



*Accession Number:* **A0907200003**  
*Reference Number:*  
*Patient:* **Sample Report**  
*Age:* 47 *Sex:* Male  
*Date of Birth:* 02/05/1962  
*Date Collected:* 7/19/09  
*Date Received:* 7/20/09  
*Report Date:* 7/20/09  
*Telephone:* (770) 446-4583  
*Fax:* (770) 441-2237  
*Reprinted:* 9/4/09  
*Comment:*

Ordering Physician:

Metamatrix

3425 Corporate Way  
Duluth, GA 30096

### **0090 ION Profile**

This report contains reference range adjustments on the Amino Acid and Organix™ profiles from routine revalidation procedures. It also contains the following three upgrades:

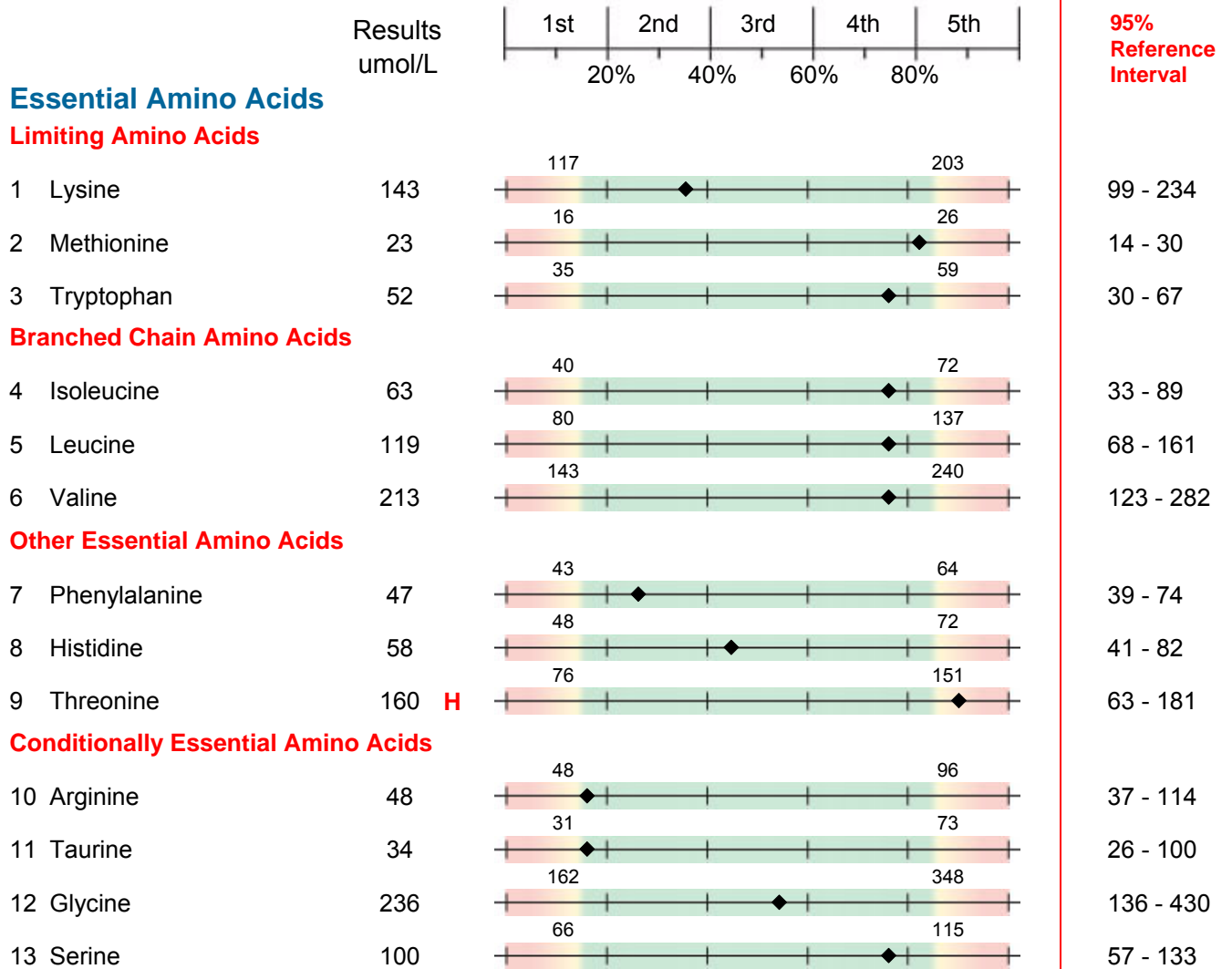
- 1) The amino acids have been reorganized so that they appear in functional categories that can convey more relevant information at a glance. The order is consistent with that found in the newly released Metamatrix Handbook.
- 2) Three calculated ratios have been added: Phenylalanine/Tyrosine, Glutamic Acid/Glutamine, and Tryptophan/LNAA.
- 3) The recommended individualized amino acid powder has been reformulated. The table will now show small amounts added when patient results fall below the middle of the third quintile rather than only when they are below the second quintile. The amounts added increase exponentially as levels fall to lower levels, giving more accurately adjusted amounts according to the levels of physiological demand. Also, rather than showing the constant percentages in the base, the table shows the more useful calculated percentages in each patient formula. The hydrochloride (HCl) forms of arginine, histidine and lysine that have always been used in the formulas are now specified in the table.

**Amino Acid Analysis - 20 Plasma**

Methodology: ION Exchange HPLC

Ranges are for ages 13 and over.

**Percentile Ranking by Quintile**



Georgia Lab Lic. Code #067-007  
CLIA ID# 11D0255349

New York Clinical Lab PFI #4578  
Florida Clinical Lab Lic. #800008124

Laboratory Directors: J. Alexander Bralley, PhD  
Robert M. David, PhD

Testing Performed by Metametrix, Inc. 3425 Corporate Way Duluth, GA 30096

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**Amino Acid Analysis - 20 Plasma**

Methodology: ION Exchange HPLC

Ranges are for ages 13 and over.

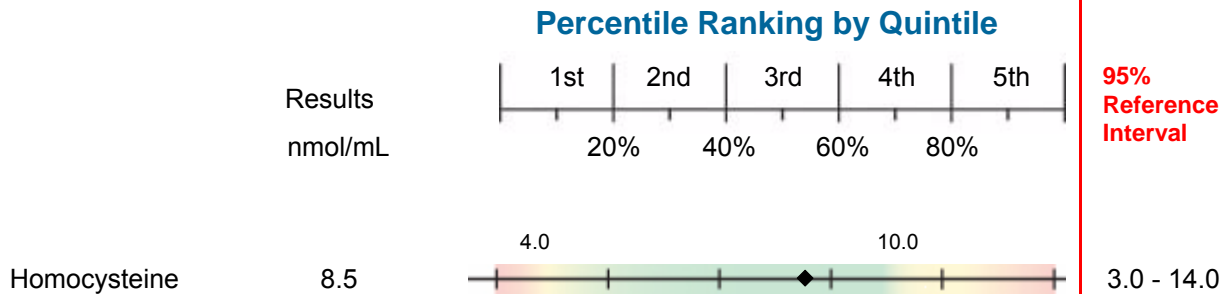
**Percentile Ranking by Quintile**

Functional Categories	Results umol/L	1st	2nd	3rd	4th	5th	95% Reference Interval
		20%	40%	60%	80%		
<b>Vascular Function</b>							
14 Arginine	48	48				96	37 - 114
15 Taurine	34	31				73	26 - 100
<b>Neurotransmitters and Precursors</b>							
16 Phenylalanine	47	43				64	39 - 74
17 Tyrosine	60	38				70	29 - 80
18 Tryptophan	52	35				59	30 - 67
19 Glutamic Acid	46	29				95	23 - 136
20 Taurine	34	31				73	26 - 100
<b>Sulfur Amino Acids (Glutathione - related)</b>							
21 Methionine	23	16				26	14 - 30
22 Taurine	34	31				73	26 - 100
<b>Urea Cycle and Ammonia Detoxification</b>							
23 Arginine	48	48				96	37 - 114
24 Citrulline	29	20				38	15 - 44
25 Ornithine	61	32				81	23 - 109
26 Glutamine	471	397				585	338 - 630
27 Asparagine	39	30				49	26 - 56
28 Aspartic Acid	7.5	4.8				9.7	4.2 - 12.5
<b>Ratios</b>							
29 Phenylalanine/Tyrosine	0.78					1.19	<= 1.44
30 Glutamic Acid/Glutamine	0.10	0.06				0.21	0.05 - 0.35
31 Tryptophan/LNAA*	0.086	0.071				0.113	0.061 - 0.12

\*Large neutral amino acids

**Homocysteine**

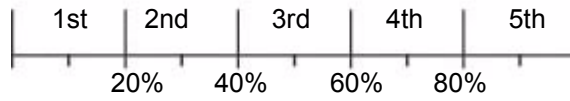
Methodology: Competitive Immunoassay



**Element - Erythrocytes and Whole Blood**

Methodology: Inductively Coupled Plasma /Mass Spectroscopy

**Percentile Ranking by Quintile**



95%  
Reference  
Interval

Results

Reference Limits

Nutrient Elements

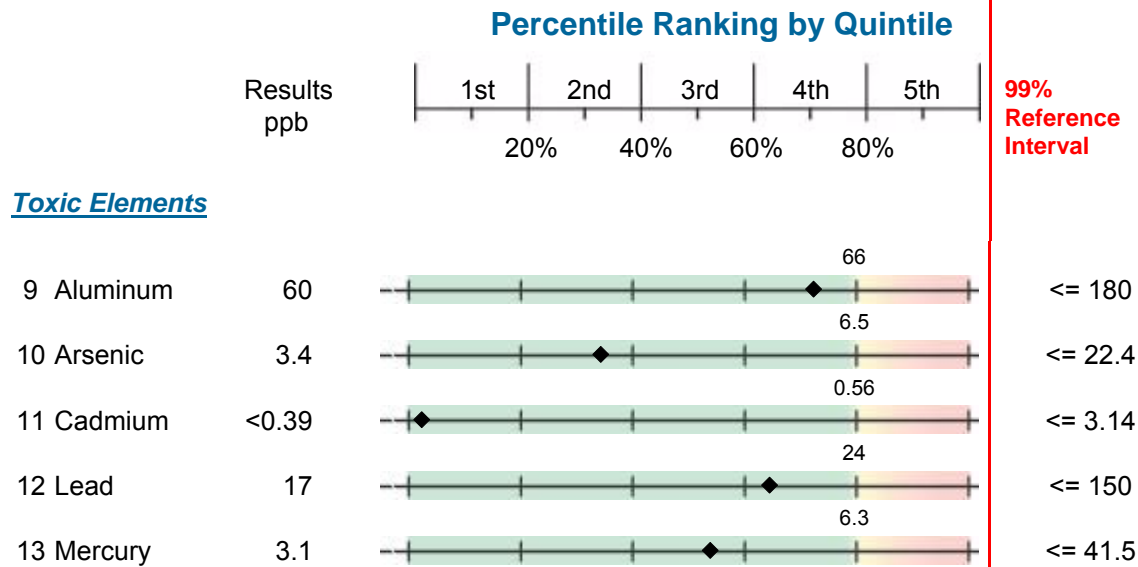
Element	Result	Percentile	Reference Limits	Units
1 Potassium	1,647	1,421	1,012 - 2,199	ppm packed cells
2 Magnesium *	24	22	16 - 32	ppm packed cells
3 Zinc	5.4	4.5	3.3 - 7.7	ppm packed cells
4 Copper	365	306	257 - 500	ppb packed cells
5 Manganese	31	24	19 - 41	ppb packed cells
6 Chromium	2.5	2.2	1.4 - 7.9	ppb packed cells
7 Selenium	0.20	0.19	0.14 - 0.47	ppm whole blood
8 Calcium	17	29	10 - 43	ppm packed cells

Relevant to membrane permeability, not nutritional status.

\*The expanded abnormal range approximates the population at risk for magnesium insufficiency disorders. See: Johnson S, Med Hypotheses. Feb 2001;56(2):163-170.

**Element - Erythrocytes and Whole Blood**

Methodology: Inductively Coupled Plasma /Mass Spectroscopy



Results for whole blood toxic elements that are within normal limits do not rule out metal accumulation in other tissues. This can be evaluated by urinary porphyrin or 24-hour urine chelation challenge tests.

**Lead Levels Considered Elevated in Adults (1)**

- ◆ At levels above 800 ppb, serious, permanent health damage may occur (extremely dangerous).
- ◆ Between 400 and 800 ppb, serious health damage may be occurring, even if there are no symptoms (seriously elevated).
- ◆ Between 250 and 400 ppb, regular exposure is occurring. There is some evidence of potential physiological problems (elevated).
- ◆ Between 100 and 250 ppb, lead is building up in the body and exposure is occurring.

In children, lead levels even below 100 ppb are associated with IQ deficits.(2), and, in adults, levels as low as 50-90 ppb cause an increased risk of death from all causes, cardiovascular disease and cancer.(3)

(1)Lead Exposure in Adults. A Guide for Health Care Providers, State of New York, Department of Public Health.

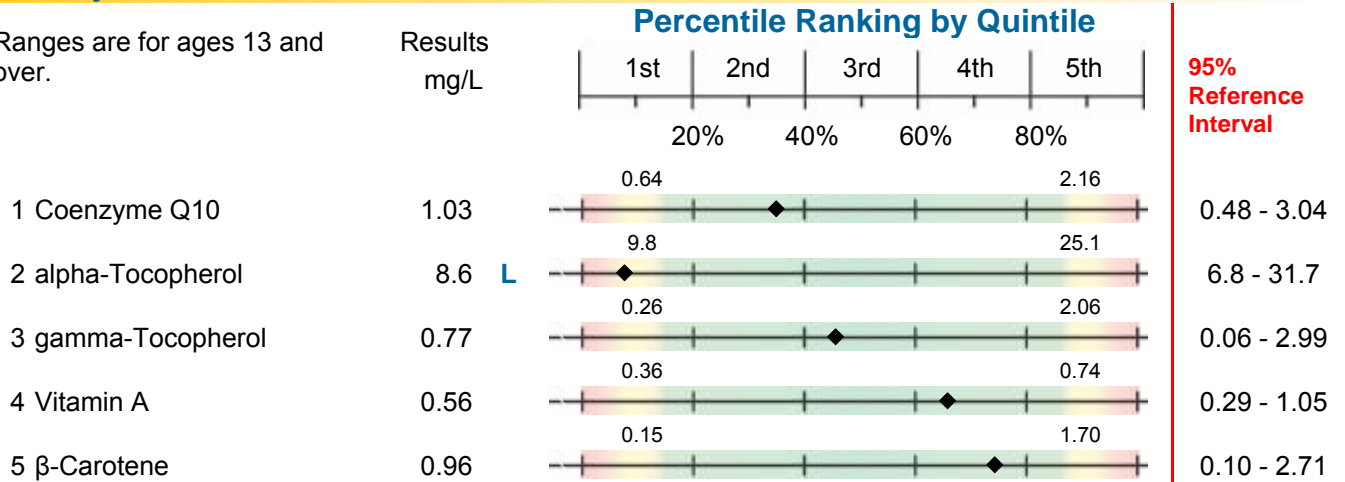
(2) Lanphear BP, Hornung R, Khoury J, et al. Low-level environmental lead exposure and children's intellectual function: an international pooled analysis. Environ Health Perspect. Jul 2005;113(7):894-899.

(3) Schober, Susan et al. Blood Lead Levels and Death from All Causes, Cardiovascular Disease, and Cancer: Results from the NHANES III Mortality Study. Environmental Health Perspect. Oct 2006; 114(10):1538-1541.

**CoEnzyme Q10 Plus Vitamin Panel - Serum**

Methodology: High Performance Liquid Chromatography

Ranges are for ages 13 and over.



**Lipid Peroxide - Serum**

Methodology: High Performance Liquid Chromatography



**8-Hydroxy-2 deoxyguanosine - Urine**

Methodology: LC/Tandem Mass Spectroscopy, Colorimetric

Ranges are for ages 13 and over.



**Vitamin D - Serum**

Methodology: Chemiluminescent immunoassay (CLIA)



Levels of 25-hydroxyvitamin D that fall below 20 ng/mL (50 nmol/L) reflect frank vitamin D deficiency. Studies based on functional markers have identified levels below 30 ng/mL (75 nmol/L) as hypovitaminosis D where stores are depleted and PTH levels may begin to rise. Optimal values lie in the 30-60 ng/ml range (4th and 5th quintiles) for the Metamatrix reference population that comes largely from North America. Extremely high levels may be toxic.

- Holick MF. Vitamin D deficiency. N Engl J Med. 2007;357(3):266-281.
- Hollis BW. Circulating 25-hydroxyvitamin D levels indicative of vitamin D sufficiency: implications for establishing a new effective dietary intake recommendation for vitamin D. J Nutr. Feb 2005;135(2):317-322.

Conversion factors: nmol/L = ng/mL x 2.5 | ng/mL = nmol/L x 0.4

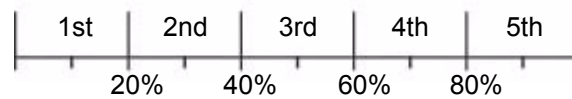
**Fatty Acids - Plasma**

Methodology: Capillary Gas Chromatography/Mass Spectrometry

Ranges are for ages 13 and over.

Results

**Percentile Ranking by Quintile**



95%  
Reference  
Interval

Polyunsaturated Omega-3

Order	Fatty Acid	Result (uM)	Percentile	Reference Interval
1	Alpha Linolenic (18:3n3)	20	15	10 - 70
2	Eicosapentaenoic (20:5n3)	13 L	14	8 - 225
3	Docosapentaenoic (22:5n3)	14	13	9 - 47
4	Docosahexaenoic (22:6n3)	50 L	54	32 - 184

Polyunsaturated Omega-6

Order	Fatty Acid	Result (uM)	Percentile	Reference Interval
5	Linoleic (18:2n6)	900	530 - 1,068	431 - 1,278
6	Gamma Linolenic (18:3n6)	9.6	5.1 - 23.4	3.1 - 31.9
7	Eicosadienoic (20:2n6)	12.1	4.9 - 13.5	3.5 - 15.9
8	Dihomogamma Linolenic (20:3n6)	65	26 - 85	18 - 99
9	Arachidonic (20:4n6)	581 H	186 - 454	137 - 560
10	Docosadienoic (22:2n6)	0.4	0.4	<= 0.6
11	Docosatetraenoic (22:4n6)	7.7	3.5 - 10.9	2.1 - 15.4

Polyunsaturated Omega-9

Order	Fatty Acid	Result (uM)	Percentile	Reference Interval
12	Mead (20:3n9)	9.1 H	3.7	<= 7.4

Monounsaturated

Order	Fatty Acid	Result (uM)	Percentile	Reference Interval
13	Myristoleic (14:1n5)	1.4	0.8 - 4.8	0.8 - 6.8
14	Palmitoleic (16:1n7)	52	28 - 110	21 - 164
15	Vaccenic (18:1n7)	92 H	36 - 74	29 - 85
16	Oleic (18:1n9)	900	640 - 1,292	501 - 1,579
17	11-Eicosenoic (20:1n9)	5.0	3.1 - 7.9	2.4 - 9.1
18	Nervonic (24:1n9)	1.1	1.4	<= 1.6

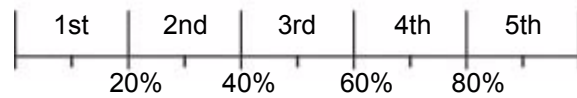
**Fatty Acids - Plasma**

Methodology: Capillary Gas Chromatography/Mass Spectrometry

Ranges are for ages 13 and over.

Results  
uM

**Percentile Ranking by Quintile**



**95%  
Reference  
Interval**

Saturated

19 Capric (10:0)	2.2		1.4	3.5	1.0 - 5.0
20 Lauric (12:0)	6.5		2.2	10.4	1.4 - 26.6
21 Myristic (14:0)	40		17	62	12 - 91
22 Palmitic (16:0)	2,051 <b>H</b>		891	2,042	806 - 2,550
23 Stearic (18:0)	760 <b>H</b>		373	642	328 - 684
24 Arachidic (20:0)	2.3		1.4	2.8	1.1 - 3.6
25 Behenic (22:0)	1.0			1.4	<= 1.7
26 Lignoceric (24:0)	1.0			1.5	<= 1.7
27 Hexacosanoic (26:0)	<0.62			0.62	<= 0.62

Odd Chain

28 Pentadecanoic (15:0)	9.9			11.0	<= 13.4
29 Heptadecanoic (17:0)	11.5			16.0	<= 20.0
30 Nonadecanoic (19:0)	1.10			1.37	<= 1.61
31 Heneicosanoic (21:0)	<0.79			0.79	<= 0.88
32 Tricosanoic (23:0)	0.62			0.63	<= 0.96

Trans

33 Palmitelaidic (16:1n7t)	2.75 <b>H</b>			1.61	<= 2.06
34 Total C:18 Trans	48 <b>H</b>			37	<= 53

Ratios

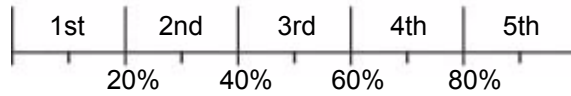
35 LA/DGLA	14			24	7 - 35
36 EPA/DGLA	0.20 <b>L</b>		0.26		0.12 - 8.18
37 AA/EPA	44.7 <b>H</b>			12.8	1.3 - 41.0
38 Triene/Tetraene	0.016 <b>H</b>			0.011	<= 0.017

**Organix™ Comprehensive - Urine**

Methodology: LC/Tandem Mass Spectroscopy, Colorimetric

Results are expressed as mcg/mg creatinine.  
Ranges are for ages 13 and over.

**Percentile Ranking by Quintile**



**95%  
Reference  
Interval**

**NUTRIENT MARKERS**

Results

Fatty Acid Metabolism

(Carnitine & B2)

1 Adipate	0.7	5.2	<= 8.3
2 Suberate	0.4	1.7	<= 3.2
3 Ethylmalonate	1.6	3.6	<= 6.3

Carbohydrate Metabolism

(B1, B3, Cr, Lipoic Acid, CoQ10)

4 Pyruvate	0.6	3.9	<= 6.4
5 L-Lactate	6	14	3 - 46
6 β-Hydroxybutyrate	3.4 <b>H</b>	2.1	<= 9.9

Energy Production (Citric Acid Cycle)

(B comp., Q10, Amino acids, Mg)

7 Citrate	377	601	56 - 987
8 Cis-Aconitate	23	51	18 - 78
9 Isocitrate	37 <b>L</b>	98	39 - 143
10 α-Ketoglutarate	3.1	19.0	<= 35.0
11 Succinate	9.8	11.6	<= 20.9
12 Fumarate	<DL*	0.59	<= 1.35
13 Malate	1.2	1.4	<= 3.1
14 Hydroxymethylglutarate	2.2	3.6	<= 5.1

B-Complex Vitamin Markers

(B1, B2, B3, B5, B6, Biotin)

15 α-Ketoisovalerate	0.07	0.25	<= 0.49
16 α-Ketoisocaproate	0.09	0.34	<= 0.52
17 α-Keto-β-Methylvalerate	0.27	0.38	<= 1.10
18 Xanthurenate	0.65 <b>H</b>	0.47	<= 0.74
19 β-Hydroxyisovalerate	7.4	7.6	<= 11.5

Methylation Cofactor Markers

(B12, Folate)

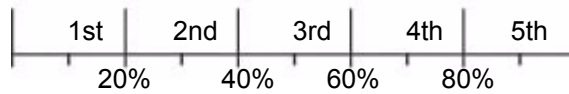
20 Methylmalonate	1.9 <b>H</b>	1.7	<= 2.3
21 Formiminoglutamate	0.1	1.2	<= 2.2

**Organix™ Comprehensive - Urine**

Methodology: LC/Tandem Mass Spectroscopy, Colorimetric

Ranges are for ages 13 and over.

**Percentile Ranking by Quintile**



**95%  
Reference  
Interval**

**CELL REGULATION MARKERS**

Neurotransmitter Metabolism Markers

(Tyrosine, Tryptophan, B6, antioxidants)

22 Vanilmandelate	2.2	1.8 - 3.9	1.3 - 4.9
23 Homovanillate	2.1	2.1 - 6.3	1.6 - 10.9
24 5-Hydroxyindoleacetate	2.6	2.1 - 5.6	1.6 - 9.8
25 Kynurenate	1.4	1.9 - 4.0	<= 2.7
26 Quinolate	3.5	4.0 - 8.0	<= 5.8
27 Picolinate	12.3 <b>H</b>	8.0 - 13.5	2.8 - 13.5

Oxidative Damage and Antioxidant Markers

(Vitamin C and other antioxidants)

28 p-Hydroxyphenyllactate	0.16	0.79 - 1.45	<= 1.45
29 8-Hydroxy-2-deoxyguanosine *	6.6 <b>H</b>	5.3 - 7.6	<= 7.6

\* Units for 8-Hydroxy-2-deoxyguanosine are ng/mg creatinine.

**TOXICANTS AND DETOXIFICATION**

Detoxification Indicators

(Arg, NAC, Met, Mg and antioxidants)

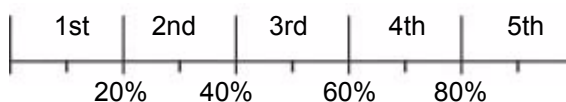
30 2-Methylhippurate	0.060	0.084 - 0.192	<= 0.192
31 Orotate	0.15	0.69 - 1.01	<= 1.01
32 Glucarate	7.1 <b>H</b>	6.3 - 10.7	<= 10.7
33 a-Hydroxybutyrate	<DL*	0.3 - 0.9	<= 0.9
34 Pyroglutamate	44	59 - 88	28 - 88
35 Sulfate	2,184	958 - 2,347	690 - 2,988

**Organix™ Comprehensive - Urine**

Methodology: LC/Tandem Mass Spectroscopy, Colorimetric

Ranges are for ages 13 and over.

**Percentile Ranking by Quintile**



**COMPOUNDS OF BACTERIAL OR YEAST/FUNGAL ORIGIN**

Bacterial - general

36 Benzoate	<DL*	0.6	<= 9.3
37 Hippurate	51	594	<= 1,150
38 Phenylacetate	<DL*	0.04	<= 0.15
39 Phenylpropionate	<DL*	0.4	<= 0.4
40 p-Hydroxybenzoate	0.01	0.99	<= 2.08
41 p-Hydroxyphenylacetate	4	19	<= 34
42 Indican	14	40	<= 74
43 Tricarballoylate	0.17	0.73	<= 1.41

L. acidophilus / general bacterial

44 D-Lactate	0.4	2.3	<= 7.0
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Clostridial species

45 3,4-Dihydroxyphenylpropionate	<DL*	0.12	<= 0.12
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Yeast / Fungal

46 D-Arabinitol	18	36	<= 73
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Creatinine = 210 mg/dL

\* <DL = less than detection limit

These test results in this report are not for the diagnosis of disease. They are intended to provide nutritional guidelines to qualified healthcare professionals with full knowledge of patient history and concerns to assist in their design of an appropriate healthcare program.

Georgia Lab Lic. Code #067-007  
CLIA ID# 11D0255349

New York Clinical Lab PFI #4578  
Florida Clinical Lab Lic. #800008124

Laboratory Directors: J. Alexander Bralley, PhD  
Robert M. David, PhD

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## ION Analyte Pattern Analysis

A0907200003

Sample Report

A multi-analyte report can provide greater insight about health risks and special nutrient needs. Patterns of abnormalities can reinforce the degree of significance indicated by a single measurement. Analytes from the various profiles in the ION report are combined below into categories associated with clinical/metabolic conditions.

The categories included cover the most common areas of concern relevant to these profiles. Above each thermometer are listed the analytes used to calculate the *degree of significance*. An H or L appears when the patient result is in the fifth quintile (80%) of the population. An additional **X** next to an analyte indicates that the patient result is outside the 95% reference interval for that analyte.

The thermometer advances to the right as the number and severity of relevant abnormalities increases. The longer the filled bar, the greater the degree of significance or likelihood that a health threat may exist in that category. The preceding laboratory reports provide the detail upon which these thermometers are based.

## Cardiovascular System

Arginine		Homocysteine		Calcium		Magnesium	
CoQ10		a-Tocopherol	L	g-Tocopherol		Lipid Peroxide	
8-OHdG	H	AA/EPA	X H				



Low significance

High significance

## Fatigue

Isoleucine		Leucine		Phenylalanine		Valine	
Magnesium		CoQ10		Adipate		Suberate	
AKG		Succinate		Malate		Xanthurenate	H
MeMalonate	H	FIGLU					



Low significance

High significance

## Metabolic Syndrome (Syndrome X)

Chromium		Magnesium		Zinc		Palmitic	H
Stearic	X H	AHB		BHB	H	BHiVal	

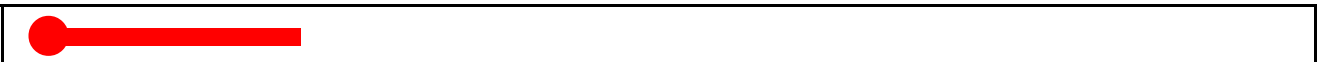


Low significance

High significance

## Mental/Emotional

Tryptophan		Tyrosine		Magnesium		EPA	L
DHA	L	Xanthurenate	H	MeMalonate	H	FIGLU	
VMA		5-HIA					



Low significance

High significance

## Intestinal Bacterial Metabolites

PhAc	PhProp	pOHBenz	pOHPhAc
Indican	Tricarb	D-Lactate	3,4-DHPP

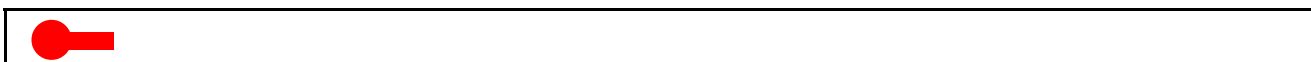


Low significance

High significance

## Intestinal Yeasts / Fungal Metabolites

D-Arabinitol

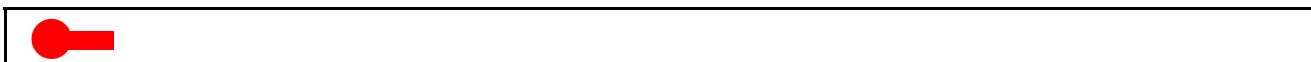


Low significance

High significance

## Digestion/Absorption

Arginine	Histidine	Isoleucine	Leucine
Lysine	Methionine	Phenylalanine	Threonine
Tryptophan	Valine	Chromium	Copper
Manganese	Selenium	Zinc	



Low significance

High significance

## Toxic Exposure

Aluminum	Cadmium	Lead	Mercury
Palmitelaidic X H	C18TrFa H	Citrate	Cis-Aconitate
Isocitrate	Quinolate	2-MeHipp	Orotate
Glucarate H			



Low significance

High significance

## Detoxification Impairment

Methionine	Glycine	Serine	Taurine
Glutamine	Pyroglutamate	Sulfate	Benzoate



Low significance

High significance

## Oxidative Stress/Antioxidant Insufficiency

Taurine	Copper	Manganese	Selenium
Zinc	Lead	Mercury	a-Tocopherol L
g-Tocopherol	Vitamin A	b-Carotene	Lipid Peroxide
8-OHdG H	pOHPHLac	Sulfate	

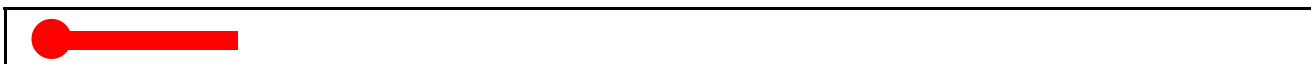


Low significance

High significance

## Mitochondrial Functional Impairment

Magnesium	CoQ10	Adipate	Suberate
Ethylmalonate	Pyruvate	L-Lactate	AHB
BHB H	Succinate	Fumarate	Malate

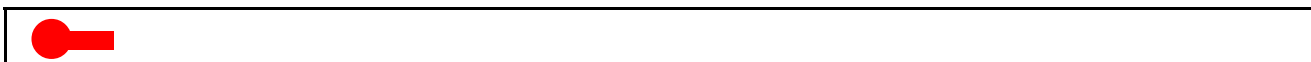


Low significance

High significance

## Amino Acid Insufficiency

Arginine	Histidine	Isoleucine	Leucine
Lysine	Methionine	Phenylalanine	Threonine
Tryptophan	Valine	AKG	Succinate
Sulfate			



Low significance

High significance

## Essential Fatty Acid Insufficiency

ALA	EPA L	DHA L	LA
GLA	DGLA	Palmitoleic	Mead X H
Triene/Tetraer H			



Low significance

High significance

## Disordered Methyl Group (Single carbon) Transfer

Homocysteine	Pentadeca	Heptadeca	Nonadecanoic
Tricosanoic	Xanthurenate H	MeMalonate H	FIGLU
Kynurenate			



Low significance

High significance

## Disordered Tryptophan Metabolism

Tryptophan	Xanthurenate	H	5-HIA	Kynurenate
Quinolinate	Indican			



Low significance

High significance

<u>Abbreviation</u>	<u>Analyte Name</u>	<u>Abbreviation</u>	<u>Analyte Name</u>
2-MeHipp	2-Methylhippurate	FIGLU	Formiminoglutamate
5-HIA	5-Hydroxyindoleacetate	g-Tocopherol	gamma-Tocopherol
8-OhdG	8-Hydroxy-2-deoxyguanosine	GLA	Gamma Linoleic (18:3n6)
AA/EPA	Arachidonic (20:4n6)/Eicosapentaenoic (20:5n3)	Heptadeca	Heptadecanoic (17:0)
AHB	a-Hydroxybutyrate	Hcys	Homocysteine
aKbMeVal	a-Keto-β-Methylvalerate	HVA	Homovanillate
aKiCap	a-Ketoisocaproate	HMG	Hydroxymethylglutarate
aKiVal	a-Ketoisovalerate	LA	Linoleic (18:2n6)
AKG	a-Ketoglutarate	MeMalonate	Methylmalonate
ALA	Alpha Linolenic (18:3n3)	Pentadeca	Pentadecanoic (15:0)
a-Tocopherol	alpha-Tocopherol	PhAc	Phenylacetate
BHB	β-Hydroxybutyrate	PhProp	Phenylpropionate
BHiVal	β-Hydroxyisovalerate	pHBenz	p-Hydroxybenzoate
C18TrFa	Total C:18 Trans	pHPhAc	p-Hydroxyphenylacetate
CoQ10	Coenzyme Q10	pHPhLac	p-Hydroxyphenyllactate
DGLA	Dihomogamma Linolenic (20:3n6)	Total C:18	Total c:18 Trans
DHA	Docosahexanoic (22:6n3)	Tricarb	Tricarallylate
3,4-DHPP	3,4-Dihydroxyphenylpropionate	Triene/Tetraene	Mead/Arachidonic Ratio
EPA	Eicosapentaenoic (20:5n3)	VMA	Vanilmandelate

## Supplement Recommendation Summary

With knowledge of a patient's full medical history and concerns, the ION Profile laboratory results may be used to help create an individually optimized nutritional support program. Based strictly on the results from this test, the summary table below shows estimates of nutrient doses that may help to normalize nutrient-dependent metabolic functions. All amounts are adult doses that should be reduced for children according to body weight.

### Customized Vitamin and Mineral Formulation

Nutrients listed in this section are normally contained in a multi-vitamin preparation. "Base" amounts may be used for insurance of health even when no abnormalities are found.

Customized preparations of the multi-vitamin/mineral formula shown below may be produced by compounding pharmacies. If such a product is made according to these specifications each dose should be thoroughly stirred into a few ounces of water or diluted fruit juice to fully release carbonates and avoid stomach bloating effects.

	Daily Amounts	
	Base	Units Added
Vitamin A	2500 IU	
B-Carotene	5500 IU	
Vitamin C	250 mg	2000 mg
Vitamin D	400 IU	
Vitamin E (Mixed Tocopherols)	100 IU	400 IU
Vitamin K*	100 mcg	
Thiamin (B1)	5 mg	
Riboflavin (B2)	5 mg	
Niacin (B3)	25 mg	
Pyridoxine (B6)	15 mg	80 mg
Folic Acid	400 mcg	
Vitamin B12	50 mcg	800 mcg
Biotin	100 mcg	600 mcg
Pantothenic Acid (B5)	25 mg	
Calcium	500 mg	
Iodine*	75 mcg	
Magnesium	250 mg	200 mg
Zinc	15 mg	
Selenium	100 mcg	
Copper	1 mg	
Manganese	5 mg	2 mg
Chromium	200 mcg	200 mcg
Molybdenum*	25 mcg	
Boron*	1 mg	
Citric Acid*	200 mg	
Malic Acid*	200 mg	

\* Nutrients with an asterisk are not modified based on the ION test results.

MM02

***Other Items Indicated for individual supplementation***

Various conditionally essential nutrients and other potentially beneficial interventions appear in this section only if relevant abnormalities are present. These ingredients are not included in the customized vitamin formula on the previous page.

Amino acids listed on this page result from functional markers of individual amino acid insufficiency and do not reflect amino acids measured in plasma.

<b>Item</b>	<b>Amount</b>
<b>Choline</b>	50 mg
<b>Fish Oil</b>	6 gm
<b>Lipoic Acid</b>	100 mg
<b>Need for Other Antioxidants</b>	Moderate
<b>Vanadium</b>	200 mcg

## Customized Free-Form Amino Acids

The table below shows a customized amino acid formula based on the results of your laboratory profile. The formula is optimized by adding amounts shown in the Grams Added column according to the relative positions of results found.

Directions: Adults mix 1 and 1/2 measuring teaspoon (5g) in juice or water 2 times daily between meals as a dietary supplement, or as directed by a health care provider. Children under 12 years old: 3/4 teaspoon 1-2 times daily between meals. Children under 5 years old: Use 1/4 teaspoon, 1-3 times daily; adjust for body weight.

	Grams Added	% of Formula	Active mg/day
L-Arginine HCl (80% active)	11	13.14	1,051
L-Histidine HCl (74% active)	1	11.33	839
L-Isoleucine	0	7.57	757
L-Leucine	0	10.40	1,040
L-Lysine HCl (80% active)	2	10.14	811
L-Methionine	0	6.20	620
L-Phenylalanine	3	11.40	1,140
Taurine	16	5.33	533
L-Threonine	0	6.52	652
L-Tryptophan	0	1.78	178
L-Valine	0	9.10	910
Pyridoxal-5-phosphate	0	0.27	24
Alpha-ketoglutaric acid	0	7.69	684

Total grams added	33
Base Formula amount	267
Total Weight	300

<input checked="" type="checkbox"/>	L-5-Hydroxytryptophan	0	0.60	36
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This formula is intended to optimize essential and conditionally essential amino acid intake. Other non-essential amino acids can be produced in human tissues. Pyridoxal-5-phosphate (an active form of vitamin B6) and alpha-ketoglutaric acid are key factors needed for the body's utilization of amino acids.

The formula may be ordered as a powder that dissolves easily in beverages or may be added to non-protein foods such as applesauce. Other forms of supplemental dietary protein or amino acids may need to be restricted while using your customized formula. If enhanced energy levels prevent sleep, avoid bedtime use.

In addition to the above customized amino acid formula, this patient may benefit from further use of single amino acids, as evidenced by profiles other than plasma amino acids. See the category, "Other Indicated Nutrients" on your Supplement Recommendation Summary Page.