



# MICRO.NUTRIENT

*Driven by Science. Inspired by You.*

Patient: **Doe, Jon**

Accession ID: 0000000000

Provider: Sample Provider, MD

**Order Status:** Complete

PATIENT	
NAME <b>Doe, Jon</b>	AGE <b>31</b>
DOB <b>8/22/1987</b>	Gender <b>Male</b>
Patient ID <b>00-000-00000</b>	

SPECIMEN	
ACCESSION ID <b>0000000000</b>	DATE COLLECTED <b>03/06/2019</b>
ORDER ID <b>0000-000000000000-000000</b>	DATE RECEIVED <b>03/07/2019</b>
	DATE REPORTED <b>03/23/2019</b>

PROVIDER	
Account ID <b>00000000</b>	CLIENT NAME <b>Sample Provider, MD</b>
Address <b>123 S. Any Street ANYWHERE, TX 77000</b>	

## Welcome to your Micronutrient Profile, **Jon!**

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 treatment 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 Immunindex (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.

PATIENT: **Doe, Jon** PROVIDER: **Sample Provider, MD**

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## Results At-A-Glance

### Functional Deficiencies

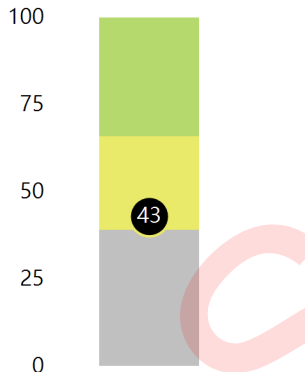
Abnormal	Suggested Supplementation *	Provider Comments
Chromium	200 mcg daily of chromium nicotinate or glycinate for 90 days	
Glucose-Insulin	Replace foods with high glycemic index (sugar, white flour) with whole foods (fruit, vegetables, and whole grains).	
Glutathione	600 mg b.i.d. (1200 mg daily) of N-Acetylcysteine (NAC) Take each dose with a meal	
Immunidex	Address individual micronutrient deficiencies.	
Vitamin B1	50 mg daily	
Vitamin B3	100 mg b.i.d. (200 mg daily) of Niacin	

\* 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.

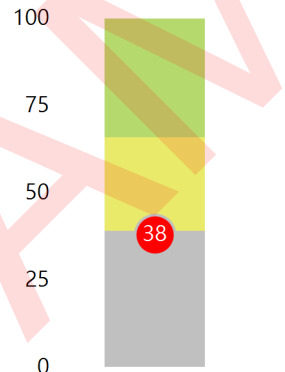
### Borderline Deficiencies

Borderline	Provider Comments
Copper	
Glutamine	
Magnesium	
Vitamin A	
Vitamin B2	

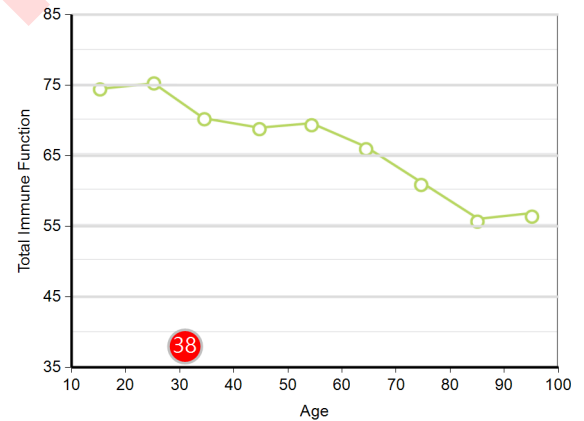
**Spectrox®**  
Total Antioxidant Function



**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.

PATIENT: **Doe, Jon** PROVIDER: **Sample Provider, MD** DATE REPORTED: **03/23/2019** ACCESSION ID: **000000000**

Micronutrients	Patient Results	Reference Range	Patient Result	Interpretation
<b>B-VITAMINS</b>				
Vitamin B1		>>78%	73	
Vitamin B2		>>53%	56	Borderline
Vitamin B3		>>80%	75	Deficient
Vitamin B6		>>54%	70	
Vitamin B12		>>14%	20	
Folate		>>32%	50	
Pantothenate		>>7%	27	
Biotin		>>34%	45	
<b>AMINO ACIDS AND METABOLITES</b>				
Serine		>>30%	37	
Glutamine		>>37%	41	Borderline
Asparagine		>>39%	51	
Choline		>>20%	30	
Inositol		>>58%	73	
Carnitine		>>46%	59	
Oleic Acid		>>65%	72	
<b>OTHER VITAMINS &amp; MINERALS</b>				
Vitamin D3		>>50%	67	
Vitamin A		>>70%	72	Borderline
Vitamin K2		>31-85%	70	
Manganese		>>50%	77	
Calcium		>>38%	48	
Zinc		>>37%	50	
Copper		>>42%	44	Borderline
Magnesium		>>37%	39	Borderline
<b>CARBOHYDRATE METABOLISM</b>				
Fructose Sensitivity		>>34%	45	
Glucose-Insulin Interaction		>>39	33	Deficient
Chromium		>>40%	34	Deficient
<b>ANTIOXIDANTS</b>				
Glutathione		>>42%	34	Deficient
Cysteine		>>41%	57	
Coenzyme Q10		>>86%	97	
Selenium		>>74%	80	
Vitamin E		>>84%	92	
Alpha Lipoic Acid		>>81%	90	
Vitamin C		>>40%	73	

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

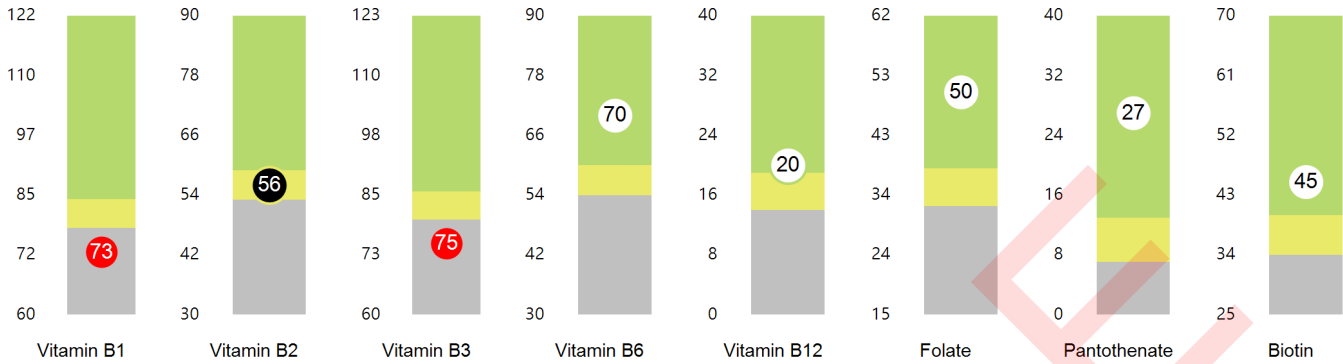
PATIENT: **Doe, Jon** PROVIDER: **Sample Provider, MD** DATE REPORTED: **03/23/2019** ACCESSION ID: **000000000**

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

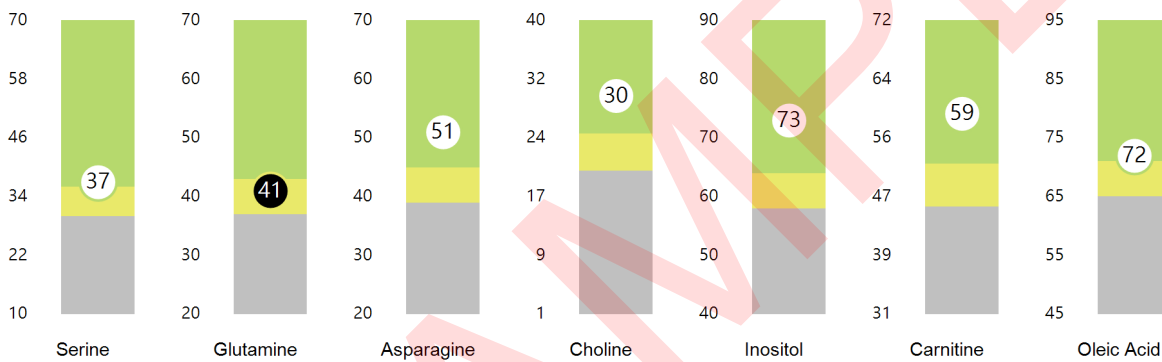
● **Borderline**  
Values in this area represent a borderline deficiency and may indicate a need for nutrient repletion or dietary changes

● **Normal**  
Values in this area represent a normal result

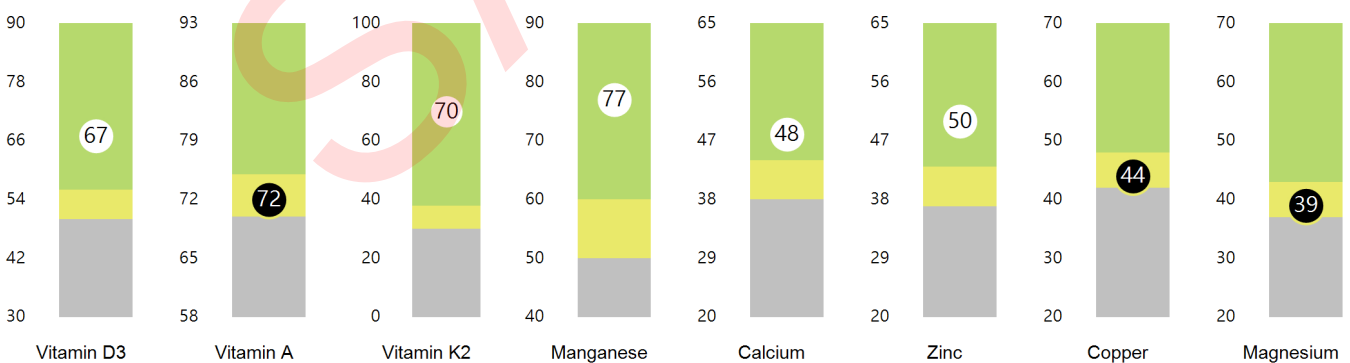
### B-Complex Vitamins



### Amino Acids & Metabolites



### Other Vitamins & Minerals



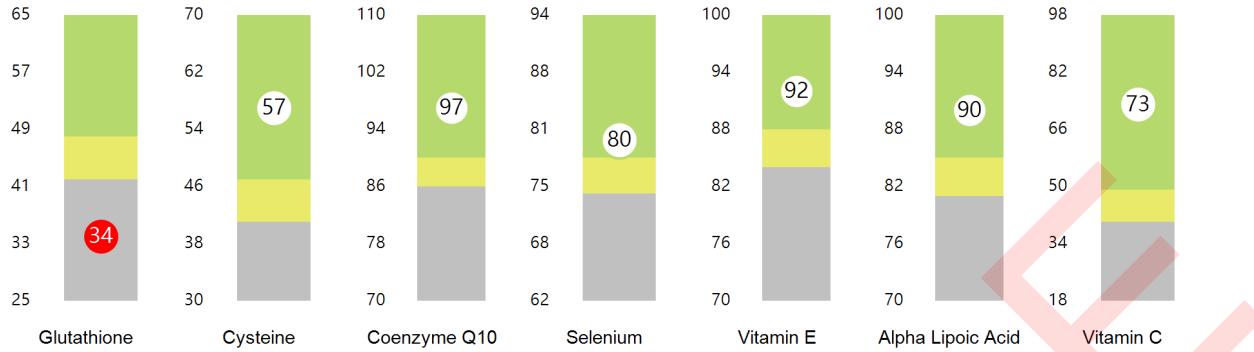
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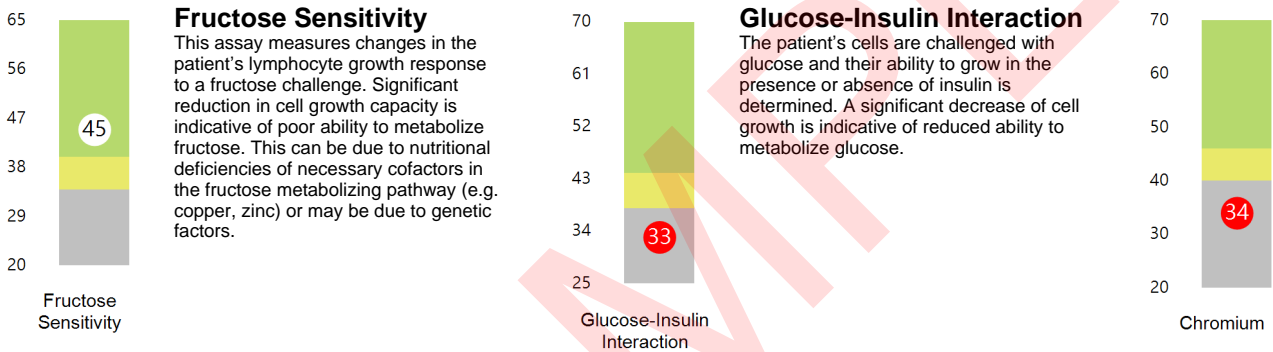
● **Borderline**  
Values in this area represent a borderline deficiency and may indicate a need for nutrient repletion or dietary changes

● **Normal**  
Values in this area represent a normal result

### Individual Antioxidants

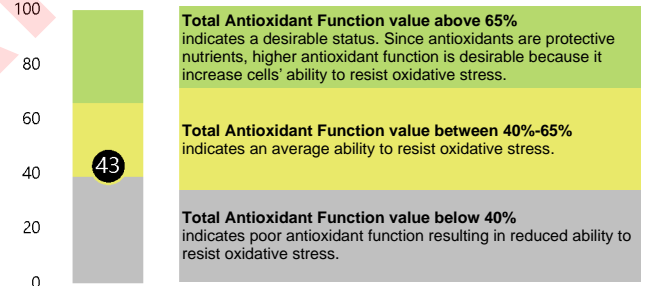


### Carbohydrate Metabolism



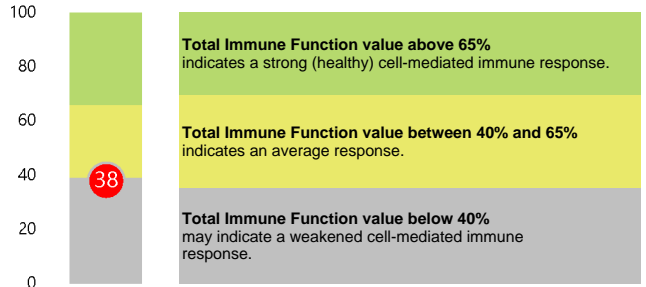
### SpectroX® - Total Antioxidant Function

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.



### Immunidex - Total Immune Function

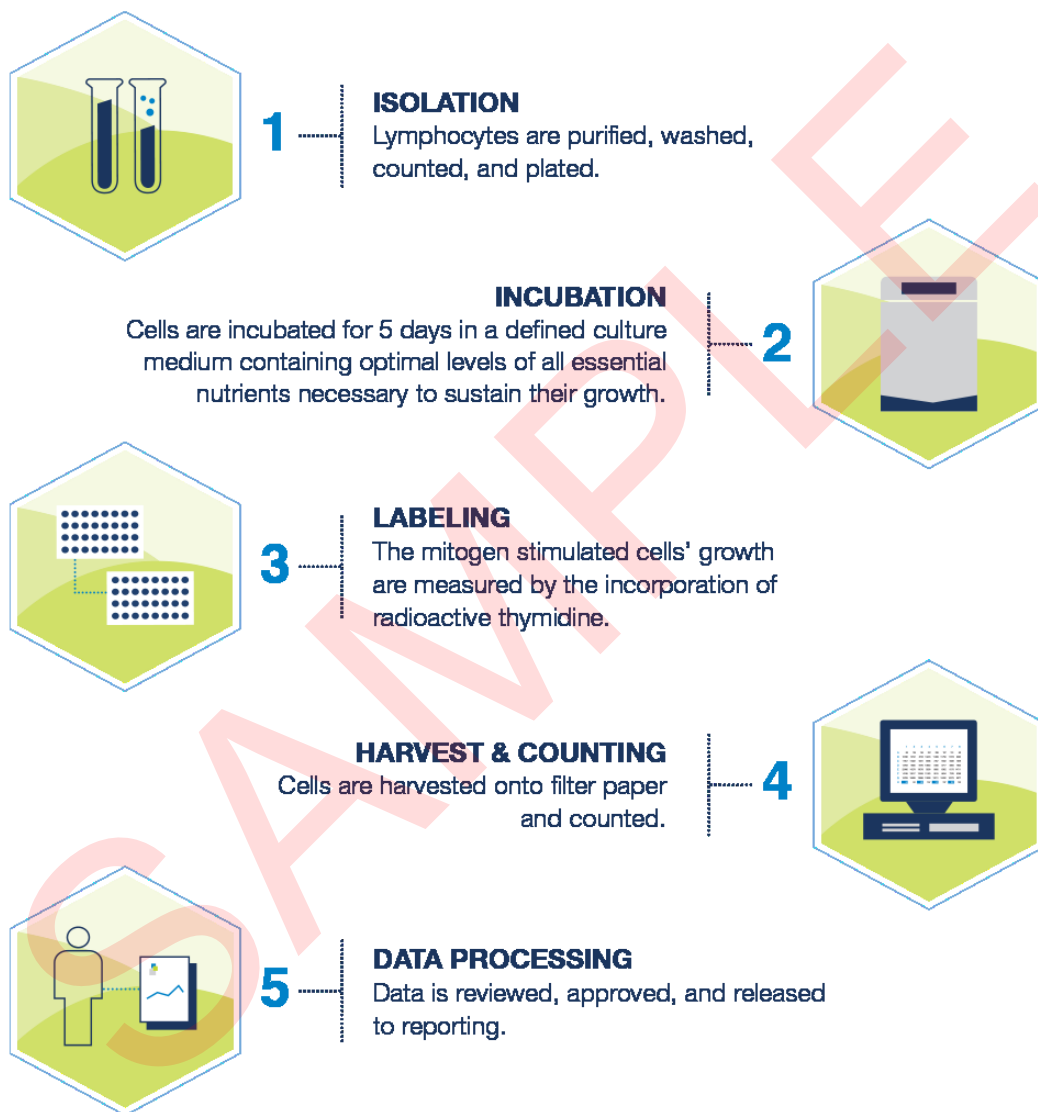
Total Immune Function is an indication of how well a person's T-lymphocytes are functioning by measuring their response to mitogen stimulation (ability to grow). Since lymphocyte function is widely considered a systemic measure of general health, a healthy (stronger) response is desired. A less-than-optimal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



## Overview of Test Methodology

Cellular Function = Performance, Not Just Potential

### Lymphocyte Proliferation Assay



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

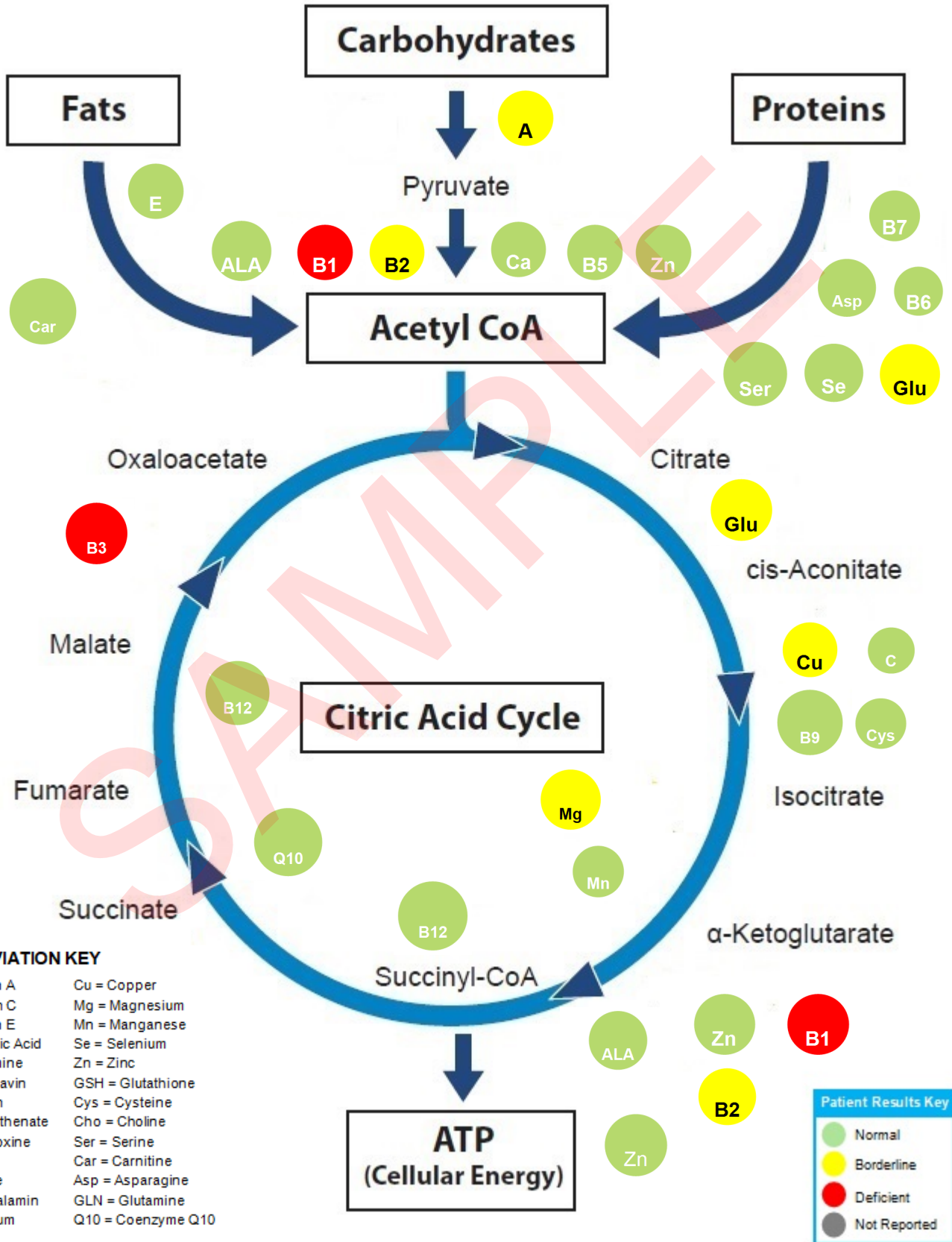
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## Krebs Cycle

Energy Production





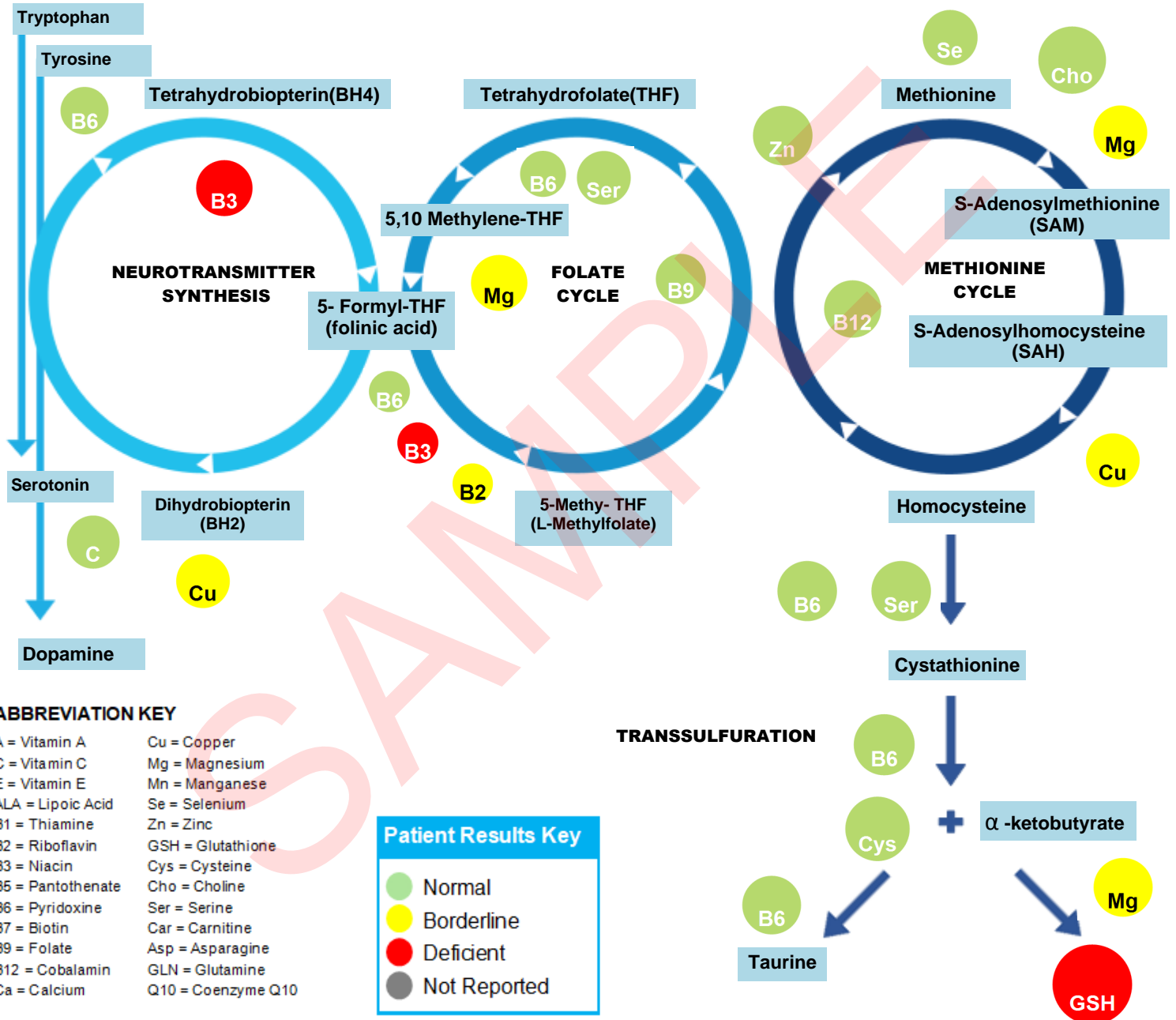
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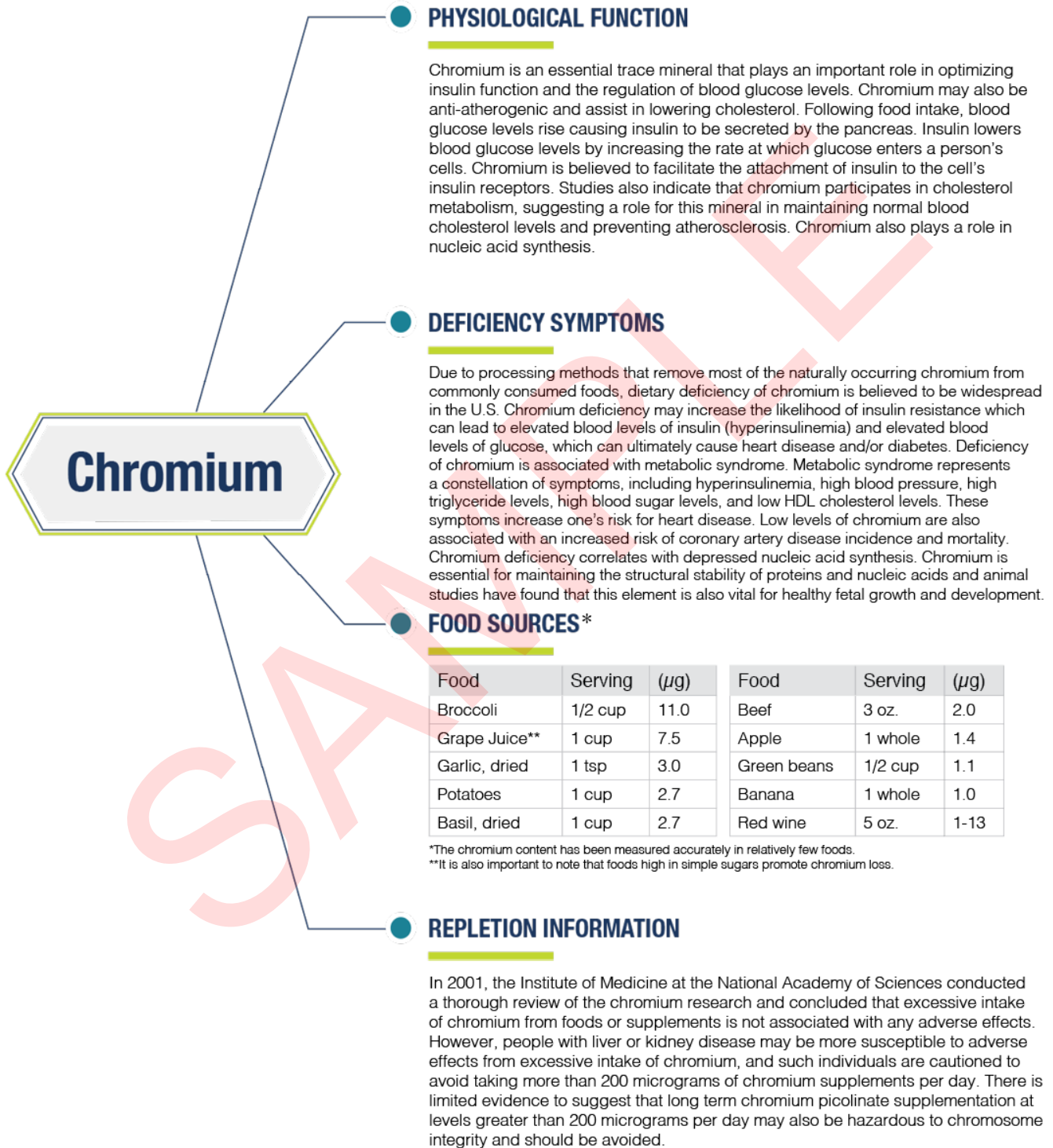
## Methylation Cycle

Detoxification, Cellular Adaptability, Gene Regulation



## Supplemental Information

### Cellular Function = Performance, Not Just Potential



## Supplemental Information

### Cellular Function = Performance, Not Just Potential

#### Glucose-Insulin Interaction

##### PHYSIOLOGICAL 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.

##### FOOD SOURCES

Dietary suggestions 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.

##### REPLETION INFORMATION

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 abnormal Glucose-Insulin Interaction.

## Supplemental Information

### Cellular Function = Performance, Not Just Potential

# Glutathione

#### PHYSIOLOGICAL 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 preeminent antioxidant.

#### DEFICIENCY SYMPTOMS

A wide range of human conditions such as aging, cancer, atherosclerosis, arthritis, viral infections, AIDS, cardiovascular, neurodegenerative diseases 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 which 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.

#### FOOD SOURCES

Unprocessed (raw) whey protein contains large amounts of the glutathione precursor, cysteine, in a form that is bioactively capable of being converted into functional glutathione.

Glutathione-rich foods include asparagus, avocado and walnuts. Glutathione is synthesized endogenously so foods that support glutathione function may raise intracellular levels. This includes the following:

- Cruciferous vegetables (cabbage, broccoli, brussels sprouts, cauliflower)
- Unprocessed citrus (lemon, lime, orange)
- Limonene-rich herbs (dill, caraway)

#### 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 appears safe. Supplementation with cysteine is not recommended as it may be poorly tolerated by many patients. In addition, it may be rapidly oxidized to L-cystine, a less usable form for the synthesis of glutathione.

## Supplemental Information

### Cellular Function = Performance, Not Just Potential

#### ● PHYSIOLOGICAL FUNCTION

##### What Does the Immunidex Measure?

A patient's Immunidex score is one measurement to evaluate a person's cell-mediated immune system performance. Specifically, it measures T-cell lymphocyte proliferation. Since immune function is a systemic measure of general health, a higher Immunidex score is generally desired since it means a person can respond efficiently not only to exogenous threats such as pathogens or allergens, but also to endogenous threats like tumors. The immune system, comprised of both cell mediated (Th1) and humoral (Th2) components, when balanced and performing optimally, affords us critical protection and promotes health and wellness.

##### How is the Immunidex Performed?

A patient's lymphocytes are isolated from whole blood and introduced to a protein that stimulates growth. The protein mitogen used to trigger mitosis, or cell division, is PHA (phytohemagglutinin), which stimulates T-lymphocytes to proliferate. The proliferative response is measured by the incorporation of radioactive thymidine into newly synthesized DNA. Your patient's response is compared to responses of a reference population and results are reported to you as an Immunidex score.

##### What Affects the Immunidex Result?

Micronutrient deficiencies will undermine a person's immune function, and thus lower the Immunidex. Since the highly complex immune system is dependent on the intracellular availability of vitamins, minerals and antioxidants, correcting specific micronutrient deficiencies typically raises the Immunidex and contributes to tangible clinical benefits, such as reduced infections and may assist in achieving Th1/Th2 balance.

##### How Does the Immunidex Correlate with Antioxidant Function?

In general, the higher the antioxidant score (Spectrox®), the higher the Immunidex score. Antioxidant function plays an important role in promoting optimal T-cell (lymphocyte) function. It is important to find out if a patient has deficiencies in specific antioxidant nutrients so they can supplement wisely. But it is also important to measure a total antioxidant function because the metabolic pathways in which antioxidants are involved are highly complex, sometimes redundant and often overlapping. Research confirms that taking excess antioxidants that are not needed (i.e. where no deficiency exists) can actually cause them to become pro-oxidants and decrease antioxidant function.

##### How is Immunidex Related to Aging?

As we age, our immune function typically decreases as seen in the figure below. Although many factors are involved in this complicated process of decline, the Immunidex is one of many relevant aging biomarkers since age diminishes the ability of a person's lymphocytes to respond to challenges. The effects of both good and poor antioxidant function on the Immunidex is shown and emphasizes the importance of testing for antioxidant function (Spectrox®) and individual antioxidant deficiencies.

##### How Do You Order Immunidex?

The Immunidex is part of SpectraCell's Micronutrient Testing panel. There is no additional charge for this calculated test result. Ordering instructions are the same – same kit, same blood draw instructions.



**IMMUNIDEX**  
Total Immune Function

## Supplemental Information

### Cellular Function = Performance, Not Just Potential



## Supplemental Information

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