SpectraCell Laboratories
Science + Health + Solutions

Baseline Nexus

Cellular Precision, Personalized Solutions

Patient: **test1, test1**

Accession ID: 2602020043

Provider: John Doe, MD

Order Status: Complete

6030 North Course Drive, Houston, TX 77072 | 1(800) 227-5227 | support@spectracell.com | www.spectracell.com

PATIENT		SPECIMEN		PROVIDER	
NAME **test1, test1**	AGE **36**	ACCESSION ID **2602020043**	DATE COLLECTED **02/01/2026**	ACCOUNT ID **117492**	CLIENT NAME **John Doe, MD**
DOB **1/1/1990**	GENDER **Male**	ORDER ID **1042-00000117492-260202**	DATE RECEIVED **02/02/2026**	ADDRESS **123 S. Any Street ANYWHERE, TX 77000**	
PATIENT ID **26-033-00028**			DATE REPORTED **02/13/2026**		

Order Comments:

MTHFR

Tests	Results
A1298C Mutation	Negative
C677T Mutation	Homozygous
MTHFR Interpretation	Homozygous Negative

MTHFR Genotyping: Methylene Tetrahydrofolate Reductase

Mutations in the MTFR enzyme can affect the metabolism of homocysteine, (an amino acid produced by breaking down protein-rich foods, this protein is dangerous at high levels, also known to act as an arterial abrasive, physically damaging the endothelial lining of the blood vessels, high levels are strongly linked to kidney and heart disease, stroke and dementia) causing accumulation which can impair methylation. Methylation is a biochemical process that is involved in numerous functions, including cellular repair, energy production, detoxification, neurotransmitter production, and immunity. MTHFR mutations have been linked to increase risk of cardiovascular disease, and MTHFR related hyperhomcysteinemia can result in blood vessel damage, blood clots, (thrombosis) stroke, and degenerative aging.

Variants (mutations) in this gene, such as C677T and A1298C, can reduce the enzyme's efficiency, potentially leading to a buildup of homocysteine, which is linked to several age-related and systemic conditions.

MTHFR mutations are also linked to mental health disorders. The enzyme produced by the MTHFR gene plays a significant role in neurotransmitter synthesis, particularly the protein of serotonin, dopamine and norepinephrine, all essential mood regulators.

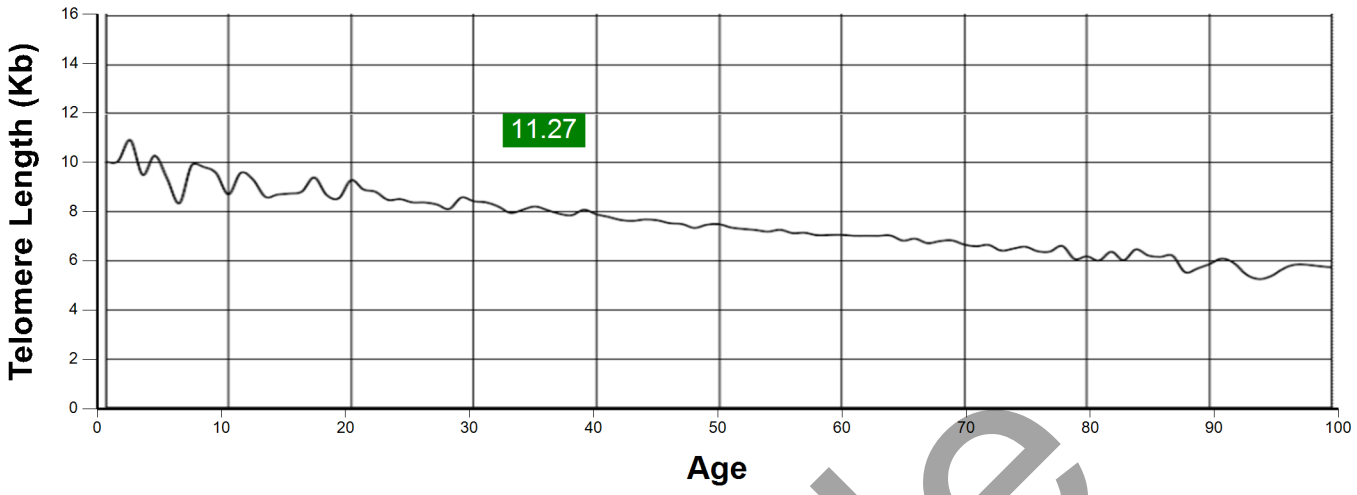
This information is provided for educational purposes.

Telomere

Tests	Results	Units
Telomere Length (Average)	11.27	Kb
Telomere Percentile (Relative to others in the same age group)	99.00	%

PATIENT: **test1, test1** PROVIDER: **John Doe, MD** DATE REPORTED: **02/13/2026** ACCESSION ID: **2602020043**

Telomere Test Results



qPCR-Based Telomere Length Report

Test Description:
Your Telomere Result is derived by measuring telomeres in nucleated white blood cells and calculating the average telomere length of these cells, which are obtained from whole blood via venipuncture.

This report provides a determination of average telomere length (in kilobases) in the patient's genomic DNA extracted from the provided sample using a quantitative polymerase chain reaction (qPCR) assay. The assay measures the telomere-to-single-copy-gene (T/S) ratio, which reflects the average telomere length relative to a reference gene. This laboratory developed test (LDT) is intended for informational purposes and to provide insight into cellular aging as part of a broader health assessment.

Telomere length is a biomarker associated with cellular aging, stress response, and potential predisposition to certain age-related conditions (e.g., cardiovascular disease, immune dysfunction, cancer, etc.) in numerous clinical studies. Telomere length may also be influenced by the activity of telomerase, the enzyme that repairs and extends telomeres.

PATIENT: **test1, test1** PROVIDER: **John Doe, MD** DATE REPORTED: **02/13/2026** ACCESSION ID: **2602020043**

Interpretation:
- An above Average Telomere Length and/or percentile, indicated by a green box, above the population mean may suggest relatively maintained telomere length, and may be associated with slower cellular aging or resilience to certain stressors. However, this does not guarantee protection from disease.

- A below Average Telomere Length and/or percentile, indicated by a red box, may indicate accelerated telomere shortening, which has been associated with increased risk of age-related diseases, chronic stress, or genetic predispositions. This finding should be interpreted cautiously and in the context of other clinical and lifestyle factors.

Disclaimer/Test limitations
Telomere length varies naturally between individuals, cell types and chromosomes and may be influenced by genetics, age, lifestyle, and environmental factors. Consequently, results may not reflect absolute telomere length or telomere length in specific cell types. qPCR-based measurements have inherent variability, and small changes in telomere length over time may not be reliably detected due to assay variability. Longitudinal trends should be interpreted cautiously and confirmed with repeated measurements.

Telomere length is not a diagnostic test for specific diseases but may serve as a general biomarker of cellular health. Results should not be used in isolation to predict health outcomes or guide medical decisions. This test does not account for or determine all contributing factors to telomere health. Results should be discussed with a healthcare provider to integrate findings with other clinical data.

Normal | Borderline | Out of Range

Lipoprotein Particle Numbers

Tests	In Range	Out of Range	Reference Range	Units
VLDL Particles (0 34 68 102 136 170)	31		<85	nmol/L
Total LDL Particles (0 360 720 1080 1440 1800)		982	<900	nmol/L
Non-HDL Particles (0 400 800 1200 1600 2000)		1013	<1000	nmol/L
Remnant Lipoprotein (0 60 120 180 240 300)		201	<150	nmol/L
Dense LDL III (0 120 240 360 480 600)	146		<300	nmol/L
Dense LDL IV (0 40 80 120 160 200)	89		<100	nmol/L
Total HDL Particles (14000 11200 8400 5600 2800 0)		5548	>7000	nmol/L
Buoyant HDL 2b (3000 2400 1800 1200 600 0)	2159		>1500	nmol/L

Lipid Panel

Tests	In Range	Out of Range	Reference Range	Units
Total Cholesterol (0 80 160 240 320 400)		246	<200	mg/dL
Triglycerides (30 84 138 192 246 300)	95		<150	mg/dL
HDL (100 80 60 40 20 0)		49	>40	mg/dL
LDL (40 84 128 172 216 260)		187	40-130	mg/dL
Non-HDL Cholesterol (0 64 128 192 256 320)		197	<160	mg/dL

SpectraCell Laboratories
Science + Health + Solutions
6030 North Course Drive, Houston, TX 77072
1(800) 227-5227 | support@spectracell.com | www.spectracell.com

PATIENT: **test1, test1** PROVIDER: **John Doe, MD** DATE REPORTED: **02/13/2026** ACCESSION ID: **2602020043**

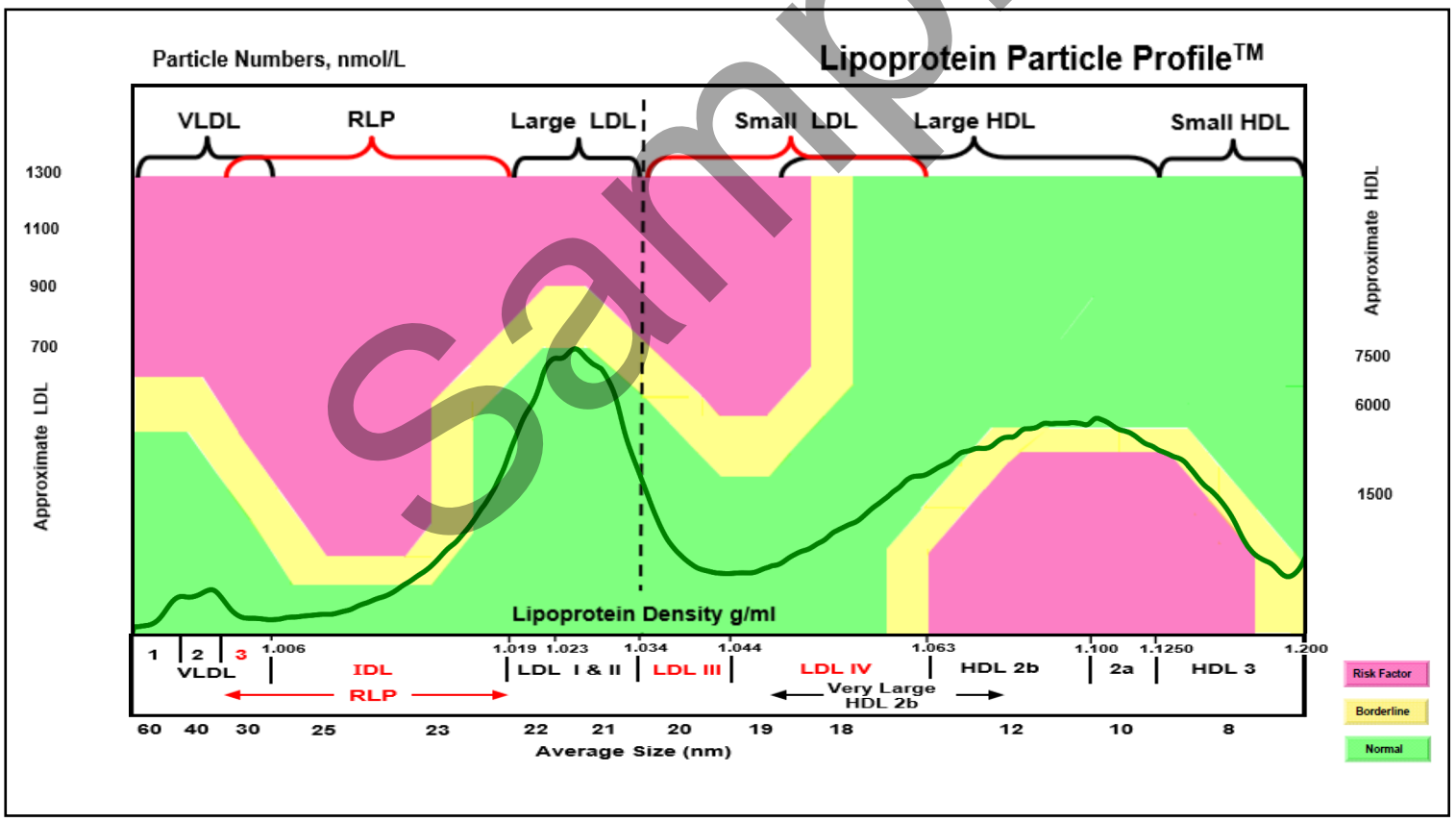
Vascular Inflammation

Tests		In Range	Out of Range	Reference Range	Units
Lipoprotein(a)	6 17 28 38 49 60	#Error	**#Error**	<30.0	mg/dL
Insulin	0 5 10 15 20 25	10.0		<21	µIU/mL
hs-CRP	0 1 2 4 5 6		**10.39**	<3.00	mg/L
Apolipoprotein B	30 64 98 132 166 200		**145**	60-130	mg/dL
Apolipoprotein A1	250 200 150 100 50 0	127		>115	mg/dL
Homocysteine	0 4 9 13 18 22	10.5		<11	µmol/L

Metabolic Syndrome Traits

Tests		In Range	Out of Range	Reference Range	Units
Metabolic Syndrome Traits		0		Zero	

A diagnosis of metabolic syndrome is confirmed if any three of the following traits exist in a patient: (1)high triglycerides [>150mg/dL]*; (2)low HDL [<40mg/dL in men, <50mg/dL in women]*; (3) elevated small dense LDL III and LDL IV [>400 nmol/L]*; (4) high fasting glucose [>100mg/dL]; (5) high blood pressure [>130/85]; (6) high waist circumference [>40 inches in men, >35 inches in women]. *Included in this section of report. Clinician must determine traits (4), (5), (6).



PATIENT: **test1, test1** PROVIDER: **John Doe, MD** DATE REPORTED: **02/13/2026** ACCESSION ID: **2602020043**

Lipoprotein Particle Profile (Component Summaries)

This information is provided for educational purposes.

Lipoprotein Particle Numbers – Lipoproteins are ball-shaped proteins in the blood that transport fats (lipids) throughout the body. The fact that lipoproteins – not the cholesterol that is carried within them – causes cardiovascular disease by penetrating the endothelial lining of the arteries, becoming oxidized and contributing to arterial plaque, has been well established. Further, the most effective treatment will depend on which lipoproteins are elevated, so measuring lipoprotein particle numbers enables a clinician to (1) determine accurately the level of cardiometabolic risk and (2) how best to treat it.

Remnant Lipoprotein (RLP) – This highly atherogenic lipoprotein causes platelet aggregation and impairs vascular relaxation. Unlike other LDL particles which have to be oxidized before they are taken into the arterial intima by macrophage cells, RLP can contribute to plaque buildup even when not oxidized. Foam cells (the sticky contributors to arterial plaque) contains high levels of RLP. Treatment with omega 3 fatty acids can be efficacious.

Dense LDL III and LDL IV – These lipoproteins are small and can thus more easily penetrate and damage the lining of the arteries due to their size, causing plaque and atherosclerosis. They are highly correlated to cardiovascular disease.

HDL2b – This is a protective lipoprotein that indicates how well cholesterol is being cleared by the liver (reverse cholesterol transport system). HDL is made in the liver as HDL3 and as it travels through the body accumulating cholesterol it becomes the larger and lipid-enriched HDL2b. It positively correlates with heart health.

Lipid Panel – The lipid panel measures cholesterol, not lipoproteins (which carry cholesterol). Although directly measuring the actual number of lipoproteins (versus the amount of cholesterol inside them) is widely recognized as a superior tool in assessing cardiometabolic health, clinicians and patients tend to be familiar with a standard lipid panel and its historical use. It is important to note that half of all people who have a heart attack will have cholesterol values that fall in the normal range. Thus, the lipid panel is most useful when viewed in the context of other biomarkers, particularly lipoprotein particle numbers. Elevated triglycerides and low HDL-cholesterol are highly correlated to metabolic syndrome and increase the risk of heart disease significantly.

Vascular Inflammation – Cardiovascular disease is generally considered an inflammatory process and the analytes included here are important determinants of cardiometabolic risk, particularly with respect to vascular inflammation.

Insulin – Insulin is a hormone made by beta cells (β-cells) in the pancreas and secreted in response to elevated blood sugar. Its main function is to regulate plasma glucose levels within a narrow range and is correlated to the efficiency with which a person can metabolize carbohydrates. If one becomes de-sensitized to the action of insulin (insulin resistant), more is needed to achieve adequate glucose-lowering effects, thus altering metabolism to favor fat storage over efficient energy production. High fasting insulin indicates insulin resistance and possible pre-diabetes. Stimulatory hormones (i.e. adrenaline, cortisol) can also raise insulin levels.

hs-CRP – High Sensitivity C-reactive Protein (hs-CRP) is an acute phase protein that reflects the presence of inflammation in the body. High CRP, regardless of cause, is strongly correlated to the risk of sudden cardiac death and low-grade chronic systemic inflammation raises the risk of metabolic syndrome, heart disease, diabetes and other degenerative diseases.

Lipoprotein(a) – This unique lipoprotein is particularly dangerous because it inhibits the formation of plasmin which is an enzyme that dissolves blood clots. High levels of Lp(a) are strongly linked to thrombosis significantly raising the risk of blood clots and associated cardiac events. It can also penetrate the arterial lining, become oxidized and build plaque, thus contributing to atherosclerosis independent of its thrombotic potential.

Apolipoprotein B – ApoB100 is a protein produced in the liver that attached to the surface of all low-density lipoproteins (LDL), regardless of type. Every molecule of VLDL, RLP, Lp(a) and LDL has exactly one, and only one apoB100 molecule attached to it and thus, apoB reflects the level of atherogenic lipoproteins in the blood.

Apolipoprotein A1 – ApoA1 is a protein that is attached to the surface of all high-density lipoproteins (HDL) and is thus reflective of the amount of protective lipoproteins in the blood. It facilitates the removal of fats (cholesterol) from arterial walls by enabling its transport back to the liver for eventual excretion. Like HDL, low levels raise risk of heart disease.

Homocysteine – A metabolic intermediate, this protein is dangerous at high levels because it indicates poor methylation (detoxification) ability. Homocysteine will also act as an arterial abrasive, physically damaging the endothelial lining of blood vessels. High levels are strongly linked to kidney and heart disease, stroke and dementia.

PATIENT: **test1, test1** PROVIDER: **John Doe, MD** DATE REPORTED: **02/13/2026** ACCESSION ID: **2602020043**

*Welcome to your Micronutrient Profile, **test1**!*

Your body is unique and your story is too. Virtually all metabolic and developmental processes that take place in the body require micronutrients and strong evidence suggests that subtle vitamin, mineral, and antioxidant deficiencies can contribute to degenerative processes. These cellular deficiencies may suggest the underlying cause of a myriad of unwanted symptoms and, if corrected, can optimize physical and mental health performance.

The SpectraCell Advantage

Superior insights, earlier interventions, customized treament plans.

Functional

We measure the functional level and capability of nutrients present within your white blood cells, where metabolism takes place and where micronutrients do their job.

Long-term

This test measures intracellular micronutrient function over a period of 4-6 months, extending beyond static serum measurements.

Proprietary

Only SpectraCell offers the patented Spectrox® (reflects antioxidant capacity) and Immunidex (an overall measure of immune function).

What we measure:

We have measured the functional levels of 31 micronutrients, from vitamins and minerals to fatty acids and metabolites, as well as an overall measurement of antioxidant capacity and immune function to provide you with a powerful tool for optimal health, performance, and insight into any health condition. We provide your unique nutrient status in the following areas:

VITAMINS & MINERALS
Discover your body's unique vitamin and mineral requirements and the disparities that exist within your makeup.

AMINO ACIDS
Learn how well your amino acids, the building block of protein, are functioning within your cells.

ENERGY, FAT AND METABOLISM
Know how well your body is metabolizing micronutrients for energy production.

ANTIOXIDANT STATUS & IMMUNE FUNCTION
Understand your body's ability to manage oxidative stress and your immune response to infections and disease.

Results **At-A-Glance**

PATIENT: **test1, test1** PROVIDER: **John Doe, MD** DATE REPORTED: **02/13/2026** ACCESSION ID: **2602020043**

Functional Deficiencies

Abnormal	Supplementation Information *	Provider Comments
Calcium	500mgb.i.d.(1000mgdaily)ascitrate,malate,ascorbateorglycinate	
Vitamin B12	300mcgdaily(methylcobalaminoradenosylcobalamin)	
Vitamin B6	25mgdaily	
Vitamin E	400IUdailyofmixedtocopherols	

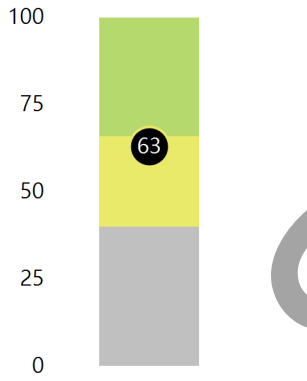
* The RDA (Recommended Daily Allowance) was first published in 1968 primarily for use in nutritional labeling of packaged foods. The DRI (Dietary Reference Intake), published in 1997, serves as replacements for the former RDA, although the actual values are generally within an order of magnitude, and are also primarily for use in nutritional labeling and fortification of packaged foods. In most cases, neither the RDA nor the DRI will be adequate to replete a nutrient in people who demonstrate a functional cellular deficiency of said nutrient. An evidence based approach was used to develop clinically relevant repletion recommendations, consisting of data from published studies and clinician expertise. However, the information presented is not intended nor implied to be a substitute for professional medical advice, diagnosis or treatment.

* Listed repletion information is for patients 12 and older. If the patient is under 12, please contact Spectracell Client Services for pediatric repletion information.

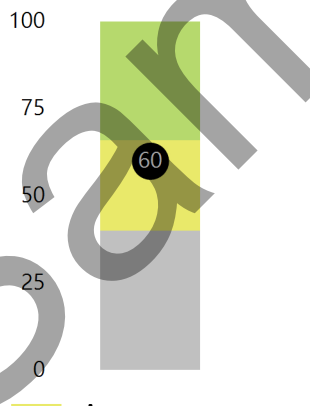
Borderline Deficiencies

Borderline	Provider Comments
Carnitine	
Cysteine	
Glutathione	
Oleic Acid	
Vitamin C	
Vitamin D3	
Zinc	

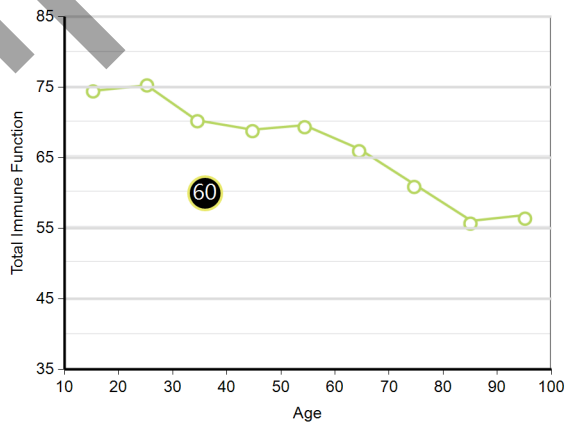
Spectrox®
Total Antioxidant Function



Immunidex
Total Immune Function



Total Immune Function vs Age



Deficient
Values in this range indicate a poor growth response. Cell function is compromised and likely requires nutrient repletion.

Average
Values in this range indicate an average growth response. Cell function is not yet optimal and may require nutrient repletion.

Strong
Values in the range indicate a stronger than average growth response. Cells are functioning well.

Spectrox®

Total Antioxidant Function is a measurement of overall antioxidant function. The patient's cells are oxidatively challenged and the cells' ability to resist damage is determined.

Immunidex

Total Immune Function is an indication of how well a person's T-lymphocytes are functioning by measuring their response to mitogen stimulation (ability to grow). Since lymphocyte function is widely considered a systemic measure of general health, a healthy (stronger) response is desired. A less-than-optimal response may improve with nutrient repletion.

6030 North Course Drive, Houston, TX 77072
1(800) 227-5227 | support@spectracell.com | www.spectracell.com

PATIENT: **test1, test1** PROVIDER: **John Doe, MD** DATE REPORTED: **02/13/2026** ACCESSION ID: **2602020043**

Micronutrients	Patient Results	Reference Range	Patient Result	Interpretation
B-VITAMINS				
Vitamin B1		>78%	90	
Vitamin B2		>53%	66	
Vitamin B3		>80%	90	
Vitamin B6		>54%	52	Deficient
Vitamin B12		>14%	14	Deficient
Folate		>32%	42	
Pantothenate		>7%	18	
Biotin		>34%	45	
AMINO ACIDS AND METABOLITES				
Serine		>30%	45	
Glutamine		>37%	48	
Asparagine		>39%	48	
Choline		>20%	28	
Inositol		>58%	66	
Carnitine		>46%	47	Borderline
Oleic Acid		>65%	70	Borderline
OTHER VITAMINS & MINERALS				
Vitamin D3		>50%	51	Borderline
Vitamin A		>70%	78	
Vitamin K2		>30%	51	
Manganese		>50%	61	
Calcium		>38%	37	Deficient
Zinc		>37%	42	Borderline
Copper		>42%	50	
Magnesium		>37%	47	
CARBOHYDRATE METABOLISM				
Fructose Sensitivity		>34%	42	
Glucose-Insulin Interaction		>38%	45	
Chromium		>40%	48	
ANTIOXIDANTS				
Glutathione		>42%	43	Borderline
Cysteine		>41%	46	Borderline
Coenzyme Q10		>86%	92	
Selenium		>74%	79	
Vitamin E		>84%	84	Deficient
Alpha Lipoic Acid		>81%	85	
Vitamin C		>40%	48	Borderline

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

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

Borderline
Values in this area represent a borderline deficiency and may indicate a need for nutrient repletion or dietary changes

Normal
Values in this area represent a normal result

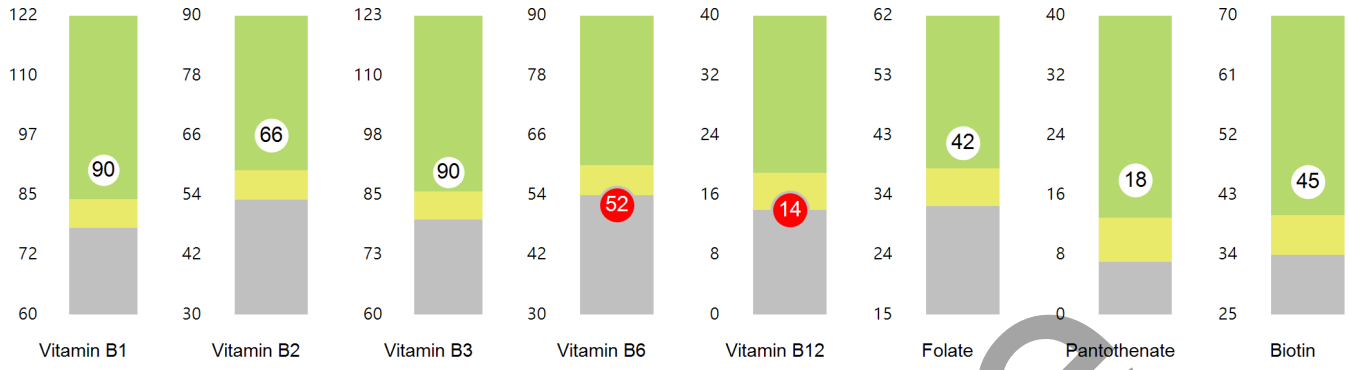
PATIENT: **test1, test1** PROVIDER: **John Doe, MD** DATE REPORTED: **02/13/2026** ACCESSION ID: **2602020043**

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

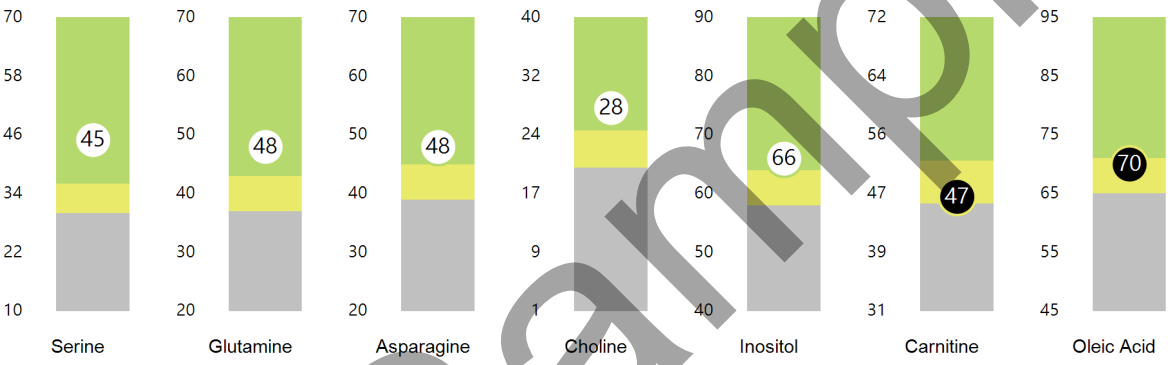
Borderline
Values in this area represent a borderline deficiency and may indicate a need for nutrient repletion or dietary changes

Normal
Values in this area represent a normal result

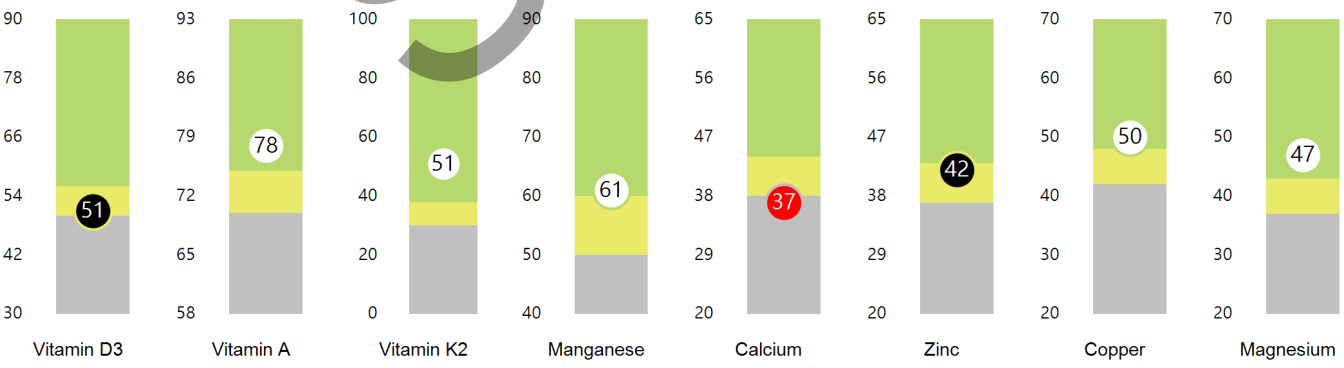
B-Complex Vitamins



Amino Acids & Metabolites



Other Vitamins & Minerals



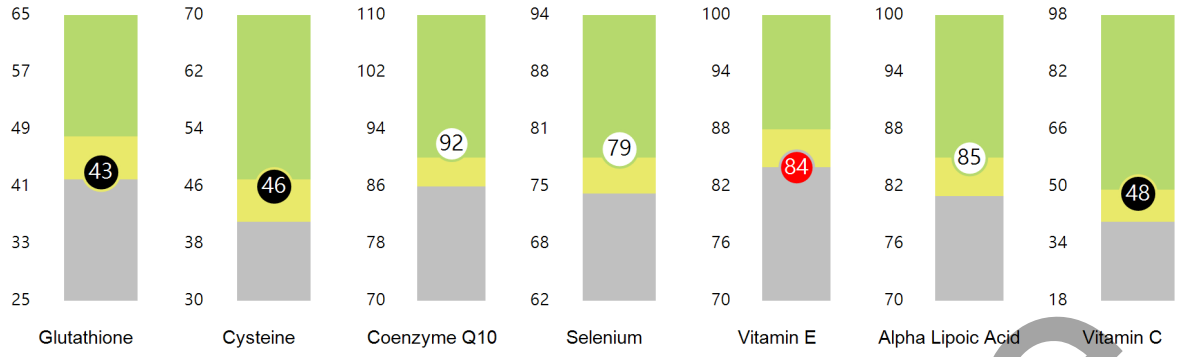
PATIENT: **test1, test1** PROVIDER: **John Doe, MD** DATE REPORTED: **02/13/2026** ACCESSION ID: **2602020043**

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

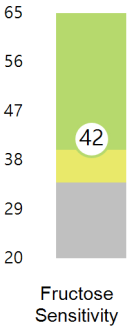
Borderline
Values in this area represent a borderline deficiency and may indicate a need for nutrient repletion or dietary changes

Normal
Values in this area represent a normal result

Individual Antioxidants

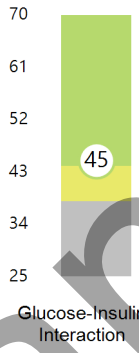


Carbohydrate Metabolism



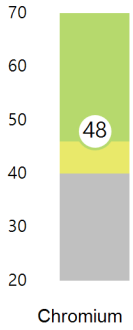
Fructose Sensitivity

This assay measures changes in the patient's lymphocyte growth response to a fructose challenge. Significant reduction in cell growth capacity is indicative of poor ability to metabolize fructose. This can be due to nutritional deficiencies of necessary cofactors in the fructose metabolizing pathway (e.g. copper, zinc) or may be due to genetic factors.



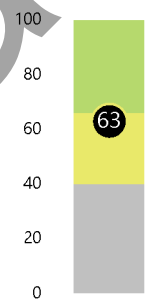
Glucose-Insulin Interaction

The patient's cells are challenged with glucose and their ability to grow in the presence or absence of insulin is determined. A significant decrease of cell growth is indicative of reduced ability to metabolize glucose.



Spectrox® - Total Antioxidant Function

Total Antioxidant Function is a measurement of overall antioxidant function. The patient's cells are oxidatively challenged and the cells' ability to resist damage is determined.



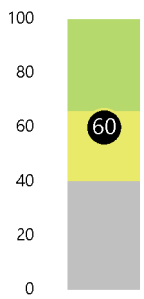
Total Antioxidant Function value above 65%
indicates a desirable status. Since antioxidants are protective nutrients, higher antioxidant function is desirable because it increase cells' ability to resist oxidative stress.

Total Antioxidant Function value between 40%-65%
indicates an average ability to resist oxidative stress.

Total Antioxidant Function value below 40%
indicates poor antioxidant function resulting in reduced ability to resist oxidative stress.

Immunidex - Total Immune Function

Total Immune Function is an indication of how well a person's T-lymphocytes are functioning by measuring their response to mitogen stimulation (ability to grow). Since lymphocyte function is widely considered a systemic measure of general health, a healthy (stronger) response is desired. A less-than-optimal response may improve with nutrient repletion.



Total Immune Function value above 65%
indicates a strong (healthy) cell-mediated immune response.

Total Immune Function value between 40% and 65%
indicates an average response.

Total Immune Function value below 40%
may indicate a weakened cell-mediated immune response.

6030 North Course Drive, Houston, TX 77072
1(800) 227-5227 | support@spectracell.com | www.spectracell.com

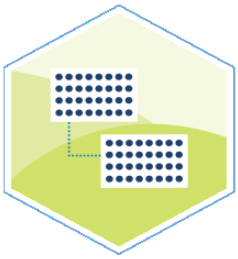
Overview of **Test Methodology**

Cellular Function = Performance, Not Just Potential

Lymphocyte Proliferation Assay

1 ISOLATION
Lymphocytes are purified, washed, counted, and plated.

INCUBATION
Cells are incubated for 5 days in a defined culture medium containing optimal levels of all essential nutrients necessary to sustain their growth. **2**



3 LABELING
The mitogen stimulated cells' growth are measured by the incorporation of radioactive thymidine.

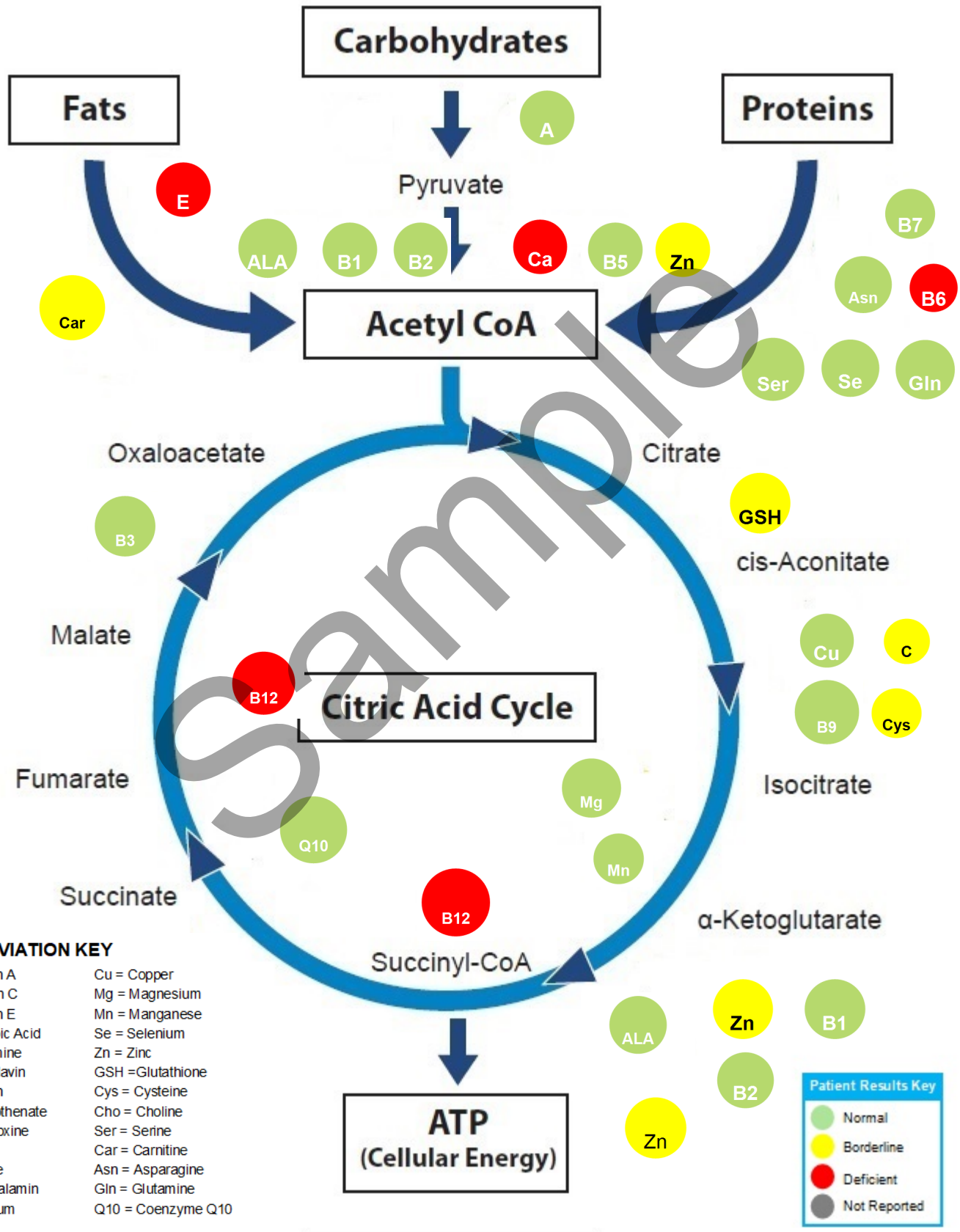
HARVEST & COUNTING
Cells are harvested onto filter paper and counted. **4**

5 DATA PROCESSING
Data is reviewed, approved, and released to reporting.

Routine turnaround time for the Micronutrient assay is 10-14 business days.

Krebs Cycle

Energy Production



ABBREVIATION KEY

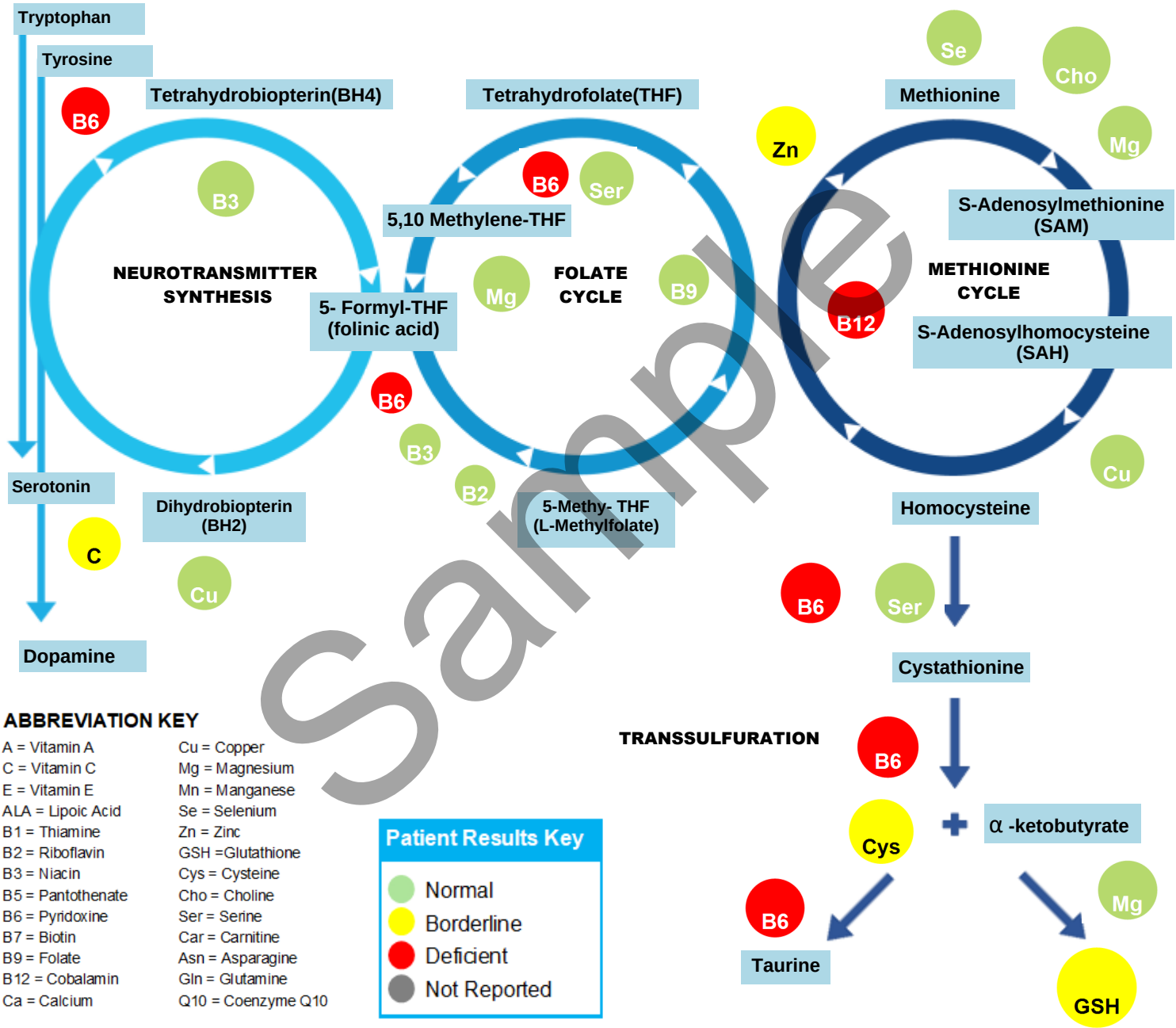
A = Vitamin A	Cu = Copper
C = Vitamin C	Mg = Magnesium
E = Vitamin E	Mn = Manganese
ALA = Lipoic Acid	Se = Selenium
B1 = Thiamine	Zn = Zinc
B2 = Riboflavin	GSH =Glutathione
B3 = Niacin	Cys = Cysteine
B5 = Pantothenate	Cho = Choline
B6 = Pyridoxine	Ser = Serine
B7 = Biotin	Car = Carnitine
B9 = Folate	Asn = Asparagine
B12 = Cobalamin	Gln = Glutamine
Ca = Calcium	Q10 = Coenzyme Q10

6030 North Course Drive, Houston, TX 77072
1(800) 227-5227 | support@spectracell.com | www.spectracell.com

PATIENT: **test1, test1** PROVIDER: **Benton John, MD** DATE REPORTED: **02/13/2026** ACCESSION ID: **2602020043**

Methylation Cycle

Detoxification, Cellular Adaptability, Gene Regulation



ABBREVIATION KEY

A = Vitamin A	Cu = Copper
C = Vitamin C	Mg = Magnesium
E = Vitamin E	Mn = Manganese
ALA = Lipoic Acid	Se = Selenium
B1 = Thiamine	Zn = Zinc
B2 = Riboflavin	GSH =Glutathione
B3 = Niacin	Cys = Cysteine
B5 = Pantothenate	Cho = Choline
B6 = Pyridoxine	Ser = Serine
B7 = Biotin	Car = Carnitine
B9 = Folate	Asn = Asparagine
B12 = Cobalamin	Gln = Glutamine
Ca = Calcium	Q10 = Coenzyme Q10

Patient Results Key

- Normal
- Borderline
- Deficient
- Not Reported

Supplemental Information

Cellular Function = Performance, Not Just Potential

PHYSIOLOGICAL FUNCTION

Calcium is the most abundant mineral in the body, with 99% residing in bones and teeth. As a component of hard tissues, Calcium fulfills a structural role to maintain body size and act as attachments for musculoskeletal tissues. The remaining 1% of calcium is present in blood and soft tissues. Functions of non-skeletal Calcium include: enzyme activation, second messenger roles (transmitting hormonal information), blood clotting, cell and cell organelle membrane function (stabilization and transport), nerve impulse transmission, and muscular contraction, tone, and irritability. Calcium levels in the blood are maintained within very strict limits by dietary intake, hormonal regulation, and a rapidly exchangeable pool in bone tissue.

DEFICIENCY SYMPTOMS

Calcium deficiencies are both acute and chronic. Acute Calcium deficiency relates to lack of ionized Calcium, causing increased muscular and nervous irritability, muscle spasms, muscle cramps, and tetany. Chronic calcium deficiency manifests as bone loss disorders (osteoporosis, osteomalacia in adults, rickets in children), tooth decay, periodontal disease, depression, and possibly hypertension.

Those at risk for Calcium deficiency include: malnourished, malabsorption, and bone loss disorders. Conditions which are known to decrease Calcium uptake or distribution are: decreased gastric acidity, Vitamin D deficiency, high fat diets, high oxalate intake from rhubarb, spinach, chard, and beet greens, high phytic acid intake from whole grains, high fiber intake, immobilization, faster gastrointestinal motility, psychological stress, thiazide diuretic therapy, aluminum compounds (aluminum-containing antacids, drugs, some parenteral feeding solutions).

FOOD SOURCES

Food	Serving	(mg)
Tofu (raw)	1/2 cup	434
Yogurt, plain	8 oz.	415
Sardines	1 can	351
Cheese	1 1/2 oz.	303
Milk	8 oz.	300
Blackstrap molasses	1 tbsp	200

Food	Serving	(mg)
Salmon, canned	3 oz.	181
Spinach, cooked	1/2 cup	115
Turnip greens	1/2 cup	99
Bok choy, cooked	1/2 cup	79
Kale, cooked	1 cup	94
Kale, raw	1 cup	24

Calcium in dairy and the kale family (broccoli, bok choy, cabbage, turnip greens) tends to be easily absorbed. However, foods high in oxalate (spinach) will significantly inhibit calcium absorption. Phytates (in whole grains and beans) will also inhibit calcium absorption.

REPLETION INFORMATION

In general, daily calcium intakes of 2.0 grams or less are safe. Certain individuals with tendency to form kidney stones should consult a physician before increasing calcium intake. Milk alkali syndrome is possible after consumption of 2 or more quarts of milk daily along with large amounts of carbonate antacids (calcium deposition in soft tissues and kidney stones). Calcium intakes greater than 2-4 grams daily may depress uptake of magnesium, zinc, iron, manganese, and other minerals, and are associated with depressed reflexes, muscle weakness, ataxia, and anorexia.

Supplemental Information

Cellular Function = Performance, Not Just Potential

PHYSIOLOGICAL FUNCTION

Vitamin B12 is required 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 the effects of the vitamin B12 deficiency on folate metabolism. Shortness of breath, fatigue, weakness, itTitability, 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 homocysteine, a toxic metabolic byproduct linked to cardiovascular disease and connective tissue abnormalities. Hypochlorhydria and gastrointestinal disturbances are frequently associated with vitamin B12 deficiency.

FOOD SOURCES

Food	Serving	(mcg)
Clams	3 oz.	84
Beef liver	3 oz.	70
Mussels	3 oz.	20
Mackerel	3 oz.	16
Crab	3 oz.	10

Food	Serving	(mcg)
Trout, wild	3 oz.	5.4
Troup, farmed	3 oz.	3.5
Salmon, farmed	3 oz.	2.4
Beef	3 oz.	2.1
Egg	1 large	0.6

REPLETION INFORMATION

No toxic effects of oral vitamin B12 intake have been demonstrated, even in doses over 1000 ug 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.

PATIENT: **test1, test1** PROVIDER: **John Doe, MD** DATE REPORTED: **02/13/2026** ACCESSION ID: **2602020043**

Supplemental Information

Cellular Function = Performance, Not Just Potential

PHYSIOLOGICAL FUNCTION

Vitamin B6 is needed to metabolize proteins and is important for a healthy immune system, nerves, bones and arteries. Vitamin B6 is a complex of three similar molecules: Pyridoxine, Pyridoxal and Pyridoxamine. All are present in foods and converted into to pyridoxal-5-phosphate, the most active coenzyme form. The primary functions of vitamin B6 are in protein metabolism, transferring amino acid and sulfur groups. Roles in synthesis of heme (for hemoglobin), niacin, neurotransmitters, connective tissues, eicosanoids, and sphingolipids in nerve sheaths are also essential. Vitamin B6 also participates in the utilization of glycogen and immune function.

DEFICIENCY SYMPTOMS

Early vitamin B6 deficiency symptoms are primarily peripheral neuropathy, weakness, irritability, depression, insomnia and anxiety. More severe deficiency leads to dermatitis, nausea, vomiting, and convulsions. Carpal tunnel syndrome, premenstrual tension syndrome, and atherosclerosis may also be related to vitamin B6 deficiency. Sideroblastic anemia is indicative of vitamin B6 deficiency. Homocysteine levels in serum may be elevated by a vitamin B6 deficiency.

FOOD SOURCES

Food	Serving	(mg)
Nutritional yeast	1 tbsp	1.5-6.0
Chickpeas	1 cup	1.1
Banana	1 cup	0.7
Potato, with skin	1 whole	0.7
Salmon, wild	1/2 cup	0.21

Food	Serving	(mg)
Chicken	3 oz.	0.5
Avocado	1/2 fruit	0.5
Spinich, cooked	1 cup	0.4
Dried plums	1 cup	0.4
Hazelnuts	1 oz.	0.2

REPLETION INFORMATION

Oral intakes of pyridoxine hydrochloride in excess of 1000 mg daily for long time periods have caused peripheral neuropathy. Doses between 200 and 1000 mg daily for long time periods have also been associated with peripheral neuropathy. In general, doses up to 100 mg daily have exhibited long-term safety. Persons with drug-induced neuritis may tolerate higher doses, while pyridoxine may diminish the effectiveness of the medication L-DOPA in patients with Parkinson's Disease.

6030 North Course Drive, Houston, TX 77072
1(800) 227-5227 | support@spectracell.com | www.spectracell.com

PATIENT: **test1, test1** PROVIDER: **John Doe, MD** DATE REPORTED: **02/13/2026** ACCESSION ID: **2602020043**

Supplemental Information

Cellular Function = Performance, Not Just Potential

PHYSIOLOGICAL 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 free radicals to less harmful derivatives, limiting formation of proinflammatory cytokines. In deficiencies of vitamin E, arachidonic acid is converted to proinflammatory 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 an antioxidant in the protection against heart disease, cancer, stroke and neurodegenerative disease (Alzheimer'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).

FOOD SOURCES *

Food	Serving	(mg)
Wheat germ oil	1 tbsp	20.3
Cod liver oil	1 tbsp	20.1
Sunflower seeds	1 oz.	7.4
Almonds	1 oz.	7.3
Hazelnuts	1 oz.	4.3

Food	Serving	(mg)
Tomato sauce	1 cup	3.5
Peanut butter	2 tbsp	3.2
Dried apricots	1/2 cup	2.8
Avocado	1 whole	2.7
Olive oil	1 tbsp	1.9

* The form of vitamin E listed in this table is alpha-tocopherol.

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. Beta-tocopherol, gamma-tocopherol and the alpha- and delta tocoretinols have less than 50% of the biological activity than d-a-tocopherol.

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 LU. per day. Some studies report effective use of vitamin E at doses up to 3000 LU. per day without observed side effects over a two-year period.