Patient Information:

DOB:	08/09/1966	Gender:		**Lab ID:**	**505447**
Received:	07/21/2023	Collected:	07/20/2023	Reported:	07/27/2023
Clinic ID:	40583	HCP:			

CELL SCIENCE SYSTEMS

CLIA#10D0283906
Lab Director
Harold Alvarez, M.D.

CELLULAR NUTRITION ASSAYS

CELLULAR MICRONUTRIENT ASSAY (CMA)

VITAMINS

Biotin		Vitamin B2	
Delta tocotrienol	116% Borderline	Vitamin B3	119% Borderline
MK4		Vitamin B6	
MK7		Vitamin B9	
Pantothenic acid		Vitamin C	
Vitamin A		Vitamin D	
Vitamin B1		Vitamin K1	115% Borderline
Vitamin B12			

MINERALS

Boron		Magnesium	
Calcium		Manganese	123% Insufficient
Chromium		Molybdenum	
Copper	134% Insufficient	Selenium	
Iodine	140% Insufficient	Strontium	
Iron	123% Insufficient	Vanadium	
Lithium	140% Insufficient	Zinc	110% Borderline

AMINO ACIDS

Arginine		L-Tyrosine	132% Insufficient
Asparagine		Lysine	
Cysteine		Methionine	
Glycine		Phenylalanine	
Histidine	111% Borderline	Taurine	
Isoleucine		Threonine	114% Borderline
Leucine		Tryptophan	
L-Glutamine	121% Insufficient	Valine	
L-Serine			

OTHER NUTRIENTS

Carnitine	121% Insufficient	Lipoic Acid	121% Insufficient
Choline		Omega 3 DHA	
Coenzyme Q10	115% Borderline	Omega 3 EPA	114% Borderline
Glutathione		Omega 9	
Inositol	110% Borderline		

100% - 109%	Nutrient Sufficiency
110% - 119%	Borderline Insufficiency
≥ 120%	Insufficiency*

These laboratory results are not intended to diagnose a disease state. The performance characteristics of all assays have been verified by Cell Science Systems, Corp. All information provided is only a suggested guideline and should not be substituted for professional medical advice, diagnosis, or treatment.

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CELLULAR MICRONUTRIENT ASSAY (CMA)

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MICRONUTRIENTS TO ADDRESS

Iodine

Iodine is an essential component of the thyroid hormones, triiodothyronine (T3) and thyroxine (T4), essential to control energy production/utilization in just about every cell in the body. **Important for:** • Thyroid hormone production • Essential for growth • Metabolism • Protein synthesis • Skeletal and CNS development **May be useful for the prevention/treatment of:** if deficient in iodine- hearing, hypothyroidism, and improvement in cognition. If not deficient iodine may be useful for treating fibrocystic breast changes, cyclical mastalgia, and hyperthyroidism **Good food sources:** Sea vegetables, fish and seafood, iodized salt, dairy products, eggs.

Lithium

Lithium is a trace mineral that is present in the diet, mainly in grains and vegetables. Some people use lithium supplements as medicine -lithium is available as an FDA approved prescription medication for use in psychiatric conditions. Supplements contain much smaller quantities than prescribed medication. **Important for:** • Modulation of the nervous system function • Modulation of neurotransmitter activity- GABA, serotonin, melatonin • Modulation of circadian rhythms • May be required for normal metabolism and neural communication **May be useful for the prevention/treatment of:** Bipolar disorder, depression, schizophrenia, impulsive aggressive behavor associated with ADHD. **Good food sources:** depending on geographical location due to uneven distribution of lithium in the earth's crust: cereals, potatoes, tomatoes, cabbage, and some mineral waters. It may also be found in some spices such as nutmeg, coriander seeds, or cumin. Small amounts also found in foods from animal origin like sardines and egg yolks. IMPORTANT: Lithium interacts with a number of herbs, supplements, medications, and medical conditions. Lithium supplementation should only be used with guidance and monitoring by a qualified practitioner.

Copper

Copper is an essential trace mineral found in all body tissues. **Important for:** • Red blood cell formation (along with iron), anemia prevention • Myocardial contractility • Maintenance of the health of blood vessels, nerves • Immune support, wound healing • Generation of energy from carbohydrate • Antioxidation (cofactor for SOD- superoxide dismutase) • Anti-inflammation support • Bone and tissue integrity • Cholesterol and glucose regulation **May be useful for the prevention/treatment of:** aortic aneurysm, burns, osteoporosis, peptic ulcer, RA, and disorders of taste **Good food sources:** Organ meats, seafood, nuts, especially cashews and walnuts, seeds, especially sesame and sunflower seeds, legumes, lentils. soybean, shiitake mushrooms, greens, asparagus, summer squash, wheat-bran cereals, and whole-grains and cocoa.

L-Tyrosine

Tyrosine is a non-essential amino acid that is synthesized in the body from an essential amino acid, phenylalanine. **Important for:** • Building block for protein synthesis • Synthesis of the brain chemicals, dopamine, norepinephrine, and epinephrine • Regulation of mood, appetite, pain sensitivity • Thyroid, adrenal, and pituitary function **May be useful for the prevention/treatment of:** depression, ADHD, cognitive performance and memory, narcolepsy, acute stress, alcohol, heroine, and cocaine withdrawal **Good food sources:** poultry, fish, avocados, almonds, cheese, milk, yogurt, bananas, soybean, legumes, nuts, seeds, and some grains

Iron

Iron is a mineral found in trace amounts in every cell in the body. Most of the iron in the body is found in the hemoglobin of red blood cells that carries oxygen from the lungs to the tissues of the body and in myoglobin, a protein providing oxygen to muscles. It also functions in several key enzymes in energy production and metabolism, including DNA synthesis. **Important for:** • Oxygen transport • Growth and development • Immune activity • Energy production and metabolism • Hormone, neurotransmitter, and DNA synthesis **May be useful for the prevention/treatment of:** ADHD, cognitive decline/dementia, fatigue, infertility, and restless leg syndrome. **Good food sources:** Iron exists in foods in two forms, heme iron and nonheme iron. The richest sources of heme iron are oysters, liver, lean red beef, poultry, tuna, and salmon. Non-heme iron is harder for the body to absorb. Sources of non-heme iron are legumes, whole grains, nuts, dried fruit, and greens. Consuming these foods with vitamin C rich foods and/or heme sources of iron, enhances the absorption of nonheme iron.

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MICRONUTRIENTS TO ADDRESS

Manganese

Manganese is an essential mineral which plays a role in the production of cartilage and bone matrix. Although important for maintaining good health, manganese can be toxic at high levels. **Important for:** • Metabolic and enzymatic reactions to process carbohydrate, amino acids, and cholesterol • Bone and cartilage health and development • Antioxidant function • Wound healing • Collagen formation **May be useful for the prevention/treatment of:** osteoporosis, epilepsy, tardive dyskinesia, and sexual dysfunction in females. **Good food sources:** Cloves, whole grains, tea, nuts, seeds, legumes, and leafy green vegetable, cinnamon, berries, garlic, basil

Lipoic Acid

Lipoic Acid is synthesized by humans and is present in a wide range of foods. **Important for:** • Antioxidation • Anti-inflammatory • Regeneration of other antioxidants- vitamin E, vitamin C, and glutathione • Endocrine support, glucose regulation • Anti-obesity • Antiviral • Cardiovascular support • Vascular support • Neurological support • Bone support **May be useful for the prevention/treatment of:** aging skin associated with sun damage, cognitive decline, diabetes, insulin resistance, erectile dysfunction, glaucoma, NASH, peripheral neuropathy, burning mouth syndrome, obesity, hepatitis, migraines, myopathy, taste disorders, vitiligo, and wound healing **Good food sources:** red meat, organ meats, spinach, broccoli, potatoes, yams, carrots, beets, and yeast

Carnitine

L-carnitine is a derivative of the amino acids, methionine and lysine, and is synthesized in the liver, kidneys, and brain. It plays a key role in energy production and is found in almost every cell of the body. Only L-carnitine is biologically active and is the form found in food. It is concentrated in skeletal and cardiac muscle tissues. **Important for:** • Mitochondrial function and energy production • Immune, brain, liver, and cardiac function • Elimination of toxic compounds • Blood lipid levels- reduction of triglycerides, increase in HDL **May be useful for the prevention/treatment of:** · certain cardiovascular issues and common diagnoses such as asthma, celiac disease, cirrhosis, IBD, diabetes, erectile dysfunction, NAFLD, fatigue, PCOS, COPD, and more. **Good food sources:** animal foods such as meat, fish, poultry, and dairy products (mostly in whey).

L-Glutamine

Glutamine is the most abundant free amino acid in the body, it is produced primarily in skeletal muscle and released into the circulation. **Important for:** • Protein, DNA, RNA, and neurotransmitter synthesis • Fuel source cells that line the small intestine • Fuel source for immune cells, such as macrophages • Maintaining nitrogen balance • Preventing the burning of other amino acids for energy **May be useful for the prevention/treatment of:** acquired immunodeficiency syndrome, alcohol addiction, burns, gastroenteritis pancreatitis, and peptic ulcer, and for preventing infections following intense exercise **Good food sources:** meat, chicken, fish, cheese, milk, yogurt, legumes, and lentils

Vitamin B3

Vitamin B3 occurs naturally in two forms, niacin (aka nicotinic acid) and niacinamide (aka nicotinamide). All the body's tissues convert niacin into its active form, nicotinamide adenine dinucleotide which is required for more than 400 enzymes to drive metabolic processes. **Important for:** • Conversion and release of energy from carbohydrate, protein, and fat • Brain function • Influence on serum lipid levels (niacin form only) • Regulation of blood glucose (niacin form only) **May be useful for the prevention/treatment of:** certain cardiovascular, dermatological, and psychiatric issues as well as disorders in hearing, olfactory, taste, addictions, osteoarthritis, ADHD, and insomnia **Good food sources:** meat, chicken, fish, whole grains, nuts, legumes, and dairy products

Delta tocotrienol

Delta tocotrienol is a natural form of vitamin E. Vitamin E is a group of eight fat soluble compounds that include four tocopherols (alpha, beta, gamma and delta) and four tocotrienols (alpha, beta, gamma, and delta). Studies suggest that tocotrienols can provide health benefits distinct from alpha-tocopherol, the most well known form of vitamin E. Tocotrienols have greater fluidity which makes it easier for the body to incorporate them into cell membranes, especially delta-tocotrienol. **Important for:** • Antioxidation • Antiaging • Anti-inflammatory • Anticancer • Brain health • Bone health • Cardiovascular effects • Prevention of platelet aggregation • Hypolipidemic effects • Neuroprotective effects **May be useful for the prevention/treatment of:** hyperlipidemia, certain types of cancer, atherosclerotic heart disease, metabolic syndrome. NAFLD, Parkinson's disease,osteopenia/osteoporosis **Good food sources:** palm oil, rice bran , annatto bean- the most potent source

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MICRONUTRIENTS TO ADDRESS

Vitamin K1

Vitamin K is a general name of a family of compounds with a common chemical structure-Vitamin K1 (phylloquinone or phytonadione), vitamin K2 (menaquinone), and vitamin K3 (menadione- no longer used in fortified foods/supplements). Vitamin K1 is the primary source of vitamin K that humans obtain through foods. **Important for:** • Regulation of blood clotting • Transport of calcium and bone metabolism • Potential antioxidant protection, and insulin sensitivity support, protection of cells lining blood vessels **May be useful for the prevention/treatment of:** atherosclerosis/ischemic heart disease, nausea hemorrhagic disease of newborns, vomiting of pregnancy, and osteoporosis **Good food sources:** green tea, leafy greens such as kale, turnip greens, and spinach, broccoli, Brussels sprouts, asparagus, cabbage, other vegetables.

Coenzyme Q10

Coenzyme Q10 is a fat-soluble compound that is synthesized in the body with the highest levels in the heart, liver, kidneys, and pancreas. It is present in small amounts in some foods. It's chemical structure is similar to vitamin K. **Important for:** • Antioxidation • Analgesic • Membrane stabilization • Anti-aging • Anti-inflammatory • Cofactor in energy synthesis • Immune support **May be useful for the prevention/treatment of:** mitochondrial dysfunction, Alzheimer's disease, AMD, eye disorders, cardiovascular disease, CHF, cardiomyopathy, myocardial infarction, hyperthyroidism, infertility, neuropathy, fibromyalgia, hypertension, migraines, NAFLD, Parkinson's disease, Huntington's disease, pre-eclampsia, PCOS, and respiratory illness **Good food sources:** As supplements, there are two forms of CoQ10 that are available, the oxidized form (ubiquinone) and the reduced form (ubiquinol) . Food sources include meat, poultry, fish, soy, nuts, fruit, vegetables, eggs, and dairy.

Threonine

Threonine is an essential amino acid used as a building block for proteins. **Important for:** • Nervous system function • Digestion • Fat metabolism in the liver • Formation of collagen , tooth enamel, health of the skin • Immune function **May be useful for the prevention/treatment of:** ALS, exercise capacity in congestive heart failure, pain, disability, and spasticity in MS **Good food sources:** Cottage cheese, watercress, sesame seeds, nuts, legumes, soy, meat and fish, lentils, eggs, dairy products

Omega 3 EPA

Eicosapentaenoic acid (EPA), one of the three main omega-3 fatty acids, is a long-chain polyunsaturated fatty acid that is found in the tissues of oily fish and marine mammals. EPA is often used in conjunction with docosahexaenoic acid (DHA) for a variety of conditions. Omega 3 fatty acids are important components of cell membranes. All of these fatty acids contain "double bonds"- connections that make them flexible and interactive but also more susceptible to damage. EPA has five double bonds. **Important for:** Cell membrane stability and fluidity • Anti-inflammatory – proper function of the body's inflammatory system depends on prostaglandins (messaging molecules). Many of the prostaglandins are made from EPA and tend to be anti-inflammatory.• Antiplatelet • Decrease in blood viscosity • Cardiovascular effects • Immunomodulatory • Reduction in serum triglycerides • Neurological effects **May be useful for the prevention/treatment of:** atherosclerosis/ischemic heart disease, cardiac arrhythmias, CHF, hypertension, hypertriglyceridemia, raynaud's disease, eczema, psoriasis, IBD-Crohn's disease, ulcerative colitis, migraines, multiple sclerosis, anxiety, ADHD, bipolar disorder, cognitive function, depression, rheumatoid arthritis, asthma, BPH, cancer, NAFLD, periodontal disease, PCOS, and more. **Good food sources:** The body can convert some ALA (alpha-linolenic acid) to EPA but in only very small quantities. Therefore, getting EPA from foods or dietary supplements is the only practical way to increase levels of EPA in the body. Most fish (cod, haddock, mackerel, sardines, ocean trout, whiting, tuna, salmon, halibut, flounder, grouper, red snapper, sole, rainbow trout) and sea plants are good sources. The omega-3 fatty acid content of farmed fish is generally lower than that of wild fish. Other grass fed animal sources that supply some EPA-eggs, dairy, meats .

Histidine

Histidine, an essential amino acid, is involved in a wide range of metabolic processes in the body, and is needed for growth and tissue repair. **Important for:** • Protection of nerve cells • Metabolism of the neurotransmitter, histamine • Immune, gastric, and sexual function • Manufacturing of red and white blood cells • Protection of tissues against radiation and heavy metals **May be useful for the prevention/treatment of:** rheumatoid arthritis, allergic diseases, ulcers, and anemia caused by kidney failure or kidney dialysis **Good food sources:** beef, lamb, pork, poultry, fish, cheese, nuts, seeds, eggs, legumes, soybeans, quinoa, and whole grains.

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MICRONUTRIENTS TO ADDRESS

Zinc

Zinc is an essential mineral involved in numerous aspects of cellular metabolism. It is a major component of over 300 metabolic enzymes. **Important for:** • Immune function and wound healing • Protein and DNA synthesis • Growth and development • Proper sense of taste and smell, visual function, hearing • Antioxidation and anti-inflammation • Protection of cell membranes Production of stomach acid **May be useful for the prevention/treatment of:** acne, brittle nails, warts, hearing, olfactory and taste disorders, colds, gastroenteritis, age-related macular degeneration, anorexia nervosa, ADHD, depression, RA, psoriatic arthritis, BPH, body odor, cirrhosis, cancer, and more. **Good food sources:** Oysters, meat, poultry, seafood, legumes, nuts, seeds, peanuts, egg yolks, whole grains, wheat bran, wheat germ, fruit, and dairy products.

Inositol

Inositol is structurally similar to glucose. It was once considered to be part of the B vitamin complex but now known to be produced in the human body so is now referred to as a pseudovitamin. Inositol is present in two forms, myo-inositol and D-chiro-inositol. **Important for:** • Cell membrane components, cell signaling • Lipoprotein components • Proper function of hormones • Possibly enhancing insulin sensitivity **May be useful for the prevention/treatment of:** Alzheimer's disease, bronchopulmonary dysplasia (BPD), depression, diabetes (d-chiro inositol)/gestational diabetes, NAFLD, OCD, panic attacks, and PCOS **Good food sources:** whole grains, buckwheat, peanuts, legumes, nuts, seeds, grapefruit, other citrus fruits, and cantaloupe

IMPORTANT! Identified adverse food reactions- allergies, sensitivities, and intolerances- should be avoided even if these cellular tests have shown those food sources of micronutrients/botanicals to be "beneficial." The CMA and APA test the responses of B and T lymphocytes, not antibodies (IgE-mediated allergies) or cells of the innate immune system (Alcat Test). Patients and practitioners are encouraged to carefully read all product/supplement labels and avoid all ingredients that are contraindicated for any reason.

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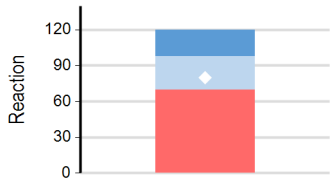
REDOX SCORE

The Redox Score is an indication of your resistance to oxidative stress, relative to the general population. An average or below average response can be improved by appropriate use of nutrients and antioxidants as determined by the Antioxidant Protection Assay and guidance from your practitioner.

80

Above Average
Normal Range
Below Average



CELLULAR NUTRITION ASSAYS

ANTIOXIDANT PROTECTION ASSAY (APA)

Antioxidants / Anti-inflammatories

Acai Berry		Lycopene	111% Protective
Andrographis		Maitake	
Astaxanthin		Mangosteen	
Astragalus		Melatonin	114% Protective
Beta-Carotene		Milk Thistle	128% Highly Protective
Bilberry		Moringa	
Boswellia	112% Protective	NADH	
Camu Camu		Noni Berry	
Catalase	127% Highly Protective	Piperine	
Chlorophyll		Pomegranate	
Cinnamon	112% Protective	Pycnogenol	
Coenzyme Q10		Pyrroloquinoline	
Delta tocotrienol		Quercetin	
Echinacea		Resveratrol	
Elderberry		Rhodiola	114% Protective
Garlic		Selenium	
Ginger		Shiitake	116% Protective
Ginkgo Biloba		SOD	
Glutathione	116% Protective	Sulforaphane	
Goji Berry	112% Protective	Turmeric	
Grape Seed		Vitamin C	115% Protective
Green Tea		Wild Cherry Bark	
Lavender		Zeaxanthin	
Lipoic Acid		Zinc	
Lutein			

≥ 120%	provides **high protection** against oxidative stress
110% - 119%	**some protective** effect against oxidative stress
100% - 109%	**no** significant protective effect

*The term **protective** describes the cell protection effect, i.e. the individual benefit of a specific nutrient to increase the antioxidative capacity

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ANTIOXIDANT PROTECTION ASSAY (APA)

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Beneficial Antioxidants

Milk Thistle

Milk thistle, also known as Silymarin (the main active ingredient), is a plant native to Europe and brought to North America by early colonists. It is now found throughout the US. Milk thistle gets its name from the milky sap that is released from the leaves. The applicable parts of milk thistle are the seeds and above grouind parts. **Important for/potential beneficial properties:** • Antioxidant • Anticancer • Insulin sensitivity support • Anti-inflammatory • Antilipemic • Antiviral • Hepatoprotective • Renal protective **May be useful for the prevention/treatment of:** Liver disorders, skin damage caused by radiation, diabetes, indigestion **Sources:** In foods, milk thistle leaves and flowers are eaten as a vegetable and seeds are roasted for use as a coffee substitute. May be consumed as tea and in supplemental form as well.

Catalase

Catalase is a key antioxidant enzyme in the body's defense against oxidative stress. It converts free radicals into hydrogen peroxide which ultimately breaks down to stable and safe water and oxygen. **Important for/potential beneficial properties:** • Antioxidation • Anti-aging and anti-degenerative • Longevity support • Fat metabolism • Support of DNA integrity **May be useful for the prevention/treatment of:** degenerative disease, mitochondrial dysfunction, cardiac issues, and cataracts **Sources:** wheat and barley grass, alfalfa, Brussels sprouts, leeks, onions, broccoli, parsnips, zucchini, spinach, kale, radishes, carrots, red peppers, turnips, cucumbers, celery, avocado, potato, and red cabbage, kiwi, peaches, cherries, apricots, bananas, watermelon, pineapple

Shiitake

Shiitake mushrooms are edible mushrooms native to East Asia. Research on the compounds in shiitake mushrooms, shows that this fungus provides many health benefits. **Important for/potential beneficial properties:** • Anti-inflammatory • Antioxidant • Cardiovascular support • Lipid lowering • Immune system support • Blood glucose regulation • Tumor inhibition **May be useful for the prevention/treatment of:** Type 2 diabetes, cardiovascular disease, certain types of cancers, immune issues, and hypertension **Sources:** You can find it fresh, dried or in various dietary supplements.

Glutathione

Glutathione is produced in the liver from the amino acids, glycine, cysteine, and glutamic acid. It is considered the body's "master antioxidant". **Important for/potential beneficial properties:** • DNA synthesis and repair • Metabolism of toxins and carcinogens • Immune support • Prevention of oxidative cell damage • Protein and prostaglandin synthesis • Transport of amino acids • Antioxidation,-fights free radicals • Antiviral • Anti-inflammation **May be useful for the prevention/treatment of:** cancer, Parkinson's disease, neurodegenerative disorders, flu, AMD, glaucoma, cataracts, diabetes, heart disease, asthma (not inhaled glutathione), lung disease, liver disease, GI disease, CFS, and side effects of chemotherapy **Sources:** Fruit, vegetables, and meat but glutathione is poorly absorbed from the GI tract. Consuming foods used in cysteine production is recommended- onions, garlic, chives, leeks. Supplementing with N-acetyl L Cysteine can boost glutathione levels. Glutathione can be taken IV or in liposomal supplemental form.

Vitamin C

Vitamin C (ascorbic acid) is a water soluble vitamin that is essential for human survival. **Important for/potential beneficial properties:** • Antioxidation • Anti-inflammation • Immune function • Blood vessel formation • Muscle formation • Collagen production • Brain Health/neurotransmitter production • Absorption of iron • Blood lipid regulation • Detoxification **May be useful for the prevention/treatment of:** allergic rhinitis,asthma, cardiovascular issues, certain types of cancer, cold and flu, GI issues- constipation, gallstones, gastritis, UTIs, muscle cramps, dysfunctional uterine bleeding, glaucoma, depression, diabetes, obesity, post exercise muscle soreness, and sinusitis **Sources:** citrus fruits, raspberries, strawberries pineapple, kiwi, cantaloupe, greens, cruciferous vegetables- Brussels sprouts, broccoli, squash, green beans, carrots, potatoes, tomatoes, peppers

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Beneficial Antioxidants

Melatonin

Melatonin is a hormone produced from tryptophan in the brain by the pineal gland and the gastrointestinal tract. It regulates the body's circadian rhythm, endocrine secretions, and sleep patterns. **Important for/potential beneficial properties:** Analgesic, Antiaging, Antiarthritis, Anticancer, Anticonvulsant (controversial), Anti-inflammatory, Antioxidant, Antiparasitic, Antiviral, Blood glucose support, Bone support, Blood pressure support, Gastrointestinal protection, Hormonal support, Immune support, Hypolipidemic, Hepatoprotective, Neuroprotective, Weight loss effects **May be useful for the prevention/treatment of:** Age- related macular degeneration, Anesthesia premedication, Cancer, Eczema, Endometriosis, Headache disorders, Insomnia, IBS, Non-ulcer dyspepsia, Sarcoidosis, Schizophrenia, Seasonal affective disorder, Tardive dyskinesia, Thrombocytopenia, Tinnitus**Sources:** Supplementation
NOTE: Because of the potential for daytime sleepiness, driving or operating machinery should be avoided 4-5 hours after taking melatonin.

Rhodiola

Rhodiola is a flowering herb that grows in cold, high-altitude regions of Europe and Asia. Other names for it include Arctic Root, Golden Root, King's Crown, and Rose Root. It is considered an adaptogen. It's applicable part is the root. **Important for/potential beneficial properties:** • Adaptogenic- protection from stressors • Antiaging- reduction in oxidative stress • Antiarrhythmic • Antibacterial • Anticancer • Antidepressant, anti-anxiety, mood support • Blood glucose regulation • Blood pressure support, cardio protective support • Anti-inflammatory • Antioxidant • Antiviral • Cognitive support • Immune support **May be useful for the prevention/treatment of:** depression, anxiety, adrenal issues, fatigue, mental performance, difficulty concentrating, and bladder cancer **Sources:** Supplemental form- capsules/tablets

Boswellia

Boswellia (Frankincense), is the hardened gum resin extruded from the trunk of the Boswellia carteri tree. **Important for/potential beneficial properties:** • Anti-inflammatory • Anti-bacterial • Antiviral • Anti-anxiety • Antiseptic, disinfectant • Immune enhancing • Memory enhancing • Hormone balancing • Digestive aid **May be useful for the prevention/treatment of:** pain and inflammation, asthma, acne, signs of aging, Crohn's disease, IBS, diabetes, cancer, osteoarthritis, depression, anxiety, leaky gut, gas, and constipation **Sources:** topically, aromatherapy

Cinnamon

Ceylon "true" cinnamon is the bark of a tropical evergreen tree grown in Sri Lnka, India, and Madagascar. The volatile oils of Ceylon cinnamon are thought to contain the active constituents. One active constituent, cinnamaldehyde makes up 60-80 % of the volatile oil from the bark. Cinnamaldehyde is thought to be responsible for most of cinnamon's health benefits.
NOTE: Cassia cinnamon contains coumarin in significant amounts which may be harmful in high doses. Ceylon cinnamon, the preferred source, is much lower in coumarin. **Important for/potential beneficial properties:** Antiallergy, Anti-inflammatory, Antibacterial, Antifungal, antiparasite, Antioxidant, Antiviral, Blood glucose support, Bone support, Weight management, Collagen support, Gastrointestinal support, Neuroprotection, Cognitive support, **May be useful for the prevention/treatment of:** Type 2 diabetes, Insulin resistance, Osteopenia, Hyperlipidemia, Cardiovascular disease, Bacterial, fungal, yeast, parasitic infections **Sources:** Ceylon is the preferred cinnamon. Ceylon cinnamon can be found in powder, sticks, and supplements from health food stores and other specialty providers. (Most cinnamon in supermarkets is the Cassia variety.)

Goji Berry

Goji berry, also known as wolfberry, is a nutrient rich bright orange-red berry that comes from a shrub native to China and distributed in Asia, the Mediterranean, North America, and Australia. The root bark and sweet, red fruits of goji are used in traditional Chinese medicine. **Important for/potential beneficial properties:** • Anticancer • Blood glucose support • Antifatigue • Antimicrobial • Antioxidant • Cardiovascular support • Hepatoprotective • Immune support **May be useful for the prevention/treatment of:** • Diabetes • Dry eye • Athletic performance • Sleep quality • Fatigue • Mood support • Overweight • Glaucoma • Fertility • Hyperlipidemia **Sources:** Goji berries can be eaten raw, cooked, or dried. Often found in herbal teas and wines.

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Clinic ID:	40583	HCP:			

CELL SCIENCE SYSTEMS

CLIA#10D0283906
Lab Director
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CELLULAR NUTRITION ASSAYS

ANTIOXIDANT PROTECTION ASSAY (APA)

The descriptions that follow are for educational purposes only. Statements are not to be interpreted as treatment recommendations and do not take the place of advice from a qualified practitioner. Please be aware that botanicals and high doses of certain nutrients may interact with medications, botanicals, and medical diagnoses, and therefore may be contraindicated. The patient is encouraged to seek guidance and an individualized food and supplement plan from a qualified nutrition practitioner.

Beneficial Antioxidants

Lycopene

Lycopene is a reddish carotenoid found in some fruits and vegetables. **Important for/potential beneficial properties:** • Antioxidant • Antiplatelet • Lipid lowering • Free radical scavenger **May be useful for the prevention/treatment of:** asthma, prostate cancer, atherosclerosis, hypertension, CHF, anti-platelet, hyperlipidemia, sunburn, oral leukoplakia, and infertility **Sources:** tomato products, watermelon, pink grapefruit, papaya, guava, and apricots

IMPORTANT! Identified adverse food reactions- allergies, sensitivities, and intolerances- should be avoided even if these cellular tests have shown those food sources of micronutrients/botanicals to be "beneficial." The CMA and APA test the responses of B and T lymphocytes, not antibodies (IgE-mediated allergies) or cells of the innate immune system (Alcat Test). Patients and practitioners are encouraged to carefully read all product/supplement labels and avoid all ingredients that are contraindicated for any reason.