Diagnostic Solutions laboratory

5894 Shiloh Rd, Ste 101 | Alpharetta GA 30005
877.485.5336

Patient: Sample Patient
Collected: 12/3/2021
DOB: 5/11/1975
Sex: Male

Accession: OMXTest13
Received: 12/3/2021
Completed: 12/7/2021
Ordered by: Diagnostic Solutions Lab

OMX ORGANIC METABOLOMICS

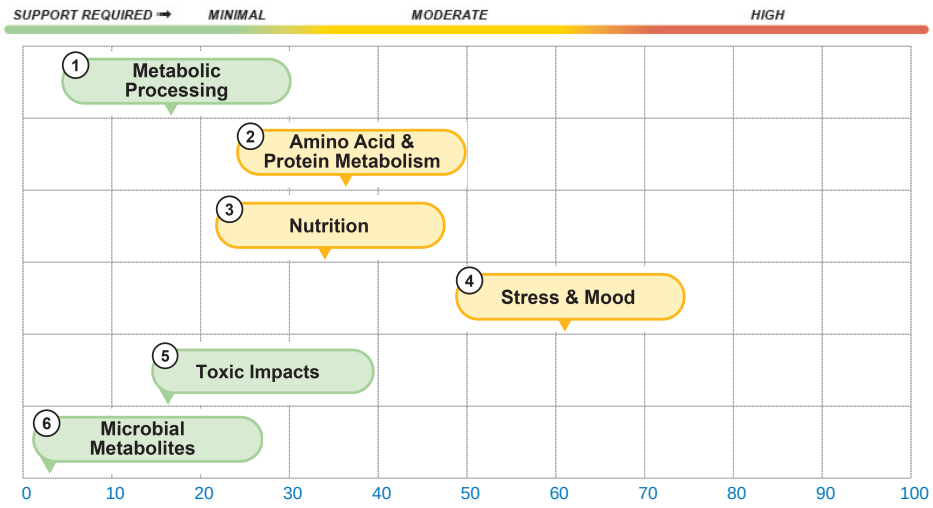
METHODOLOGY: LC-MS/MS - OMX Urine

YOUR PERSONALIZED REPORT

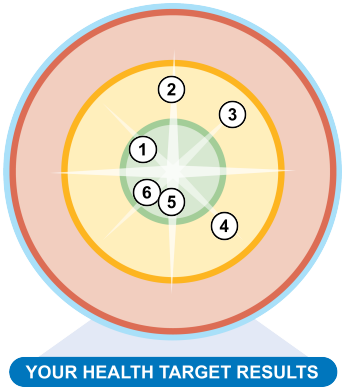
The charts on this page are designed to give you a bird's-eye-view of your current metabolic signature and help you get a general preview of the detailed report found on the following pages.

METABOLOMIC SIGNATURE

Identifying Impact of Functional Categories



PERCENT OF MARKERS BEYOND THE REFERENCE RANGE



Findings show that 3 of 6 Functional Categories have markers beyond the reference range.

Subcategories are identified below.

Identifying Impact of Subcategories

NOTE: Below is a list of the Functional Categories and the included subcategories. It lists the percentage of markers that are beyond the reference range so clinicians can better target areas of concern.

PERCENT OF MARKERS BEYOND THE REFERENCE RANGE

0-20%	21-60%	61-100%
MINIMAL	*MODERATE*	*HIGH*

1 Metabolic Processing — 19 %

Subcategory	
Glycolysis	
Krebs Cycle	
Fatty Acid Oxidation	
Ketones	

2 Amino Acid & Protein Metabolism — 38 %

Subcategory	
Collagen Catabolism	
Phenylalanine Metabolism	
Branched-Chain Amino Acids	
Tryptophan Metabolism	
Methionine Metabolism	
Histidine Metabolism	
Threonine/Glycine/Serine	
Lysine Metabolism	
Glutamate & Aspartate	

3 Nutrition — 36 %

Subcategory	
B-Complex (B1, B2, B3, B5, LA)	
Vitamin B-12	
Folate	
Vitamin B6	
Biotin	
Plant Components	
Meat intake	
Sugar Intake	

4 Stress & Mood — 60 %

Subcategory	
Catecholamine Turnover	
Serotonin Turnover	
Steroid Hormone	
Neurotransmitter	

5 Toxic Impacts — 13 %

Subcategory	
Oxidative Damage	
Toxins	
Urea Cycle	
Kidney Impacts	

6 Microbial Metabolites — 0 %

Subcategory	
Amino Acid Microbial Metabolites	
Fungal Assessment	
Isoflavone microbial Metabolites	
Polyphenols Microbial Metabolites	

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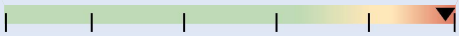
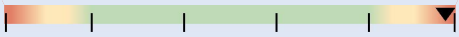
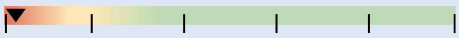
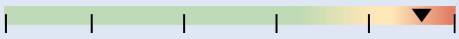
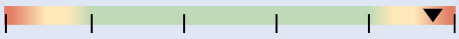
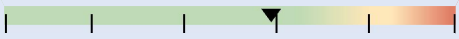
CLIA# 11D-2097795
Medical Director - Diane Farhi, MD

Patient: Sample Patient **Accession: OMXTest13**

ORGANIC METABOLOMICS

1 - Metabolic Processing

Glycolysis	Result	20% 40% 60% 80%	Reference
Glucose *Glucokinase*	17.9 H		< 15.2 mg/dL
Pyruvic Acid *Pyruvate dehydrogenase + B1, B2, B3, B5 LA*	38.1		< 47.2 nmol/mg Creatinine
Lactic Acid *Lactate dehydrogenase + B3*	1112.3 H		23.1 - 722.6 nmol/mg Creatinine
Alanine *Alanine transaminase + B6*	1197.8 H		65.4 - 572.6 nmol/mg Creatinine

Krebs Cycle	Result	20% 40% 60% 80%	Reference
Citric Acid *Citrate synthase*	137.5 L		> 356.2 nmol/mg Creatinine
***cis*-Aconitic Acid** *Aconitase*	302.8		91.3 - 363.1 nmol/mg Creatinine
Isocitric Acid *Isocitrate dehydrogenase + B3*	385.6		< 415.6 nmol/mg Creatinine
α-Ketoglutaric Acid *alpha-Ketoglutarate dehydrogenase + B1, B2, B3, B5, LA*	30.6		< 157.2 nmol/mg Creatinine
Succinic Acid *Succinic dehydrogenase + B2*	132.0		4.8 - 224.1 nmol/mg Creatinine
Fumaric Acid *Fumarase*	1322.0		320.2 - 3375.5 nmol/mg Creatinine
Malic Acid *Malate dehydrogenase + B3*	6.6		< 21.5 nmol/mg Creatinine

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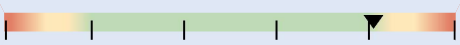
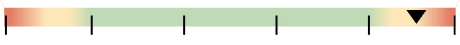
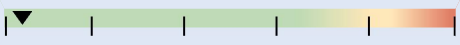
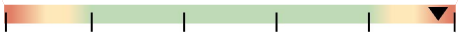
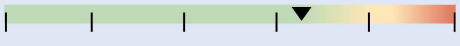
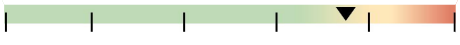
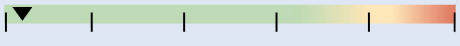
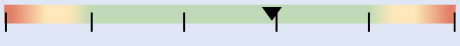
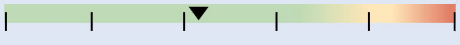
1 - Metabolic Processing

Fatty Acid Oxidation	Result	20% 40% 60% 80%	Reference
Adipic Acid *Saturated dicarboxylic acid*	**7.6**		2.0 - 15.1 nmol/mg Creatinine
Suberic Acid *Fatty acid oxidation + Carnitine*	**17.3**		3.0 - 29.4 nmol/mg Creatinine
Sebacic Acid *Fatty acid oxidation + Carnitine*	**<DL**		< 3.7 nmol/mg Creatinine
Pimelic Acid *Saturated dicarboxylic acids*	**28.1**		5.9 - 31.8 nmol/mg Creatinine
Hexanoylglycine *Medium-chain acyl glycines*	**0.8**		< 2.6 nmol/mg Creatinine
Suberylglycine *Medium-chain acyl glycines*	**1.2**		< 2.3 nmol/mg Creatinine
3-Phenylpropionylglycine *Medium-chain acyl glycines*	**<DL**		< 1.3 nmol/mg Creatinine
Ethylmalonic Acid *Dicarboxylic acid*	**22.3**		5.0 - 43.3 nmol/mg Creatinine
2-Methylsuccinic Acid *Dicarboxylic acid*	**8.0**		3.2 - 21.1 nmol/mg Creatinine

Ketones	Result	20% 40% 60% 80%	Reference
β-Hydroxybutyric Acid *beta-Hydroxybutyrate dehydrogenase + B3*	**3.3**		< 60.5 nmol/mg Creatinine

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CLIA# 11D-2097795
Medical Director - Diane Farhi, MD

2 - Amino Acid & Protein Metabolism

Phenylalanine Metabolism	Result	Reference
Phenylalanine *Phenylalanine hydroxylase + BH4*	100.5 H	11.7 - 73.7 nmol/mg Creatinine
Phenylacetic Acid *Aldehyde dehydrogenase*	1.4	0.5 - 19.1 nmol/mg Creatinine
Tyrosine *Tyrosine hydroxylase + BH4*	150.4 H	11.4 - 126.7 nmol/mg Creatinine
Homovanillic Acid *COMT + Magnesium & Monoamine oxidase + B2*	40.9 H	< 10.3 nmol/mg Creatinine
Vannilylmandelic Acid *Monoamine oxidase + B2*	19.4	4.8 - 21.4 nmol/mg Creatinine
4-Hydroxyphenylpyruvic Acid *Tyrosine aminotransferase + B6*	288.2	35.5 - 1116.3 nmol/mg Creatinine
Homogentisic Acid *4-Hydroxyphenylpyruvate dioxygenase + Iron*	95.6	7.9 - 336.4 nmol/mg Creatinine

Branched-Chain Amino Acids	Result	Reference
Total Branched Chain Amino Acids *Branched-chain amino acid transaminase + B6*	152.9 H	14.3 - 105.4 nmol/mg Creatinine
Valine *Branched-chain amino acid transaminase + B6*	68.7 H	9.2 - 48.9 nmol/mg Creatinine
α-Ketoisovaleric Acid *Branched-chain keto acid dehydrogenase + B1, B2, B3, B5, LA*	62.9 H	< 11.9 nmol/mg Creatinine
Isoleucine/allo-Isoleucine *Branched-chain amino acid transaminase + B6*	20.2 H	< 14.9 nmol/mg Creatinine
α-Keto-β-methylvaleric Acid *Branched-chain keto acid dehydrogenase + B1, B2, B3, B5, LA*	1.5	< 11.9 nmol/mg Creatinine
Leucine *Branched-chain amino acid transaminase + B6*	64.0 H	< 35.4 nmol/mg Creatinine
α-Ketoisocaproic Acid *Branched-chain keto acid dehydrogenase + B1, B2, B3, B5, LA*	19.8 H	< 17.0 nmol/mg Creatinine

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2 - Amino Acid & Protein Metabolism

Tryptophan Metabolism	Result	20% 40% 60% 80%	Reference
Tryptophan *Tryptophan hydroxylase + BH4*	6.3 L		10.5 - 68.7 nmol/mg Creatinine
5-Hydroxyindoleacetic Acid *Aldehyde dehydrogenase + B3*	15.2		6.3 - 28.7 nmol/mg Creatinine
Kynurenine *Kynurenine mono-oxygenase (KMO) + B2*	5.2		< 13.7 nmol/mg Creatinine
KT Ratio *Kynurenine / Tryptophan*	0.818 H		0.064 - 0.638
Hydroxykynurenine *Kynureninase + B6*	<DL		< 12.1 nmol/mg Creatinine
Xanthurenic Acid *Kynurenine transaminase + B6*	4.1		< 9.5 nmol/mg Creatinine
Anthranilic Acid *Kynureninase + B6*	<DL		< 11.8 nmol/mg Creatinine
Picolinic Acid *Non-enzymatic conversion*	<DL		< 4.0 nmol/mg Creatinine
Kynurenic Acid *Kynurenine transaminase + B6*	24.6 H		2.1 - 18.5 nmol/mg Creatinine
Quinolinic Acid *Non-enzymatic conversion*	88.0		9.0 - 105.7 nmol/mg Creatinine

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2 - Amino Acid & Protein Metabolism

Methionine Metabolism	Result	20% 40% 60% 80%	Reference
Methionine *Methionine adenosyltransferase*	9.7		< 11.0 nmol/mg Creatinine
Homocystine *Methionine synthase + B12*	3.1		< 5.7 nmol/mg Creatinine
Cystathionine *Cystathionine gamma-lyase + B6*	109.5 H		3.6 - 85.5 nmol/mg Creatinine
Sulfocysteine	4.1		< 8.8 nmol/mg Creatinine
Taurine *Hypotaurine dehydrogenase*	746.4		41.9 - 3644.8 nmol/mg Creatinine
Cystine *Oxidation*	265.0 H		9.7 - 96.1 nmol/mg Creatinine
α-Hydroxybutyric Acid *Dehydrogenase + B3*	106.1 H		10.6 - 62.6 nmol/mg Creatinine
α-Ketobutyric Acid *Lactate dehydrogenase + B3*	1.9		< 7.2 nmol/mg Creatinine
Pyroglutamic Acid *5-Oxoprolinase*	157.1 H		< 72.7 nmol/mg Creatinine

Histidine Metabolism	Result	20% 40% 60% 80%	Reference
Histidine *Histidine decarboxylase + B6*	1198.0		126.4 - 1592.8 nmol/mg Creatinine
3-Methylhistidine *Myofibrillar Breakdown*	2125.5 H		49.7 - 1852.9 nmol/mg Creatinine
β-Alanine *Carnosine synthase*	2.5		< 11.8 nmol/mg Creatinine

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2 - Amino Acid & Protein Metabolism

Threonine/Glycine/Serine	Result	Reference
Threonine *Glycine C-acetyltransferase + B6*	223.1	38.3 - 402.2 nmol/mg Creatinine
Glycine *Glutathione synthetase*	1615.3	248.3 - 6396.0 nmol/mg Creatinine
Serine *Cystathionine beta-synthase + B6, Iron*	444.1	11.7 - 724.3 nmol/mg Creatinine
Sarcosine *Sarcosine dehydrogenase + B2*	14.9	< 148.3 nmol/mg Creatinine
Ethanolamine *Ethanolamine kinase*	381.0	68.0 - 405.0 nmol/mg Creatinine
Phosphoethanolamine *Phosphoethanolamine cytidylyltransferase*	53.0 H	< 49.7 nmol/mg Creatinine

Lysine Metabolism	Result	Reference
Lysine *alpha-Aminoadipic semialdehyde synthase*	401.2	23.3 - 1800.4 nmol/mg Creatinine
α-Aminoadipic Acid *Aminotransferase + B6*	79.1 H	4.5 - 75.3 nmol/mg Creatinine
Glutaric Acid *Glutaryl-CoA dehydrogenase + B2*	1.3	< 4.5 nmol/mg Creatinine

Glutamate & Aspartate	Result	Reference
Glutamine *Glutaminase*	656.7	126.4 - 659.1 nmol/mg Creatinine
Glutamic Acid *Glutamate cysteine ligase*	28.5	6.5 - 83.4 nmol/mg Creatinine
Glutamine / Glutamate Ratio *Glutaminase*	0.043 L	2.5 - 39.5
Asparagine *Asparaginase*	169.7	30.6 - 199.2 nmol/mg Creatinine
Aspartic Acid *Asparagine synthase*	<DL	< 51.1 nmol/mg Creatinine

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2 - Amino Acid & Protein Metabolism

Collagen Catabolism	Result	20% 40% 60% 80%	Reference
Proline *Prolyl hydroxylase + Vitamin C*	11.2		< 14.7 nmol/mg Creatinine
Hydroxyproline *4-Hydroxyproline oxidase*	<DL		< 25.3 nmol/mg Creatinine
Glycylproline *Dipeptide of Glycine + Proline*	14.2		< 18.9 nmol/mg Creatinine

3 - Nutrition

B-Complex (B1, B2, B3, B5, LA)	Result	20% 40% 60% 80%	Reference
Branched Chain Alpha-Keto Organic Acids *Branched-chain keto acid dehydrogenase + B1, B2, B3, B5, LA*	84.2 H		0.8 - 35.8 nmol/mg Creatinine
α-Ketoglutaric Acid *alpha-Ketoglutarate dehydrogenase + B1, B2, B3, B5, LA*	30.6		< 157.2 nmol/mg Creatinine
Pyruvic Acid *Pyruvate dehydrogenase + B1, B2, B3, B5, LA*	38.1		< 47.2 nmol/mg Creatinine

Vitamin B-12	Result	20% 40% 60% 80%	Reference
Methylmalonic Acid *Methylmalonyl-CoA mutase + B12*	22.6		2.7 - 25.9 nmol/mg Creatinine

Folate	Result	20% 40% 60% 80%	Reference
Formiminoglutamic Acid *Glutamate formimino-transferase + Folate*	0.1		< 0.4 nmol/mg Creatinine

Vitamin B6	Result	20% 40% 60% 80%	Reference
Pyridoxic Acid *Aldehyde oxidase*	<DL		< 111.9 nmol/mg Creatinine
Xanthurenic Acid *Kynurenine transaminase + B6*	4.1		< 9.5 nmol/mg Creatinine

Biotin	Result	20% 40% 60% 80%	Reference
β-Hydroxyisovaleric Acid *Methylcrotonyl-CoA carboxylase + Biotin*	446.5 H		25.1 - 223.4 nmol/mg Creatinine

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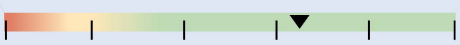
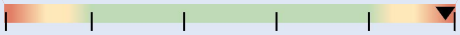
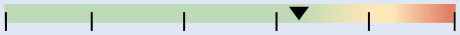
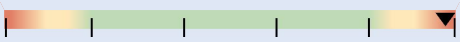
3 - Nutrition

Plant Components	Result	20% 40% 60% 80%	Reference
Quercetin *Polyphenol: Flavonoid*	8.4		> 2.7 nmol/mg Creatinine
Tartaric Acid *Plant component*	7.8		> 1.8 nmol/mg Creatinine

Meat intake	Result	20% 40% 60% 80%	Reference
1-Methylhistidine *Dietary meat & fish*	1057.9 H		88.0 - 394.4 nmol/mg Creatinine
Carnosine *Carnosinase*	158.5 H		3.9 - 70.0 nmol/mg Creatinine
Anserine *Anserinase*	149.4		< 364.6 nmol/mg Creatinine

Sugar Intake	Result	20% 40% 60% 80%	Reference
Fructose *Fructokinase*	12.0 H		0.1 - 9.2 nmol/mg Creatinine

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ORGANIC METABOLOMICS

4 - Stress & Mood

Neurotransmitter	Result	20% 40% 60% 80%	Reference
γ-Aminobutyric Acid *gamma-Aminobutyric acid aminotransferase + B6*	<DL		< 2.9 nmol/mg Creatinine

Catecholamine Turnover	Result	20% 40% 60% 80%	Reference
Homovanillic Acid *COMT + magnesium & monoamine oxidase + B2*	40.9 H		< 10.3 nmol/mg Creatinine
Vannilylmandelic Acid *Monoamine oxidase + B2*	19.4		4.8 - 21.4 nmol/mg Creatinine

Serotonin Turnover	Result	20% 40% 60% 80%	Reference
5-Hydroxyindoleacetic Acid *Aldehyde dehydrogenase + B3*	15.2		6.3 - 28.7 nmol/mg Creatinine

Steroid Hormone	Result	20% 40% 60% 80%	Reference
Cortisol *11-beta-Hydroxysteroid dehydrogenase + B3*	64.7 H		2.2 - 32.1 mcg/g Creatinine

5 - Toxic Impacts

Oxidative Damage	Result	20% 40% 60% 80%	Reference
8-Hydroxy-2'-deoxyguanosine *DNA oxidation*	4.3		< 8.4 nmol/mg Creatinine

Toxins	Result	20% 40% 60% 80%	Reference
2-Methylhippuric Acid *Xylene exposure*	1.8		< 2.1 nmol/mg Creatinine
Mandelic Acid *Styrene exposure*	2.1		< 4.6 nmol/mg Creatinine
Benzoylform *Styrene exposure*	4.6 H		< 4.3 nmol/mg Creatinine
Glucaric Acid	12.1		3.6 - 25.8 nmol/mg Creatinine

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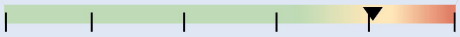
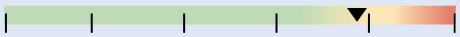
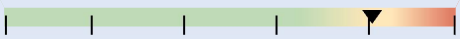
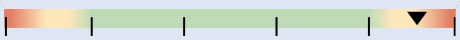
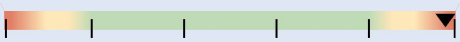
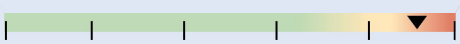
Patient: Sample Patient **Accession: OMXTest13**

ORGANIC METABOLOMICS

5 - Toxic Impacts

Urea Cycle	Result	20% 40% 60% 80%	Reference
Arginine *Arginase & Nitric oxide synthase*	**19.6**		< 31.4 nmol/mg Creatinine
Citrulline *Argininosuccinate synthase*	**8.1**		< 13.6 nmol/mg Creatinine
Ornithine *Ornithine transcarbamylase*	**16.1**		< 63.0 nmol/mg Creatinine
Homocitrulline *Argininosuccinate synthase*	**21.5**		6.1 - 43.5 nmol/mg Creatinine
Arginosuccinic Acid *Argininosuccinate lyase*	**33.2**		< 49.7 nmol/mg Creatinine

Kidney Impacts	Result	20% 40% 60% 80%	Reference
Orotic Acid *Uridine monophosphate synthase*	**4.3**		0.7 - 6.0 nmol/mg Creatinine
Microalbumin *Blood protein*	**59.4**		< 130.4 mcg/g Creatinine
Phosphate *Charged particle (ion)*	**197.5 H**		11.2 - 192.4 mg/dL
Creatinine *Creatine breakdown*	**95.4**		29.3 - 296.8 mg/dL
Oxalic Acid *Divalent metallic cations*	**838.6**		< 1532.5 nmol/mg Creatinine

KEY: < dl = Results below detection limit.

The assays were developed and/or the performance characteristics determined by Diagnostic Solutions Laboratory. The results are for research and not for diagnostic purposes.

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6 - Microbial Metabolites

Amino Acid Microbial Metabolites	Result	Reference
4-Hydroxyphenylacetic Acid *Disordered tyrosine metabolism*	**276.0**	85.8 - 902.3 nmol/mg Creatinine
Indoleacetic Acid *Disordered tryptophan metabolism*	**2.1**	< 13.7 nmol/mg Creatinine

Polyphenols Microbial Metabolites	Result	Reference
3,4-Dihydroxyhydrocinnamic Acid *Polyphenol metabolite*	**<DL**	< 1490.3 nmol/mg Creatinine
3,5-Dihydroxybenzoic Acid *Microbial metabolite*	**111.5**	< 277.1 nmol/mg Creatinine
4-Hydroxybenzoic Acid *Hydroxybenzoic acid derivative*	**4.1**	< 14.9 nmol/mg Creatinine
Benzoic Acid *Glycine N-benzoyltransferase*	**<DL**	< 488.0 nmol/mg Creatinine
Hippuric Acid *Glycine conjugate of benzoate*	**290.8**	< 291.9 nmol/mg Creatinine

Isoflavone microbial Metabolites	Result	Reference
Equol *Isoflavone metabolite*	**<DL**	< 12.8 nmol/mg Creatinine

Fungal Assessment	Result	Reference
Arabinitol *Dehydrogenase*	**4.4**	< 9.0 nmol/mg Creatinine

KEY: < dl = Results below detection limit.

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PERSONALIZED METABOLOMIC RECOMMENDATIONS

Note: Nutrient supplementation is up to the treating clinician's discretion with full understanding of the patient's medical history and current clinical condition.

MICRONUTRIENTS	*Support Required*	Recommendations	Food Sources
B-Complex	None	No Additional Support	Mixed diet
Thiamin (B1)	Moderate	20 mg	Rice, wheat germ, lentils, peas, pork, whole wheat bread, spinach
Riboflavin (B2)	None	1.3 mg*	Milk, almonds, eggs, salmon, chicken, broccoli, spinach
Niacin (B3)	None	16 mg*	Chicken, tuna, turkey, cereal, peanuts, lentils, coffee
Cobalamine (B12)	None	2.4 mcg*	Clams, mussels, mackerel, crab, beef, salmon, milk, eggs
Folate (B9)	None	400 mcg DFE*	Lentils, garbanzo beans, spinach, asparagus, lima beans, orange juice
Biotin (B7)	High	1000 mcg	eggs, liver, salmon, avacado, raspberries, cauliflower, bread
CoQ10	Moderate	60+ mg	Beef, herring, chicken, canola oil, Rainbow trout, peanuts, pistachio nuts, brocolli
Magnesium	None	420 mg*	Beef, pork, milk, cod, chicken, avocado
Carnitine	None	10+ mg	Beef, pork, milk, cod, chicken, avocado
Copper	None	0.9 mcg	Eastern oysters, crab meat, clams, cashews, sunflowers, hazelnuts, almonds

** DV or Daily Values, are the recommended amounts of nutrients per day for a healthy, non-deficient adult.*

PROTEIN	*Findings*	Suggested Recommendation
Phenylalanine	High	Increases in protein can impact results; check catecholamine turnover; Evaluate risk of diabetes, mood disorders
Isoleucine/allo-Isoleucine	High	Represents protein intake 24-48 hrs before collection; consider metabolic conditions and BMI; check B6 need and alpha-ketoglutaric acid
Leucine	High	Represents protein intake 24-48 hrs before collection; consider metabolic conditions; check B6 and alpha-ketoglutaric acid
Valine	High	Represents protein intake 24-48 hrs before collection; consider metabolic conditions and BMI; check B6 need and alpha-ketoglutaric acid
Tryptophan	Low	Assess calorie and protein intake; evaluate digestion; check inflammation, kidney function and mood disorders; check pathways (kynurenine, serotonin, indoles)
Methionine	Adequate	No Additional Support
Threonine	Adequate	No Additional Support
Lysine	Adequate	No Additional Support
Histidine	Adequate	No Additional Support
Arginine	Adequate	No Additional Support
Glycine	Adequate	No Additional Support
Taurine	Adequate	No Additional Support

ADDITIONAL SUPPORT	*Support Required*	Suggested Recommendation
Glutathione Need	None	No Additional Support
Inflammation	None	No Additional Support
Liver Parameters	None	No Additional Support
Kidney Parameters	None	No Additional Support