SpectraCell Laboratories, Inc.

LABORATORY REPORT

Account Number: 19 0101 032

[redacted]
Tampa, FL 33607-

Name: [redacted]
Gender: Male Age: 48
Accession Number: F50047
Date of Collection: 01/06/06
Date Received: 01/07/06
Date Reported: 01/22/06
Requisition Number: 500963

Summary of Test Results

FIA Comprehensive Profile 5000 has determined the following functional deficiencies:

Vitamin B12 (Cobalamin)	Serine	Choline
Glucose-Insulin Interaction	Coenzyme Q-10	Selenium
Vitamin E (a-tocopherol)		
Glutathione		

SPECTROX ™ Total Antioxidant Function:

Interpretation: Average Result: 30.6 Percentile

John F. Crawford, Ph.D.
Laboratory Director

Repletion Suggestions

1. Vitamin B12 (Cobalamin)	100 mcg daily
2. Serine	500 mg t.i.d. (1500 mg daily)
3. Choline	Three options for Choline supplementation exist: 1) 1000 mg daily of Choline from choline bitartrate, choline citrate, or choline chloride in divided doses 2) 6000 mg daily (2 capsules with each meal) of phosphatidyl choline concentrate or liquid lecithin 3) 3 Tablespoons of lecithin granules daily
4. Glucose-Insulin Interaction	Replace intake of foods with high glycemic index (sugar, white flour) with whole foods (fruit, vegetables, whole grains, legumes).
5. Glutathione	1000 mg of N-Acetyl-Cysteine daily
6. Coenzyme Q-10	60 mg coenzyme Q-10 per day
7. Selenium	100 mcg selenium per day for 6 months 50 mcg per day thereafter
8. Vitamin E (a-tocopherol)	400 I.U. d-alpha tocopherol per day
9. SPECTROX ™ Total Antioxidant	Increase intake of foods rich in antioxidants, such as fresh fruits and vegetables.
Function	If supplementation is desired, the following daily doses of nutrient antioxidants have been suggested as safe for long-term intake in humans by scientific research:

Vitamin C	1000 mg
Vitamin E	400 IU d-alpha-tocopherol
Selenium	100 mcg

Please note: Supplementation is usually required for four to six months to effect the repletion of a functional deficiency in lymphocytes.

Suggestions for supplementation with specific micronutrients must be evaluated and approved by the attending physician. This decision should be based upon the clinical condition of the patient and the evaluation of the effects of supplementation on current treatment and medication of the patient.

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[redacted]

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Laboratory Test Report

FIA ™ Test Description	Test Result (% CONTROL)	Reference Range
B Complex Vitamins		
Vitamin B1 (Thiamin)	101.00	> 79 %
Vitamin B2 (Riboflavin)	65.00	> 54 %
Vitamin B3 (Niacinamide)	113.00	> 81 %
Vitamin B6 (Pyridoxine)	72.00	> 55 %
Vitamin B12 (Cobalamin)	13.00	> 15 %
Folate	41.00	> 33 %
Pantothenate	12.00	> 8 %
Biotin	113.00	> 70 %
Amino Acids		
Serine	27.00	> 31 %
Glutamine	124.00	> 75 %
Asparagine	116.00	< 122 %
Metabolites		
Choline	19.00	> 21 %
Inositol	72.00	> 59 %
Carnitine	94.00	< 109 %
Fatty Acids		
Oleic Acid	98.00	< 132 %
Other Vitamins		
Vitamin D (ergocalciferol)	16.00	< 21 %
Vitamin A (retinol)	29.00	< 58%
Carbohydrate Metabolism		
Glucose-Insulin Interaction	128.00	< 120 %
Fructose Sensitivity	111.00	> 81 %
Minerals		
Calcium	98.00	< 130 %
Zinc	95.00	< 125%
Magnesium	112.00	< 124 %
Antioxidants		
Glutathione	80.00	> 85 %
Cysteine	90.00	< 127 %
Coenzyme Q-10	33.00	< 26 %
Selenium	67.00	< 51 %
Vitamin E (a-tocopherol)	42.00	< 31 %
Alpha Lipoic Acid	23.00	< 36 %
Spectrox		
Total Antioxidant Function	30.6	> 75 %

The reference ranges listed in the above table are valid for male and female patients 12 years of age or older.

Requisition Number 500963

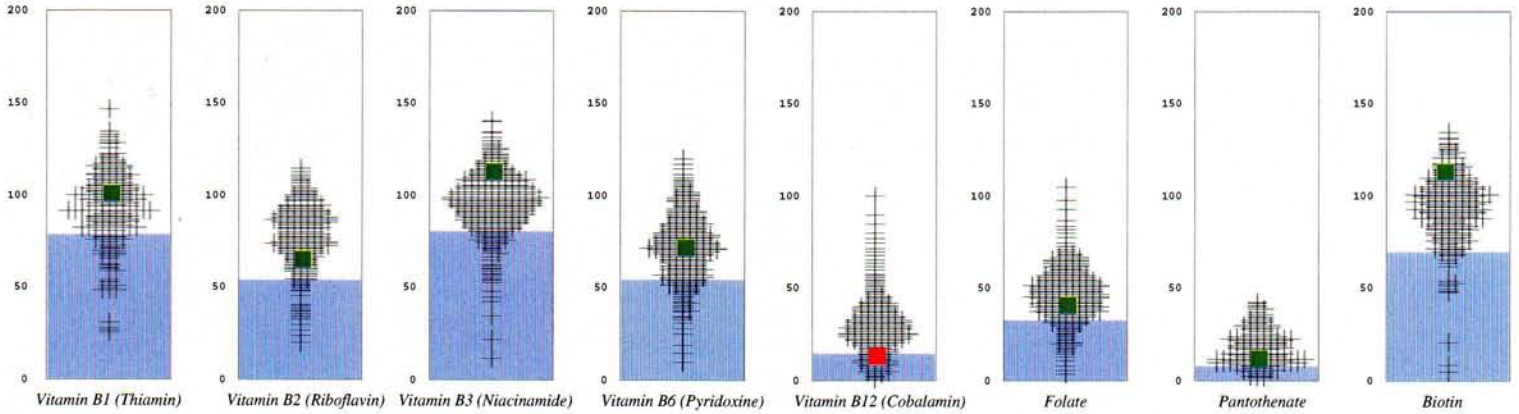
[redacted]

Adequate

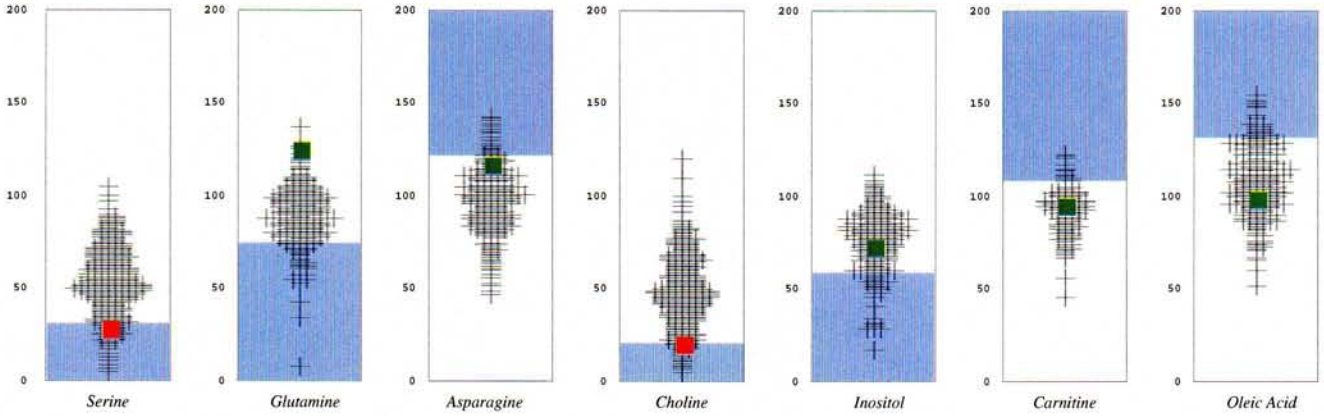
Deficient

Values in this area represent a deficiency and patient may require nutrient repletion or dietary changes.

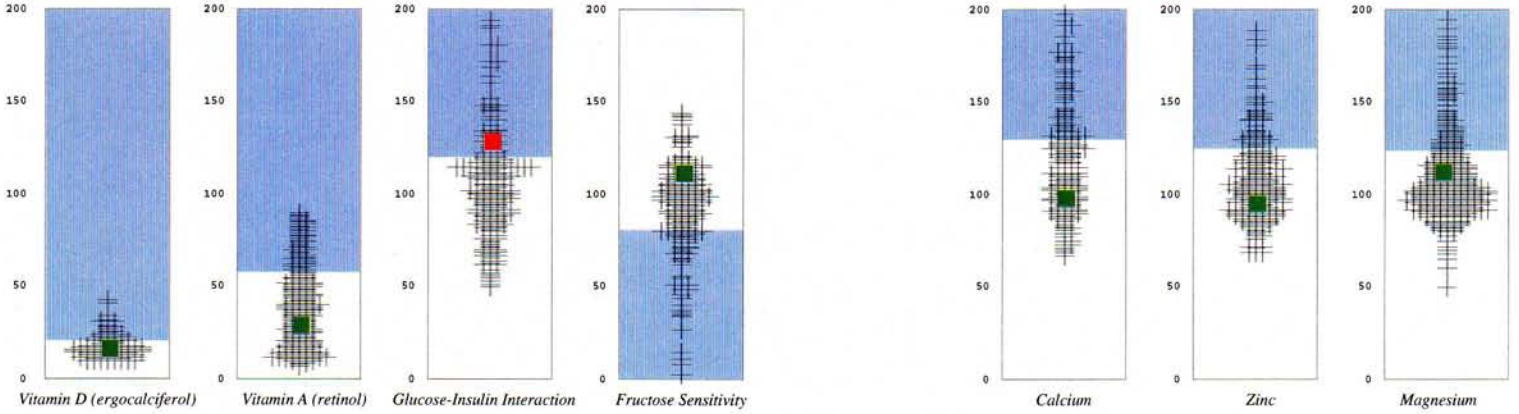
B Complex Vitamins



Amino Acids & Metabolites



Other Vitamins, Carbohydrates & Minerals



Requisition Number 500963

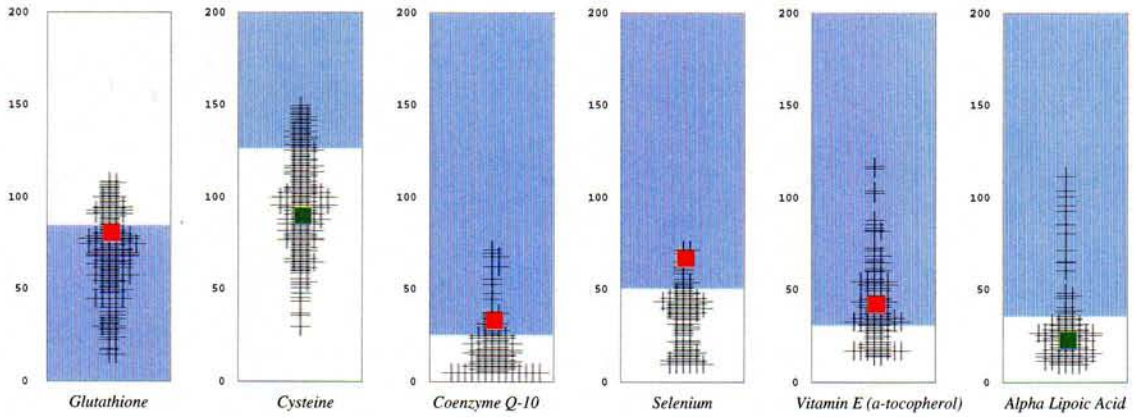
[redacted]

Adequate

Deficient

Values in this area represent a deficiency and patient may require nutrient repletion or dietary changes.

Antioxidants



SPECTROX Total Antioxidant Function

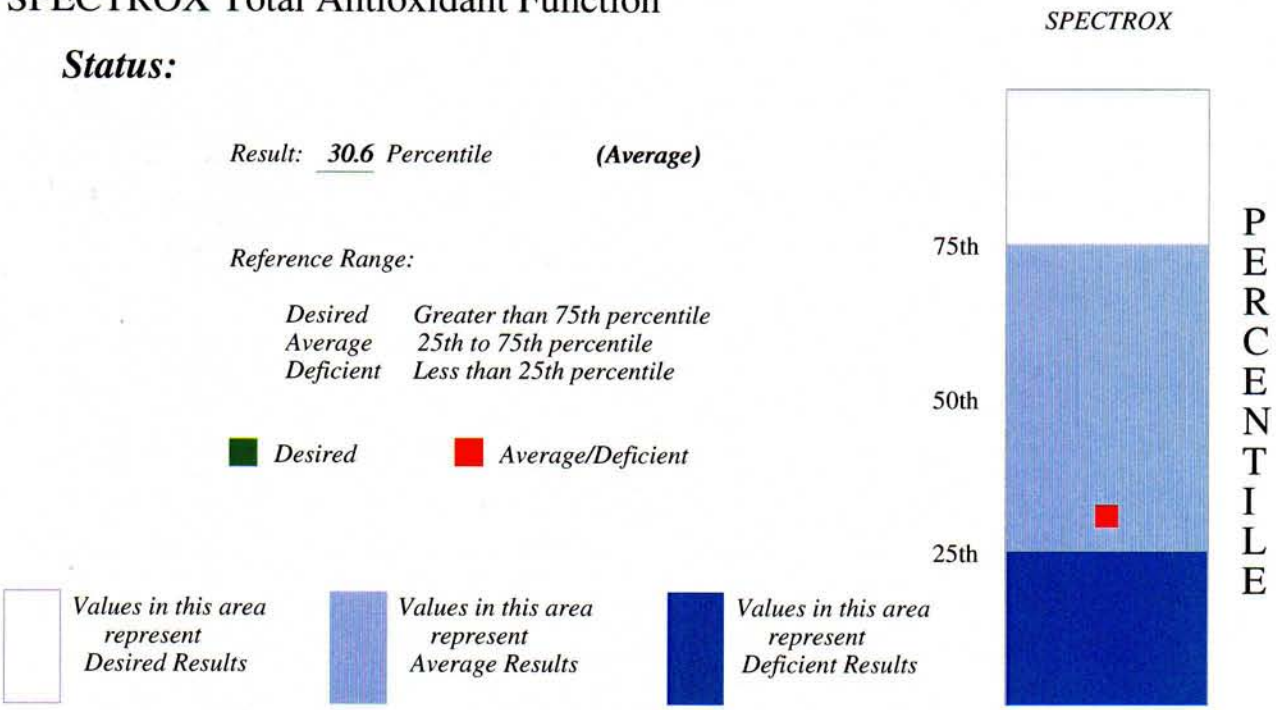
Status:

Result: ***30.6*** *Percentile* ***(Average)***

Reference Range:

Desired	*Greater than 75th percentile*
Average	*25th to 75th percentile*
Deficient	*Less than 25th percentile*

Desired *Average/Deficient*



Interpretation: Average

A SPECTROX value between the 25th to 75th percentiles indicates an average antioxidant function for apparently healthy persons. Since antioxidants are protective nutrients, an average status means an ability to resist an oxidative stress similar to the majority of persons. However, average status is not ideal, nor is it clearly deficient.

SPECTROX values below the 25TH percentile indicate a deficient antioxidant function. A deficient antioxidant status indicates decreased ability to resist oxidative stress, or an increased oxidant load. A deficient antioxidant status may arise from lack of intake of nutrient antioxidants, lack of uptake of dietary antioxidants, endogenous overproduction or exogenous exposure to free radicals and/or oxidative events, deficient synthesis of endogenous antioxidants, increased utilization of antioxidants, deficient cellular repair mechanisms, or any combination of these factors.

SPECTROX measures the lymphocytes' total antioxidant function by addition of a peroxide [oxidative stress] to complete medium. Lymphocyte growth response with peroxide is reported as a percentile of growth responses from a reference range of apparently healthy persons. Since SPECTROX measures total antioxidant functions, clinical interpretation of results should consider physiological, pathological, environmental, lifestyle and dietary factors. Please consider that prior, current or additional supplementation with nutrient antioxidants [vitamin C, vitamin E, beta carotene, etc.] reflects only a part of the total antioxidant systems. Supplementation and lifestyle changes may or may not improve overall antioxidant functions, due to the many factors that affect antioxidant status.

SpectraCell Laboratories, Inc.

SUPPLEMENTAL INFORMATION

Name: [redacted]
Gender: Male
Accession Number: F50047

Date Received: 01/07/06
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Account Number: [redacted]
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Vitamin B12 (Cobalamin)

Status:

The patient's lymphocytes have shown a deficient status for Vitamin B12 (Cobalamins).

Function:

Vitamin B12 is needed to form blood and immune cells and support a healthy nervous system. A series of closely-related compounds known collectively as cobalamins or Vitamin B12 are converted into active forms methylcobalamin or 5'-deoxyadenosylcobalamin. Methylcobalamin interacts with folate metabolism, preventing folate derivatives from being trapped in unusable states. Adenosylcobalamin is involved in the metabolism of odd-chain fatty acids and branched-chain amino acids.

Deficiency Symptoms:

Deficiency symptoms of Vitamin B12 are both hematological (pernicious anemia) and neurological. A megaloblastic anemia may occur because of the effects of Vitamin B12 deficiency on folate metabolism. Shortness of breath, fatigue, weakness, irritability, sore tongue, decrease in blood cell counts (red, white, and platelets) are all clinical signs of a Vitamin B12 deficiency. Neurological symptoms are manifested as a progressive neuropathy, with loss of position sense and ataxia. If Vitamin B12 repletion is not initiated, permanent neurological damage, including degeneration of nerves and spinal cord can result. Recent evidence suggests that mental symptoms of depression and fatigue are detectable before anemia develops. Vitamin B12 is necessary to prevent accumulation of homocystine, a toxic metabolic byproduct linked to cardiovascular disease and connective tissue abnormalities. Hypochlorhydria and gastrointestinal disturbances are frequently associated with Vitamin B12 deficiency.

Repletion Information

Dietary sources for cobalamins are strictly from animal foodstuffs. Vitamin B12 is not found in plant foodstuffs. Dietary supplements can also contain Vitamin B12.

The 1989 RDA for Vitamin B12 is 2.0 μg for adults. No toxic effects of oral Vitamin B12 intake have been demonstrated, even in doses over 1000 μg daily.

Since the absorption and intracellular activation of oral Vitamin B12 are frequently difficult, consideration should be given to injectable forms of Vitamin B12. Some patients may require more frequent or larger doses than usual before repletion occurs.

Serine

Status:

The patient's lymphocytes have shown a deficient status for Serine.

Function:

Serine is used to manufacture proteins, energy, cell membrane structure and synthesis of other cell components (DNA and RNA). Serine is a dispensable amino acid obtained from the diet and synthesized from other amino acids and metabolites of glucose. Serine participates in protein synthesis, energy production, phospholipid synthesis (phosphatidyl serine and ethanolamine) and one-carbon unit metabolism (necessary for DNA and RNA synthesis). Quantitatively, serine supplies more one-carbon units than any other nutrient. Serine is an attachment point for carbohydrates on protein chains.

Deficiency Symptoms:

No specific deficiency symptoms are known for serine; however, some individuals may have a metabolic defect in serine synthesis or conditional need for serine during periods of cell growth or physiological stress. Preliminary clinical evidence suggests neurological symptoms (neuropathy, neuritis, and behavioral disturbances may be associated with serine deficiencies. Additional laboratory tests to determine other aspects of serine metabolism would include amino acid analysis of serum and/or urine.

Repletion Information

Since serine is a dispensable amino acid, no dietary RDA exists. Serine is present in foods that are rich in protein. Doses of 1-2 grams daily of pure serine appear safe.

Choline

Status:

The patient's lymphocytes have shown a deficient status for Choline.

Function:

Choline is an essential nutrient that is part of cell membranes and is used by nerves to send impulses. Choline is known to be essential for mammals, and is essential for human cell growth. A dietary requirement for choline in humans has not been proven, although recent data on infants and dietary choline depletion in adults suggests that choline is an essential nutrient. Historically, choline is considered as a lipotrope and member of the B vitamin complex. Choline has several distinct functions. First, choline serves as a source of one-carbon units (methyl groups) for biosynthesis of other compounds. Interactions with methionine, Vitamin B12, folate, ethanolamine, and betaine allow choline to partially replace, or be replaced by other constituents in one-carbon metabolism. Second, choline is a component of phosphatidyl choline, the major component of cell membranes. Lecithin is a commerical name for phospholipids containing 10-35% phosphatidyl choline. Phosphatidyl choline has interactions with cholesterol and lipoprotein metabolism.

Deficiency Symptoms:

Symptoms of Choline deficiency in humans primarily include: liver dysfunction and decreased serum cholesterol. Abnormal liver function resembling Choline deficiency symptoms in animals has been noticed in long-term intravenous feeding (containing no Choline), and during malnutrition. Symptoms of inadequate cholinergic transmission may indicate an increased need for Choline.

Repletion Information

Dietary sources richest in Choline (per serving) include:

Phosphatidyl Choline Supplements	
Choline Supplements	Lecithin
Liver	Egg Yolks
Wheat Germ	Soy Products
Brain and Organ Meats	Peanuts and Legumes
Potatoes	Lettuce

At this time, there is no regulatory guideline for choline intake in humans. Usual dietary intake is from 0.5 - 1.0 gram daily. Choline intake can be accomplished by two types of choline forms: choline salts and phospholipids. Choline salts include choline chloride, choline bitartrate, and choline citrate. No apparent adverse effects after daily intakes of up to 10 grams of choline as choline salts have been reported. However, doses of 20 grams daily or more have been associated with symptoms of excess cholinergic stimulation (increased salivation, sweating, nausea, dizziness, diarrhea, depression, and ECG changes). Choline supplementation in the form of lechithin or phosphatidyl choline in daily doses of up to 100 grams appears to have no toxicity. However, occasional changes in bowel habits or upset stomachs appear, and the caloric content of additional lipids needs to be considered.

Glucose-Insulin Interaction

Status:

The patient's lymphocytes have shown a deficient status for Glucose-Insulin Interaction.

Function:

A stimulation of lymphocyte growth by insulin may indicate a functional deficiency of insulin in vivo, or a metabolic defect in glucose utilization. At suboptimal glucose concentrations, supplementation of lymphocyte cultures with insulin exerted a sparing effect. This means that insulin addition makes uptake or utilization of glucose and amino acids more efficient, producing more cellular energy, and thus, a greater growth response. At optimal concentrations of glucose, insulin does not exert a sparing effect in healthy persons.

Deficiency Symptoms:

Preliminary evidence suggests that persons with abnormal Glucose-Insulin Interaction exhibit hypoglycemia or hyperglycemia based on glucose tolerance testing. Morbidly obese persons with abnormal Glucose-Insulin Interaction may indicate insulin resistance. Thus, deficiency symptoms include fatigue, headaches, nausea, disorientation, dizziness, cold hands and feet, glucose intolerance.

Repletion Information

Dietary suggestion are to replace, as much as possible, refined carbohydrates (table sugar, corn syrup, white flour, products made predominantly with white flour and/or sugar) with whole-food, unrefined carbohydrates (whole grain products, legumes, fruits). Reduce intake of foods with a high glycemic index. If clinically indicated, it is suggested that further laboratory testing of glucose and insulin metabolism be conducted (glucose tolerance test, glycosylated hemoglobin).

Since chromium status is closely linked with insulin function and glucose tolerance, a chromium deficiency is one possible reason for an abnormal Glucose-Insulin Interaction. Therefore, consider improving chromium status. Chromium is depleted in refined foods, and rich in whole grains. Chromium supplements include Chromemate (chromium polynicotinate), chromium picolinate, and high-chromium yeast. A daily dose of 200 μg of chromium is sufficient for safe chromium repletion.

Glutathione

Status:

The patient's lymphocytes have shown a deficient status for Glutathione.

Function:

Glutathione is implicated in many cellular functions, including antioxidant protection and detoxification. It is also essential for the maintenance of cell membrane integrity in red blood cells. Intracellular glutathione concentrations are principally derived by intracellular synthesis, as few cells directly uptake glutathione from the surrounding extracellular fluid. The high concentration of glutathione in virtually all cells clearly indicates its importance in metabolic and oxidative detoxification processes. Glutathione may be considered the master antioxidant.

Deficiency Symptoms:

A wide range of human conditions such as aging, cancer, atherosclerosis, arthritis, viral infections, AIDS, cardiovascular, neurodegenerative and pulmonary diseases may be produced, or made worse, by "free radicals". Their treatment or prevention often includes antioxidants such as vitamin C, vitamin E, carotenoids, and selenium. Glutathione is an essential component of the antioxidant defense system: producing a "sparing effect" for both tocopherol and ascorbate by reducing the oxidized forms; and by eliminating hydrogen peroxide by reacting with glutathione peroxidase. Cellular glutathione functions to decrease the formation of oxidized LDL, implicated in the development of atherosclerosis. T-lymphocytes become deficient in glutathione in the progression of AIDS, and this impairs immune function. Glutathione is also required for the synthesis of some prostaglandins from n-3 and n-6 polyunsaturated fatty acids, which are important in the inflammatory response. Patients with adult respiratory distress syndrome are favorably affected by treatments that increase cellular glutathione.

Repletion Information

Glutathione is poorly absorbed from the gastrointestinal tract and foods rich in glutathione do not appear to contribute to increases in intracellular glutathione levels. Cysteine appears to be the limiting amino acid in the intracellular synthesis of glutathione and supplementation with up to 2000 mg daily of N-Acetyl-L-Cysteine appear safe. Supplementation with cysteine is not recommended as it may be poorly tolerated by many patients. In addition, it may be rapidly oxidized to cysteine, a less usable form for the synthesis of glutathione. Foods rich in cysteine are generally high protein foods such as meats, yogurt, wheat germ and eggs.

Coenzyme Q-10

Status:

The patient's lymphocytes have shown a deficient functional intracellular status for coenzyme Q-10.

Function:

Coenzyme Q-10 belongs to a family of substances called ubiquinones. These compounds are lipophilic, water-insoluble substances involved in electron transport and energy production within the mitochondria. In this capacity, coenzyme Q-10 facilitates the conversion of the enery released thru glycolysis into ATP (adenosine triphosphate). Coenzyme Q-10 is also a powerful antioxidant, facilitating the removal of destructive free radicals from the mitochondrial environment. Coenzyme Q-10 is believed to provide a sparing effect on vitamin E. Virtually every cell of the human body requires coenzyme Q-10, with heart muscle and the liver having the greatest concentration since their mitochondrial contest is the greatest in the body.

Deficiency Symptoms:

Deficiency is poorly understood, but may be caused by synthesis problems in the body rather than insufficiency in the diet. It is now established that many patients on statin drugs (cholesterol lowering medications and HMG CoA Reductase Inhibitors) have lowered coenzyme Q-10 levels and are at increased risk for deficiency. Many cardiologists routinely utilize coenzyme Q-10 for treating congestive heart failure. Low blood levels have been reported in people with heart failure, cardiomyopathies, gingivitis (an inflamation of the gums), morbid obesity, hypertension, muscular dystrophy, AIDS and in some patients on peripheral dialysis. Aging is also associated with lower coenzyme Q-10 levels. Some studies have indicated that high doses of coenzyme Q-10 are useful in arresting Parkinson's Disease and the treatment of Altzheimer's Disease. The most common deficiency symptoms include angina and fatigue.

Repletion Information

Coenzyme Q-10 is in every plant and animal cell. However, the amount of coenzyme Q-10 is probably insufficient to produce the clinical effects associated with therapy. The richest dietary sources of coenzyme Q-10 are fish and red meat. The best supplement preparations are soft-gelatin capsules that contain coenzyme Q-10 in an oil base. Capsules range in dosages from 10 to 250 mg. Toxicity is not known, but doses greater than 250 mg can be associated with nausea and diarrhea.

Pregnant women and nursing mothers should avoid supplementing with coenzyme Q-10 because long-term safety studies have yet to be completed. Patients with congestive heart failure on coenzyme Q-10 therapy should not discontinue the treatment without physician approval.

Selenium

Status:

The patient's lymphocytes have shown a deficient functional intracellular status for selenium.

Function:

The trace mineral selenium functions primarily as a component of the antioxidant enzyme, glutatione peroxidase. Glutathione peroxidase, which requires selenium for activity, facilitates the recycling of vitamins C and E, which optimizes the performance of the antioxidant system. Low levels of selenium have been linked to a higher risk for cancer, cardiovascular disease, inflammatory diseases and other conditions associated with free radical damage, including aging and cataract formation. Selenium is also essential for healthy cell-mediated immune function, stimulating immune properties of lymphocytes. Selenium is also needed for the activation of thyroid hormones.

Deficiency Symptoms:

Chronic low selenium intake is associated with an increased risk for heart disease, cancer and depressed immune function. Selenium appears to provide protection against heart disease and stroke. Selenium supplementaion (100 ugm/day) increases the ratio of HDL to LDL and inhibits platelet aggregation.

Selenium and glutathione peroxidase activity are low in patients with rheumatoid arthritis, eczema, psoriasis and most inflammatory conditions. This is related to the increased synthesis of proinflammatory prostaglandins and leuktrienes. Immune system function is enhanced by selenium, by contributing to higher natural killer cell (NKC) activity. Natural killer cells have the ability to destroy cancer cells and bacterial and viral agents. Heavy metal toxicity symptoms may be alleviated by selenium acting as an antagonist. Selenium deficiency may also contribute to male infertility.

Repletion Information

Selenium is safe at the level generally used for supplementation (100-200 mcg/day). However, taking more than 750 mcg of selenium per day may cause toxicity reactions such as loss of fingernails, skin rash and neurological aberrations. In the presence of iodine deficiency goiter, selenium supplementaion has been reported to exacerbate low thyroid function.

Selenium is available in several different forms. Studies indicate that inorganic salts like sodium selenite are less effectively absorbed and not as biologically active as organic forms of selenium, such as selenomethionine or high-selenium content yeast. Richest sources of dietary selenium are found in:

Wheat Germ	Bran
Brazil nuts	Red Swiss Chard
Whole Wheat Bread	Oats
Brown Rice	Turnips

The adult RDA for selenium is 50 ug/day.

Vitamin E (a-tocopherol)

Status:

The patient's lymphocytes have shown a deficient functional intracellular status for vitamin E.

Function:

Vitamin E is an antioxidant that protects cell membranes and other fat-soluble compounds from oxidative damage by free radicals. For example, the oxidative damage to LDL-cholesterol appears to lead to the deposition of cholesterol in the arterial wall leading to atherosclerotic disease. In the past few years many other functions of vitamin E have been clarified. Alpha-tocopherol has direct effect on the control of inflammation, red and white blood cell production, connective tissue growth and genetic control of cell division. Vitamin E acts to reduce free radical damage by converting arachidonic acid residues to non-inflammatory (12-HPETE) derivitives. In deficiencies of vitamin E, arachidonic acid is converted to pro-inflammatory leukotrienes and cytokines. In neutralizing free radicals, vitamin E is oxidized to a free radical. Conversion back to the reduced form occurs by reaction with vitamin C (ascorbate).

Deficiency Symptoms:

The principle use of vitamin E is as an antioxidant in the protection against heart disease, cancer, stroke and neurodegenerative disease (Altzheimer's). In addition, alpha-tocopherol supplementation is useful in treating other cardiovascular diseases, diabetes, fibrocystic breast disease, menopause symptoms and tardive dyskinesia. It may also have applications in Parkinson's Disease and arthritis. Vitamin E is important to immune function, protecting thymic function and white blood cells from oxidative stress.

Symptoms of vitamin E deficiency include nerve damage, muscle weakness, poor coordination, involuntary eye movements, red blood cell fragility, anemia and retrolental fibroplasia (eye disease).

Repletion Information

Vitamin E is available in many different formulations, either natural or synthetic. Natural forms of vitamin E are designated d-, as in d-a-tocopherol. Synthetic forms are designated as dl-. The biologically active form of the vitamin is the d- form and it is recommended for supplementation over the dl- (synthetic) forms. Beta-tocopherol, gamma-tocopherol and the alpha- and delta-tocoretinols have less than 50% of the biological activity than d-a-tocopherol.

The RDA for vitamin E (d-a-tocopherol) is set at 15 I.U. per day. The amount of vitamin E required is dependent upon the amount of polyunsaturated fat in the diet. The more polyunsaturated fat in the diet, the greater the risk for oxidative damage, and the vitamin E requirement is increased. Most studies have utilized doses between 200-400 I.U. per day. Some studies report effective use of vitamin E at doses up to 3000 I.U. per day without observed side effects over a two-year period.

SPECTROX ™ TOTAL ANTIOXIDANT FUNCTION

Function:

The function of antioxidants is to protect biomolecules from oxidative damage. SPECTROX measures the net ability of antioxidant and repair mechanisms of each individual's own cells, giving a total assessment of antioxidant function.

Oxidative Stress:

Each person's cells and tissues are constantly subjected to highly reactive and unstable molecules termed free radicals, causing oxidative stress. These hostile molecules are a normal byproduct of life and are produced by metabolism of oxygen, immune system cells, numerous enzyme reactions essential for metabolism, and environmental sources (smoke, ionizing radiation, air pollution, chemicals, toxic heavy metals and oxidized (rancid) fats. Some of the more common free radicals are superoxide, hydroxyl, singlet oxygen, and peroxides. By their chemical nature, free radicals, although short-lived, promote a chain reaction of radical formation, followed by a wake of chemically-altered damaged biological molecules. Research is continuing to find that much biological damage and diseases are induced and/or mediated by injury from free radicals.

Cellular Antioxidants:

Protection of deleterious effects from free radicals is found in a diverse range of molecules termed antioxidants. Free radicals, and their chain reaction byproducts, can be neutralized and converted to less harmful products (quenched) by antioxidants. Antioxidants are enzymes (superoxide dismutases, catalases, glutathione peroxidases), essential nutrients (beta carotene, vitamin C, vitamin E, selenium, cysteine) or a wide variety of endogenous (glutathione, sulfhydryl groups, thioredoxin, lipoic acid, coenzyme Q10, urate, bilirubin) or dietary (mannitol, bioflavonoids, phenolic acid derivatives, proanthocyanidins) compounds. Antioxidants interact in a complex manner with recharging and overlapping, redundant functions. Cells also possess extensive mechanisms to repair damaged biomolecules, which appear protective in a net antioxidant function test.

The clinical correlation of antioxidant status to health remains under investigation. Research evidence in humans has indicated that deficient intakes or levels of nutrient antioxidants are associated with higher risks of cancer, cardiovascular disease, arthritis, cataracts and many other degenerative diseases. Also, higher intakes or levels of nutrient antioxidants are associated with lower incidence of chronic degenerative diseases. Encouraging studies have shown that intervention with antioxidant nutrient supplements may have therapeutic benefits in humans. Thus, strong scientific evidence illustrates that antioxidants help to prevent chronic degenerative diseases and may help to restore health.