



Ordering Physician:

Metamatrix
John Doe MD

1234 Main St.
Anywhere, GA 30096

Accession Number: **A1304040372**
Order Number: **G1234567**
Reference Number:
Patient: Sample Report
Age: 51 *Sex:* Female
Date of Birth: 02/05/1962
Date Collected: 4/3/13
Date Received: 4/4/13
Report Date: 4/5/13
Telephone: 7704464583
Fax: 7704412237
Reprinted: 7/24/13
Comment:

0490 ION® with Amino Acids 40 Profile

Amino Acids 40 Profile - Plasma

Methodology: High Performance Liquid Chromatography

Ranges: Ages 13 and over.

Essential Amino Acids

Limiting Amino Acids

	Results µmol/L	Quintile Ranking	95% Reference Interval
		1st 2nd 3rd 4th 5th	
1 Lysine	295 H	147 263	120 - 318
2 Methionine	23	17 34	14 - 48
3 Tryptophan	48	39 69	31 - 83

Branched Chain Amino Acids

4 Isoleucine	62	40 82	35 - 104
5 Leucine	136	87 164	74 - 196
6 Valine	245	167 316	146 - 370

Other Essential Amino Acids

7 Phenylalanine	53	48 77	42 - 95
8 Histidine	77	63 97	57 - 114
9 Threonine	122	88 172	73 - 216

Conditionally Essential Amino Acids

10 Arginine	77	43 107	29 - 137
11 Taurine	73	36 99	29 - 136
12 Glycine	237	192 418	155 - 518
13 Serine	118	74 139	60 - 172

Functional Categories

Vitamin B6 Status Markers

14 α-aminoadipic acid	<0.5	0.5	<= 1.5
15 α-Amino-n-butyric acid (α-ANB)	41 H	28	<= 39
16 γ-aminobutyric acid (GABA)	<0.6	0.6	<= 1.5
17 Cystathionine	<0.2	0.3	<= 0.3

Amino Acids 40 Profile - Plasma

Methodology: High Performance Liquid Chromatography

Ranges: Ages 13 and over.

	Results µmol/L	Quintile Ranking					95% Reference Interval
		1st	2nd	3rd	4th	5th	
<u>Vascular Function</u>							
18 Arginine	77	43				107	29 - 137
19 Taurine	73	36				99	29 - 136
20 α-aminoadipic acid	<0.5				0.5		<= 1.5
<u>Neurotransmitters and Precursors</u>							
21 Phenylalanine	53	48				77	42 - 95
22 Tyrosine	59	45				87	38 - 110
23 Tryptophan	48	39				69	31 - 83
24 Glutamic Acid	205 H	33				136	24 - 214
25 Taurine	73	36				99	29 - 136
<u>Sulfur Amino Acids (Glutathione - related)</u>							
26 Methionine	23	17				34	14 - 48
27 Cystathionine	<0.2					0.3	<= 0.3
28 Homocystine	<0.6					0.6	<= 0.6
29 Cystine	7.5	1.6				16.3	0.8 - 27.5
30 Taurine	73	36				99	29 - 136
<u>Urea Cycle and Ammonia Detoxification</u>							
31 Arginine	77	43				107	29 - 137
32 Citrulline	25	22				45	18 - 57
33 Ornithine	73	36				86	28 - 117
34 Glutamine	493	458				771	372 - 876
35 Asparagine	57	39				71	31 - 90
36 Aspartic Acid	4.2	3.5				8.6	2.9 - 12.6

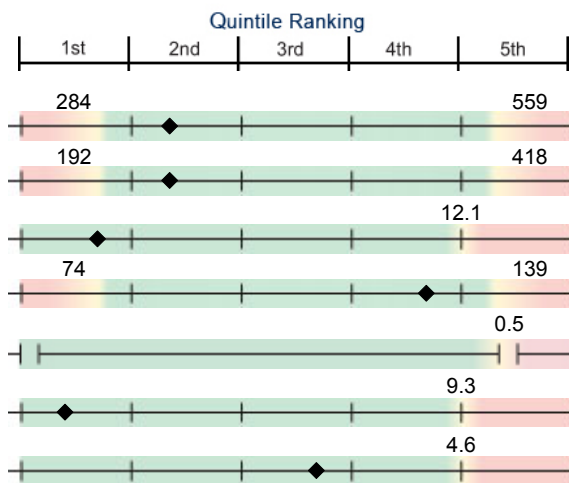
Amino Acids 40 Profile - Plasma

Methodology: High Performance Liquid Chromatography

Ranges: Ages 13 and over.

Glycine, Serine and Related Amino Acids

Results
µmol/L

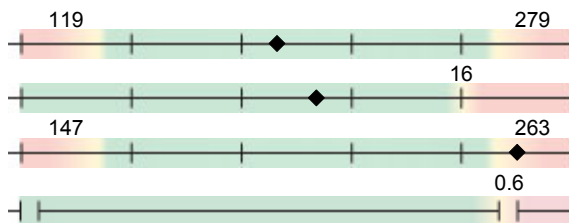


**95%
Reference
Interval**

230 - 681
155 - 518
≤ 19.5
60 - 172
≤ 0.8
≤ 11.6
≤ 7.4

Collagen - Related Amino Acids

Results
µmol/L



99 - 363
≤ 26
120 - 318
≤ 0.6

β-Amino Acids and Derivatives

Results
µmol/L



≤ 5.0
57 - 114
≤ 6.3
≤ 9.8
≤ 43

DNA (Thymine) Degradation

Results
µmol/L



≤ 3.2

Muscle-Specific Amino Acids

Results
µmol/L



≤ 52

Ratios

Results



≤ 1.10
0.06 - 0.23
≤ 0.152
≤ 0.22
0.090 - 0.102

*Large neutral amino acids (Leu+Ile+Val+Phe+Tyr)

Ordering Physician:

John Doe MD

Date Received: 4/4/2013

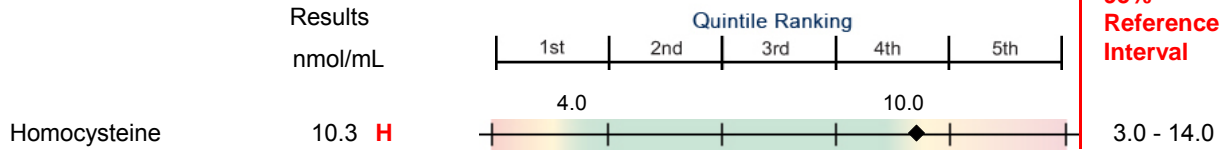
Date Reported: 4/5/2013

A1304040372

Sample Report

Homocysteine Assay - Plasma

Methodology: Competitive Immunoassay



Nutrient & Toxic Elements Profile - Blood

Methodology: Inductively Coupled Plasma /Mass Spectroscopy



*Relevant to membrane permeability, not nutritional status.

Toxic metals are flagged high when the result is above the 95% Reference Interval. Results for whole blood toxic elements that are within normal limits do not rule out metal accumulation in other tissues. This can be evaluated with urinary porphyrin or urine elements tests.

CoEnzyme Q10 Plus Vitamins Profile - Serum

Methodology: High Performance Liquid Chromatography

Ranges: Ages 13 and over.

	Results mg/L	Quintile Ranking	95% Reference Interval
		1st 2nd 3rd 4th 5th	
1 Coenzyme Q10	0.87	0.64 2.16	0.48 - 3.04
2 alpha-Tocopherol	20.8	9.8 25.1	6.8 - 31.7
3 gamma-Tocopherol	2.11 H	0.26 2.06	0.06 - 2.99
4 Vitamin A	0.69	0.36 0.74	0.29 - 1.05
5 β-Carotene	0.38	0.15 1.70	0.10 - 2.71

Lipid Peroxide Assay - Serum

Methodology: High Performance Liquid Chromatography

	Results nmol/mL	Reference Interval
6 Lipid Peroxides	0.70	≤ 2.60

DNA/Oxidative Stress Marker Assay - Urine

Methodology: LC/Tandem Mass Spectroscopy, Colorimetric

Ranges: Ages 13 and over.

	Results ng/mg creatinine	Reference Interval
7 8-Hydroxy-2-deoxyguanosine	2.2	≤ 7.6

Vitamin D Profile - Serum

Methodology: LC/Tandem Mass Spectroscopy

	Results ng/mL	Reference Interval
8 25-Hydroxyvitamin D	43.1	30.0 - 100.0
9 25-Hydroxyvitamin D2	0.4	
10 25-Hydroxyvitamin D3	42.7	

Sufficient
Optimal

Total 25-Hydroxyvitamin D is considered the best assessment of vitamin D status. The test reflects vitamin D from all sources (diet, supplements, and sun exposure). A 2011 Endocrine Society Clinical Practice Guideline suggested vitamin D deficiency be defined as < 20 ng/ml, insufficiency as 21-29 ng/ml, and sufficiency as 30-100 ng/ml.¹ The Vitamin D Council has proposed 50-80 ng/ml as optimal, and 100 ng/ml as an upper limit.² 25-Hydroxyvitamin D3 is from sun exposure, vitamin D-rich foods, or vitamin D3 supplements. 25-Hydroxyvitamin D2 is only from fortified foods or supplements.

- Holick MF, Binkley, NC, Bischoff-Ferrari, HA, et al. Evaluation, treatment, and prevention of vitamin D deficiency: an Endocrine Society clinical practice guideline. *J Clin Endocrinol Metab.* July 2011, 96(7):1911-1930.
- Vitamin D Council <http://www.vitamindcouncil.org>.

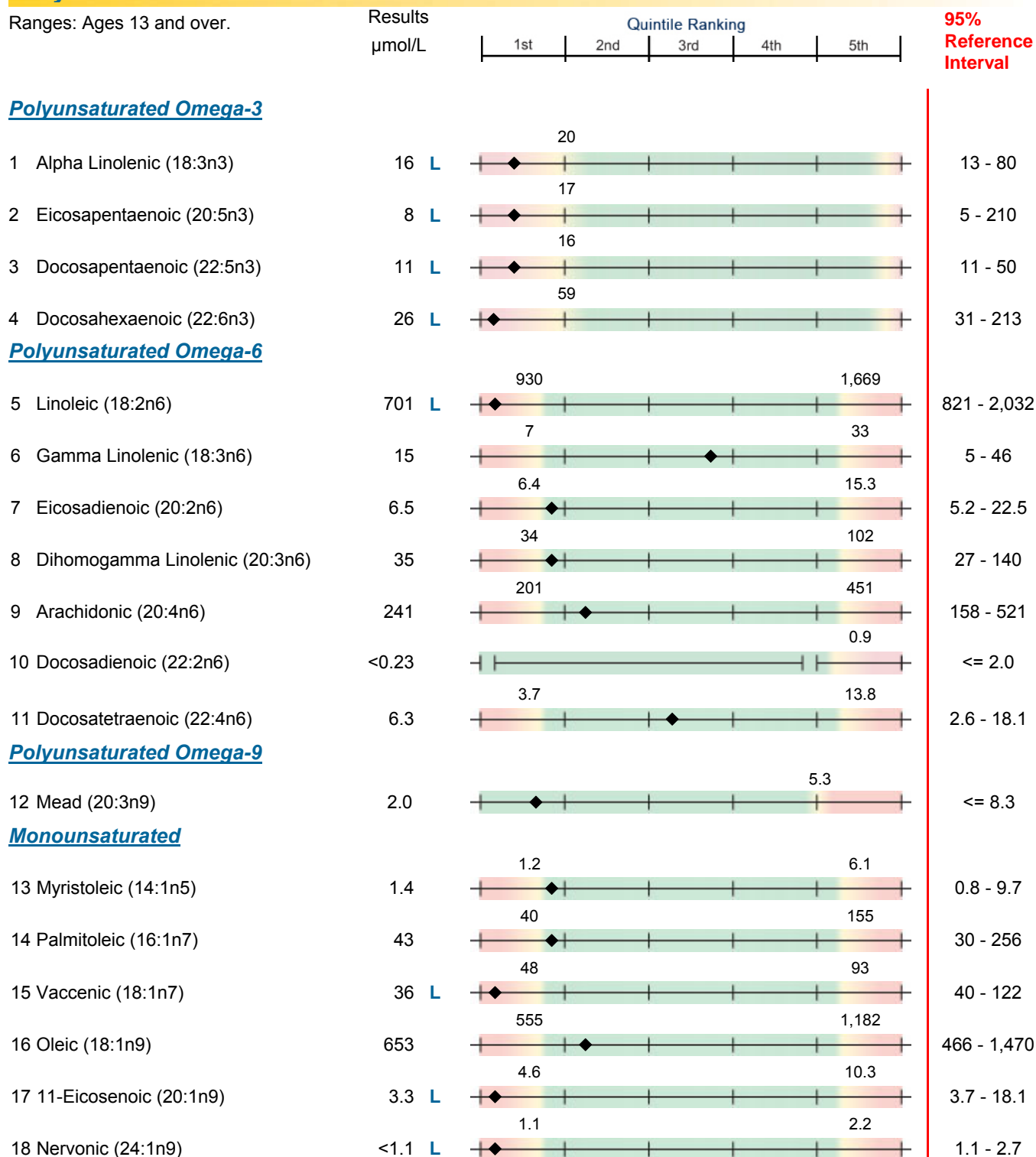
Conversion factors: nmol/L = ng/mL x 2.5 | ng/mL = nmol/L x 0.4

* <DL = less than detection limit

Fatty Acids Profile - Plasma

Methodology: Capillary Gas Chromatography/Mass Spectrometry

Ranges: Ages 13 and over.



Fatty Acids Profile - Plasma

Methodology: Capillary Gas Chromatography/Mass Spectrometry

Ranges: Ages 13 and over.

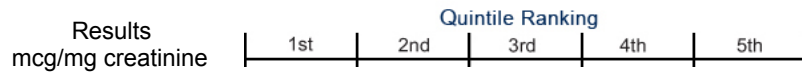


Organix® Comprehensive Profile - Urine

Methodology: LC/Tandem Mass Spectroscopy, Colorimetric

Ranges: Ages 13 and over.

95%
Reference
Interval



NUTRIENT MARKERS

Fatty Acid Metabolism

(Carnitine & B2)

Item	Results	Quintile Ranking	Reference Interval
1 Adipate	1.7	6.2	<= 11.1
2 Suberate	1.2	2.1	<= 4.6
3 Ethylmalonate	1.2	3.6	<= 6.3

Carbohydrate Metabolism

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

Item	Results	Quintile Ranking	Reference Interval
4 Pyruvate	<DL*	3.9	<= 6.4
5 L-Lactate	3.7	12.6	1.6 - 57.1
6 β-Hydroxybutyrate	<DL*	2.1	<= 9.9

Energy Production (Citric Acid Cycle)

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

Item	Results	Quintile Ranking	Reference Interval
7 Citrate	170	601	56 - 987
8 Cis-Aconitate	24	51	18 - 78
9 Isocitrate	58	98	39 - 143
10 α-Ketoglutarate	0.7	19.0	<= 35.0
11 Succinate	3.4	11.6	<= 20.9
12 Fumarate	0.08	0.59	<= 1.35
13 Malate	0.5	1.4	<= 3.1
14 Hydroxymethylglutarate	1.6	3.6	<= 5.1

B-Complex Vitamin Markers

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

Item	Results	Quintile Ranking	Reference Interval
15 α-Ketoisovalerate	0.07	0.25	<= 0.49
16 α-Ketoisocaproate	0.09	0.34	<= 0.52
17 α-Keto-β-Methylvalerate	0.14	0.38	<= 1.10
18 Xanthurenate	0.05	0.34	<= 0.46
19 β-Hydroxyisovalerate	2.7	7.6	<= 11.5

Methylation Cofactor Markers

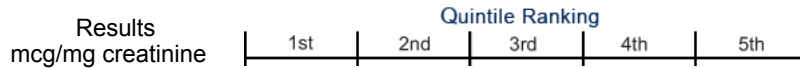
(B12, Folate)

Item	Results	Quintile Ranking	Reference Interval
20 Methylmalonate	0.6	1.7	<= 2.3
21 Formiminoglutamate	<DL*	1.2	<= 2.2

Organix® Comprehensive Profile - Urine

Methodology: LC/Tandem Mass Spectroscopy, Colorimetric

Ranges: Ages 13 and over.



95%
Reference
Interval

CELL REGULATION MARKERS

Neurotransmitter Metabolism Markers

(Tyrosine, Tryptophan, B6, antioxidants)

Item	Results	Quintile Ranking	95% Reference Interval
22 Vanilmandelate	1.8	1.6 - 3.9	1.2 - 5.3
23 Homovanillate	4.5	1.9 - 5.7	1.4 - 7.6
24 5-Hydroxyindoleacetate	1.7 L	2.1 - 5.6	1.6 - 9.8
25 Kynurenate	0.3	1.0	<= 1.5
26 Quinolinate	1.6	4.0	<= 5.8
27 Picolinate	2.5 L	8.0	2.8 - 13.5

Oxidative Damage and Antioxidant Markers

(Vitamin C and other antioxidants)

28 p-Hydroxyphenyllactate	0.23	0.39	<= 0.66
29 8-Hydroxy-2-deoxyguanosine	2.2	5.3	<= 7.6

(Units for 8-Hydroxy-2-deoxyguanosine are ng/mg creatinine).

TOXICANTS AND DETOXIFICATION

Detoxification Indicators

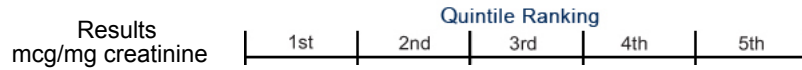
(Arg, NAC, Met, Mg and antioxidants)

30 2-Methylhippurate	0.064	0.084	<= 0.192
31 Orotate	0.14	0.69	<= 1.01
32 Glucarate	2.3	6.3	<= 10.7
33 a-Hydroxybutyrate	0.2	0.3	<= 0.9
34 Pyroglutamate	33	59	28 - 88
35 Sulfate	614 L	958 - 2,347	690 - 2,988

Organix® Comprehensive Profile - Urine

Methodology: LC/Tandem Mass Spectroscopy, Colorimetric

Ranges: Ages 13 and over.



**95%
Reference
Interval**

COMPOUNDS OF BACTERIAL OR YEAST/FUNGAL

Bacterial - general

Compound	Result	Quintile Ranking	95% Reference Interval
36 Benzoate	<DL*	0.6	<= 9.3
37 Hippurate	475	548	<= 1,070
38 Phenylacetate	<DL*	0.11	<= 0.18
39 Phenylpropionate	1.08 H	1.1	<= 0.06
40 p-Hydroxybenzoate	0.2	19	<= 1.8
41 p-Hydroxyphenylacetate	34 H	64	<= 34
42 Indican	50	0.73	<= 90
43 Tricarballoylate	0.26	1.9	<= 1.41

L. acidophilus / general bacterial

44 D-Lactate	0.7	1.9	<= 4.3
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Clostridial species

45 3,4-Dihydroxyphenylpropionate	0.39 H	0.05	<= 0.05
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Yeast / Fungal

46 D-Arabinitol	10	36	<= 73
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Creatinine = 244 mg/dL

* <DL = less than detection limit

** >LIN = greater than linearity limit

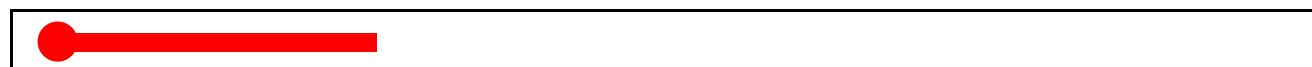
A multi-analyte report can provide greater insight about health risks and special nutrient needs. Patterns of abnormalities can reinforce the degree of significance indicated by a single measurement. Analytes from the various profiles in the ION report are combined below into categories associated with 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	H	Calcium	Magnesium
CoQ10	a-Tocopherol		g-Tocopherol	Lipid Peroxides
8-OHdG	AA/EPA	H		



Low significance

High significance

Fatigue

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

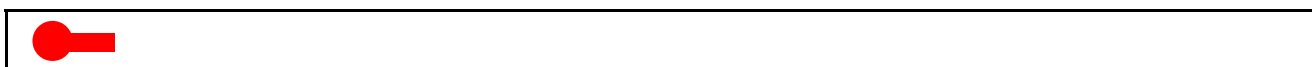


Low significance

High significance

Metabolic Syndrome (Syndrome X)

Magnesium	Palmitic	Stearic	AHB
BHB	BHiVal		

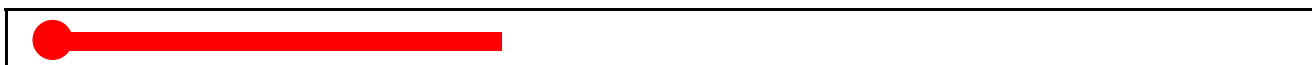


Low significance

High significance

Mental/Emotional

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

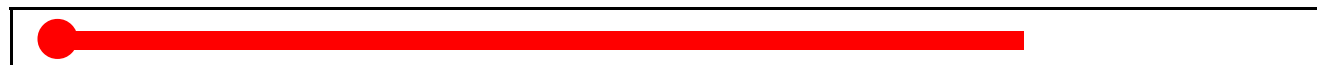


Low significance

High significance

Intestinal Bacterial Metabolites

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

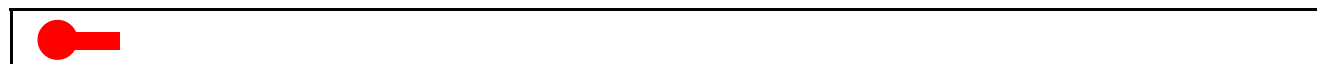


Low significance

High significance

Intestinal Yeasts / Fungal Metabolites

D-Arabinitol

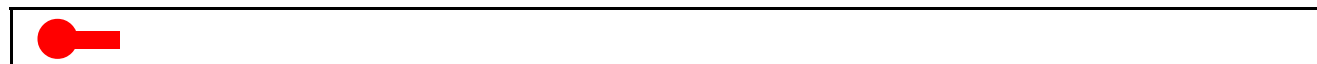


Low significance

High significance

Digestion/Absorption

Arginine	Histidine	Isoleucine	Leucine
Lysine	Methionine	Phenylalanine	Threonine
Tryptophan	Valine	Selenium	

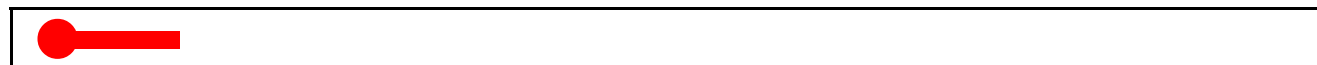


Low significance

High significance

Toxic Exposure

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

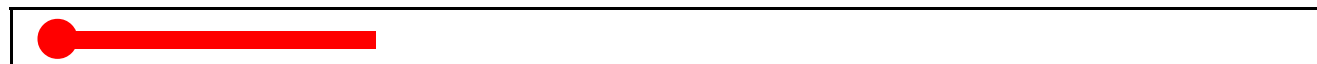


Low significance

High significance

Detoxification Impairment

Methionine	Glycine	Serine	Taurine
Glutamine	Pyroglutamate	Sulfate	X L Benzoate



Low significance

High significance

Oxidative Stress/Antioxidant Insufficiency

Taurine	Selenium	Lead	Mercury
a-Tocopherol	g-Tocopherol	Vitamin A	b-Carotene
Lipid Peroxides	8-OHdG	pOHPHac	Sulfate XL

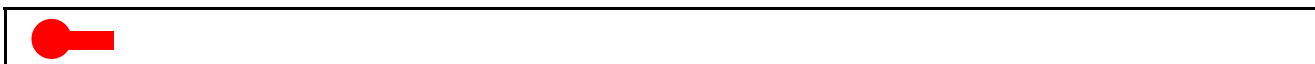


Low significance

High significance

Mitochondrial Functional Impairment

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

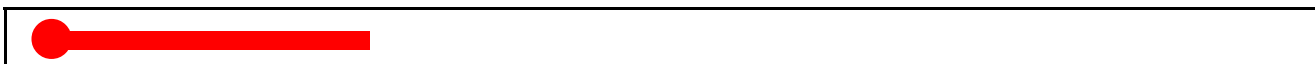


Low significance

High significance

Amino Acid Insufficiency

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



Low significance

High significance

Essential Fatty Acid Insufficiency

AA	ALA	L	EPA	L	DHA XL
LA XL	GLA		DGLA		Palmitoleic
Triene/Tetraene					



Low significance

High significance

Disordered Methyl Group (Single carbon) Transfer

Homocysteine	H	Pentadeca	Heptadeca	Nonadecanoic
Tricosanoic		Xanthurenate	MeMalonate	FIGLU
Kynurenate				



Low significance

High significance

Disordered Tryptophan Metabolism

Tryptophan	Xanthurenate	5-HIA	L	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
AKG	a-Ketoglutarate	HMG	Hydroxymethylglutarate
aKiCap	a-Ketoisocaproate	LA	Linoleic (18:2n6)
aKiVal	a-Ketoisovalerate	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.

Customized Vitamin and Mineral Formulation

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

Customized preparations of the multi-vitamin/mineral formula shown below may be produced by compounding pharmacies.

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

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

MM01

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.

Item	Amount
Potential to Benefit from Probiotics	Medium
Fish Oil	6 gm
N-Acetylcysteine	400 mg
S. boulardii	As needed

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)	0	10.50	840
L-Histidine HCl (74% active)	0	12.20	902
L-Isoleucine	0	8.40	840
L-Leucine	0	11.52	1,152
L-Lysine HCl (80% active)	0	10.50	840
L-Methionine	0	6.88	688
L-Phenylalanine	2	12.19	1,219
Taurine	0	0.00	0
L-Threonine	1	7.57	757
L-Tryptophan	1	2.31	231
L-Valine	0	10.09	1,009
Pyridoxal-5-phosphate	0	0.27	27
Alpha-ketoglutaric acid	0	7.69	759

Total grams added	4
Base Formula amount	296
Total Weight	300

✓ <input type="checkbox"/>	L-5-Hydroxytryptophan	0	0.73	46
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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 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.

This formula is provided as a starting point that may guide decisions about medical treatment based on the test results. It is derived only from the laboratory results included in this report. Final recommendations should be based on consideration of the patient's medical history and current clinical condition.

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.