



The Great Plains Laboratory, Inc.

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# Information Guide

A research-based clinical laboratory offering services worldwide.

William Shaw, PhD, Director | 11813 West 77th Street, Lenexa, KS 66214 | (913) 341-8949 | [GPL4U.com](http://GPL4U.com)

## Who We Are

The Great Plains Laboratory, Inc. (GPL) is a research-based clinical laboratory that offers testing for nutritional factors in chronic illnesses worldwide. Our company was founded in 1996 and is currently serving more than 100 countries. We provide a variety of metabolic tests that are not routinely available through other laboratories. Our goal is to help people achieve their maximum potential through quality laboratory testing, knowledgeable staff, and excellent customer service.

## Our Mission

Our mission is to improve health treatment outcomes for chronic illnesses by providing the most accurate, reliable, and comprehensive biomedical analyses available – using the latest technology and proven techniques – and by providing education to patients, families, and healthcare practitioners.

## About the Director

**William Shaw, PhD**, is board certified in the fields of clinical chemistry and toxicology by the American Board of Clinical Chemistry. Before he founded The Great Plains Laboratory, Dr. Shaw worked for the Centers for Disease Control and Prevention, Children's Mercy Hospital, University of Missouri at Kansas City School of Medicine, and Smith Kline Laboratories. He is the author of "Biological Treatments for Autism and PDD," originally published in 1998 and "Autism: Beyond the Basics," published in 2009. He is also a frequent speaker at conferences worldwide.

Dr. Shaw is the stepfather of a child with autism and has helped thousands of patients and medical practitioners to successfully improve the lives of people with autism, AD(H)D, Alzheimer's disease, arthritis, bipolar disorder, chronic fatigue, depression, fibromyalgia, immune deficiencies, multiple sclerosis, OCD, Parkinson's disease, seizure disorders, tic disorders, Tourette syndrome, and other serious conditions.

Dr. Shaw's research led him to discover the neurological effects that yeast and bacteria metabolites have on the behavior of children with autism. His research soon expanded to fungal metabolites, oxalate production, cholesterol deficiency, and specific mitochondrial markers. All these discoveries in combination with the latest technology allowed Dr. Shaw to develop a very unique Organic Acids Test that measures specific markers from yeast and bacteria.



**William Shaw, PhD**

Revised April 2021

## Contact Information

### Hours of Operation

8 a.m. to 5 p.m. central time USA  
1400 (2 p.m.) to 2300 (11 p.m.)  
Coordinated Universal Time (UTC)

### Customer Service

Toll Free: 800-288-0383  
Local: 913-341-8949  
Fax: 913-341-6207  
CustomerService@gpl4u.com

### Sales

Direct Line: 913-341-8949 x507  
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Sales@gpl4u.com



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Our laboratory offers comprehensive evaluation panels that provide physicians with the right tools for a more effective, individualized treatment. We are equipped with state-of-the-art instrumentation. Our superior technology allows us to develop more unique tests than regular commercial laboratories, while adhering to the strictest quality control and quality assurance guidelines of regulatory agencies.

## Lab Certifications

### CLIA

The Great Plains Laboratory is fully certified under the federally mandated Clinical Laboratory Improvement Amendments (CLIA). All referral laboratories used by The Great Plains Laboratory are also CLIA certified.

### CAP

The Great Plains Laboratory voluntarily participates in all proficiency programs offered by the College of American Pathologists (CAP). CAP is the world's largest association composed exclusively of board-certified pathologists and pathologists-in-training and is the worldwide leader in laboratory quality assurance. In this program, our laboratory must constantly demonstrate our ability to successfully identify and quantify unknown specimens.

## Internal Quality Control

In addition to inspections by the state and participation in external proficiency testing programs of the CAP, GPL also has a strong internal quality control program. We have a dedicated staff of scientific professionals whose focus is to monitor the effectiveness of our tests and to ensure the quality and integrity of all laboratory methods. Portions of quality control samples are analyzed with every test batch to ensure laboratory quality. Patient samples are also frequently split to make sure that different technologists perform similar work.

## Food and Drug Administration (FDA) Approvals

The FDA regulates companies that sell instruments and reagents to clinical testing laboratories. The Great Plains Laboratory uses many FDA-approved instruments and reagents. In some cases, there are no commercially available instruments or reagents. Such tests, termed "home brew" tests, are regulated by the CLIA regulatory agencies. The FDA does not directly regulate clinical laboratories.

### Billing / Insurance:

Direct Line: 913-754-0459  
Billing@gpl4u.com

### International Support:

Customer service support is available in multiple languages: Spanish, German, French, Italian, Portuguese, and Japanese.  
international@gpl4u.com

# Organic Acids Test



## General Description

The Organic Acids Test (OAT) provides information about the body's biochemical balance by measuring metabolic byproducts in urine. The 76 metabolites detected in the OAT, including creatinine, can indicate vitamin and hormone metabolism, energy cycle function, intestinal wall integrity, neurotransmitter metabolites, and muscle function. Our Organic Acids Test also includes exclusive markers for HPPHA and oxalates. Specimens from individuals with a chronic illness, allergic condition, or neurological disorder often have one or more abnormal organic acids. Some organic compounds are produced by an overgrowth of gastrointestinal yeast or bacterial species due to impaired immune function, exposure to broad-spectrum antibiotics, or high consumption of simple carbohydrates. The OAT reliably detects the overgrowth of yeast and bacteria species commonly missed by conventional culture methods. These organisms and their metabolites can produce or magnify symptoms of many medical conditions. Identification of yeast or bacterial overgrowth paired with successful treatment increases the chance of recovery.

### The Organic Acids Test report includes:

Markers for Krebs Cycle abnormalities, neurotransmitter levels, nutritional and antioxidant deficiencies, yeast and Clostridia overgrowth, fatty acid metabolism, oxalate levels, and more.

## Clinical Usefulness

- Understand vitamin and hormone metabolism
- Determine capacity to generate energy
- Evaluate intestinal wall integrity
- Assess performance of the central nervous system
- Evaluate muscle function
- Reveal excessive levels of gastrointestinal (GI) yeast
- Reveal excessive levels of GI bacteria
- Detect nutritional or antioxidant deficiencies
- Determine problems in fatty acid metabolism
- Identify oxalate imbalances

When ordering an Organic Acids Test for urine, you have the option of adding these tests for a discounted price: GPL-TOX, Glyphosate Test, and Calcium + Magnesium Profile

## Recommendations

Depending on test results, follow-up may include:

- Dietary modification
- Probiotic supplementation
- Nutritional supplementation
- Oral anti-fungal or anti-bacterial medications
- Antioxidant therapy
- Initiation of detoxification protocols
- Follow-up genetic testing

## Specimen Requirements

10 mL of first-morning urine before food or drink. Patient must avoid apples, grapes (including raisins), pears, cranberries, and their juices 48 hours prior to specimen collection. Avoid arabinogalactan, echinacea, reishi mushrooms, and ribose supplements for 12 hours before collection.

## CPT Codes

82131 82507 82570 83150 83497 83605 83921\*63 83945 84207 84210 84585

## Microbial Organic Acids Test

(21 components, including creatinine)

This test is included in the Organic Acids Test and primarily shows metabolites produced by yeast and bacteria. Additional indicators of yeast and bacterial metabolism are also included.

The Microbial Organic Acids Test (MOAT) is ideal as a follow-up to the OAT and may be recommended by practitioners looking for a specific abnormality, monitoring certain microbial balances, or assessing treatment efficacy. We strongly recommend the OAT as the initial screening test.

**The Microbial Organic Acids Test report includes:** markers of dysbiosis, inflammation, beneficial and harmful bacteria, Clostridia, Candida, and other yeast and fungal species

## Specimen Requirements

10 mL of first-morning urine before food or drink. Patient must avoid apples, grapes (including raisins), pears, cranberries, and their juices 24 hours prior to the specimen collection. Avoid arabinogalactan, echinacea, reishi mushrooms, and ribose supplements for 12 hours before collection.

## CPT Codes

82570 83921\*20



## The Great Plains Laboratory, Inc.

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(913) 341-8949

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Requisition #:

Physician:

Patient Name:

Date of Collection:

Patient Age: 40

Time of Collection: 07:30 AM

Patient Sex: F

Print Date: 04/18/2019



### Organic Acids Test - Nutritional and Metabolic Profile

Metabolic Markers in Urine      Reference Range (mmol/mol creatinine)      Patient Value      Reference Population - Females Age 13 and Over

#### Intestinal Microbial Overgrowth

##### Yeast and Fungal Markers

1 Citramalic	≤ 3.6	H	3.7	
2 5-Hydroxymethyl-2-furoic (Aspergillus)	≤ 14	H	31	
3 3-Oxoglutaric	≤ 0.33	H	3.6	
4 Furan-2,5-dicarboxylic (Aspergillus)	≤ 16		15	
5 Furancarboxylglycine (Aspergillus)	≤ 1.9		1.1	
6 Tartaric (Aspergillus)	≤ 4.5		3.7	
7 Arabinose	≤ 29	H	167	
8 Carboxycitric	≤ 29		0.46	
9 Tricarballic (Fusarium)	≤ 0.44	H	0.45	

##### Bacterial Markers

10 Hippuric	≤ 613	H	615	
11 2-Hydroxyphenylacetic	0.06 - 0.66		0.27	
12 4-Hydroxybenzoic	≤ 1.3		0.29	
13 4-Hydroxyhippuric	0.79 - 17		8.8	
14 DHPA (Beneficial Bacteria)	≤ 0.38	H	0.61	

##### Clostridia Bacterial Markers

15 4-Hydroxyphenylacetic (C. difficile, C. stricklandii, C. lituseburensis & others)	≤ 19		5.1	
16 HPPHA (C. sporogenes, C. caloritolerans, C. botulinum & others)	≤ 208		26	
17 4-Cresol (C. difficile)	≤ 75		6.0	
18 3-Indoleacetic (C. stricklandii, C. lituseburensis, C. subterminale & others)	≤ 11		0.28	

# Organic Acids Test

## Report Analysis

**Glycolysis:** Elevations may result from infection, exercise, or B vitamin deficiency. Very high levels may result from genetic metabolic disorders.

**Krebs cycle:** Abnormalities may result from nutrient deficiencies, microbial overgrowth, or glutathione (GSH) synthesis deficiency.

**2-oxoglutaric:** Regeneration of amino acids to remove excess ammonia may result in low levels.

**Neurotransmitters:** Metabolites of dopamine, norepinephrine, adrenaline, and serotonin are measured. Abnormalities may result from stress or poor detoxification, toxic metal exposure, and rarely, specific tumors. Low levels may be associated with mood disorders or depression.

**Pyrimidines:** Slight elevations may occur from folic acid deficiency. Significant elevations can indicate possible genetic disorders.

**Fatty acids:** Elevations can result from ketogenic diets or fasting, intake of medium-chain triglycerides, carnitine deficiency, diabetes, or genetic disorders.

**Toxic indicators:** Abnormalities can result from a deficiency of glutathione, poor ammonia detoxification, or the ingestion of aspartame or salicylates.

**Vitamin indicators:** Abnormalities involving B12, B6, B5, B2, CoQ10, absorbic acid, biotin, and ascorbic acid are measured.

**Amino acids:** High elevations are associated with possible genetic errors in metabolism. These markers are deaminated by-products of amino acids themselves. Low levels do not indicate inadequate protein intake.

Slight elevations of valeric acid analogs may indicate a greater requirement for thiamine (B1).

### 3-Methylglutaric or 3-methylglutaconic Acid:

Elevated levels indicate reduced capacity to metabolize leucine. Small elevations may accompany impairment of mitochondrial function.

**3-Hydroxyglutaric Acid:** Elevations indicate deficiency in the enzyme involved in the breakdown of lysine hydroxylysine and tryptophan.

**Phosphate:** Low phosphate is primarily associated with vitamin D deficiency. Individuals consuming a low-grain diet may have lower phosphoric acid compared to those on a conventional "Western Diet." More rarely, hypoparathyroidism may be involved.



The Great Plains Laboratory, Inc.

## The Clinical Significance of the Organic Acids Test

The Organic Acids Test (OAT) provides an accurate metabolic snapshot of what is going on in the body. Besides offering the most complete and accurate evaluation of intestinal yeast and bacteria, it also provides information on important neurotransmitters, nutritional markers, glutathione status, oxalate metabolism, and much more. The test includes 76 urinary metabolite markers that can be very useful for discovering underlying causes of chronic illness.

Patients and physicians report that treating yeast and bacterial abnormalities reduces fatigue, increases alertness and energy, improves sleep, normalizes bowel function, and reduces hyperactivity and abdominal pain.

### The OAT Assists in Evaluating:

- Krebs Cycle Abnormalities
- Neurotransmitter Levels
- Nutritional Deficiencies
- Antioxidant Deficiencies
- Yeast and Clostridia Overgrowth
- Fatty Acid Metabolism
- Oxalate Levels
- And More!

### The OAT Pairs Well with the Following Tests:

- GPL-TOX: Toxic Non-Metal Chemical Profile
- IgG Food MAP with Candida + Yeast
- MycoTOX Profile

Learn how to better integrate the OAT into your practice, along with our other top tests by attending one of our GPL Academy Practitioner Workshops!

Visit [www.GPLWorkshops.com](http://www.GPLWorkshops.com) for workshop dates and locations.



## OAT Resources

Resources for understanding the Organic Acids Test are our Clinical Significance of the Organic Acids Test brochure and Organic Acids Test booklet, which you may download from the Organic Acids Test page on our website. We have several webinars about the OAT in our online Webinar Library and we provide OAT training workshops for practitioners all over the country.

For all upcoming workshop dates and locations, go to: [www.GPLAcademy.com](http://www.GPLAcademy.com).

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## General Description

Every day, we are exposed to hundreds of toxic chemicals through products like pharmaceuticals, pesticides, packaged foods, household products, and environmental pollution.

As we have become more exposed to chemical-laden products and to toxic chemicals in food, air, and water, we have been confronted with an accelerating rate of chronic illnesses like cancer, heart disease, chronic fatigue syndrome, chemical sensitivity, autism spectrum disorders, ADD / AD(H)D, autoimmune disorders, Parkinson's disease, and Alzheimer's disease.

Because exposure to environmental pollutants has been linked to many chronic diseases, The Great Plains Laboratory has created GPL-TOX, a toxic non-metal chemical profile that screens for the presence of 173 different toxic chemicals including organophosphate pesticides, phthalates, benzene, xylene, vinyl chloride, pyrethroid insecticides, acrylamide, perchlorate, diphenyl phosphate, ethylene oxide, acrylonitrile, and more. This profile also includes Tiglylglycine (TG), a marker for mitochondrial disorders resulting from mutations of mitochondrial DNA. These mutations can be caused by exposure to toxic chemicals, infections, inflammation, and nutritional deficiencies.

## Clinical Usefulness

- GPL-TOX screens for 173 different environmental pollutants using 18 different metabolites, all from a single urine sample.
- GPL-TOX uses the power of advanced mass spectrometry (MS/MS), which is necessary to detect lower levels of certain genetic, mitochondrial, and toxic chemical markers that conventional mass spectrometry often misses.
- GPL-TOX also includes Tiglylglycine, a marker for mitochondrial damage often seen in chronic toxic chemical exposure.
- GPL-TOX pairs perfectly with our Organic Acids Test (OAT) and our Glyphosate Test in the ENVIROtox Panel. This panel uses a single urine sample to screen for the presence of over 173 toxicants and assess organic acid levels, which are correlated with toxic exposure and resulting damage.

## Recommendations

Depending on test results, follow-up may include:

- Eating organic food whenever possible
- Drinking water that has been treated by reverse osmosis or other process that removes pesticides
- Avoiding the use of chemical-laden products including cleaning products, beauty products, and food packaging
- Avoiding future exposures to potential environmental pollutants whenever possible (fumes from industrial plants, vehicles, etc.)
- Various supplements that aid in detoxification
- Infrared sauna therapy to aid in detoxification

## Environmental Pollutants Tested

### Phthalates

Perhaps the most widespread group of toxic chemicals found in our environment, phthalates are commonly in: after shave lotions, aspirin, cosmetics, detergents, foods microwaved with plastic covers, oral pharmaceutical drugs, intravenous products prepared in plastic bags, hair sprays, insecticides, insect repellents, nail polish, nail polish remover, skin care products, adhesives, explosives, lacquer, janitorial products, perfumes, paper coatings, printing inks, safety glass, and varnishes. Phthalates have been implicated in reproductive damage, depressed leukocyte function, and cancer. Phthalates have also been found to impede blood coagulation, lower testosterone, and alter sexual development in children. Low levels of phthalates can feminize the male brain of the fetus, while high levels can hyper-masculinize the developing male brain.

### Vinyl Chloride

Vinyl chloride is an intermediate in the synthesis of several commercial chemicals, including polyvinyl chloride (PVC). Exposure to vinyl chloride may cause central nervous system depression, nausea, headache, dizziness, liver damage, degenerative bone changes, thrombocytopenia, enlargement of the spleen, and death.

### Benzene

Benzene is a mutagenic and carcinogenic by-product of all sources of combustion, including cigarette smoke, and is released by outgassing from synthetic materials. It is an extremely toxic chemical pollutant released by numerous industrial processes. High levels of exposure to benzene cause nausea, vomiting, dizziness, lack of coordination, central nervous system depression, and death. It can also cause hematological abnormalities.

### Pyrethrins

Pyrethrins are widely used as insecticides. Exposure during pregnancy doubles the likelihood of autism. Pyrethrins may affect neurological development, disrupt hormones, induce cancer, and suppress the immune system.

# GPL-TOX: Toxic Non-Metal Chemical Profile

## Xylenes

Xylenes (dimethylbenzenes) are solvents found not only in products such as paints, lacquers, pesticides, cleaning fluids, fuel and exhaust fumes, but also in perfumes and insect repellents. Xylenes are oxidized in the liver and bound to glycine before eliminated in urine. High xylene levels may be due to the use of certain perfumes and insect repellents. High exposures to xylene create an increase in oxidative stress, causing symptoms such as nausea, vomiting, dizziness, central nervous system depression, and death. Occupational exposure is often found in pathology laboratories where xylene is used for tissue processing.

## N-acetyl-S-(3-hydroxypropyl)-L-cysteine (3-HPMA)

3-HPMA is the main urinary metabolite of acrolein. Acrolein is an environmental pollutant, commonly used as an herbicide and in many different chemical industries. Acrolein is also present in the burning of cigarettes, gasoline, and oil. Certain bacteria produce acrolein, such as *Clostridium*. Acrolein metabolites are associated with diabetes and insulin resistance.

## Styrene

Styrene is used in the manufacturing of plastics, in building materials, and is found in car exhaust fumes. Polystyrene and its copolymers are widely used as food-packaging materials. The ability of styrene monomer to leach from polystyrene packaging to food has been reported. Occupational exposure due to inhalation of large amounts of styrene adversely impacts the central nervous system, causes concentration problems, muscle weakness, tiredness and nausea, and irritates the mucous membranes of the eyes, nose, and throat.

## Organophosphates

Organophosphates are one of the most toxic groups of substances used throughout the world. They are often used as biochemical weapons and terrorist agents, but are most commonly used in pesticide formulations. Organophosphates are inhibitors of cholinesterase enzymes, leading to overstimulation of nerve cells, causing sweating, salivation, diarrhea, abnormal behavior, including aggression and depression. Children exposed to organophosphates have more than twice the risk of developing pervasive developmental disorder (PDD), an autism spectrum disorder. A study done in the San Francisco Bay area found that in California agricultural areas, children born to mothers living within 500 meters of fields where organochlorine pesticides were used were more than 6 times more likely to develop autism than children whose mothers did not live near such fields. ASD risk increased with the poundage of organochlorines applied and decreased with distance from field sites. Maternal organophosphate exposure has been associated with various adverse outcomes including having shorter pregnancies and children with impaired reflexes.

## MTBE and ETBE

MTBE and ETBE are gasoline additives used to improve octane ratings. Exposure to these compounds is most likely due to groundwater contamination, inhalation or skin exposure to gasoline or its vapors, and exhaust fumes. MTBE has been demonstrated to cause hepatic, kidney, and central nervous system toxicity, peripheral neurotoxicity, and cancer in animals. Since the metabolites of these compounds are the same, ETBE may be similarly toxic.

## 2, 4-Dichlorophenoxyacetic Acid (2,4-D)

A common herbicide that was a part of Agent Orange, used by the United States during the Vietnam War to increase visibility for war planes by destroying plant undergrowth and crops. It is most commonly used in agriculture on genetically modified foods, and as a weed killer for lawns. Exposure to 2, 4-D via skin or oral ingestion is associated with neuritis, weakness, nausea, abdominal pain, headache, dizziness, peripheral neuropathy, stupor, seizures, brain damage, and impaired reflexes. 2, 4-D is a known endocrine disruptor, and can block hormone distribution and cause glandular breakdown.

## Diphenyl Phosphate

This is a metabolite of the organophosphate flame retardant triphenyl phosphate (TPHP), which is used in plastics, electronic equipment, nail polish, and resins. TPHP can cause endocrine disruption. Studies have also linked TPHP to reproductive and developmental problems.

## Acrylamide

Acrylamide can polymerize to form polyacrylamide, which is used in many industrial processes such as plastics, food packaging, cosmetics, nail polish, dyes, and treatment of drinking water. Food and cigarette smoke are also two major sources of exposure. Acrylamide has been found in foods like potato chips, French fries, and many others such as asparagus, potatoes, legumes, nuts, seeds, beef, eggs, and fish. Asparagine, which is also found in these foods, can produce acrylamide when cooked at high temperatures in the presence of sugars. High levels of acrylamide can elevate a patient's risk of cancer. In addition, acrylamide is known to cause neurological damage.

## Perchlorate

This chemical is used in the production of rocket fuel, missiles, fireworks, flares, explosives, fertilizers, and bleach. Studies show that perchlorate is often found in water supplies. Many food sources are also contaminated with perchlorate. Perchlorate can disrupt the thyroid's ability to produce hormones. The EPA has also labeled perchlorate a likely human carcinogen. Patients that are high in perchlorate can use a reverse osmosis water treatment system to remove the chemical from their water supply.

## 1,3 Butadiene

This is a chemical made from the processing of petroleum. It is often a colorless gas with a mild gasoline-like odor. Most of this chemical is used in the production of synthetic rubber. 1,3 Butadiene is a known carcinogen and has been linked to increased risk of cardiovascular disease. Individuals that come into contact with rubber, such as car tires, could absorb 1,3 Butadiene through the skin. The increased use of old tires in the production of crumb rubber playgrounds and athletic fields is troubling because children and athletes may be exposed to toxic chemicals this way.

## Propylene Oxide

This chemical is used in the production of plastics and is used as a fumigant. Propylene oxide is used to make polyester resins for textile and construction industries. It is also used in the preparation of lubricants, surfactants, and oil demulsifiers. It has also been used as a food additive, an herbicide, a microbicide, an insecticide, a fungicide, and a miticide.



# GPL-TOX: Toxic Non-Metal Chemical Profile

## 1-Bromopropane (1-BP)

1-Bromopropane is an organic solvent used for metal cleaning, foam gluing, and dry cleaning. Studies have shown that 1-BP is a neurotoxin and reproductive toxin. Research indicates that exposure to 1-BP can cause sensory and motor deficits. Chronic exposure can lead to decreased cognitive function and impairment of the central nervous system. Acute exposure can lead to headaches.

## Ethylene Oxide

Ethylene oxide is used in many different industries, including agrochemicals detergents, pharmaceuticals, and personal care products. Ethylene oxide is also used as a sterilizing agent on rubber, plastics, and electronics. Chronic exposure to ethylene oxide has been determined to be mutagenic to humans. Multiple agencies have reported it as a carcinogen. Studies of people exposed to ethylene oxide show an increased incidence of breast cancer and leukemia. Caution is needed with ethylene oxide because it is odorless at toxic levels.

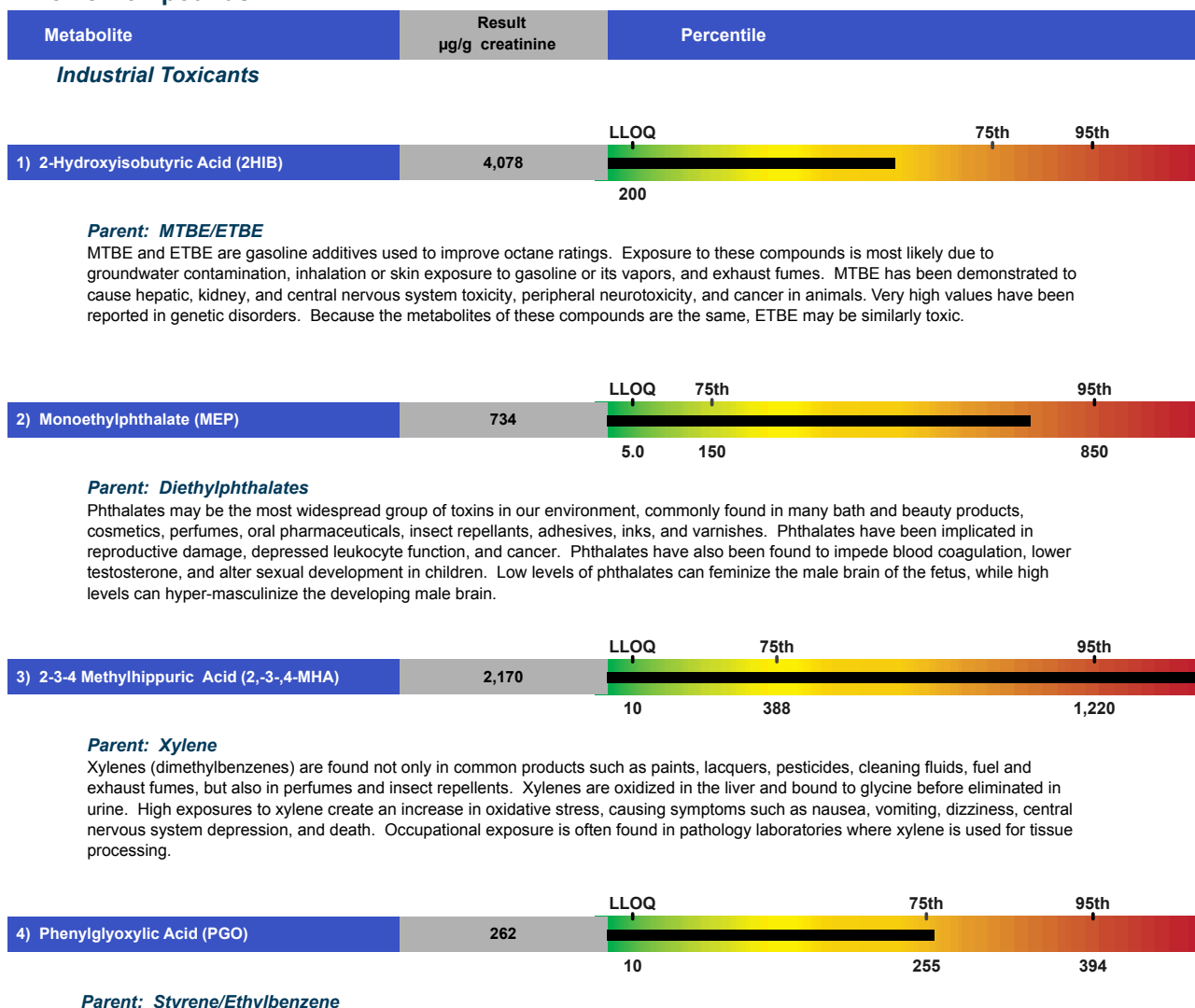
## Acrylonitrile

Acrylonitrile is a colorless liquid with a pungent odor. It is used in the production of acrylic fibers, resins, and rubber. Use of any of these products could lead to exposure to acrylonitrile. Smoking tobacco and cigarettes is another potential exposure. Exposure to acrylonitrile can lead to headaches, nausea, dizziness, fatigue, and chest pains. The European Union has classified acrylonitrile as a carcinogen.

## Specimen Requirements

10 mL of the first morning urine before food or drink is suggested. Fasting for 24 hours may increase the excretion of toxic chemicals from the adipose tissue.

### Toxic Compounds





## General Description

Mycotoxins are some of the most prevalent toxins in the environment. Mycotoxins are metabolites produced by fungi like mold, which can infest buildings, vehicles, and foodstuffs. A majority of mycotoxin exposures are through food ingestion or airborne exposure. In the European Union, 20% of all grains harvested have been found to be contaminated with mycotoxins. Unfortunately, mycotoxins are resistant to heat and many processing procedures.

Diseases and symptoms linked to mycotoxin exposure include fever, pneumonia-like symptoms, heart disease, rheumatic disease, asthma, sinusitis, cancer, memory loss, vision loss, chronic fatigue, skin rashes, depression, ADHD, anxiety, and liver damage. With our MycoTOX Profile, we can identify mycotoxin exposures and make recommendations for detoxification treatments that have been effective.

## Clinical Usefulness

- MycoTOX screens for 11 different mycotoxins, from 40 species of mold, in one urine sample.
- MycoTOX uses the power of advanced mass spectrometry (MS/MS), which is necessary to detect lower levels of these fungal toxins. This test is optimal for follow up testing to ensure that detoxification therapies have been successful.
- MycoTOX pairs perfectly with the Organic Acids Test (OAT), GPL-TOX (Toxic Non-Metal Chemical Profile), and the Glyphosate Test. This gives you comprehensive testing from a single urine sample to assess exposure to common environmental toxins and the damage that can be caused by this exposure.

## Markers In The MycoTOX Profile

**Aflatoxin M1 (AFM1)** is the main metabolite of aflatoxin B1, which is a mycotoxin produced by the mold species *Aspergillus*. Aflatoxins are some of the most carcinogenic substances in the environment.

**Ochratoxin A (OTA)** is a nephrotoxic, immunotoxic, and carcinogenic mycotoxin. This chemical is produced by molds in the *Aspergillus* and *Penicillium* families. Exposure is primarily through contaminated foods, but it also comes from inhalation exposure in water-damaged buildings.

**Sterigmatocystin (STG)** is a mycotoxin that is closely related to aflatoxin. STG is produced from several species of mold such as *Aspergillus* and *Penicillium*. STG has been found in the dust from damp carpets. It is also a contaminant of many foods.

**Roridin E** is a macrocyclic trichothecene produced by the mold species *Fusarium*, *Myrothecium*, and *Stachybotrys*. Even low levels of exposure to macrocyclic trichothecenes can cause severe neurological damage, immunosuppression, endocrine disruption, cardiovascular problems, and gastrointestinal distress.

**Verrucarin A** is a macrocyclic trichothecene mycotoxin produced from *Stachybotrys*, *Fusarium*, and *Myrothecium*. Trichothecenes are frequently found in buildings with water damage, but can also be found in contaminated grain.

**Enniatin B1** is a fungal metabolite categorized as cyclohexa depsipeptides toxin produced by the fungus *Fusarium*. This strain of fungus is one of the most common cereal contaminants. Chronic exposure to enniatin may lead to weight loss, fatigue, and liver disease.

**Zearalenone (ZEA)** is a mycotoxin that is produced by the mold species *Fusarium*. It is commonly found in several foods including wheat, barley, rice, and maize. ZEA has estrogenic activity and exposure to ZEA can lead to reproductive changes.

**Gliotoxin (GTX)** is produced by the mold genus *Aspergillus*. *Aspergillus* spreads in the environment by releasing conidia which are capable of infiltrating the small alveolar airways of individuals. In order to evade the body's defenses, *Aspergillus* releases Gliotoxin to inhibit the immune system. One of the targets of Gliotoxin is PtdIns (3,4,5) P3. This results in the downregulation of phagocytic immune defense, which can lead to the exacerbation of polymicrobial infections. Gliotoxin impairs the activation of T-cells and induces apoptosis in monocytes and monocyte-derived dendritic cells. These impairments can lead to multiple neurological syndromes.

**Mycophenolic Acid (MPA)** is produced by the *Penicillium* fungus. MPA is an immunosuppressant that inhibits the proliferation of B and T lymphocytes. MPA exposure can increase the risk of opportunistic infections such as *Clostridia* and *Candida*. MPA is associated with miscarriage and congenital malformations when the woman is exposed in pregnancy.

**Dihydrocitrinone** is a metabolite of Citrinin (CTN), which is a mycotoxin that is produced by the mold species *Aspergillus*, *Penicillium*, and *Monascus*. CTN exposure can lead to nephropathy, because of its ability to increase permeability of mitochondrial membranes in the kidneys. The three most common exposure routes are through ingestion, inhalation, and skin contact. CTN has been shown to be carcinogenic in rat studies. Multiple studies have linked CTN exposure to a suppression of the immune response.

**Chaetoglobosin A (CHA)** is produced by the mold *Chaetomium globosum* (CG). CG is commonly found in homes that have experienced water damage. Up to 49% of water-damaged buildings have been found to have CG. CHA is highly toxic, even at minimal doses. CHA disrupts cellular division and movement. Most exposure to CG is through the mycotoxins because the spores tend not to aerosolize. Exposure to CHA has been linked to neuronal damage, peritonitis, and cutaneous lesions.

## Recommendations

Depending on test results, recommendations may include:

- Elimination or reduction of exposure to mold, including potential mold removal done by a licensed contractor.
- Treatment for mold exposure should include fluid support to prevent dehydration.
- The drug Oltipraz can increase glutathione conjugation of mold toxins while inhibiting the toxic effect of P450 oxidation, reducing liver toxicity and promoting safer elimination.
- A diet of carrots, parsnips, celery, and parsley may reduce the carcinogenic effects of mold. Bentonite clay and zeolite clay are reported to reduce the absorption of mold found in food.
- Supplementation with chlorophyllin, zinc, A, E, C, NAC, rosmarinic acid, and liposomal glutathione alone or in combination have been shown to mitigate the oxidative effects of mold toxins.

## Specimen Requirements

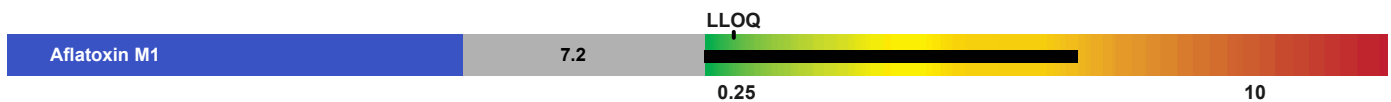
10 mL of the first morning urine before food or drink is suggested. Fasting for 12 hours may increase the excretion of mycotoxins from the adipose tissue. However, fasting is not recommended if running this test in combination with other urine tests.

Learn about our new complimentary test on page 29:

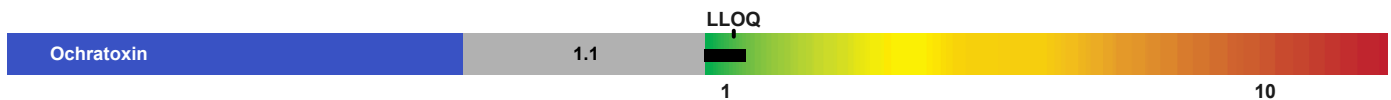


## Mycotoxins

Metabolite	Result µg/g creatinine
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Aflatoxin M1 (AFM1) is the main metabolite of Aflatoxin B1, which is a mycotoxin produced by the mold species *Aspergillus*. Aflatoxins are some of the most carcinogenic substances in the environment. Clinical signs of aflatoxicosis are non-pruritic macular rash, headache, gastrointestinal dysfunction (often extreme), lower extremity edema, anemia, and jaundice.



Ochratoxin A (OTA) is a nephrotoxic, immunotoxic, and carcinogenic mycotoxin. This chemical is produced by molds in the *Aspergillus* and *Penicillium* families. Exposure is primarily through contaminated foods such as cereals, grape juices, dairy, spices, wine, dried vine fruit, and coffee. Exposure to OTA can also come from inhalation exposure in water-damaged buildings.



Sterigmatocystin (STG) is a mycotoxin that is closely related to aflatoxin. STG is produced from several species of mold such as *Aspergillus*, *Penicillium*, and *Bipolaris*. It is considered to be carcinogenic, particularly in the cells of the GI tract and liver. STG has been found in the dust from damp carpets. It is also a contaminant of many foods including grains, corn, bread, cheese, spices, coffee beans, soybeans, pistachio nuts, and animal feed.



## Glyphosate Test

### General Description

Glyphosate is the world's most widely produced herbicide and is the primary toxic chemical in Roundup™, as well as in many other herbicides. Glyphosate was introduced in the 1970s to kill weeds by targeting the enzymes that produce the amino acids tyrosine, tryptophan, and phenylalanine.

The enzymes of many bacteria are also susceptible to inhibition by this chemical, thus altering the flora of many animals. Usage of glyphosate has since amplified, after the introduction of genetically modified (GMO) glyphosate-resistant crops that can grow well in the presence of this chemical in soil. In addition, in 2014 Enlist Duo™, a herbicide product which contains a 2,4-dichlorophenoxyacetic acid (2,4-D) salt and glyphosate, was approved for use in Canada and the U.S. for use on genetically modified soybeans and genetically modified maize, both of which were modified to be resistant to both 2,4-D and glyphosate. 2,4-D has many toxic effects of its own and can be measured in the GPL-TOX test. Our Glyphosate Test is done via urine sample and can be easily added on to other urine tests like the Organic Acids Test or GPL-TOX Toxic Non-Metal Chemical Profile at a discounted rate.

### Specimen Requirements

10 mL of first morning urine before food and drink is preferred. We are now testing water samples for glyphosate. Contact us for more details.

### Recommendations

Depending on test results, follow-up may include:

- Eating organic food as often as possible
- Drinking water that has been treated by reverse osmosis or other process that removes pesticides and herbicides
- Various supplements that may aid in detoxification
- Infrared sauna therapy to aid in detoxification

### Clinical Significance

Glyphosate has been declared a likely carcinogen by the International Agency for Research on Cancer of the World Health Organization. Chronic kidney disease of farm workers has also been associated with glyphosate exposure. Researchers Stephanie Seneff and Anthony Samsel have proposed that glyphosate toxicity in animals is due to alteration of cytochrome P450 enzyme activities. In addition, many beneficial microorganisms are susceptible to glyphosate, leading to decreases in beneficial flora and increases in bacterial pathogens such as Salmonella and Clostridia. Recent studies by Seneff et al have found significant associations between the ingestion of glyphosate and/or GMO foods and a variety of diseases including common cancers, autism, Alzheimer's disease, diabetes, multiple sclerosis, and many others.

## The Great Plains Laboratory, Inc.

### Glyphosate Profile

*Requisition #:*

*Patient Name:*

*Patient Age:*

*Sex:*

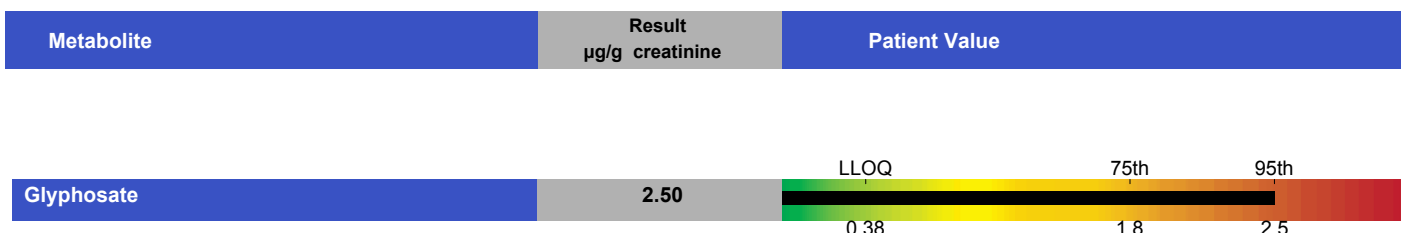
*Physician Name:*

*Date of Collection:*

*Time of Collection:*

*Print Date:*

### Glyphosate Profile





The Great Plains Laboratory

# GPL Academy

Practitioner Workshops

**GPL Academy** is a series of workshops designed to help practitioners learn how to integrate our comprehensive testing into their practices. When you attend a GPL Academy workshop, you will find out why our tests may be incredibly valuable to your practice, what particular markers may be the most meaningful to specific patients, and how to use our tests in tandem to provide your patients with the most personalized treatment plans possible.

**CME Available! Register now at [GPLWorkshops.com](https://www.gplworkshops.com).**



**The Great Plains Laboratory, Inc.**

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## General Description

Elevated levels of IgG (Immunoglobulin G) antibodies are associated with a wide variety of illnesses. Symptoms ranging from headaches and nausea to seizures and hyperactivity may occur hours or even days after the offending food has been ingested. The degree and severity of symptoms vary due to the individual's genetic makeup. The complete elimination of IgG positive foods may result in important improvements in symptoms of irritable bowel syndrome, autism, AD(H)D, cystic fibrosis, rheumatoid arthritis, and epilepsy, as demonstrated in numerous clinical studies. The 190 foods tested increase the identification of various offending foods.

## Clinical Usefulness

High IgG antibody levels have frequently been found in children with diabetes mellitus, Crohn's disease, celiac disease, and in those considered to be obese. IgG food test results are often used to develop food antibody-guided exclusion/elimination diets. The implementation of such diets has been shown to alleviate symptoms associated with nonceliac gluten sensitivity and food sensitivity-induced atopic conditions, reduce the frequency of migraine headaches, decrease the occurrence of diarrhea, decrease failure-to-thrive among children with

cystic fibrosis, reduce symptoms of irritable bowel syndrome, improve rectal compliance, decrease stool frequency in Crohn's disease, prevent seizures and hyperkinetic behavior in children with epilepsy, and ameliorate kidney function in glomerulonephritis. Food elimination diets also hold promise for the improvement of behaviors associated with attention-deficit hyperactivity disorder.

- Promote non-invasive, food-based therapy
- Eliminate allergy triggers
- Reduce the burden on the immune system
- Reduce gut inflammation
- Reduce food cravings
- Improve assimilation of nutrients
- Reduce food mediated behaviors

## Upgraded Sensitivity and Specificity

GPL's xMAP® immunoassay with fluorescence readout has proven to be even more sensitive than ELISA tests. The IgG Food MAP test detects all food antibodies with greater precision than ELISA tests thanks to the superior technology we've developed for the test. Antigen-specific IgG antibodies are captured on multiplexed magnetic beads, using xMAP® (Multiple Analyte Profiling) technology. The xMAP® bead-based immunoassay allows for the simultaneous detection of IgG antibodies to all 190 foods in two single test wells, reducing sample volume requirements and reagents while increasing sensitivity and specificity as compared to traditional plate-based ELISA tests. The upgraded immunoassay is cost and time effective, easy to perform and reproducible. We have now fully automated all steps of our testing processes, leading to even better precision.

## Analyte List (190 Foods + Candida + Yeast)

### Dairy

- Beta-Lactoglobulin
- Casein
- Cheddar Cheese
- Cow's Milk
- Goat's Milk
- Mozzarella Cheese
- Sheep's Yogurt
- Whey
- Yogurt

### Beans and Peas

- Adzuki Bean
- Black Bean
- Garbanzo Bean
- Green Bean

- Green Pea
- Kidney Bean
- Lentil
- Lima Bean
- Mung Bean
- Navy Bean
- Pinto Bean
- Soybean
- Tofu

### Fruits

- Acai Berry
- Apple
- Apricot
- Banana
- Blueberry
- Cantaloupe
- Cherry
- Coconut
- Cranberry
- Date
- Grape
- Grapefruit
- Guava
- Jackfruit
- Kiwi
- Lemon
- Lychee
- Mango
- Orange
- Papaya
- Passion Fruit
- Peach
- Pear
- Pineapple
- Plum

- Pomegranate
- Raspberry
- Strawberry
- Watermelon

### Grains

- Amaranth
- Barley
- Buckwheat
- Corn
- Gliadin
- Malt
- Millet
- Oat
- Quinoa
- Rice
- Rye
- Sorghum

- Teff
- Wheat Gluten
- Whole Wheat

### Fish/Seafood

- Abalone
- Anchovy
- Bass
- Bonito
- Codfish
- Crab
- Halibut
- Lobster
- Mackerel Saba
- Octopus
- Oyster
- Pacific Mackerel (Saba)
- Pacific Saury
- Perch
- Red Snapper
- Salmon
- Sardine
- Scallop
- Shrimp
- Small Clam
- Squid
- Tilapia
- Trout
- Tuna

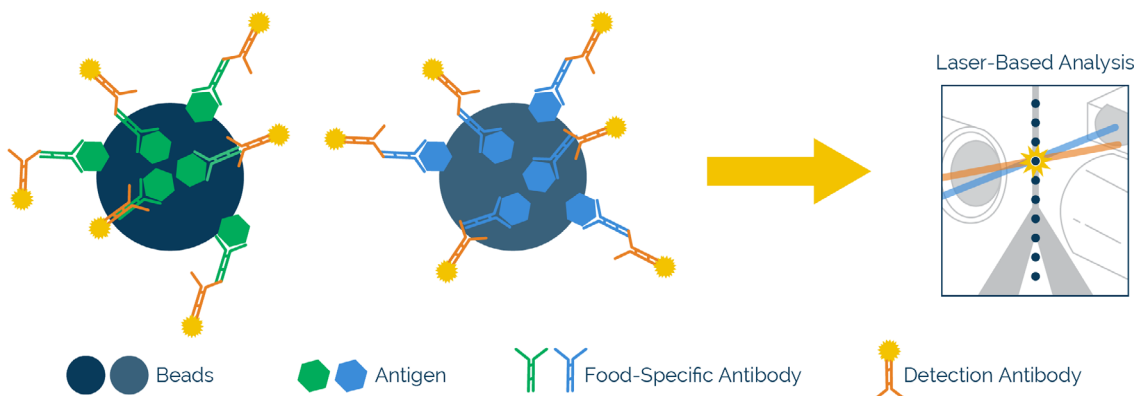
### Meat/Fowl

- Beef
- Chicken
- Duck
- Egg White

## Multiple Analyte Profiling with xMAP® Technology

The bead-based immunofluorescent assay uses color-coded magnetic beads, which are covalently coupled to 190 different food proteins specific to each protein's IgG target. The color-coding of the beads into spectrally distinct sets allows the simultaneous capture and detection of multiple food IgG analytes from a single reaction well.

The xMAP® bead-based immunoassay occurs on the surface of magnetic beads by adding a patient's serum sample and observing the classic antigen/antibody interaction, detected by using a fluorescent labeled antibody. Laser-based analysis of the fluorescent signal response is proportional to the binding of food-specific IgG antibodies onto the beads.



## Recommendations

Depending on test results, follow-up may include:

- Elimination of offending foods
- Immune system support
- Gut restoration
- Implementation of a food rotation diet (included in report)
- Supplementation

## Specimen Requirements

**Serum:** 1 mL of serum in a gold-topped SST vial.

- or -

**Dried Blood Spot (DBS):** Three full circles of blood on the protein saver card.

## CPT Codes

86001\*190 86628 86671

- Egg Yolk
- Goose
- Lamb
- Pork
- Turkey

### Nuts/Seeds

- Almond
- Brazil Nut
- Cashew
- Chestnut
- Chia Seed
- Flax Seed
- Hazelnut
- Hemp Seed
- Macadamia Nut
- Peanut
- Pecan
- Pine Nut

- Pistachio
- Pumpkin Seed
- Sesame Seed
- Sunflower Seed
- Walnut

### Vegetables

- Artichoke
- Asparagus
- Avocado
- Bamboo Shoot
- Bean Sprout
- Beet
- Bell Pepper
- Bitter Gourd
- Broccoli
- Brussel Sprout
- Burdock Root
- Cabbage

- Carrot
- Cauliflower
- Celery
- Chili Pepper
- Cucumber
- Eggplant
- Enoki Mushroom
- Garlic
- Kale
- Leek
- Lettuce
- Lotus Root
- Napa Cabbage
- Olive (Green)
- Onion
- Portabella Mushroom

- Potato
- Pumpkin
- Radish
- Seaweed Kombu
- Kelp
- Seaweed Nori
- Seaweed Wakame
- Shitake Mushroom
- Spinach
- Sweet Potato
- Tomato
- Yam
- Yellow Squash
- Yuca
- Zucchini

### Herbs/Spices



- Basil
- Bay Leaf
- Black Pepper
- Cayenne Pepper
- Cilantro
- Cinnamon
- Cloves
- Cumin
- Curry
- Dill
- Ginger
- Hops
- Mint
- Miso
- Mustard Seed
- Oregano
- Paprika

- Rosemary
- Sage
- Tarragon
- Thyme
- Turmeric
- Vanilla Bean

### Miscellaneous

- Bromelain
- Cane Sugar
- Cocoa Bean
- Coffee
- Green Tea
- Honey
- Meat glue
- Oolong Tea

## Sample Report



Requisition #: 609652      Physician Name: \_\_\_\_\_  
 Patient Name: \_\_\_\_\_      Date of Collection: 09:18 AM  
 Date of Birth: \_\_\_\_\_      Time of Collection: 09:18 AM  
 Gender: F      Print Date: Jul 10, 2020

### IgG Food MAP (190) - Serum MFI x 1000

Food Category	Food Item	MFI x 1000	
Dairy	Beta-Lactoglobulin	10.04	
	Casein	28.29	
	Cheddar Cheese	19.79	
	Cow's Milk	20.78	
	Goat's Milk	4.07	
	Mozzarella Cheese	16.28	
	Sheep's Yogurt	2.69	
	Whey	19.83	
	Yogurt	27.06	
	Beans and Peas	Azuki Bean	8.18
		Black Bean	8.47
		Garbanzo Bean	5.65
		Green Bean	10.21
		Green Pea	4.78
		Kidney Bean	8.39
Lentil		7.63	
Lima Bean		3.47	
Mung Bean		12.26	
Navy Bean		8.40	
Pinto Bean		6.87	
Soybean		13.44	
Tofu		10.09	
Fruits		Acai Berry	5.92
		Apple	1.62
	Apricot	17.02	
	Banana	5.23	
	Blueberry	1.03	
	Cantaloupe	2.32	
	Cherry	27.56	
	Grains	Coconut	11.56
		Cranberry	1.10
		Date	8.42
		Fig	15.21
		Grape	7.64
		Grapefruit	15.12
		Guava	2.55
		Jadfruit	17.27
Kiwi		4.33	
Lemon		10.10	
Lychee		2.70	
Mango		4.58	
Orange		8.41	
Papaya		19.20	
Passion Fruit		1.79	
Peach	13.04		
Pear	2.35		
Pineapple	9.13		
Plum	2.91		
Pomegranate	1.27		
Raspberry	5.21		
Strawberry	1.52		
Watermelon	3.44		
Grains	Amaranth	6.64	
	Barley	2.97	
	Buckwheat	2.39	
	Corn	6.63	
	Gliadin	26.82	
	Malt	1.23	
	Millet	8.31	
	Oat	6.23	
	Quinoa	3.41	

Testing performed by The Great Plains Laboratory, Inc., Lenexa, Kansas. The Great Plains Laboratory has developed and determined the performance characteristics of this test. This test has not been evaluated by the U.S. Food and Drug Administration.

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 Date of Birth: \_\_\_\_\_      Time of Collection: 09:18 AM  
 Gender: F      Print Date: Jul 10, 2020

### IgG Food MAP (190) - Serum MFI x 1000

Food Category	Food Item	MFI x 1000	
Grains	Rice	9.98	
	Rye	9.33	
	Sorghum	7.67	
	Teff	5.45	
	Wheat Gluten	31.96	
	Whole Wheat	26.14	
	Meat/Poultry	Beef	1.06
		Chicken	0.27
		Duck	0.89
		Egg White	47.59
		Egg Yolk	24.29
		Goose	1.90
		Lamb	0.88
		Pork	0.64
		Turkey	0.84
Nuts/Seeds		Almond	27.96
		Brazil Nut	1.62
		Cashew	5.81
		Chestnut	3.28
		Chia Seed	2.24
		Flax Seed	7.14
	Hazelnut	14.36	
	Hemp Seed	4.20	
	Macadamia Nut	7.43	
	Peanut	12.89	
	Pecan	0.82	
	Pine Nut	5.57	
	Pistachio	9.85	
	Pumpkin Seed	5.92	
	Sesame Seed	4.79	
Sunflower Seed	13.80		
Walnut	9.20		
Vegetables	Artichoke	4.16	
	Asparagus	6.17	
	Avocado	13.92	

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 Gender: F      Print Date: Jul 10, 2020

### IgG Food MAP (190) - Serum MFI x 1000

Food Category	Food Item	MFI x 1000	
Vegetables	Bamboo Shoot	2.18	
	Bean Sprout	8.41	
	Beet	3.80	
	Bell Pepper	21.93	
	Bitter Melon	8.15	
	Broccoli	17.13	
	Brussel Sprout	19.38	
	Burdock Root	2.14	
	Cabbage	43.96	
	Carrot	6.22	
	Cauliflower	18.39	
	Celery	17.75	
	Chili Pepper	36.89	
	Cucumber	12.05	
	Eggplant	9.46	
Enoki Mushroom	0.28		
Garlic	15.71		
Kale	11.97		
Leek	9.60		
Lettuce	6.33		
Lotus Root	1.25		
Napa Cabbage	6.57		
Olive (Green)	0.28		
Onion	10.57		
Portabella Mushroom	0.71		
Potato	19.01		
Pumpkin	14.56		
Radish	15.76		
Seaweed Kombu Kelp	0.26		
Seaweed Nori	0.37		
Seaweed Wakame	0.28		
Shitake Mushroom	0.34		
Herbs/Spices	Spinach	4.35	
	Sweet Potato	8.62	
	Tomato	16.52	
	Yam	4.66	
	Yellow Squash	18.84	
	Yuca	0.00	
	Zucchini	5.46	
	Miscellaneous	Basil	2.54
		Bay Leaf	0.56
		Black Pepper	2.97
		Cayenne Pepper	10.42
		Cilantro	0.97
		Cinnamon	1.29
		Cloves	2.46
		Cumin	11.01
Curry		5.52	
Dill		1.59	
Ginger		9.13	
Hops		4.56	
Mint		0.64	
Miso		8.91	
Mustard Seed		34.01	
Oregano	0.27		
Paprika	20.00		
Rosemary	2.76		
Sage	2.67		
Tarragon	2.17		
Thyme	3.47		
Turmeric	0.88		
Vanilla Bean	5.21		
Miscellaneous	Bromelain	22.50	

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 Gender: F      Print Date: Jul 10, 2020

### IgG Food MAP (190) - Serum MFI x 1000

Food Category	Food Item	MFI x 1000
Miscellaneous	Cane Sugar	3.51
	Cocoa Bean	0.89
	Coffee	0.33
	Green Tea	6.80
	Honey	10.29
	Meat glue	16.05
	Oolong Tea	2.07

**Food Reactivity Scale**      MFI x 1000

Not Significant	< 4.47
Low	4.47-9.86
Moderate	9.87-15.99
High	>=16

(\*) Median Fluorescent Intensity

### Reactivity Summary

High	Moderate	Low
Almond	Avocado	Acai Berry
Broccoli	Beta-Lactoglobulin	Banana
Cabbage	Cucumber	Bitter Melon
Celery	Cumin	Black Bean
Chili Pepper	Garlic	Broccoli Sprout
Cow's Milk	Grapefruit	Carrot
Egg Yolk	Hazelnut	Cashew
Meat glue	Honey	Corn
Mozzarella Cheese	Lemon	Curry
Paprika	Peach	Date
Tomato	Radish	Eggplant
Wheat Gluten	Rice	Garlic
Yellow Squash	Tofu	Ginger
Yogurt		Green Tea
		Leek
		Macadamia Nut
		Mango
		Miso
		Napa Cabbage
		Orange
		Oat
		Pine Nut
		Pineapple
		Pumpkin Seed
		Raspberry
		Rye
		Sesame Seed
		Sorghum
		Sweet Potato
		Teff
		Vanilla Bean
		Walnut
		Yam
		Zucchini

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## Sample Report, continued

### Four Day Rotation Diet – Customized for You



#### Congratulations,

The IgG test was an important step in improving your health. A Food Rotation Diet based on your results may further improve your symptoms.

The Great Plains Laboratory, Inc.

#### FOOD ROTATION DIET BASED ON IGG RESULTS

The following personalized rotation diet is presented as an example of this approach to symptom reduction based on your IgG results.

Foods that showed elevated IgG levels on your test (those in the moderate or high categories) have been removed from rotation. Your rotation diet is constructed from the foods that tested in the clinically insignificant or low categories on your results. Foods were grouped by food families, such as the cabbage family or the fish family, as related organisms are more likely to share similar proteins with similar immune reactivity.

#### Rotation diets are a recommended method for reducing negative responses to foods:

In general, eating from different food families distributed over several days reduces overall inflammation and toxic load, as well as lessening the chance of developing additional food sensitivities. Consult your health practitioner for advice on how long to follow your rotation diet and when to reintroduce foods as a challenge. Many individuals require at least a year or more of food elimination and rotation for IgG levels to return to normal. Continuing to eat a variety of whole foods is a healthy lifestyle choice.

#### Rotation diets may reduce overall food reactivity:

Eating similar foods every day is an easy pattern to adopt for busy lives, however, this behavior may increase food reactivity. Rotating foods decreases the burden on the immune system and possibly reduces overall toxin load, while providing adequate nutrition and variety. Food cravings may lessen and awareness of responses to specific foods may be heightened. Rotating foods may also "unmask" hidden food sensitivities, especially if a detailed food and symptom daily record is maintained.

Please note that the rotation diet is based only on IgG testing:

Testing for IgE antibodies to food allergens should be considered PRIOR TO BEGINNING A ROTATION DIET, even if histamine reactions are not symptomatically evident. The most common IgE reactions are to dairy, eggs, peanuts, or seafood. IgE allergies are most common in childhood, and often are outgrown by adulthood.

For additional information and references on IgG and dietary intervention, please visit [www.greatplainslaboratory.com](http://www.greatplainslaboratory.com). Select A Test – IgG



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### Four Day Rotation Diet – Customized for You

Day 1	Day 2	Day 3	Day 4
<b>Dairy</b>			
		Goat's Milk Sheep's Yogurt	
<b>Beans and Peas</b>			
Black Bean Kidney Bean Navy Bean Pinto Bean	Adzuki Bean	Lentil Lima Bean	Garbanzo Bean Green Pea
<b>Fruits</b>			
Apple Date Lychee Passion Fruit Pear	Acai Berry Cantaloupe Guava Orange Pomegranate Watermelon	Blueberry Cranberry Grape Kiwi Plum Raspberry Strawberry	Banana Mango Pineapple
<b>Grains</b>			
Millet Sorghum Teff	Amaranth Buckwheat Oat Quinoa	Corn	Barley Malt Rye

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#### Fish/Seafood

Anchovy Codfish Halibut Sardine	Abalone Crab Jack Mackerel Lobster Octopus Oyster Scallop Shrimp Small Clam Squid	Perch Red Snapper Salmon Trout	Bass Bonito Pacific Saury Tuna
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#### Meat/Fowl

Beef Lamb	Chicken Duck Goose Turkey		Pork
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#### Nuts/Seeds

Flax Seed Pine Nut Sesame Seed	Chestnut Hemp Seed Pecan Walnut	Cashew Chia Seed Macadamia Nut	Brazil Nut Pistachio Pumpkin Seed
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#### Vegetables

Napa Cabbage Sweet Potato Yam	Artichoke Beet Bitter Gourd Burdock Root Seaweed Kombu Kelp Seaweed Nori Seaweed Wakame Spinach Zucchini	Asparagus Eggplant Leek	Bamboo Shoot Bean Sprout Carrot Enoki Mushroom Lettuce Lotus Root Portabella Mushroom Shitake Mushroom
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#### Herbs/Spices

Bay Leaf Cinnamon Cloves Tarragon	Black Pepper Ginger Miso Turmeric	Basil Mint Oregano Rosemary Sage Thyme	Culantro Curry Dill Hops Vanilla Bean
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#### Miscellaneous

Miscellaneous foods are not rotated. Remove foods with a moderate or high antibody response.

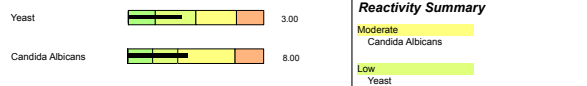
William Shaw, Ph.D., Director | 11813 West 77th Street Lenexa, KS 66214 | (913) 341-8949 | Fax: (913) 341-6207 | GPL4u.com

The Great Plains Laboratory, Inc.



Requisition #: Physician Name:  
 Patient Name: Date of Collection:  
 Date of Birth: Time of Collection:  
 Gender: F Print Date: Jul 9, 2020

#### IgG Yeasts Allergy Test (2) Serum



The Candida albicans scale accounts for the observation that background levels of Candida-specific immunoglobulins are normally present in virtually all individuals tested. It is intended to provide a clearer description of its clinical significance and was established according to population percentile ranks obtained from a random subset of 1,000 patients.

The *Candida* and Yeast antigens were not suitable for the xMAP® technology. Therefore, antibodies to these antigens were measured by ELISA and this report is provided at no additional charge.

# Advanced Cholesterol Profile

## General Description

The concept of “good” and “bad” cholesterol depends highly on the circumstances of the individual person. Although very high blood serum cholesterol values are associated with heart disease, low values (below 160 mg/dL) are associated with increased violent behavior, suicide, depression, anxiety, bipolar disease, Parkinson’s disease, and increased mortality from cancer. Low cholesterol values are also associated with manganese deficiency, Celiac disease, hyperthyroidism, liver disease, malabsorption, and malnutrition.

## Clinical Usefulness

- Determine whether a cholesterol deficiency is present
- Determine if cholesterol is elevated
- Identify the presence of abnormalities in cholesterol transport
- Determine if the body is eliminating homocysteine
- Identify risk factors for vascular and neurological disease
- Assess risk of having a premature baby

## Recommendations

Depending on test results, follow-up may include:

- Dietary modification
- Supplementation
- Follow-up/confirmational testing

## Specimen Requirements

4 mL of serum in a gold-topped SST no-additive vial.

## CPT Codes

82172\*2 82465 83090 83695 83718

# Amino Acids Test

## General Description

The Amino Acids Urine and Plasma Tests can be utilized by the medical practitioner for different purposes. Urinary amino acids are discarded by the body as excess or “waste,” while amino acids present in plasma indicate availability for building structural, transport, and storage proteins. Amino acids also play a role in neurotransmitter functioning, cholesterol and carbohydrate metabolism, and detoxification processes.

## Clinical Usefulness

- Determine the availability of essential/conditionally indispensable amino acids
- Evaluate urea cycle metabolites
- Assess the efficiency of B6, B12, and folate-dependent enzymes
- Identify the level of magnesium-dependent markers
- Measure nonessential amino acids levels
- Evaluate protein digestion and absorption

## CPT Codes

82139\*1 82140 84540

## Recommendations

Depending on test results, follow-up may include:

- Dietary modification
- Modification of vitamin and antioxidant intake
- Magnesium supplementation
- Probiotic supplementation
- Digestive enzyme supplementation
- Follow-up tests for metabolic syndromes

## Specimen Requirements

**Urine:** 25 mL of first-morning urine before food or drink.  
- or -

**Plasma:** 7 mL of whole blood in a lavender-topped EDTA vial. Specimen must be received within 48 hours of the collection. The sample must be immediately frozen and shipped with frozen gel pack. This test is only available in the US.

***No special diet is required for this test, however, if you are taking antibiotic medications, please finish the course of medication, then wait 48 hours before starting collection. The patient should discontinue amino acid supplementation 48 hours prior to collection.***

## General Description

While many laboratories offer testing for calcium and magnesium in blood, urine testing for calcium and magnesium is more clinically useful than blood testing. This test can easily be added on to our Organic Acids Test, GPL-TOX Profile, or other urine tests at a discounted price.

## Specimen Requirements

**Urine:** 10 mL of first morning urine before food or drink is suggested.

## Recommendations

Depending on test results, follow-up may include:

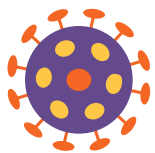
- Dietary modification
- Supplementation
- Follow-up/confirmational testing

## Clinical Usefulness

The concentration of calcium in the plasma is one of the most constant laboratory values ever measured. In the great majority of normal people, calcium only varies from 9-11 mg per dL, regardless of the diet. An average adult ingests about 750 mg per day of calcium and secretes about 625 mg of calcium in the intestinal juices. If all the ingested calcium is absorbed, there would be a net absorption of 125 mg per day of calcium. Since the average person excretes about 125 mg calcium per day in the urine, the average person has a zero net calcium balance except when bone is being deposited. If bone is being deposited due to the stress of exercise or following a fracture, the regulation of the amount of urinary calcium excretion is the major factor to allow for bone growth. Since urine is the major controlling element for maintaining calcium balance that is under tight hormonal control, it appears that urine calcium is the best indicator of adequate dietary calcium.



# Comprehensive Stool Analysis



## Comprehensive Stool Analysis

### General Description

The Comprehensive Stool Analysis detects the presence of 218 pathogenic microorganisms such as yeast, parasites, and bacteria that contribute to chronic illness and neurological dysfunction – **now with 14 new viral markers!** It provides helpful information about prescription and natural products effective against specific microorganism strains detected in the sample. The test also evaluates beneficial bacteria levels, intestinal immune function, overall intestinal health (occult blood, short chain fatty acids, pH, and mucus), and inflammatory markers.

### Clinical Usefulness

- Parameters for digestion and absorption
- Cultures for bacteria
- Cultures for yeast
- Parasite testing
- Sensitivity panels
- Inflammatory markers
- Stool metabolic markers
- Infectious pathogens

### Recommendations

Depending on test results, follow-up may include:

- Antifungal agents
- Antibiotic agents
- Antiparasitic agents
- Probiotics
- Digestive enzymes
- Follow-up/confirmational tests
- Nutritional supplements

### Specimen Requirements

Samples must be collected on two separate days or at least 12 hours apart. All four stool specimens must be received within 7 days of the first collection. We suggest collecting the first specimen on a weekend. Items that should be discontinued 48 hours prior to collection unless otherwise instructed by a doctor include: digestive enzymes, antacids, iron supplements, vitamin C over 250 mg, aspirin, anti-inflammatories, and large amounts of meat.

### CPT Codes

82272\* 82542 82656 83516\* 83631 83986 83993 85549\*  
87045 87046 87102 87177\*2 87209\*2 87328 87329 89125  
89160\* \*No Medicare Coverage

### Report Analysis

#### NEW – 14 viral markers

Adenovirus F40/41, Norovirus GI/GII, Rotavirus A, *Campylobacter* (*C. jejuni*, *C. coli*, and *C. lari*), *Clostridium difficile* Toxin A/B, *Salmonella* spp., *Vibrio cholera*, *Cryptosporidium* (*C. parvum* and *C. hominis*), *Entamoeba histolytica*, *Giardia duodenalis* (intestinalis & lamblia), Enterotoxigenic *Escherichia coli* (EPEC) lt/st, Shiga-like toxin-producing *Escherichia coli* (STEC) stx1/stx2, *Escherichia coli* O157, *Shigella* (*S. boydii*, *S. sonnei*, *S. flexneri* & *S. dysenteriae*).

#### Bacterial culture

73 possible species of imbalanced and dysbiotic bacteria, 6 species of beneficial bacteria.

#### Yeast (mycology) culture

48 possible yeast and fungal species.

#### Parasite isolation

22 possible parasites, markers of digestion and absorption. Findings can indicate if an individual has pancreatic insufficiency and provide information regarding macronutrient absorption.

#### Inflammatory markers

Findings can indicate whether the individual has moderate or high inflammation in the gut lining. These markers are helpful in diagnosing irritable bowel syndrome as well as transient inflammation due to acute illness.

#### Immunology

Secretory Immunoglobulin A (sIgA) is the primary antibody of the GI tract. This is the primary defense in our assimilation of food particles versus pathogens. Low levels can predispose a person to infections and bowel disease.

#### Short chain fatty acids

Short chain fatty acids result from the fermentation of dietary fiber by beneficial bacteria. These fats play an important role in the health of the GI tract as well as protecting against disease.

#### Intestinal health markers

These markers can be elevated in infection, cancer, and colitis.

#### Yeast

The microscopic examination of yeast identifies the visible presence of yeast cells.

#### Yeast sensitivity to:

Fluconazole, Itraconazole, Ketoconazole, Nystatin, Berberine, Caprylic Acid, Goldenseal, Oregano, Tanalbit, Undecylenic Acid, Uva Ursi

#### Bacterial sensitivity to:

Amoxicillin, Ampicillin, Augmentin, Ciprofloxacin, Trimeth-sulfa, Berberine, Black Walnut, Caprylic Acid, Cats Claw, Citrus Seed Extract, Goldenseal, Oregano, Uva Ursi

#### For *Staphylococcus aureus*:

Benzpenicillin, Oxacillin, Tetracycline, Trimeth-sulfa, Vancomycin, Berberine, Black Walnut, Caprylic Acid, Cats Claw, Citrus Seed Extract, Goldenseal, Oregano, Uva Ursi

## COPPER + ZINC PROFILE

### General Description

The Copper + Zinc Profile is an excellent way to assess immune status and the nutritional intake and/or absorption of zinc and copper. Zinc is an essential trace element required for the activity of more than 300 enzymes. It is necessary for proper functioning of the immune system and is involved in most major metabolic pathways. Zinc has an inverse relationship with copper in the body. As zinc status decreases, copper status increases, and vice versa. Adequate copper levels are essential for the growth of new blood vessels, wound healing, and recovery from heart attacks and strokes. When levels are only slightly above normal physiological amounts, copper can be toxic. Any mild abnormality or impairment of liver function can lead to copper excess.

### Clinical Usefulness

- Assessment of zinc status
- Assessment of copper status and toxicity
- Assessment of immune status

### Recommendations

Depending on test results, follow-up may include:

- Zinc supplementation
- Copper supplementation
- Dietary modification
- Molybdenum salt supplementation
- Administration of penicillamine to reduce copper excess

### Specimen Requirements

3 mL of serum drawn into a royal blue-topped no-additive vial.

### CPT Codes

82390 82525 84630



# DNA Methylation Pathway Profile

## General Description

The DNA Methylation Pathway Profile allows clinicians to screen their patients for a variety of genetic changes (single nucleotide polymorphisms, or SNPs) that may impact the function of important biochemical processes such as methionine metabolism, detoxification, hormone balance and Vitamin D function. The presence or absence of SNPs may modify disease risk. The risks may be reduced by lifestyle changes, and inefficient biochemical processes can be supported by diet and nutritional supplements to maximize the functions of metabolic pathways.

## Clinical Usefulness

Identifying SNPs that may influence health and risk for diseases facilitates clinical support for patients. The DNA Methylation Pathway Profile includes a variety of SNPs known to influence many aspects of health including those for:

- Insulin Sensitivity
- Bone Health
- Cancer Risks
- Cardiovascular Health
- Detoxification Processes
- Fertility
- Mitochondrial Function and Metabolism
- Methylation
- Neurotransmitter Balance

## Important SNPs in the Profile

**VDR:** (the vitamin D receptor) is a nuclear receptor protein that binds 1,25-dihydroxy vitamin D to activate a signaling molecule that is believed to have important roles in a 3rd of the human genome. Some functions that are known are xenobiotic detoxification.

**BHMT:** (betaine-homocysteine methyltransferase) is a transferase enzyme that catalyzes the transfer of a methyl group from betaine to homocysteine, which produces methionine. Other enzymatic roles for BHMT is the choline oxidation processes. This enzyme is found in the liver and kidney.

**COMT:** (catechol-O-methyltransferase) functions in the nerve cells, liver, kidneys, and red blood cells. Its role is to help inactivate 2- and 4-hydroxyestradiols, and catecholamine hormones prior to excretion of bile. COMT is also found in the CNS where its role is the degradation of catecholamine neurotransmitters.

**MAO A:** (monoamine oxidase type A) its main role is to detoxify biological and xenobiotic amines. This enzyme also degrades neurotransmitters in both the central and peripheral nervous system.

**AHCY:** (adenosylhomocysteinase) an enzyme that breaks down methionine by converting S-adenosylhomocysteinase into homocysteine. This reaction regulates the methylation of other compounds.

**CBS:** (cystathionine beta-synthase) this enzyme is responsible for using vitamin B6 to convert serine and homocysteine into cystathionine which will be later converted into cysteine.

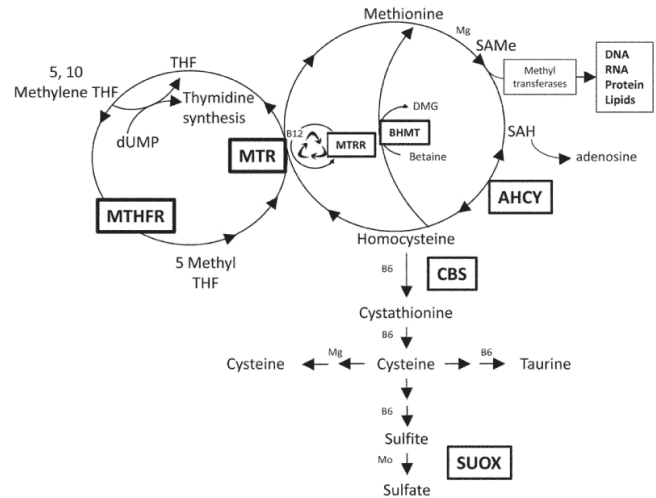
**MTHFR:** (methylenetetrahydrofolate reductase) enzyme responsible for the conversion of 5,10-methylenetetrahydrofolate to 5-methyltetrahydrofolate. This reaction allows for the conversion of homocysteine to methionine.

**MTR:** (methionine synthase) enzyme that catalyzes the re-methylation of homocysteine to methionine using the methyl-B-12 as a cofactor.

**MTRR:** (methionine synthase reductase) responsible for the regeneration of methyl-B-12.

**SHMT:** (serine hydroxymethyltransferase) responsible for catalyzing the interconversion of glycine to serine.

**SUOX:** (sulfite oxidase) mitochondrial enzyme responsible for oxidizing sulfites to sulfates. Sulfites are produced by the transsulfuration cycle or from diet.



## Benefits of DNA Testing

- Clarification of diagnosis suggested by other testing
- Indication for supplements and diet modifications

## Specimen Requirements

**Saliva:** Four buccal swabs are required.

Gene Name / Variation	RESULTS		Call
	Mutation Not Present	Mutation(s) Present	
SHMT / C1420T	-/-	Present	G
AHCY / 1		+/-	Hetero
AHCY / 2		+/-	Hetero
AHCY / 19		+/-	Hetero
MTHFR / C677T	-/-		C
MTHFR / A1298C		+/+	C
MTHFR / 3	-/-		C

## General Description

Dipeptidyl Peptidase IV or DPP-IV is a critical enzyme that regulates a wide variety of physiological processes including eating, digestion, immune function, pain perception, growth, infection, and many others. DPP-IV deficiency is associated with a wide range of conditions including many psychiatric illnesses, autoimmune diseases, digestive diseases, lung diseases, and cancer.

## Recommendations

Depending on test results, follow-up may include:

- Dietary modification
- Supplementation
- Follow-up/confirmation testing

## Specimen Requirements

**Saliva:** 3 mL of serum

## Clinical Usefulness

Since DPP-IV inhibitors can cause pronounced side effects, foods that are converted to DPP-IV inhibitors through enzymatic digestion may have pronounced effects on human function. The food proteins that have the highest amounts of these DPP-IV inhibitors are cow's milk and wheat. Each of these proteins produces a peptide with five to seven amino acids with high opiate activity when digested. Both of these opiate peptides can be broken down further by DPP-IV by removing the first four amino acids. The residual three amino acid peptides of both casomorphin and gliadorphin are potent DPP-IV inhibitors that will inhibit the function of DPP-IV in regulating all of the other endocrine and immune functions of the proteins and peptides that are substrates of DPP-IV. Substance P, a nine amino acid peptide, mediates the perception of pain when released from injured tissue and continues to provoke pain until DPP-IV removes two amino acids from substance P, terminating the pain perception. Thus, a person with a diet high in gluten and casein might be much more subject to pain and anxiety if their substance P persists for longer periods of time due to the high amounts of potent DPP-IV inhibitors from gluten and casein.

# Homocysteine Test

## General Description

Excess homocysteine is a key factor in cardiovascular disease, psychiatric disorders, cancer, hip fractures, and Alzheimer's disease. Factors that increase homocysteine include genetic deficiencies of enzymes in the transsulfuration methylation cycle such as MTHFR, CBS, BHMT and others, a diet high in methionine, or deficiencies of folate.

## Recommendations

Depending on test results, follow-up may include:

- Dietary modification
- Supplementation
- Follow-up/confirmation testing

## Specimen Requirements

**Saliva:** 3 mL of serum

## Clinical Usefulness

Factors that increase homocysteine include severe or mild genetic deficiencies of enzymes in the transsulfuration methylation cycle such as MTHFR, CBS, BHMT and others, a diet high in methionine, or deficiencies of folate, vitamin B12, vitamin B6, or betaine. Other factors that elevate homocysteine include megadoses of niacin, nitrous oxide anesthesia, and excessive copper.

Homocysteine is decreased by a diet high in folate compounds, vitamin B12, methylcobalamin, betaine or supplements containing these vitamins. In addition, exposure to many toxic chemicals can upregulate CBS leading to increased conversion of homocysteine to cystathionine with concomitant decrease of homocysteine. Conversely, removal of toxic chemicals may result in increased homocysteine.

# Hormones Profile



## General Description

Sex hormones and adrenal (stress) hormones are subject to change due to age, environmental stress, and other factors. DHEA and cortisol are the main adrenal stress hormones. The primary sex hormones are the three main estrogens (Estrone, Estradiol, and Estriol) and testosterone. Men and women make both, plus several more that must be in balance for optimum health.

An imbalance of any hormone can throw physical and mental health out of balance, causing aggravating and even serious health problems. Being able to identify a hormonal imbalance is essential to designing an effective treatment plan. If a patient is seeking bio-identical hormone replacement therapy (BHRT) or a topical hormone therapy, free hormone levels should be assessed first before proceeding with a particular therapy.

## Specimen Requirements

**Saliva:** 3/4 Saliva Vial full x4

## Clinical Usefulness

- Determine if there are hormonal imbalances
- Determine if there is estrogen dominance
- Monitor exogenous hormone therapies
- Assess disruption of optimum diurnal cortisol patterns

## Recommendations

Depending on test results, follow-up may include:

- Adjustments in hormone therapy
- Lifestyle changes
- Symptom relief therapy

## Report Analysis

### Comprehensive Profile (for men + women):

- Estradiol (estrogen)
- Progesterone
- Testosterone
- DHEA
- Cortisol (2x a day)

### Comprehensive Plus Profile (for women only):

- Add: Estrone, Estriol

## CPT Codes

### Comprehensive Profile:

82670 84144 84402 82626 82530\*4

### Comprehensive Plus Profile:

82679 82670 82677 84144 84402 82626 82530\*4

# Iron + Total Iron Binding Capacity Test

## General Description

Excess iron can affect virtually every aspect of health. The most common cause of excess iron is a genetic disorder called hemochromatosis, which causes the absorption of iron to be increased. Hemochromatosis patients carry an increased risk of several cancers. In addition, there is a significant association of both neurological and psychiatric symptoms associated with excessive iron, including Parkinson's disease, Alzheimer's disease, depression, and bipolar depression.

## Recommendations

Depending on test results, follow-up may include:

- Dietary modification
- Supplementation
- Follow-up/confirmation testing

## Specimen Requirements

**Saliva:** 3 mL of serum

## Clinical Usefulness

High iron causes toxicity by the Fenton reaction, in which hydroxyl free radicals are formed from iron (II) and hydrogen peroxide. Patients with hemochromatosis manifest hepatomegaly, abdominal pain, bronze skin pigmentation (particularly in sun-exposed areas), deranged glucose homeostasis or frank diabetes mellitus, and cardiac dysfunction (arrhythmias, cardiomyopathy, and atypical arthritis). In some patients, the presenting complaint is hypogonadism, with amenorrhea in the female and loss of libido and impotence in the male. The classic triad of pigment cirrhosis with hepatomegaly, skin pigmentation, and diabetes mellitus does not always develop. Death may result from cirrhosis or cardiac disease.

Eggs contain a compound called phosvitin that binds iron. One boiled egg can reduce absorption of iron in a meal by as much as 28%. Phenolic acid found in apples, peppermint, and some herbal teas, and tannins found in black teas, coffee, cocoa, spices, walnuts, fruits such as apples, blackberries, raspberries and blueberries all have the ability to inhibit iron absorption. Although spinach is high in iron, the high oxalate content of spinach prevents iron absorption. Turmeric is among the spices known to inhibit iron absorption by 20%-90% in humans, reducing iron absorption in a dose-dependent manner.





## General Description

Type one, or "classic," allergy causes redness, swelling, and heat in the body as a result of the elevated blood levels of Immunoglobulin E (IgE). Contrary to popular belief, the symptoms produced by IgE can be subtle and similar to those seen in other conditions. This potential confusion makes diagnostic testing very important in recognizing the offending source. The Advanced IgE Tests increase the chance that a patient may identify numerous offending foods and/or inhalants, including *Candida*.

## Clinical Usefulness

- Promote non-invasive, food-based therapy
- Eliminate allergy triggers
- Reduce the burden on the immune system
- Reduce inflammation
- Reduce food cravings
- Improve assimilation of nutrients

## Recommendations

Depending on test results, follow-up may include:

- Elimination of the offending foods
- Elimination of the offending inhalants
- Immune system support
- Gut restoration
- Implementation of a rotation diet
- Supplementation
- Administration of antihistamines
- Use of air purifiers

## Specimen Requirements

### IgE Food Allergy Tests:

5 mL (Basic), or 8 mL (Advanced) of serum in a gold-topped SST no-additive vial. The elimination of a food will reduce the ability for our laboratory to detect antibodies (allergies) to that food.

### IgE Inhalant Allergy Tests:

5 mL (Basic) or 8 mL (Advanced) of serum in a gold-topped SST no-additive vial.

### IgG Allergy Combined Advanced Tests:

12 mL of serum in a gold-topped SST vial.

## CPT Codes

**IgE Food Allergy Tests:** 86003\*162

**IgE Inhalant Allergy Tests:** 86003\*36 86003\*69

**IgE Allergy Advanced Combined:**

86003\*12 86003\*25 86003\*93

\*No Medicare Coverage

### IgE Food Allergy Basic Test (27)

Almond, Apple, Barley, Beef, Carrot, Chicken, Chocolate, Corn, Egg (Whole), Garlic, Green Bean, Milk, Oat, Onion, Orange, Peanut, Pork, Potato, Rice, Shrimp, Soybean, Tomato, Tuna, Wheat, White Bean, Yeast (Bakers)

### IgE Food Allergy Advanced Test (93)

Almond, Apple, Apricot, Asparagus, Avocado, Banana, Barley, Beans and Peas, Beet, Blueberry, Broccoli, Buckwheat, Cabbage, Cane Sugar, Carrot, Casein, Cashews, Celery, Cheese, Chicken, Cocoa, Coconut, Cod Fish, Coffee, Corn, Crab, Cranberry, Egg White, Egg Yolk, Eggplant, Flax, Garbanzo Bean, Garlic, Goat Cheese, Grape, Grapefruit, Green Bean, Green Pepper, Halibut, Hazelnut, Honey, Kidney Bean, Lamb, Lemon, Lentil, Lettuce, Lima Bean, Lobster, Mango, Milk, Millet, Mushroom, Oat, Onion, Orange, Papaya, Pea, Peach, Peanut, Pear, Pecan, Pineapple, Pinto Bean, Pistachio, Plum (Prune), Pork, Potato, Pumpkin, Radish, Raisin, Rice, Rye, Salmon, Sardine, Sesame, Shrimp, Soybean, Spinach, Strawberry, Sunflower, Sweet Potato, Tomato, Tuna, Turkey, Walnut, Watermelon, Wheat Gluten, Wheat, Whey, Yeast (Bakers, Brewers), Yogurt, Zucchini

### IgE Inhalant Allergy Basic Test (36)

Alder, Alternaria Tenuis, Ash (White), Aspergillus Fumigatus, Beech (American), Bermuda Grass, Birch (White), Box Elder, Burning Bush, Cat, Cladosporium Herbarum, Cocklebur, Cockroach, Cottonwood (Eastern), Dog, Elm (White), Hickory, White, Lamb's Quarters, Marsh Elder (Rough), Meadow Fescue, Mite (D. Farinae, D. Pteronyssinus), Mugwort, Nettle, Oak (White), Orchard/Cocksfoot, Penicillium Notatum, Perennial Rye, Pigweed (Rough), Pine Mix, Plantain (English), Privet, Ragweed (Short), Sheep Sorrell, Sycamore, Timothy Grass

### IgE Inhalant Allergy Advanced Test (69)

Acacia, Alder, Alternaria Tenuis, Amoxicillin, Ash (White), Aspergillus Fumigatus, Bahia Grass (Tall), Bermuda Grass, Bipolaris Spicifera, Bluegrass (Kentucky), Box Elder, Brome Grass, Candida Albicans, Cat, Cladosporium Herbarum, Cocklebur, Cockroach, Corn, Cottonwood (Eastern), Cypress (Bald), Dockweed (Yellow), Dog, Elm (White), Epicoccum Purpurascens, Fusarium Moniliforme, Fusarium Oxysporum, Goldenrod, Helminthosporium Halodes, Hickory, White, Horse Dander, Johnson Grass, Lamb's Quarters, Latex, Maple (Red), Marsh Elder (Rough), Meadow Fescue, Mite (D. Farinae, D. Pteronyssinus), Mountain Cedar, Mouse, Mucor Racemosus, Mulberry (Red and White), Nettle, Oak (Live, Red, White), Oats (Cultivated), Pecan, Penicillium Notatum, Perennial Rye, Phoma Betae, Pigweed (Rough), Plantain (English), Poplar (White), Privet, Rabbit, Ragweed (Giant, Short), Rye (Cultivated), Sheep Sorrell, Stemphylium Botryosum, Sweet Gum, Sycamore, Timothy Grass, Tree of Heaven, Walnut (Black), Wheat (Cultivated), Willow (Black)

### IgE Allergy Advanced Combined Test (162)

- IgE Food Allergy Advanced Test (93)
- IgE Inhalant Allergy Advanced Test (69)

# METALS

## Metals Hair Test

Heavy metals toxicity, caused by increasing levels of environmental pollution, is a growing threat to the health and development of children. High levels of toxic metals deposited in body tissues, and subsequently the brain, may cause significant developmental and neurological damage. A Metals Hair Test is ideal for checking current exposure to toxic metals. A study in Poland found a high correlation between hair and brain mercury.

The U.S. Environmental Protection Agency stated in a recent report that "... if hair samples are properly collected and cleaned, and analyzed by the best analytic methods, using standards and blanks as required, in a clean and reliable laboratory by experienced personnel, the data are reliable" (U.S.E.P.A. 600/4-79-049). The Center for Disease Control acknowledges that hair mercury levels provide a valuable maternal and infant marker for exposure to neurotoxic methylmercury from fish.

## Clinical Usefulness

- Determine if metal toxicity is contributing to a disorder
- Determine if a mineral deficiency is inhibiting metabolic processes

## Recommendations

Depending on test results, follow-up may include:

- Identification of the source of contamination
- Elimination of heavy metals from the environment
- Elimination of heavy metals from the body
- Mineral supplementation
- Administration of supplements that support detoxification

## Specimen Requirements

1 gram of hair.

## CPT Codes

**Hair:** 82108 82300 82525 83018\*28 83655 83735 83785 83825 83885 84100 84255 84630

No Medicare Coverage

## Additional Metals Tests

**Blood** is routinely checked for metals toxicity; however, blood only reflects very acute and extreme poisoning by metals. Cellular damage can occur at much lower levels than what is expressed in blood. We recommend blood only for checking levels of essential minerals and acute exposure to heavy metals.

**Urine** testing is recommended to check how well toxic metals are being eliminated after consuming a chelating agent.

**Fecal** testing is recommended to determine actual exposure to metals as opposed to the accumulation of metals in the body. For many toxic metals, fecal (biliary) excretion is the primary natural route of elimination from the body. Thus, the representation of metals in fecal matter is a reflection of the metals ingested in the diet or excreted into the intestine.

## Specimen Requirements

**Whole Blood:** 7 mL of whole blood drawn in a royal blue-topped potassium EDTA vial.

**Red Blood Cell:** 4 mL of packed cells in a royal blue-topped potassium EDTA vial.

**Urine:** 50 mL of urine.

**Fecal:** 35 mL of stool collected in the red-topped vial (with ultra-pure water). Do not overfill the specimen.

## CPT Codes

**Whole Blood:** 82310 82495 82525 83018\*7 83655 83735 83825 84132 84255 84285 84295 84630

**Red Blood Cell:** 82175 82300 82310 82495 82525 83015 83018\*4 83655 83735 83785 83825 84100 84132 84255 84630

**Urine:** 82108 82175 82300 82495 82525 82570 83018 83540 83655 83735 83785 83825 83885 84100 84133 84255 84300 84630

**Fecal:** 82175 82300 82525 83015 83655 83825 83885

No Medicare Coverage (for all metals tests)

## Report Analysis – Additional Tests for Metals

### Whole Blood

**Essential:** Calcium, Chromium, Copper, Lithium, Magnesium, Manganese, Molybdenum, Selenium, Strontium, Vanadium, Zinc

**Toxic:** Arsenic, Barium, Cadmium, Cobalt, Lead, Mercury, Nickel, Platinum, Tungsten, Thallium, Uranium

### Red Blood Cell

**Essential:** Boron, Chromium, Calcium, Copper, Iron, Magnesium, Manganese, Molybdenum, Phosphorus, Potassium, Selenium, Zinc

**Toxic:** Arsenic, Cadmium, Lead, Mercury, Thallium

### Urine

**Essential:** Boron, Calcium, Chromium, Cobalt, Copper, Iron, Magnesium, Manganese, Molybdenum, Phosphorus, Potassium, Selenium, Sodium, Strontium, Sulfur, Vanadium, Zinc

**Toxic:** Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Cadmium, Cesium, Gadolinium, Lead, Mercury, Nickel, Palladium, Platinum, Tellurium, Thallium, Thorium, Tin, Tungsten, Uranium

### Fecal

**Toxic:** Antimony, Arsenic, Beryllium, Bismuth, Cadmium, Copper, Lead, Mercury, Nickel, Platinum, Thallium, Tungsten, Uranium



## Mold IgE Allergy Test

The Great Plains Laboratory now offers an IgE blood test that measures patient antibodies to most common molds. The Mold IgE Allergy Test includes 13 mold allergens, with markers known to be involved in mold-related illnesses. Use of both the Mold IgE Allergy Test and MycoTOX Profile allow a wider array of molds to be detected.

## Clinical Usefulness

- Mold allergy is an abnormal immune reaction to mold spores or mold cell components. People can be exposed to mold spores or byproducts at work, home or outdoors.
- Certain occupations have potential for high mold exposure: crop and dairy farming, greenhouse plant husbandry, logging, carpentry, millwork, furniture repair and commercial baking.
- Immune reactions to mold can be identified by the level of immunoglobulin E (IgE) antibodies to specific mold species.
- The IgE antibodies are detected in blood serum using an FDA-approved enzyme-linked immunosorbent assay (ELISA).
- The most common molds known to cause allergic conditions include *Alternaria*, *Aspergillus*, *Cladosporium* and *Penicillium*.

## Recommendations

Depending on test results, recommendations may include:

- Elimination or reduction of exposure to mold, including potential mold removal done by a licensed contractor.
- Treatment for mold exposure should include fluid support to prevent dehydration.
- The drug Oltipraz can increase glutathione conjugation of mold toxins while inhibiting the toxic effect of P450 oxidation, reducing liver toxicity and promoting safer elimination.
- A diet of carrots, parsnips, celery, and parsley may reduce the carcinogenic effects of mold. Bentonite clay and zeolite clay are reported to reduce the absorption of mold found in food.
- Supplementation with chlorophyllin, zinc, A, E, C, NAC, rosmarinic acid, and liposomal glutathione alone or in combination have been shown to mitigate the oxidative effects of mold toxins.

## Specimen Requirements

2 mL of serum.

## CPT Codes

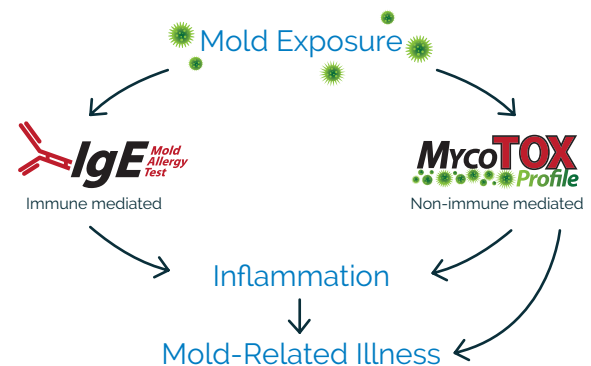
86003\*13 No Medicare Coverage

## Test Markers

- *Penicillium notatum (chrysogenum)*
- *Cladosporium herbarum*
- *Aspergillus fumigatus*
- *Mucor racemosus*
- *Candida albicans*
- *Alternaria tenuis (alternata)*
- *Helminthosporium halodes*
- *Fusarium moniliforme*
- *Fusarium oxysporum*
- *Stemphylium botryosum*
- *Phoma betae*
- *Epicoccum purpurascens*
- *Bipolaris spicifera*

## Comparison: IgE Mold & MycoTOX Profile

- IgE looks at immune response to mold exposure.
- MycoTOX Profile looks at mycotoxin levels excreted from the body.
- Mold allergies and mold mycotoxin toxicity are distinct responses related to mold illness.
- 70% of patients exposed to mold have positive skin tests to those molds, indicating that testing for IgE antibody in blood will complement the mycotoxin test.



## Why Both Tests Are Beneficial

- IgE levels predict individual response, mild or severe, to the molds in the environment.
- IgE levels may indicate reactivity to mold species whose mycotoxin products were not excreted at the time of the mycotoxin test or are not among the mycotoxins included in the MycoTOX Profile.
- The two tests provide a more comprehensive picture of individual mold exposure.
- Mycotoxins predict the effects of toxins on multiple bio-systems in the body.

# Microbiology Test

## General Description

Clinical microbiology plays a crucial role in individual and community health. Because most microbes living on or within the body are beneficial, distinguishing those that are disease-producing is critical. Through specimens collected from a variety of body sites and the use of advanced assays and technology, this test determines what microorganisms are present and which may be causing infection. This painstaking approach can help you select the most appropriate antimicrobial therapy and the comprehensive nature of the testing represents real value for your patients and practice. This test can now identify over 1400 species of gastrointestinal organisms, including 170 yeast and fungal species.

## Clinical Usefulness

This test provides information that can assist in the diagnosis and treatment of dysbiosis and yeast overgrowth.

## Recommendations

- Various antifungal drugs or supplements as identified by the test results
- Dietary recommendations

## Specimen Requirements

5 mL stool is the absolute minimum. Do not discontinue any medications without first consulting your physician.

## CPT Codes

87045 87046 87102 87106 87184 87220

# Omega-3 Index Complete

## General Description

Many studies have shown that people with higher (vs. lower) omega-3 index levels are at decreased risk for a variety of diseases and have longer life expectancies. These include heart disease, stroke, dementia, and depression. Raising your omega-3 index and keeping it up should help reduce your risk these conditions. Omega-3 fatty acids are found primarily in fish, especially “oily” fish such as salmon, herring, tuna, and sardines. The two most important omega-3 fatty acids are EPA and DHA. It should be noted that omega-3 fatty acids from flaxseed oil (alpha-linolenic acid, or ALA) will have little to no effect on your Omega-3 Index. Therefore, ALA is not an effective substitute for EPA and DHA. To ensure your Omega-3 Index remains in the target range, you should re-check it every six months.

## Clinical Usefulness

- Monitoring treatment of essential fatty acid deficiency
- Monitoring the response to provocative tests, such as fasting or loading tests

## Included in the Test Report

- Full 24 Fatty Acid Profile
- Omega-3 Index
- Trans Fat Index
- Omega-6/Omega-3 ratio
- AA/EPA ratio

## Recommendations

Depending on test results, follow-up may include:

- Flaxseed oil as source of ALA from which EPA and DHA are synthesized
- Fish oil or cod liver oil as direct sources of EPA and DHA
- Evening primrose oil, borage oil, or black currant oil as sources of GLA if insufficiently synthesized
- Hemp oil as source of both ALA and GLA

## Specimen Requirements

Dried Blood Spot (DBS): One drop of blood on collection card. Please see kit instructions for all collection details.

## General Description

Porphyryns are generated as the body builds hemoglobin, the compound that carries oxygen in blood cells. Porphyryns (from the Greek word for purple) is made up of four ring compounds joined together, a structure conducive to holding a metal ion in its center, iron in the heme porphyryns of hemoglobin, and magnesium in chlorophyll. Small amounts of several porphyryns appear in urine normally. The relative amounts of each porphyryns are altered by certain hereditary diseases and by environmental or nutritional influences. The classic cases of hereditary porphyria displayed highly-colored urine, skin eruptions, and neurological symptoms of mania and "madness."

## Specimen Requirements

**Urine:** 10 mL of urine collected and poured into an amber vial with no additive.

## CPT Codes

84120\*6

## Clinical Usefulness

- Determine possible exposure to mercury, lead, and many other toxic chemicals
- Determine if the person has a genetic disease that is causing an array of symptoms
- Determine values to monitor the severity of the disease and the efficacy of various treatments
- Rule out causes of liver disease, skin photosensitivity, neuropathy, or psychiatric diseases

## Recommendations

Depending on test results, follow-up may include:

- DNA tests to confirm suspected genetic diseases
- Tests of heavy metals and/or toxic nonmetal chemicals to determine causes of elevated porphyryns
- Extensive drug history to rule out drug-induced porphyria

# Streptococcus Antibodies Profile

## General Description

This profile screens for the two most common antibodies against streptococcus: DNase antibodies in serum (ADB) and antistreptolysin O titer (ASO). These antibodies may cross-react with brain tissue causing abnormal behaviors. Both of these tests are performed to identify a previous infection of group A beta-hemolytic Streptococcus. These infections cause rheumatic fever or a kidney disease called glomerulonephritis, poststreptococcal versions of these diseases, as well as scarlet fever. Recently, high titers of these antibodies have been associated with PANDAS (Pediatric Autoimmune Neuropsychiatric Disorder Associated with Streptococcal Infections) and with autism, Tourette syndrome, tic disorder, Parkinson's disease, and OCD.

## Specimen Requirements

1 mL of serum collected in a gold-topped SST vial.

## CPT Codes

83883 86215

## What Causes PANDAS?

Group A  $\beta$ -hemolytic streptococci (GABHS) infections can cause several immune-mediated diseases. Rheumatic fever (RF), primarily a childhood disease, is a classic example of a complication resulting from a GABHS infection. RF is an inflammatory disease of the heart, joints, and central nervous system that occurs two to three weeks after a GABHS infection. Antibodies that formed against the GABHS organisms cross-react with normal human tissues, causing heart valve damage, inflamed joints and neurological disorders. Sydenham's Chorea, characterized by uncontrolled movements of the face, hands, and feet, is a common neurological disorder seen in rheumatic fever caused by the cross reactivity of antibodies with brain tissue. These movements are strikingly similar to motor tics, and many patients also display phonic tics, OCD, and ADHD. This observation, along with reports of sudden-onset tics and psychiatric disorders following an outbreak of GABHS in Rhode Island in the early 1990's, led to a new diagnostic subcategory of Tourette's syndrome called PANDAS, which was defined by symptoms of Tourette's syndrome following streptococcal infections. There is often a recovery period as the GABHS antibodies reduce to normal. Helping the brain recover with nutrients may reduce vulnerability to further damage from strep antibodies.

# Vitamin D Test



## General Description

Vitamin D is a generic term that includes several metabolically-related sterol substances that have hormonal activity. The metabolite 25-hydroxyvitamin D is the major circulating form of vitamin D in the body, and the best indicator of a patient's status due to its long half-life (2-3 weeks). The major biologic function of vitamin D is to maintain normal blood levels of calcium and phosphorus involved in bone mineralization. Vitamin D also controls more than 1,000 genes, including those responsible for the regulation of cellular proliferation, differentiation, apoptosis, and angiogenesis. The immune-modulating effects of vitamin D are profound as evidenced by the many conditions associated with vitamin D deficiency.

## Clinical Usefulness

- Determine if dietary vitamin D is sufficient
- Determine if sun exposure is adequate
- Determine if supplementation is reaching toxic levels
- Assess the likelihood of malabsorption, liver disease, and nephrotic syndrome

## Report Analysis

### Vitamin D

Two forms of vitamin D (25-OH-VitD2 and 25-OH-VitD3) are measured in this analysis. Vitamin D is obtained from foods of animal origin and from ultraviolet light-stimulated conversion of 7-dehydrocholesterol in the skin. Small amounts of vitamin D are obtained from foods of plant origin. Vitamin D is used to fortify various foods and is available in over-the-counter supplements.

Desirable values are 25-80 ng/mL. Mild to moderate deficiency values are 10-24 ng/mL. Values below 10 ng/mL indicate severe deficiency, and values over 80 ng/mL indicate possible toxicity.

## Recommendations

Depending on test results, follow-up may include:

- Addition of vitamin D supplementation
- Increased sun exposure
- Discontinuation of supplementation
- Dietary modifications
- Additional testing

## Specimen Requirements

**Serum:** 2 mL of serum in a gold-topped SST vial.

- or -

**Dried Blood Spot (DBS):** Five full circles of dried blood on the protein saver card.

## CPT Codes

82306 82542  
No Medicare Coverage

**The Great Plains Laboratory, Inc.**

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Requisition #: Physician Name:  
Patient Name: Date of Collection:  
Patient Age: Time of Collection:  
Sex: Print Date:

Metabolic Marker	Reference Range - ng/mL	Patient Value - ng/mL
25-Hydroxy D2		< 4.0
25-Hydroxy D3		29.0
25-Hydroxy D Total (D2+D3)	25 - 80	29.0 ***

**Vitamin D 25 OH**

<10 ng/mL severe deficiency\*  
10-24 ng/mL mild to moderate deficiency\*\*  
25-80 ng/mL optimum levels\*\*\*  
81-150 ng/mL toxicity possible\*\*\*\*  
>150 ng/mL toxic levels\*\*\*\*\*

\* Could be associated with osteomalacia or rickets  
\*\* May be associated with increased risk of osteoporosis or secondary hyperparathyroidism  
\*\*\* Optimum levels in the normal population  
\*\*\*\* 80ng/mL is the lowest reported level associated with toxicity in patients without primary hyperparathyroidism who have normal renal function.  
\*\*\*\*\* Most patients with toxicity have levels >150ng/mL. Patients with renal failure can have very high 25-OH-VitD levels without any signs of toxicity, as renal conversion to the active hormone 1,25-OH-VitD is impaired or absent.

These reference ranges represent clinical decision values that apply to males and females of all ages, rather than population-based reference values. Population reference ranges for 25-OH-VitD vary widely depending on ethnic background, age, geographic location of the studied populations, and the sampling-season. Population-based ranges correlate poorly with serum 25-OH-VitD concentrations that are associated with biologically and clinically relevant Vitamin D effects and are therefore of limited clinical value.



UNDEFINED UNDEFINED



# COMBO TESTS AND PANELS

# OAT + Amino Acids Urine Test

## General Description

The Great Plains Laboratory offers the **Organic Acids Test** and **Amino Acids Urine Test** as a combo. The OAT and Amino Acids Test quantifies different markers for assessing GI function, detoxification capacity, and certain nutritional deficiencies. Together they provide a more in-depth evaluation of overall nutritional status and digestive sufficiency and when you order them together you receive a discount. This combo is an excellent value if your insurance company does not typically reimburse for the standalone Amino Acids Urine Test. Visit the Insurance Benefits section on the OAT + Amino Acids Combo webpage for more details.

## Clinical Usefulness

- More complete insight into overall nutritional status
- More complete evaluation of GI function and intestinal dysbiosis
- More complete assessment of detoxification capacity
- Indication of potential harmful genetic variations
- Stronger clinical assessment of complex patients
- Assistance in building a treatment plan

## Recommendations

Depending on test results, follow-up may include:

- Treatment for intestinal dysbiosis
- Nutritional and supplement support
- Detoxification
- Genetic testing

## Specimen Requirements

35 mL of first-morning urine before food or drink. Patient must avoid apples, grapes (including raisins), pears, cranberries, and their juices 24 hours prior to specimen collection. The patient should also discontinue amino acid supplementation 24 hours prior to collection. Avoid arabinogalactan, echinacea, reishi mushrooms, and ribose supplements for 12 hours before collection.

## CPT Code

82139\*1 82140 82492 84540 82131 82507 82570 83150 83497 83605 83921\*65 83945 84207 84210 84585 84591

# Functional Allergy and Nutrition (FAN) Panel

## General Description

The Functional Allergy and Nutrition (FAN) Panel is a comprehensive panel of tests that GPL has created to help practitioners determine personalized, optimal diets for their patients. These tests together provide indicators of specific allergies and sensitivities, as well as clinically-relevant nutritional deficiencies and excesses that are common in the population, but not commonly tested. All of these tests are blood serum tests and can be easily run on the same sample.

## This Panel Includes

- IgG Food MAP (190 foods)
- Homocysteine Test
- Dipeptidyl Peptidase IV (DPP-IV) Test
- Iron + Total Iron-Binding Capacity Test

## Recommendations

Depending on test results, follow-up may include:

- Dietary modification
- Supplementation
- Follow-up/confirmation testing

## Specimen Requirements

3 mL of serum



## General Description

This innovative and valuable panel by the Great Plains Laboratory (GPL) provides an excellent and accurate description of the patient's overall health in regards to their metabolism, vitamins and mineral levels, food allergies, and metal toxicity. Testing for organic acids, IgGs, food allergies, and metals is crucial to detect malfunction within the body.

**This panel is available in serum or dried blood spot (DBS) for the IgG Food Allergy Test portion.**

## This Panel Includes

### Organic Acids Test – Urine

The Organic Acids Test (OAT) provides a metabolic “snapshot” based on the products the body discards through the urine. These small, discarded organic acid molecules are byproducts of human cellular activity, the digestion of foods, and the metabolism of gastrointestinal flora. The Organic Acids Test includes 76 urinary metabolites, including 9 yeast markers, 8 bacterial markers, 3 oxalate markers, 3 glycolytic cycle markers, 6 Krebs cycle markers, 7 neurotransmitter markers, 1 folate metabolism markers, 8 fatty acid oxidation markers, 8 vitamin markers, 3 indicators of detoxification, 14 amino acid metabolites, and 1 bone metabolite. This makes it the most comprehensive Organic Acids test available anywhere.

### IgG Food MAP – DBS or Serum

IgG (immunoglobulin G) testing is a useful guide for structuring elimination diets in many chronic conditions. Individuals with neurological, gastrointestinal, and movement disorders often suffer from IgG food allergies. IgG Food allergies do not usually release histamine but cause inflammation and elevated C-reactive protein. The 93 foods tested in the IgG Food Allergy Test w/ Candida can identify problem foods so they can be eliminated from the patient's diet.

### Metals Hair or Red Blood Cell (RBC) Test

Today, with increasing pollution levels, the presence of toxic metals in the environment is constantly growing. Chemical products, fertilizers, industrial paint, building materials, fish, silver dental fillings, and vaccines are just some of the sources of heavy metals in everyday life. Toxic metals may normally be present in the body in very low levels, but continuous exposure or metabolic abnormalities can cause accumulation of heavy metals in body tissues, and subsequently, in the brain.

The metals test is important for measuring toxic metals that can impede development and normal brain function, as well as measuring levels of minerals essential for normal growth and good health. The results indicate levels of 39 toxic and essential elements, 5 ratios and includes an individualized report interpretation.

## Clinical Usefulness

- Evaluate energy production
- Assess central nervous system function
- Evaluate integrity of intestinal wall
- Reveal high levels of GI yeast and bacteria
- Detect nutritional and antioxidant deficiencies
- Determine problems in fatty acid metabolism
- Identify excess oxalate
- Identifies possible food reactions that may be contributing to physical or mental symptoms
- Determine if metal toxicity or mineral deficiency is contributing to a disorder
- Monitor the effects of chelation (elimination of heavy metals from the body)

## Specimen Requirements

**Urine:** 10 mL of first-morning urine before food or drink. Patient must avoid apples, grapes (including raisins), pears, cranberries, and their juices 24 hours prior to specimen collection. Avoid arabinogalactan, echinacea, reishi mushrooms, and ribose supplements for 12 hours before collection.

- |           |  |
|-----------|--|
| SERUM KIT | <b>Serum:</b> 2 mL of in a gold-topped SST vial. (Only required for the GPL3 Serum Panel)                  |
|           | <b>Red Blood Cell:</b> 4 mL of packed cells in a royal blue-topped potassium EDTA vial.                    |
| DBS KIT   | <b>Dried Blood Spot (DBS):</b> Five full circles of dried blood on the protein saver card is required.     |
|           | <b>Hair:</b> 0.25 grams (approximately 1 tablespoon) of hair is the absolute minimum. 1 gram is preferred. |

## CPT Codes

### Organic Acids Test

82131 82507 82570 83150 83497 83605  
83921\*63 83945 84207 84210 84585

### IgG Food MAP

86001\*93 86628 86671\*2

### Metals Hair Test

82108 82300 82525 83018\*28 83655 83735  
83785 83825 83885 84100 84255 84630

### Red Blood Cell

82175 82300 82310 82495 82525 83015 83018\*4 83655  
83735 83785 83825 84100 84132 84255 84630

# GPL Basic Panel

## General Description

This panel is very comprehensive and includes several tests that analyze organic acids and vitamin and mineral levels, as well as help detect a wide variety of common problems including bacterial and fungal overgrowth, food allergies, and toxic chemical and metals exposure. The blood portions of this test panel come in two options – **Dried Blood Spot (DBS) or Serum.**

For all specimen requirements and CPT codes for the tests in this panel, please refer to the individual test pages in this guide.

## Included in the DBS Panel

- GPL-TOX: Toxic Organic Chemical Profile (URINE)
- Glyphosate Test (URINE)

- IgG Food MAP (DRIED BLOOD SPOT)
- Metals Hair Test (HAIR)
- Organic Acids Test (URINE)
- Omega-3 Index Complete Test (DRIED BLOOD SPOT)

## Included in the Serum Panel

- GPL-TOX: Toxic Organic Chemical Profile (URINE)
- Glyphosate Test (URINE)
- IgG Food MAP (SERUM)
- Metals Red Blood Cell Test (Whole Blood)
- Organic Acids Test (URINE)

# GPL Complete Panel

## General Description

This is our most comprehensive panel available, allowing you to gain the most information possible about your patient's overall health at a great value. It includes several tests that analyze organic acids and vitamin and mineral levels, as well as help detect a wide variety of common problems including inflammation, bacterial and fungal overgrowth, food allergies, and toxic chemical and metals exposure. This panel includes all tests in the GPL Basic Panel, plus five more tests. You receive a significant discount when you purchase these tests together and get the value of very comprehensive testing.

For all specimen requirements and CPT codes for the tests in this panel, please refer to the individual test pages in this guide.

## Included in the GPL Complete:

- Advanced Cholesterol Profile (SERUM)
- Comprehensive Stool Analysis (STOOL)
- Copper + Zinc Profile (SERUM)
- Ferritin (SERUM)
- GPL-TOX: Toxic Organic Chemical Profile (URINE)
- Glyphosate Test (URINE)
- IgG Food MAP (SERUM)
- Metals Hair Test (HAIR)
- Organic Acids Test (URINE)
- Vitamin D Test (SERUM)

# Autism Panel

## General Description

This panel is recommended for those diagnosed with Autism. It includes tests that look for common biomedical underlying causes of many symptoms of autism, including low cholesterol, high oxalates, bacterial and fungal overgrowth, food allergies, and toxic chemical and metal exposure. Addressing many of these problems with various treatment methods can lead to a reduction in symptoms. Receive a significant discount when you purchase these tests together and get the value of more comprehensive testing.

For all specimen requirements and CPT codes for the tests in this panel, please refer to the individual test pages in this guide.

## Included in the Autism Panel:

- Advanced Cholesterol Profile (SERUM)
- Comprehensive Stool Analysis (STOOL)
- Glyphosate Test (URINE)
- GPL-TOX: Toxic Non-Metal Chemical Profile (URINE)
- IgG Food MAP (SERUM)
- Metals Hair Test (HAIR)
- Organic Acids Test (URINE)
- Omega-3 Index Complete Test (DRIED BLOOD SPOT)

## General Description

This panel is recommended for any child who has been diagnosed with AD(H)D or exhibits signs and symptoms related to AD(H)D. It includes tests that look for common biomedical underlying causes of many symptoms of AD(H)D including vitamin and mineral imbalances, bacterial and fungal overgrowth, food allergies, and toxic chemical and metal exposure. Once discovered, addressing many of these problems with various treatment methods can lead to a reduction in the symptoms of AD(H)D.

For all specimen requirements and CPT codes for the tests in this panel, please refer to the individual test pages in this guide.

## Included in the AD(H)D Panel:

- Glyphosate Test (URINE)
- GPL-TOX: Toxic Non-Metal Chemical Profile (URINE)
- IgG Food MAP (SERUM)
- Metals Hair Test (HAIR)
- Organic Acids Test (URINE)
- Omega-3 Index Complete Test (DRIED BLOOD SPOT)

# ENVIROtox Panel

## General Description

Because exposure to environmental pollutants has been linked to many chronic diseases, The Great Plains Laboratory has created the Enviro-TOX Panel, a group of tests specifically designed to assess exposure to common environmental toxins and the damage that can be caused by this exposure. This panel uses a single urine sample to screen for the presence of over 173 toxicants and assess organic acid levels, which are correlated with toxic exposure and resulting damage. You receive a significant discount when you purchase these tests together and get the value of more comprehensive testing.

For all specimen requirements and CPT codes for the tests in this panel, please refer to the individual test pages in this guide.

## Included in the ENVIROtox Panel

- GPL-TOX: Toxic Non-Metal Chemical Profile (URINE)
- Organic Acids Test (URINE)
- Glyphosate Test (URINE)

# ENVIROtox Complete Panel

## General Description

The ENVIROtox Complete Panel includes all three tests in the ENVIROtox Panel, plus the MycoTOX Profile, giving you even more value and more comprehensive testing for exposure to a wide variety of toxins, including mycotoxins from mold. This panel uses a single urine sample to screen for the presence of over 173 toxicants and assess organic acid levels, which are correlated with toxic exposure and resulting damage. You receive a significant discount when you purchase these tests together and get the value of more comprehensive testing.

For all specimen requirements and CPT codes for the tests in this panel, please refer to the individual test pages in this guide.

## Included in the ENVIROtox Complete Panel

- ENVIROtox Panel + MycoTOX Profile

# Fibromyalgia & CFS Panel

## General Description

This panel is recommended for anyone who has been diagnosed with fibromyalgia or chronic fatigue syndrome, or exhibits several symptoms correlated with either disorder. Fibromyalgia is an autoimmune disorder characterized primarily by chronic fatigue, poor sleep, and intermittent muscle pain particularly at “trigger points”, as well as cognitive and mood changes, digestive symptoms, food and chemical sensitivities, and chronic headaches. Chronic fatigue syndrome (CFS) is a complex illness affecting the brain and multiple body systems. It is defined by incapacitating fatigue that is not relieved by rest, and four or more of the following symptoms for at least six months: impaired short-term memory or concentration which significantly affects normal activities, sore throat, tender lymph nodes in the neck or underarms, muscle and joint pain, headaches, and general malaise that lasts more than 24 hours following physical exertion. Many problems including food allergies, vitamin and mineral imbalances, and toxic chemical and metal exposure can increase symptoms of both disorders. Discovering these underlying problems and treating them can help improve symptoms for many patients. You receive a significant discount when you purchase these tests together and get the value of more comprehensive testing.

For all specimen requirements and CPT codes for the tests in this panel, please refer to the individual test pages in this guide.

## Included in the Fibromyalgia Panel

- Omega-3 Index Complete Test (DRIED BLOOD SPOT)
- GPL-TOX: Toxic Non-Metal Chemical Profile (URINE)
- Glyphosate Test (URINE)
- IgG Food MAP (SERUM)
- Metals Hair Test (HAIR)
- Organic Acids Test (URINE)

# Mental Health Panel

## General Description

Mental health disorders like depression and anxiety can be disabling. The underlying issues that contribute to various mental health disorders are different in each patient and must be identified to effectively treat the disorders.

Potential contributing factors include sleep disorders, toxic chemical exposure, poor digestion, food allergies/sensitivities, nutritional deficiencies, immune reactions, hormone levels, oxidative stress, and inflammation. Finding and treating possible underlying causes can reduce symptoms and help patients achieve greater wellness. You receive a significant discount when you purchase these tests together and get the value of more comprehensive testing.

For all specimen requirements and CPT codes for the tests in this panel, please refer to the individual test pages in this guide.

## Included in the Mental Health Panel

- Amino Acids Plasma Test (PLASMA)
- Glyphosate Test (URINE)
- GPL-TOX: Toxic Non-Metal Chemical Profile (URINE)
- Omega-3 Index Complete Test (DRIED BLOOD SPOT)
- IgG Food MAP (SERUM)
- Metals Hair Test (HAIR)
- Organic Acids Test (URINE)

## Authorization

Our laboratory requires an authorization from a medical practitioner on all tests performed in the United States and practitioners may keep a signature on file with us, so a new signature is not required for all tests. Authorization is not required for patients who reside outside the United States. We do not provide testing for any patient or medical practitioner who resides or practices in New York. Practitioners qualified to authorize tests include MDs, DOs, DCs, NDs, DOMs, LAcS, PAs, ARNPs, CNMs, CCNs, and RDs.

## Order a Test Kit

Test kits can be ordered online, by phone or by fax. The kits are mailed directly to the practitioner or patient and will include everything needed to collect and submit the specimen. A signature must be kept on file or a signed Test Requisition Form (TRF) must be returned with the specimen or sent to our lab directly by the practitioner.

A Test Requisition Form must be signed by a practitioner to be considered authorized. Practitioners can submit signed TRFs to our lab via fax or through our online Test Requisition Form. A completed copy of the online Test Requisition Form will be included in the test kits for convenience. Faxed authorizations will be kept on file at the lab to be matched with patient specimen upon arrival.

No payment is necessary to order a test kit within the United States. Test kits ordered from within the United States will include a Test Requisition Form, instructions, specimen collection components, and a pre-paid FedEx overnight clinical pack.

## Specimen Collection

Test collection instructions are included with all test kits. The urine, stool, hair, and IgG dried blood spot (DBS) specimens can all be collected from home by the patient. Blood kits will need to be taken to a phlebotomist to perform a blood draw. The majority of blood draw sites will ship the blood for the patient using the test kit provided. Those that do not ship the specimen should return the specimen to the patient for return shipment. Our Customer Service staff is available to answer questions about specimen collection. A list of frequently asked questions is on our website.

## International Support

Payment is required for kits ordered from outside of the United States. Practitioners/patients are responsible for the cost of shipping test kits both into and out of the laboratory. Please contact International Support at 913-754-0461 to find out if there is a distributor in your country. Shipping charges vary depending on the country.

## Shipping

Shipping in the United States is free. Practitioners and patients within the United States will not need to pay FedEx when sending samples to our laboratory. After collecting the sample, please call 1-800-463-3339 (1-800-GoFedEx) for pick up. Mention you need to schedule a pick-up using a billable stamp. Do not put kits in a FedEx drop box.

## Results

Results are sent out according to the parameters established by the practitioner on the New Client Form. The practitioner/patient can also request that the laboratory send out results via secure email or secure fax after they are completed. Customer Service will make every attempt to accommodate the practitioner's/patient's request for results. In some cases, the patients will have to obtain results from their medical practitioner.

## Cancellation Policy

The Great Plains Laboratory must be notified by the medical practitioner, patient, or parent/guardian to cancel a test. Cancellations will be honored if requested within 24 hours of receipt of the sample by the laboratory. Because testing processes begin within 24 hours, requests for cancellation beyond this time will not be honored.

# Payment and Insurance Options

## Payment Overview

Payment information must be received by the time the specimen arrives at our laboratory for the specimen to be processed. Please see the remainder of this page for all payment and insurance options available.

## Blue Cross and Blue Shield

The Great Plains Laboratory works with most BCBS plans as either a contracted or non-contracted provider with only a few exceptions\*. We offer different insurance options for patients across the United States participating with a BCBS plan. For more detailed information about a specific BCBS plan, please contact your account representative or our insurance department.

\*See the insurance section on our website for exceptions to the BCBS program.

## Tricare

We are a participating provider with Tricare in every region of the United States. Patients should include a copy of the front and back of their insurance card, as well as the member's social security number (SSN). For a detailed list of tests covered by Tricare, call your account representative or our insurance department.

## Medicare

The Great Plains Laboratory is contracted with Medicare and our flagship test, the Organic Acids Test, is covered by Medicare. See the Advance Beneficiary Notice (ABN) for a list of non-covered tests. All patients who have Medicare must sign and return the ABN with the specimen. This form is included in all test kits (with the Test Requisition Form). We require a copy of the front of the patient's Medicare card be sent with the specimen.

If the patient is enrolled in a Medicare Advantage Plan, we require a copy of the front and back of the patient's Medicare Advantage card. A Medicare Advantage card is not the same as a Medicare card. Please contact our Billing Department with any questions concerning coverage.

## United Health Care, Cigna and Other Carriers

The Great Plains Laboratory currently works with United Healthcare, Cigna and other plans as a non-contracted provider. For more detailed information about a specific insurance plan, please contact your account representative or our insurance department.

## Insurance Plans Not Filed

We currently do not work with state-run Medicaid programs, Humana, Aetna, or HMOs (check the website for HMO exceptions), however, we do offer reduced cash prices for patients participating in these plans.

## Insurance Coverage Verification Guide

We provide an Insurance Coverage Verification Guide. This helpful tool includes an insurance overview that patients can use to determine eligibility, restrictions, and requirements. By calling your insurance provider, you can verify your coverage and gather information to determine any out-of-pocket expenses.

To view or receive a copy of the Insurance Coverage Verification Guide, visit Pricing and Payment Options on our website, or contact Customer Service.

## Cash Price

We offer cash prices for patients and practitioners wishing to pay out of pocket. We accept checks and all major credit cards including Visa, MasterCard, Discover, American Express, JCP and Diners Club. We will send a statement of services for you to file with your insurance company.

**For questions, please contact the Billing Department at 913-754-0459 or [Billing@gpl4u.com](mailto:Billing@gpl4u.com).**

## Interpretation Guides

The Great Plains Laboratory offers a written interpretation with most test results. Any abnormal values that are uncovered in the analysis are considered and expanded upon in the interpretation. The information we provide will help the practitioner to understand the clinical significance of each abnormal value associated with a particular analyte. The significance of the result depends greatly on the individual value associated with the metabolite. The interpretation will narrow down the possible causes of the abnormality.

## Free Consultation with Results

We want our clients to receive the maximum value for their laboratory testing which is why we offer free 30-minute consultations to explain the test results in detail. Medical practitioners are better equipped to move forward with the appropriate treatment once they have a clear understanding of the test results. Our staff has been observing trends in test results for over 10 years, and they are glad to provide their experience and expertise to the troubling cases that need more attention.

## Educational Events

GPL is dedicated to educating both patients and practitioners alike. We frequently host, sponsor, and attend educational conferences around the world. To find out where GPL is participating in a conference, visit our website, [www.GreatPlainsLaboratory.com](http://www.GreatPlainsLaboratory.com), scroll down to the bottom, and click on Upcoming Events.

Our GPL Academy workshops provide practitioners the opportunity to learn about the Organic Acids Test, GPL-TOX (Toxic Non-Metal Chemical Profile), MycoTOX Profile and other tests that we offer. The workshops are designed to help practitioners incorporate these tests in their practices effectively and help their patients achieve greater health outcomes. For a current list of all upcoming workshop dates and locations, go to [www.GPLWorkshops.com](http://www.GPLWorkshops.com).

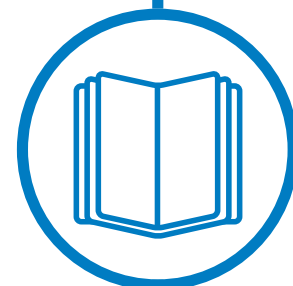
We are the primary sponsor of the annual Integrative Medicine for Mental Health (IMMH) Conference. IMMH is an organization that supports a whole-body approach, utilizing multiple fields of medicine and nutritional sciences to help patients obtain mental wellness. The integrative approach includes metabolic testing, nutritional therapies, dietary interventions, and traditional medical treatments. IMMH organizes an annual conference that presents concepts and practical guidelines that can dramatically improve the quality of life of your patients. Practical applications and effective protocols are presented and can be easily applied in a clinical setting. For more information about IMMH and the annual IMMH conference, go to [www.IMMH.org](http://www.IMMH.org).

## Free Webinars

GPL offers webinars presented by physicians and other professionals on a variety of topics, including autism, mental health, and laboratory testing. A wide range of experts on the topic of biomedical treatment and testing conduct educational seminars via webinars. The information is designed to provide useful information about the clinical manifestations that occur in certain disorders. Presenters draw from years of experience to bring you important, helpful information about various situations that can occur in the body to create illness and disease. In addition, a large number of our webinars are archived in our Webinar Library and can be accessed any time. Find out more on our website [www.GreatPlainsLaboratory.com](http://www.GreatPlainsLaboratory.com).

## Blood Draw Locations

We are contracted with national phlebotomy services which can provide blood draw services for our testing. In addition, many children's hospitals and national laboratory chains have walk-in phlebotomy clinics that will perform a blood draw using a GPL blood kit. You may also go to [www.greatplainslaboratory.com/general-blood-draw-services](http://www.greatplainslaboratory.com/general-blood-draw-services) to see if there is a location near you that will perform a blood draw using one of our kits or call our Customer Service for recommended blood draw facilities in your area. Patients are responsible for any fees associated with a blood draw. Additionally, phlebotomy services can be arranged either at home or an agreed upon site for an added fee. More details regarding blood collection can be found on our website under the Resources section.



## **The most accurate, reliable, and comprehensive biomedical analysis.**

The Great Plains Laboratory, Inc. is a world leader in providing testing for nutritional factors in chronic illnesses such as autism, fibromyalgia, and AD(H)D.

We offer a variety of metabolic tests such as immune deficiency evaluations, amino acid tests, essential fatty acid tests, organic acids testing, metal toxicity, and food allergies tests. Our vision is to have no borders when it comes to improving people's quality of life.



**The Great Plains Laboratory, Inc.**

[www.GreatPlainsLaboratory.com](http://www.GreatPlainsLaboratory.com)