DEMO DEMO

Name: DEMO DEMO
Date of Birth: 11-12-1990
Biological Sex: Male
Age: 35
Height: 64 inches
Weight: 160 lbs
Fasting:

Telephone: 000-000-0000
Street Address:
Email:

FINAL REPORT

Accession ID: 2933765722

Provider Information

Practice Name: DEMO CLIENT, MD
Provider Name: DEMO CLIENT, MD
Phlebotomist: 0

Telephone: 000-000-0000
Address: 3521 Leonard Ct, Santa Clara, CA 95054

Report Information

Current Result | Previous Result | In Control | Moderate | Risk

Specimen Information

Sample Type	Collection Time	Received Time	Report	Final Report Date
Metal Free Urine	2026-01-15 10:00 (PST)	2026-01-15 16:37 (PST)	Organic Acids - P2	2026-01-16 09:32 (PST)

SAMPLE

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TNP Test not performed

R&L Refer to risks and limitations at the end of report

Notes Refer to Lab notes at the end of the table

Organic Acids

INTRODUCTION

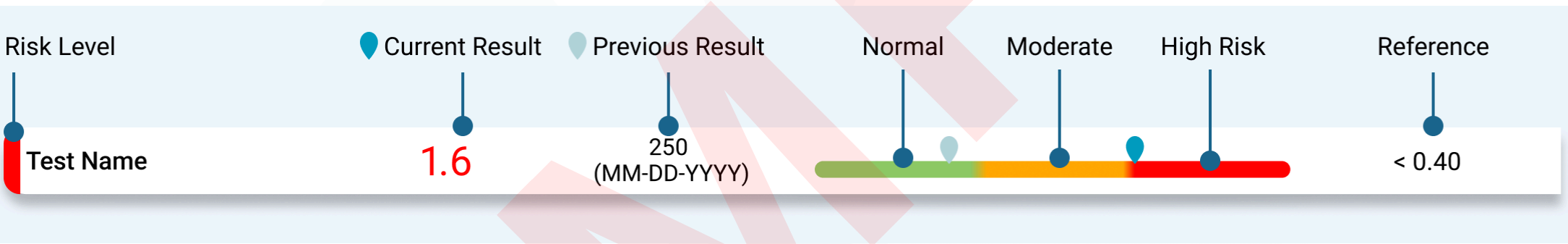
Vibrant Wellness is pleased to present the Organic Acids Panel to support healthy lifestyle choices in consultation with your healthcare provider. The Organic Acids Panel provides quantitative assessment of amino acid metabolites, detoxification and oxidative stress markers, mitochondrial function indicators, microbial metabolites, neurotransmitter and stress hormone metabolism, and nutritional status markers. Results are intended to be interpreted by healthcare providers to guide personalized wellness strategies informed by insights into metabolic function, biochemical balance, and cellular health.

Methodology

The Organic Acids panel uses gas chromatography tandem mass spectrometry (GC-MS/MS) for quantitative detection of organic acids in urine samples. Additionally, catecholamine metabolites and serotonin & kynurenine metabolites are measured using liquid chromatography tandem mass spectrometry methodology (LC-MS/MS). Urine creatinine is measured using a kinetic colorimetric assay based on the Jaffé method. All organic acids markers are reported as the quantitative result normalized to urine creatinine to account for urine dilution variations.

Interpretation of Report

The report begins with the summary page which lists only the organic acids whose levels are outside the normal reference range. Reference ranges have been established using a cohort of 1000 apparently healthy adults over 18 years of age, and pediatric reference ranges are not available . Following this section is a graphical representation of the AXON terminal and a summary of Krebs cycle including the results for the relevant analytes. This is followed by a complete list of the organic acids which are represented normalized to urine creatinine, in a bar graph form to enable a full overview along with the reference ranges. The level of the organic acid has a green (normal) or red (high/low) highlight around the cell indicating the corresponding result based on the reference range of each organic acid. Additionally, the previous value (if available) is also indicated to help check for improvements every time the test is ordered. The reference metric is listed to the right of the reference range. The previous and current result are listed to the left of the reference range. (result example illustration below)



Please note: It is important that you discuss any modifications to your diet, exercise, and nutritional supplementation with your healthcare provider before making any changes.

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Organic Acids - Summary

Amino Acid Metabolites

Amino Acid Metabolites	Current	Previous	Result	Reference
2-Oxoisovaleric (mmol/mol)	2.06	10.00 (05-17-2024)	0 2	≤2.0

2-oxoisovaleric acid is a product of valine catabolism. It is also called It is used as a marker for maple syrup urine disease, which is a condition that involves a mutation in the branched chain a-keto acid dehydrogenase complex (BCKDH), that's responsible for breaking down all branched chain amino acids. This enzyme requires Vitamin B1, Vitamin B2 (FAD), Vitamin B3 (NAD), Vitamin B5 (Coenzyme A) and Lipoic acid as nutrient cofactors. Elevated levels of stress can increase breakdown of muscle/proteins and result in higher levels of BCAA metabolites. 2-oxoisovaleric acid can then undergo a series of metabolic reactions to form succinyl CoA, which can enter the kreb's cycle and affect energy metabolism[ii]. Considerations may include sufficient intake of nutrient cofactors, including vitamin B1, B2, B3, B5 and alpha lipoic acid and limit intake of high amounts of branched chain amino acid in the diet or via supplementation.

Detoxification & Oxidative Stress

No markers are outside the normal reference range

Metabolism & Mitochondrial Function

Mitochondrial Function	Current	Previous	Result	Reference
3-Hydroxyglutaric acid (mmol/mol)	5.73	10.00 (05-17-2024)	0 4.9	≤4.9

3-Hydroxyglutaric acid (3HGA) is an organic acid that's elevated in the neurometabolic disorder involving a glutaryl-CoA dehydrogenase deficiency, leading to type 1 glutaric aciduria. This is an autosomal recessive defect in the metabolic pathway of lysine, hydroxylysine, and tryptophan. Clinical presentations early in life for this condition include macrocephalus, mild hypotonia, jittery, irritability and feeding difficulties with progression to more significant neurological symptoms over time. 3HGA has been shown to provoke a moderate impairment in brain energy metabolism[xvi]. It can also induce excitotoxic cellular injury by activating N-methyl-d-aspartate receptors. Intervention consideration may include a low-protein diet to restrict glucogenic amino acids (lysine, tryptophan, and hydroxylysine). Other considerations may include carnitine supplementation and aggressive treatment during acute episodes of intercurrent illnesses[xvii].

Microbial Metabolites

No markers are outside the normal reference range

Neurotransmitters & Stress Hormones

Serotonin & Kynurenine Metabolites & Ratios	Current	Previous	Result	Reference
Quinolinic acid/5-HIAA Ratio	0.18	10.00 (05-17-2024)	0 0.31 1.1	0.32-1.1

Quinolinic acid is a neuroactive product of the kynurenine pathway. Quinolinic acid acts as an NMDA receptor agonist and effectively inhibits reuptake of glutamate by astrocytes, contributing to excitotoxicity. Quinolinic acid has multiple neurotoxic impacts on the body, including production of reactive oxygen species, disruption of the blood brain barrier, destabilization of the cellular cytoskeleton, promotion of tau phosphorylation, impaired autophagy and enhanced inflammatory response from proinflammatory mediators in astrocytes. Under certain conditions such as stress or inflammation, L-tryptophan is shunted way from the serotonin pathway and towards the kynurenine pathway, which forms quinolinic acid and then synthesizes NAD+ as the end product.

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Organic Acids - Summary

Nutrition & Oxalates

Nutrients	Current	Previous	Result	Reference
Glutaric acid (Vitamin B2) (mmol/mol)	0.01	10.00 (05-17-2024)	0 0.02 0.38	0.03-0.38

Glutaric acid is an organic acid that's often used to assess riboflavin (Vitamin B2) levels. Glutaric acid is produced from the metabolism of amino acids, such as lysine and tryptophan. In order to convert glutaryl-CoA to Crotonyl-CoA, the enzyme glutaryl CoA dehydrogenase requires vitamin B2. Therefore, elevated levels may indicate a vitamin B2 deficiency. Chronically high levels of glutaric acid are associated with metabolic disorders, including glutaric aciduria type I, malonyl-CoA decarboxylase deficiency, and glutaric aciduria type III. Glutaric aciduria type I leads to the inability of the body to completely break down the amino acids lysine, hydroxylysine, and tryptophan due to a deficiency of mitochondrial glutaryl-CoA dehydrogenase. Intervention considerations may include restricting lysine and other amino acid intake, supplementing with vitamin B2 and carnitine.

Creatinine

Urine Creatinine	Current	Previous	Result	Reference
Urine Creatinine (mg/ml)	0.65	10.00 (05-17-2024)	0 0.24 2.16	0.25-2.16

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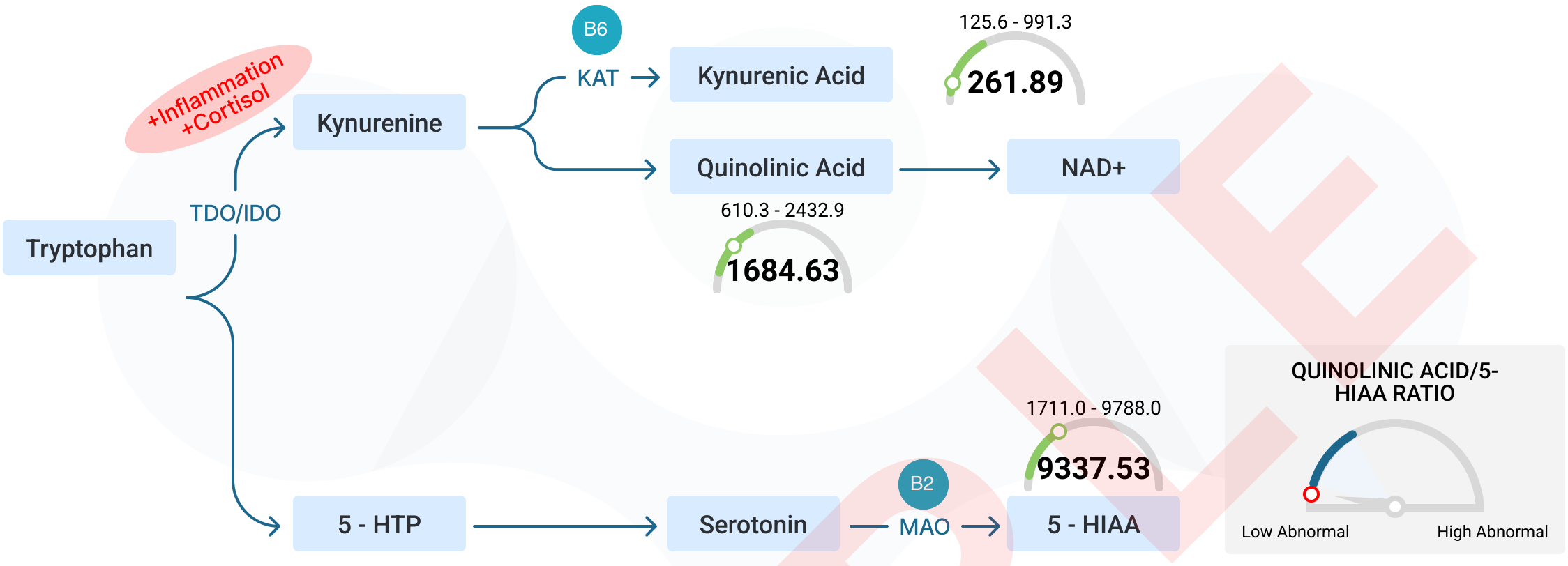
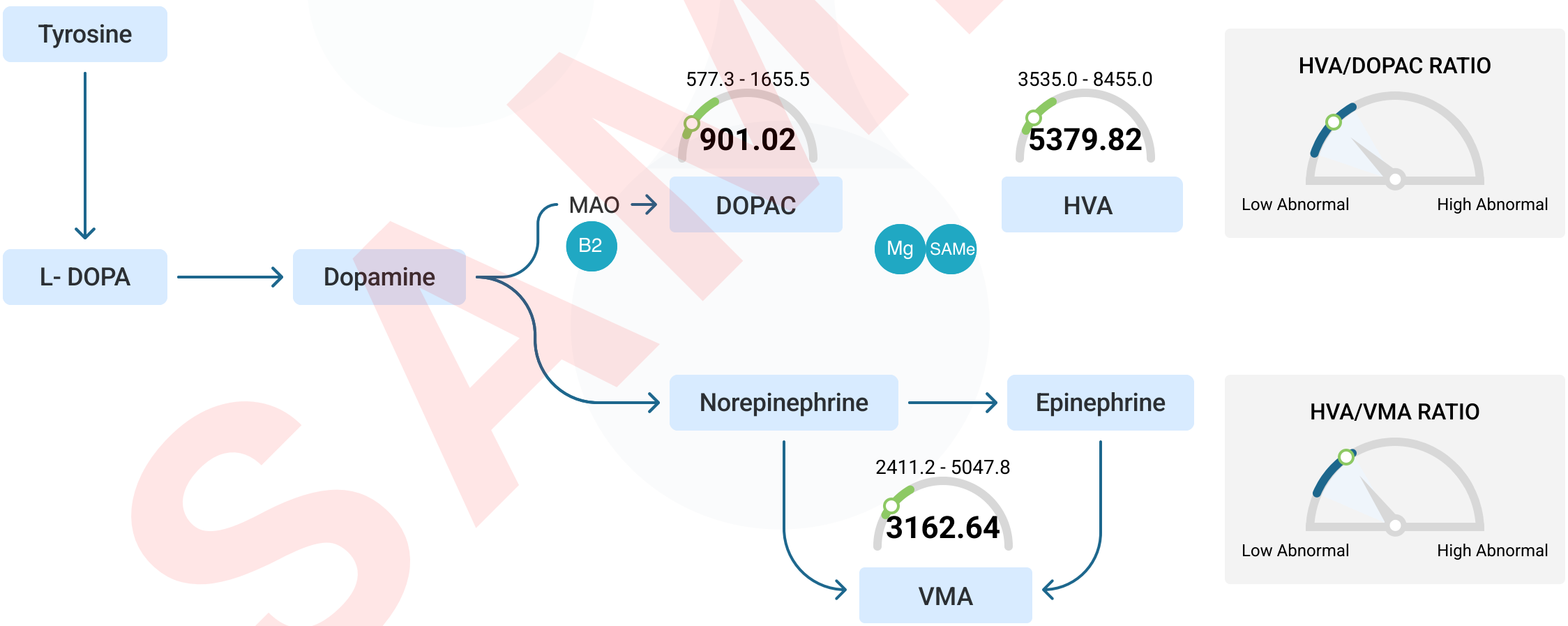
Organic Acids - Summary

AXON Terminal

Tryptophan metabolites & ratios



Catecholamine Metabolites & Ratios



Legend

High/Low | Moderate | In control | Current Value

NOTE

Inflammation and cortisol are inducers of the kynurenine pathway

ABBREVIATION KEY

5-HTP	*5-hydroxytryptophan*	**HVA**	*Homovanillic acid*	**MAO**	*Monoamine oxidase*
5-HIAA	*5-hydroxyindoleacetic acid*	**IDO**	*Indoleamine 2,3-dioxygenase*	**TDO**	*Tryptophan-2,3-dioxygenase*
COMT	*Catechol-O-methyltransferase*	**KAT**	*Kynurenine aminotransferase*	**VMA**	*Vanillylmandelic acid*
DOPAC	*3,4-dihydroxyphenylacetic acid*	**L-DOPA**	*L-3,4-dihydroxyphenylalanine*	**DBH**	*Dopamine Beta Hydroxylase*

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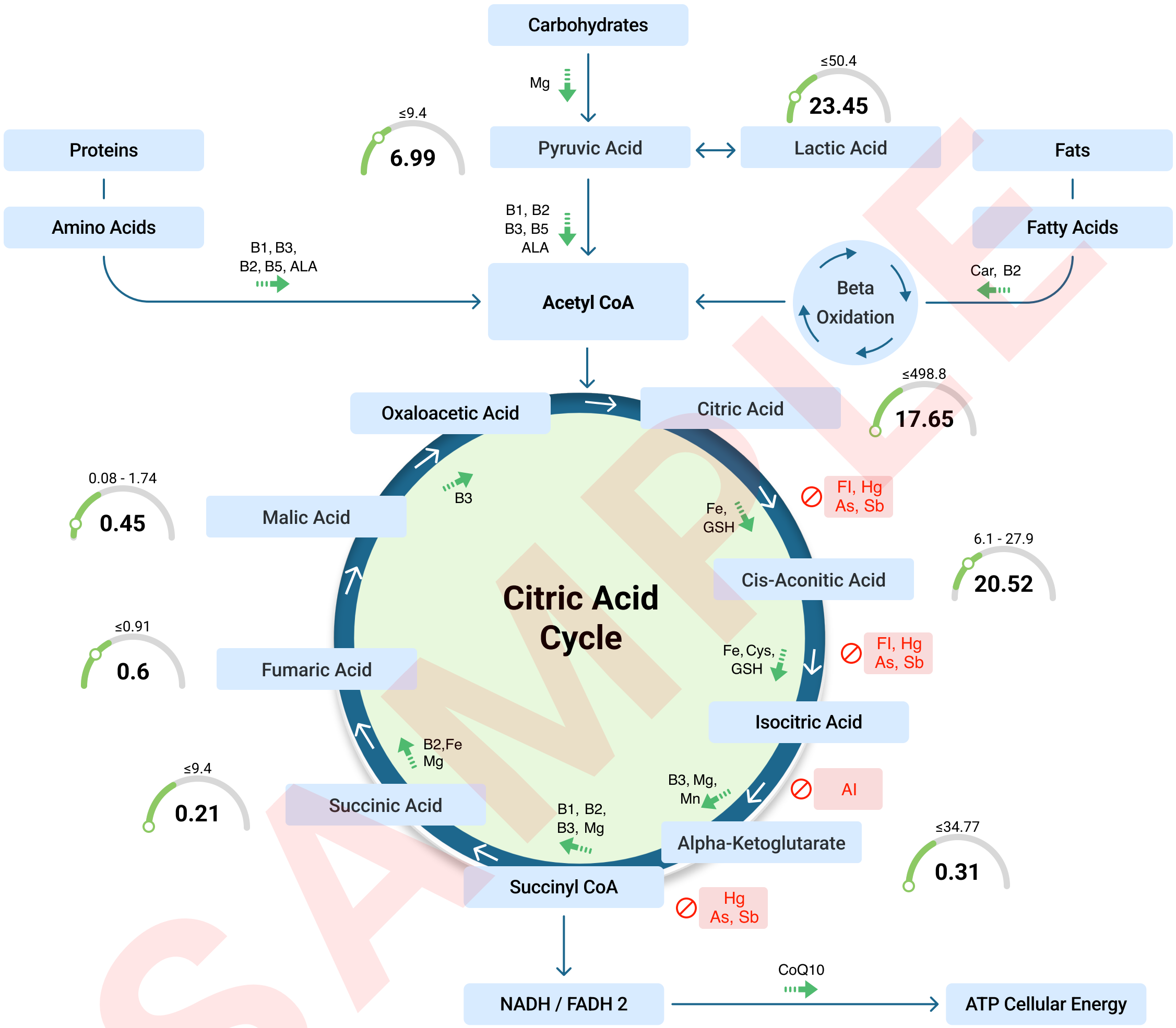
Organic Acids - Summary

Krebs Cycle At-A-Glance



Legend

High/Low · Moderate · In control · Current Value · Main Pathway · Cofactors · Inhibitors

ABBREVIATION KEY

Al	*Aluminum*	**B2**	*Riboflavin*	**GSH**	*Glutathione*
As	*Arsenic*	**B3**	*Niacin*	**Hg**	*Mercury*
ALA	*Alpha lipoic acid*	**B5**	*Pantothenic acid*	**Mg**	*Magnesium*
Car	*Carnitine*	**FAD**	*Flavin adenine dinucleotide*	**Mn**	*Manganese*
CoQ10	*Co Enzyme Q10*	**FADH2**	*Flavin adenine dinucleotide*	**NADH**	*Nicotinamide adenine dinucleotide*
Cys	*Cysteine*	**Fl**	*Fluoride*	**Sb**	*Antimony*
B1	*Thiamine*	**Fe**	*Iron*		

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Patient Name: **DEMO DEMO**
Date of Birth: **11-12-1990** Accession ID: **2933765722**
Service Date: **2026-01-15 10:00 (PST)**

Organic Acids - All Markers

Amino Acid Metabolites

Amino Acid Metabolites	Current	Previous	Result	Reference
2-Hydroxyisocaproic acid (mmol/mol)	0.34	10.00 (05-17-2024)	0 — 0.88	≤0.88
2-Hydroxyisovaleric acid (mmol/mol)	0.14	10.00 (05-17-2024)	0 — 0.4	≤0.4
2-Oxo-4-methiolbutyric acid (mmol/mol)	0.10	10.00 (05-17-2024)	0 — 0.18	≤0.18
2-Oxoisocaproic acid (mmol/mol)	0.38	10.00 (05-17-2024)	0 — 0.41	≤0.41
2-Oxoisovaleric (mmol/mol)	2.06	10.00 (05-17-2024)	0 — 2	≤2.0
3-Methyl-2-oxovaleric acid (mmol/mol)	2.32	10.00 (05-17-2024)	0 — 2.6	≤2.6
4-Hydroxyphenyllactic acid (mmol/mol)	0.38	10.00 (05-17-2024)	0 — 0.84	≤0.84
Homogentisic acid (mmol/mol)	0.31	10.00 (05-17-2024)	0 — 0.35	≤0.35
Malonic acid (mmol/mol)	9.29	10.00 (05-17-2024)	0 — 9.8	≤9.8
N-Acetylaspartic acid (mmol/mol)	0.73	10.00 (05-17-2024)	0 — 3.9	≤3.9
Phenyllactic acid (mmol/mol)	0.08	10.00 (05-17-2024)	0 — 0.21	≤0.21
Phenylpyruvic acid (mmol/mol)	1.45	10.00 (05-17-2024)	0 — 0.22 — 2.2	0.23-2.2

Detoxification & Oxidative Stress

Ammonia	Current	Previous	Result	Reference
Orotic acid (mmol/mol)	0.15	10.00 (05-17-2024)	0 — 0.07 — 0.52	0.08-0.52

Glutathione	Current	Previous	Result	Reference
N-Acetylcysteine acid (mmol/mol)	0.13	10.00 (05-17-2024)	0 — 0.26	≤0.26
Pyroglutamic acid (mmol/mol)	22.08	10.00 (05-17-2024)	0 — 10.1 — 32.4	10.14-32.45

Oxidative Stress	Current	Previous	Result	Reference
2-Hydroxybutyric acid (mmol/mol)	0.14	10.00 (05-17-2024)	0 — 0.05 — 1.58	0.06-1.58

Toxins	Current	Previous	Result	Reference
Mandelic acid (mmol/mol)	0.09	10.00 (05-17-2024)	0 — 0.24	≤0.24

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Date of Birth: **11-12-1990** Accession ID: **2933765722**
Service Date: **2026-01-15 10:00 (PST)**

Organic Acids - All Markers

Metabolism & Mitochondrial Function

Amino Acid Metabolites	Current	Previous	Result	Reference
4-Hydroxybutyric acid (mmol/mol)	2.32	10.00 (05-17-2024)	0 4.57	≤4.57

Fat & Ketones	Current	Previous	Result	Reference
3-Hydroxybutyric acid (mmol/mol)	3.27	10.00 (05-17-2024)	0 3.5	≤3.5
Acetoacetic acid (mmol/mol)	0.80	10.00 (05-17-2024)	0 9.6	≤9.6
Adipic acid (mmol/mol)	0.58	10.00 (05-17-2024)	0 0.03 3.9	0.04-3.9
Ethylmalonic acid (mmol/mol)	2.50	10.00 (05-17-2024)	0 0.46 2.74	0.47-2.74
Methylsuccinic acid (mmol/mol)	1.51	10.00 (05-17-2024)	0 0.12 2.14	0.13-2.14
Sebacic acid (mmol/mol)	0.14	10.00 (05-17-2024)	0 0.23	≤0.23
Suberic acid (mmol/mol)	0.23	10.00 (05-17-2024)	0 0.15 2.18	0.16-2.18

Glycolysis	Current	Previous	Result	Reference
Lactic acid (mmol/mol)	23.45	10.00 (05-17-2024)	0 50.4	≤50.4
Pyruvic acid (mmol/mol)	6.99	10.00 (05-17-2024)	0 9.4	≤9.4

Kreb's Cycle	Current	Previous	Result	Reference
Citric acid (mmol/mol)	17.65	10.00 (05-17-2024)	0 498	≤498.8
Cis-aconitic acid (mmol/mol)	20.52	10.00 (05-17-2024)	0 6.09 27.9	6.1-27.9
Alpha-ketoglutarate (mmol/mol)	0.31	10.00 (05-17-2024)	0 34.7	≤34.77
Succinic acid (mmol/mol)	0.21	10.00 (05-17-2024)	0 9.4	≤9.4
Fumaric acid (mmol/mol)	0.60	10.00 (05-17-2024)	0 0.91	≤0.91
Malic acid (mmol/mol)	0.45	10.00 (05-17-2024)	0 0.07 1.74	0.08-1.74

Mitochondrial Function	Current	Previous	Result	Reference
3-Hydroxyglutaric acid (mmol/mol)	5.73	10.00 (05-17-2024)	0 4.9	≤4.9
3-Methylglutaconic (mmol/mol)	2.87	10.00 (05-17-2024)	0 6.2	≤6.2
3-Methylglutaric acid (mmol/mol)	0.08	10.00 (05-17-2024)	0 0.75	≤0.75

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Date of Birth: **11-12-1990** Accession ID: **2933765722**
Service Date: **2026-01-15 10:00 (PST)**

Organic Acids - All Markers

Microbial Metabolites

Bacterial Metabolites	Current	Previous	Result	Reference
2-Hydroxyphenylacetic acid (mmol/mol)	0.59	10.00 (05-17-2024)	0 0.04 0.69	0.05-0.69
4-Hydroxybenzoic acid (mmol/mol)	0.46	10.00 (05-17-2024)	0 1.3	≤1.3
4-Hydroxyhippuric acid (mmol/mol)	10.74	10.00 (05-17-2024)	0 0.73 16.9	0.74-16.98
Dihydroxyphenylpropionic acid(DHPPA) (mmol/mol)	0.39	10.00 (05-17-2024)	0 0.44	≤0.44
Hippuric acid (mmol/mol)	193.03	10.00 (05-17-2024)	0 607	≤607.0

Clostridia Metabolites	Current	Previous	Result	Reference
3-Indoleacetic acid (IAA) (mmol/mol)	4.27	10.00 (05-17-2024)	0 12.6	≤12.67
4-Cresol (mmol/mol)	31.68	10.00 (05-17-2024)	0 74.8	≤74.88
4-Hydroxyphenylacetic acid (mmol/mol)	5.66	10.00 (05-17-2024)	0 20.1	≤20.1
3-(3-hydroxyphenyl)-3-hydroxypropionic acid(HPHPA) (mmol/mol)	18.43	10.00 (05-17-2024)	0 227	≤227.0

Fungal Metabolites	Current	Previous	Result	Reference
3-Oxoglutaric acid (mmol/mol)	0.14	10.00 (05-17-2024)	0 0.31	≤0.31
Arabinose (mmol/mol)	2.76	10.00 (05-17-2024)	0 30	≤30.0
Carboxycitric acid (mmol/mol)	3.63	10.00 (05-17-2024)	0 30	≤30.0
Citramalic acid (mmol/mol)	1.81	10.00 (05-17-2024)	0 3.8	≤3.8
Tartaric acid (mmol/mol)	1.23	10.00 (05-17-2024)	0 4.47	≤4.47
5-Hydroxymethyl-furoic acid (mmol/mol)	0.11	10.00 (05-17-2024)	0 13.4	≤13.4
Furan-2,5-dicarboxylic acid (mmol/mol)	14.43	10.00 (05-17-2024)	0 16.7	≤16.7
Furancarbonylglycine (mmol/mol)	0.16	10.00 (05-17-2024)	0 1.82	≤1.82
Tricarballyic acid (mmol/mol)	0.11	10.00 (05-17-2024)	0 0.5	≤0.5

Neurotransmitters & Stress Hormones

Catecholamine Metabolites & Ratios	Current	Previous	Result	Reference
Dihydroxyphenylacetic acid (DOPAC) (mcg/g)	901.02	10.00 (05-17-2024)	0 577 1655	577.3-1655.5

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Organic Acids - All Markers

Neurotransmitters & Stress Hormones

Catecholamine Metabolites & Ratios	Current	Previous	Result	Reference
Homovanillic acid (HVA) (mcg/g)	5379.82	10.00 (05-17-2024)	0 3534 8455	3535.0-8455.0
Vanillylmandelic acid (VMA) (mcg/g)	3162.64	10.00 (05-17-2024)	0 2411 5047	2411.2-5047.8
HVA/DOPAC Ratio	5.97	10.00 (05-17-2024)	0 2.59 8.3	2.6-8.3
HVA/VMA Ratio	1.70	10.00 (05-17-2024)	0 0.73 1.88	0.74-1.88

Serotonin & Kynurenine Metabolites & Ratios	Current	Previous	Result	Reference
5-Hydroxyindoleacetic acid (5-HIAA) (mcg/g)	9337.53	10.00 (05-17-2024)	0 1710 9788	1711.0-9788.0
Kynurenic acid (mcg/g)	261.89	10.00 (05-17-2024)	0 125 991	125.6-991.3
Quinolinic acid (mcg/g)	1684.63	10.00 (05-17-2024)	0 610 2432	610.3-2432.9
Quinolinic acid/5-HIAA Ratio	0.18	10.00 (05-17-2024)	0 0.31 1.1	0.32-1.1

Nutrition & Oxalates

Nutrients	Current	Previous	Result	Reference
3-Hydroxy-3-methylglutaric (mmol/mol)	14.76	10.00 (05-17-2024)	0 0.13 38.9	0.14-38.95
Ascorbic acid (Vitamin C) (mmol/mol)	151.95	10.00 (05-17-2024)	0 12.1 179	12.2-179.25
Glutaric acid (Vitamin B2) (mmol/mol)	0.01	10.00 (05-17-2024)	0 0.02 0.38	0.03-0.38
Methylcitric acid (Biotin) (mmol/mol)	2.41	10.00 (05-17-2024)	0 0.14 2.96	0.15-2.96
Methylmalonic acid (Vitamin B12) (mmol/mol)	1.56	10.00 (05-17-2024)	0 2.21	≤2.21
Pantothenic acid (Vitamin B5) (mmol/mol)	5.89	10.00 (05-17-2024)	0 9.91	≤9.91
Pyridoxic acid (Vitamin B6) (mmol/mol)	9.67	10.00 (05-17-2024)	0 34	≤34.0
Phosphoric acid (mmol/mol)	3850	10 (05-17-2024)	0 999 5000	1000.0-5000.0

Oxalates	Current	Previous	Result	Reference
Glyceric acid (mmol/mol)	7.40	10.00 (05-17-2024)	0 0.73 7.4	0.74-7.4
Glycolic acid (mmol/mol)	18.78	10.00 (05-17-2024)	0 12.5 128	12.6-128.7
Oxalic acid (mmol/mol)	7.43	10.00 (05-17-2024)	0 6.16 110	6.17-110.52

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Organic Acids - All Markers

Nutrition & Oxalates

Pyrimidines	Current	Previous	Result	Reference
Thymine (mmol/mol)	0.07	10.00 (05-17-2024)	0 — 0.63	≤0.63
Uracil (mmol/mol)	1.00	10.00 (05-17-2024)	0 — 9.4	≤9.4
Salicylates	**Current**	**Previous**	**Result**	**Reference**
2-Hydroxyhippuric acid (mmol/mol)	0.11	10.00 (05-17-2024)	0 — 1.42	≤1.42

SAMPLE

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SAMPLE

Risk and Limitations

Results reflect biological and analytical findings at the time of specimen collection and may vary between individuals. Reference ranges for laboratory-developed tests (LDT) were established using a healthy adult population and may not be representative of other specific populations (e.g. pediatric, pregnant, individuals with chronic conditions or from all ethnic backgrounds). They do not provide absolute levels at which the symptoms may occur and hence clinical correlation by the provider is recommended.

Results may be affected by pre-analytical variables related to specimen type, collection, handling, transport, and storage. Urine specimens may be impacted by factors such as improper collection technique, contamination, insufficient sample volume, delayed shipment, or improper storage conditions. Variability in urine concentration or dilution may also influence analyte measurements. Degradation or instability of certain analytes may occur if specimens are not collected, preserved, or shipped according to recommended guidelines, potentially affecting result accuracy or leading to a Test Not Performed (TNP). In some TNP cases, repeat testing may be recommended when clinically appropriate, although repeat testing may still not yield a reportable result if the underlying limitations persist.

Results obtained from random urine specimens reflect analyte levels at the time of collection and may vary based on hydration status, timing of exposure, and individual metabolic factors. While normalization methods such as urinary creatinine adjustment may be used to account for urine concentration, random urine testing may not represent long-term or cumulative exposure. Results should be interpreted in the context of clinical history, environmental factors, and other relevant information.

Results generated using laboratory testing methodologies are subject to inherent analytical limitations related to instrument performance, assay specifications of individual FDA-approved and laboratory-developed test (LDT) analytes included in the test panel, and methodological variability. As with all clinical laboratory testing, there is a small chance that the laboratory could report incorrect results.

The reported analytes and associated informational content are informed by scientific knowledge at the time of reporting, including peer-reviewed scientific publications, publicly available research, and guidance from recognized scientific and public health organizations. Interpretive content may be updated as scientific knowledge continues to evolve.

Vibrant does not diagnose, treat, or cure medical conditions and does not replace the care of a licensed medical practitioner or counselor, nor does Vibrant recommend self-diagnosis or self-medication. Depending on the nature of testing, individuals who receive moderate- or high-risk results may be advised to pursue confirmatory testing and appropriate medical follow-up. Vibrant assumes no liability for any loss, injury, or damages arising from the procurement, compilation, interpretation, delivery, or reporting of information contained in this report, nor from any decisions made or actions taken based on these results.

The supplement recommendations and dosage guidelines provided are intended for general informational purposes only and should not replace professional medical advice; final dosage decisions must be made in consultation with your healthcare provider. Vibrant disclaims any liability for adverse effects, outcomes, or consequences arising from the use of these suggestions.

SAMPLE