigen (allergen) is successful in binding with another, different antigen

### Globulin protein

a family of globular proteins which are insoluble in pure water but dissolve in dilute salt solutions

### IgA

Immunoglobulin A is a type of antibody produced against an antigen

### IgG

Immunoglobulin G is a type of antibody produced against an antigen

### Isoforms

two or more functionally similar proteins that have a similar but not identical amino acid sequence

### Monosensitization

sensitive to only one allergen

### Onset

first appearance of symptoms

### Pathogens

a bacterium, virus, or other microorganism that can cause disease

### Peanut sensitivity

immune reactivity mediated by IgG and IgA antibodies

## Key Terms/Glossary

### Peptide sequence

short sequence of amino acids

### Polymerization

a process of reacting monomer molecules together in a chemical reaction to form polymer chain networks

### Polysensitization

sensitive to more than one allergen

### Superfamily

a taxonomic category that ranks above family and is comprised of families sharing a set of similar nature or character

### Trypsin

a digestive enzyme that breaks down proteins in the small intestine

SAMPLE

## Citations/Sources

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## Risk and Limitations

This test has been developed and its performance characteristics determined by Vibrant America LLC., a CLIA certified lab. These assays have not been cleared or approved by the U.S. Food and Drug Administration.

Quantification of specific IgG and IgA antibodies is not FDA- recognized diagnostic indicator of allergy.

Peanut sensitivity testing is performed at Vibrant America, a CLIA certified laboratory, and utilizes ISO-13485 developed technology. Vibrant America has effective procedures in place to protect against technical and operational problems. However, such problems may still occur. Examples include failure to obtain the result for a specific antigen due to circumstances beyond Vibrant's control. Vibrant may re-test a sample in order to obtain these results but upon re-testing the results may still not be obtained. As with all medical laboratory testing, there is a small chance that the laboratory could report incorrect results.

A tested individual may wish to pursue further testing to verify any results. The information in this report is intended for educational purposes only. While every attempt has been made to provide current and accurate information, neither the author nor the publisher can be held accountable for any errors or omissions.

Vibrant Wellness makes no claims as to the diagnostic or therapeutic use of its tests or other informational materials. Vibrant Wellness reports and other information do not constitute medical advice and are not a substitute for professional medical advice. Please consult your healthcare practitioner for questions regarding test results, or before beginning any course of supplementation or dietary changes.