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| Final Report Date: | 09-25-2018 15:02 | Specimen Collected: | 09-24-2018 15:02 |
| Accession ID: | 1809250261 | Specimen Received: | 09-25-2018 09:02 |

| LAST NAME | FIRST NAME | MIDDLE NAME | GENDER | DATE OF BIRTH | ACCESSION ID |
|--------------|------------|-------------|--------|---------------|--------------|
| DAIRY ZOOMER | DEMO | | MALE | 1996-04-13 | 1809250261 |

PATIENT

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

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

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**.



DAIRY ZOOMER

Dairy Zoomer

To identify, monitor, and manage dairy sensitivity



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



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 Dairy 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 Dairy Zoomer is an array of dairy 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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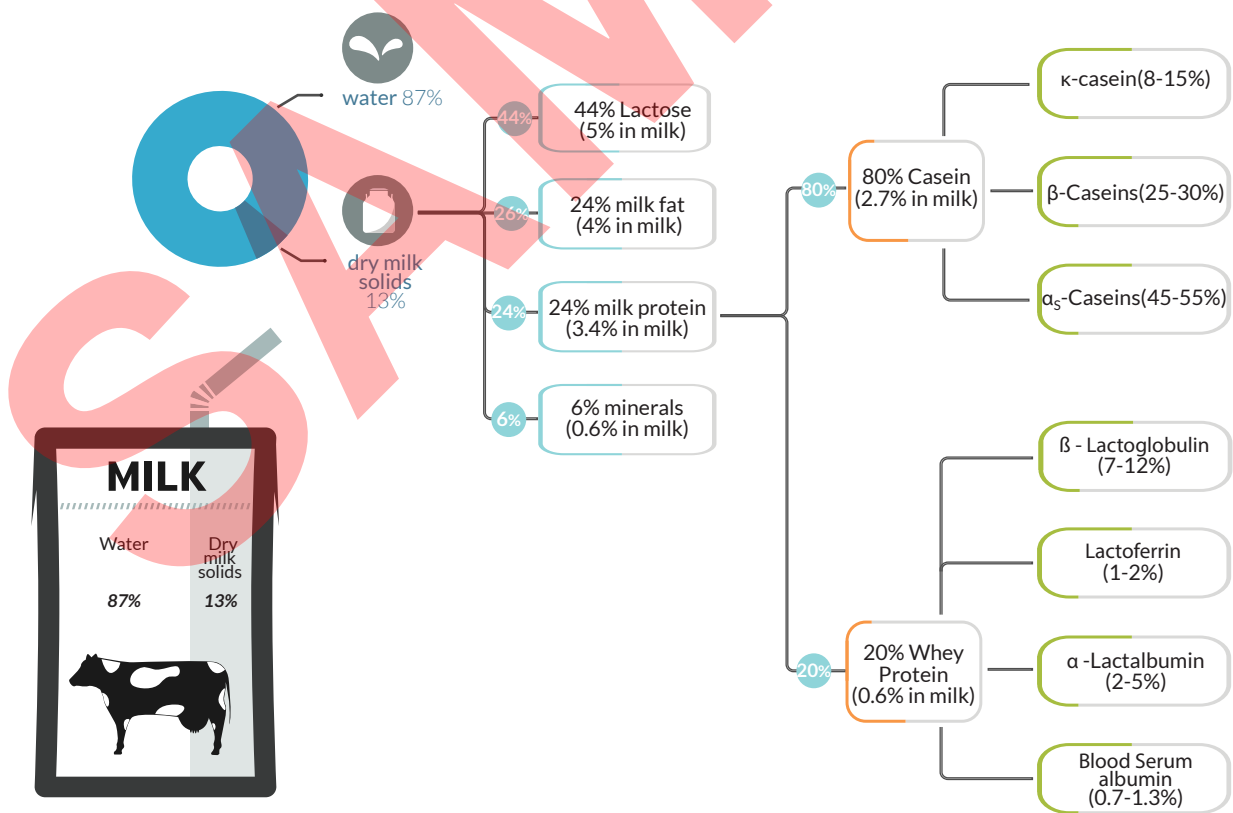
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INTRODUCTION

Milk is a commonly consumed animal protein source comprised of numerous valuable nutritional components.¹ It contains 3.3% total protein including all 9 essential amino acids required by humans. Casein and whey are the two major milk proteins which have been well studied. In cow's milk, approximately 80% of milk protein is casein and the remaining 20% is whey protein. The casein family of proteins contains phosphorus. It can coagulate or precipitate at low pH and is also found to be heat stable. The whey proteins do not contain phosphorus, and these proteins remain in solution in milk at low pH. Alpha-lactalbumin and beta-lactoglobulin are the major whey proteins, which constitute about 70-80% of the total whey proteins. The whey proteins are more sensitive to heat than the caseins, except for the whey protein alpha-lactalbumin which is very heat stable.¹

Dairy sensitivity has been extremely problematic due to the wide use of dairy products in commercial food production and the presence of a variety of dairy antigens. Dairy sensitivity includes the delayed, mild to moderate symptoms associated with consumption of cow's milk and associated products.

The Vibrant™ Dairy Zoomer evaluates sensitivity to all major antigens in cow's milk. The peptide-based microarray technique eliminates the requirement of testing different forms of cow's milk (raw vs. cooked) and removes the false positives caused by cross reactivity seen in raw extracts.



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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 | | | | |
| | Casein αS2-casein and Retinal S-antigen overlap | | Casein A1 β-casein and Islet cell overlap | Casein | | | |
| | | | | αs1-casein and αs2-casein | kappa casein | β casein | Beta-casomorphins (BCM) |
| | | | | Whey | | | |
| | | | | α-lactalbumin | β- lactoglobulin | serum albumin | Lactoferrin |
| | | | | Butyrophilin | | | |
| | | | | Butyrophilin | | | |

Cow's Milk IgE

| Test name | In Control | Moderate | High Risk | In Control Range | Moderate Range | High Risk Range | Previous |
|-----------------------|------------|----------|-----------|------------------|----------------|-----------------|--------------------|
| Cow's Milk IgE (kU/L) | | 0.90 | | ≤0.34 | 0.35~3.49 | ≥3.50 | 0.70 08/25/2018 |

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LIFESTYLE CONSIDERATIONS

-  Cow's milk is highly nutritional, provides immunological protection, and is the best natural source of calcium. Milk is a common ingredient in many foods, therefore, avoiding dairy is not easy. Toddlers who need to avoid cow's milk products might be at risk for nutrient deficiencies if they do not consume replacement foods. A diet without cow's milk products can reduce intake of calcium, vitamin D, and other essential nutrients that are not commonly supplemented outside of dairy intake; but, these deficits can easily be avoided by taking supplements which lack specific antigenic dairy content.
-  Attention should be given to labels while purchasing food products. Labels such as: "contains milk ingredients," "made with milk ingredients," or "processed in a facility that also processes milk products" should be avoided.
-  Enzyme drops or supplements are available over the counter and are used by individuals to prevent symptoms. These enzyme supplements help augment the body's own pancreatic enzymes in individuals with low pancreatic enzyme output. Specific enzymes digest specific food groups. For example, lactase enzyme breaks down the carbohydrates in milk into single sugar units while protease enzymes help break down proteins into amino acids, which are then absorbed by the small intestine.
-  Sometimes the form of cow's milk consumption can be altered for some people who can tolerate milk in other forms. For example, milk heated in baked goods, or some processed dairy such as yogurt may have little to no peptide content from certain cow's milk peptides that are reduced during cooking or fermentation.
-  Following physician guided rotational diets (avoiding the habit of eating the same things every day, and working to create a variety of foods consumed on a rotating pattern) may reduce cow's milk sensitivities.
-  Consider using A2 cow's milk after discussing with your medical provider for reactivity to Beta casomorphin 7 and/or A1 β -casein.



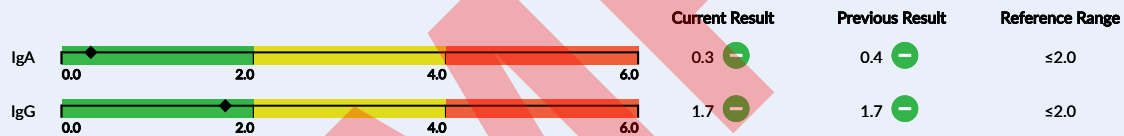
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CASEIN

Casein is highly digestible in the intestinal tract and a high-quality source of amino acids. Casein is a phosphoprotein and exists in milk as the calcium salt, also known as calcium caseinate. The casein is made up of four different subunits - α S1-casein, α S2-casein, β -casein and κ -casein, which together form a complex with phosphorus, calcium, water, and enzymes to make a sphere called a micelle.² The purpose of a micelle is to make large insoluble molecules soluble in water. The casein micelle assists in digestion and growth. It is also necessary for cheese-making and other food production technologies. Of all the caseins, α S1-casein (37%) and β -casein (35%) are predominant in cow's milk casein, whereas α S2- and κ -casein make up 10 and 12%.

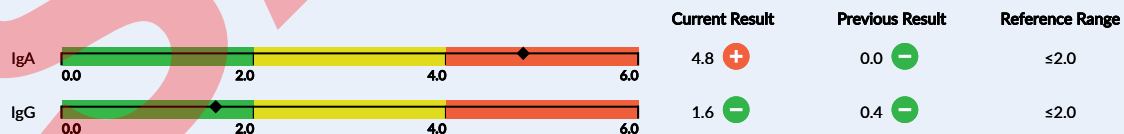
α S1-casein & α S2-casein

α S1- and α S2-casein are two individual gene products of α S-Casein, with the 'S' denoting a sensitivity to calcium. They are highly phosphorylated and are relevant for stabilizing internal micellar structure. α S1- and α S2-casein, possess 14 and 24 lysines (lysine is an essential amino acid in humans, an effective nutritional supplement).³



α S2-casein & Retinal S-antigen overlap

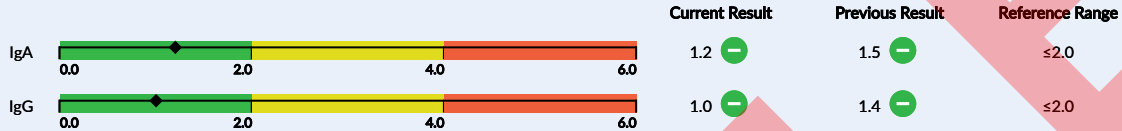
Retinal S-antigen is one of the most potent uveitogenic antigens. Uveitis is an inflammation of the middle layer of the eye (uvea). It has been described that peptides from α S2- casein of cow's milk could cross-react with retinal S-antigen, due to their similarities in amino acid sequence, causing an inflammation reaction in the eye. Enhanced antibody titers to the α S2-casein have been detected in serum of uveitis patients.⁴



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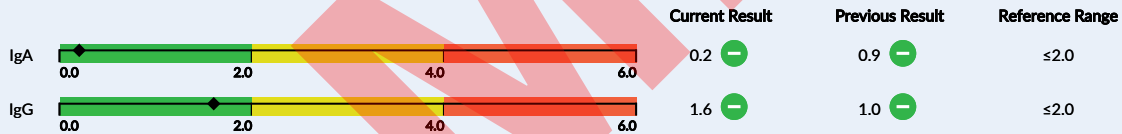
κ-casein

κ-casein is the only casein which is glycosylated and does not contain any phosphoprotein. It can prevent tooth decay by reducing the activity of the plaque-promoting enzyme.¹² κ-casein forms a protective layer around the calcium-sensitive caseins (αs1-, αs2-, β-, and γ-), resulting in stabilizing casein micelles.



β-casein

β-casein possesses only one phosphoprotein and causes low levels of cholesterol in the blood.⁵ A1 and A2 β-casein are genetic variants of the β-casein milk protein that differ by one amino acid. Human milk and goat's milk do not contain A1 β-casein. According to research, a bovine albumin peptide may be a possible trigger of insulin-dependent diabetes mellitus.⁶ Several observational studies indicate that drinking A1 milk during childhood may increase the risk of type 1 diabetes and heart disease.^{7,8,9}



A1 β-casein & Islet cell overlap

Amino acid sequence similarities between A1 β-casein and islets of Langerhans cell proteins may lead to the development of type 1 diabetes. Islets of Langerhans are tiny clusters of cells scattered throughout the pancreas – the organ which produces insulin. An antibody produced to this milk antigen could cross react with the islets leading to type 1 diabetes.^{5,10}

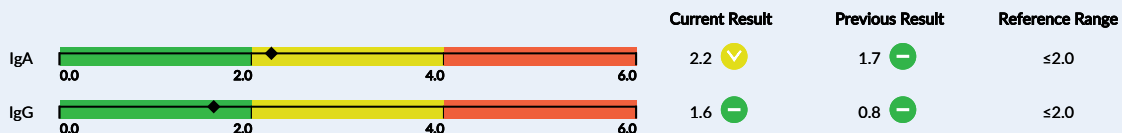
β-Casein Peptide 25-40:

G E I V E S L S S S E E S I T R

Islet Cell Autoantigen 325-40:

G O O I G I L I S L E E E N O R

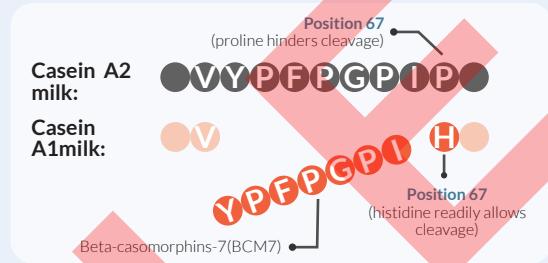
It has been demonstrated that consumption of the milk containing A1 β-casein was associated with greater gastrointestinal symptoms -- i.e. longer gastrointestinal transit times, softer stools, and diarrhea.¹¹ Consumption of milk containing only A2 β-casein did not adversely affect these mentioned variables, indicating that the changes observed with milk containing both β-casein types were attributable to the presence of A1 β-casein.



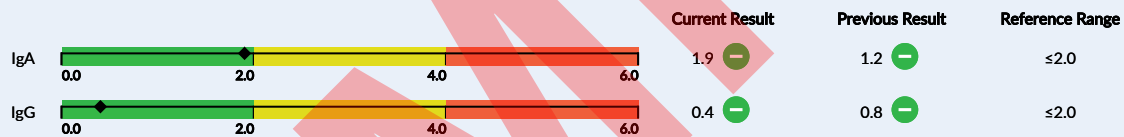
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Beta-casomorphin (BCM)

Beta-casomorphins (BCMs) are a group of peptides with opioid properties and are formed from proteolytic digestion of β -casein. The difference between the A1 and A2 type beta-casein variants is a single amino acid substitution at the 67th residue of the 209-amino acid beta casein protein chain. The sole difference between A1 and A2 takes place at amino acid position 67, where histidine is substituted for proline. The proline forms a tight bond with amino acids on either side of it, but histidine does not. In the human digestive tract, because of the weakness of the peptide bonds with histidine, a peptide consisting of 7 amino acids breaks off. This peptide is BCM-7 and is also an opioid peptide. BCM7 has also been linked to symptoms of autism and schizophrenia (animal and human trials) and BCM7 has been widely reported to be found in the urine of autistic people.¹³



An association between schizophrenia and pre-illness onset levels of immunoglobulin G (IgG) antibodies to cow's milk casein has also been identified.¹⁴ A study reported significantly increased levels of antibodies to bovine casein and casein subunits in individuals with recent onset psychosis and long-term schizophrenia. This data suggested that anti-casein antibodies arise early during the course of disease and are likely to persist for many years.¹⁵



SAMPLE

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WHEY

Whey protein is the collection of globular proteins in milk. They may protect the human body against some cancers (colon, prostate, breast).¹⁶ The protein in cow's milk is 20% whey protein and 80% casein protein, whereas the protein in human milk is 60% whey and 40% casein.¹⁷ Alpha-lactalbumin and beta-lactoglobulin are the predominant whey proteins and comprise about 70–80% of the total whey proteins. Whey proteins also include enzymes, hormones, growth factors, nutrient transporters, disease resistance factors, and other proteins.

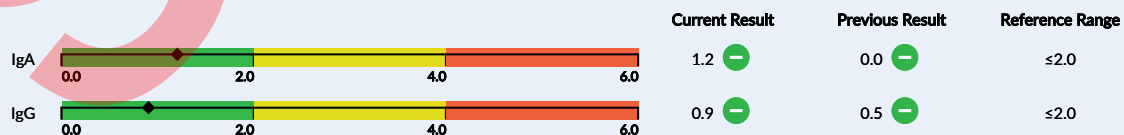
α -Lactalbumin

It comprises ~25 % of the total whey protein content in milk. α -lactalbumin is vital to the process of milk synthesis, especially for lactose. Bovine alpha-lactalbumin has a high homology with human alpha-lactalbumin. It provides anticarcinogenic, antibacterial, and antiviral activity.^{18,19} α -lactalbumin is rich in cysteine, an amino acid used to make glutathione. Glutathione is a strong antioxidant which helps increase immunity.



β - Lactoglobulin

It comprises ~50 % of the total whey protein content in milk. It provides anticarcinogenic activity.²⁰ β -lactoglobulin has been identified as a cow's milk antigen. It is present in the milk of ruminants, but not humans. β -lactoglobulins belong to the lipocalin superfamily. Lipocalins have a high antigenic potential.²¹ Glycodelin, a human protein made during pregnancy, has significant homology with β -lactoglobulin which could influence autoimmune activity.¹² Heating of β -lactoglobulin results in changes in the degree of antigenicity, but this is dependent on the extent of heating. For irreversible denaturation, the time needed is dependent on temperatures, such as at 70 °C, 30% denaturation requires >30 min; at 90 °C such a time gives >90% denaturation.²²



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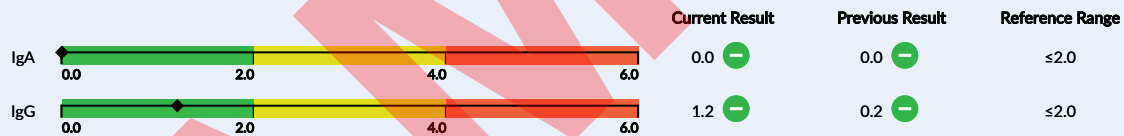
Serum albumin

It is a serum protein and comprises about 2-5% of whey protein. Bovine serum albumin is used as a common additive in processed foods due to its high resistance to degradation.²³ It is physically and immunologically very similar to human blood serum albumin.²⁴ Its key role is the transport, metabolism, and distribution of ligands and the protection from free radicals.²⁵



Lactoferrin

It is an iron-binding glycoprotein from the transferrin family. Lactoferrin (Lf) has been shown to be involved in several physiological and protective functions, including regulation of iron absorption in the bowel, as well as antioxidant, anticancer, anti-inflammatory, and antimicrobial activities. It also displays a potent antiviral activity against both enveloped and naked viruses like cytomegalovirus (CMV), herpes simplex virus (HSV), human hepatitis C (HCV), and human hepatitis B (HBV) viruses.^{1,26} In addition, there is growing evidence of specific immunomodulatory activity of Lf in adults and newborns where, beyond the well-known nutritional immunity, Lf is of particular importance for the development of the immune system.²⁵



Butyrophilin

Butyrophilin (BTN) is a milk fat globule membrane protein. Cross reactivity has been observed between BTN and myelin oligodendrocyte glycoprotein (MOG), a candidate autoantigen in Multiple Sclerosis.^{27,28} With cow's milk and dairy products being staple nutritional components of the Western diet, BTN should be considered a universal environmental factor that can influence the autoimmune response to this specific myelin autoantigen. BTN linked cross-reactivity has also been identified in autistic patients.²⁹



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Antigen

a molecule capable of inducing an immune response in the host organism

Antibody

a blood protein produced in response to and counteracting a specific antigen. Antibodies combine chemically with substances that the body recognizes as foreign, such as bacteria, viruses, and foreign substances in the blood.

Amino Acids

building blocks of proteins

Epitope

a molecular region on the surface of an antigen capable of eliciting an immune response

Gene

a unit of heredity that is transferred from a parent to offspring

Globular

spherical shaped

Heterogeneous

diverse in character or content

Inflammation

a localized physical condition in which part of the body becomes reddened, swollen, hot, and often painful, especially as a reaction to injury or infection

Immunoglobulins

any of a class of proteins present in the serum and cells of the immune system, that function as antibodies

Immunomodulatory

capable of modifying or regulating one or more immune functions

Opioid

an opium-like compound that binds to one or more of the three opioid receptors of the body

Peptide

a compound consisting of two or more amino acids linked in a chain

Phosphate-conjugated

phosphate groups (PO₄) joined together

Key Terms/Glossary

Phosphoprotein

a protein that contains phosphorus (other than in an associated nucleic acid or phospholipid)

Phosphorylate

introduce a phosphate group into (a molecule or compound)

Ruminants

mammals that chew the cud regurgitated from their rumen. The ruminants comprise the cattle, sheep, antelopes, deer, giraffes, and their relatives.

Serum

an amber-colored, protein-rich liquid that separates out when blood coagulates

Sequence homology

biological similarity

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.

Cow's milk 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.

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