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: 2795895049

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

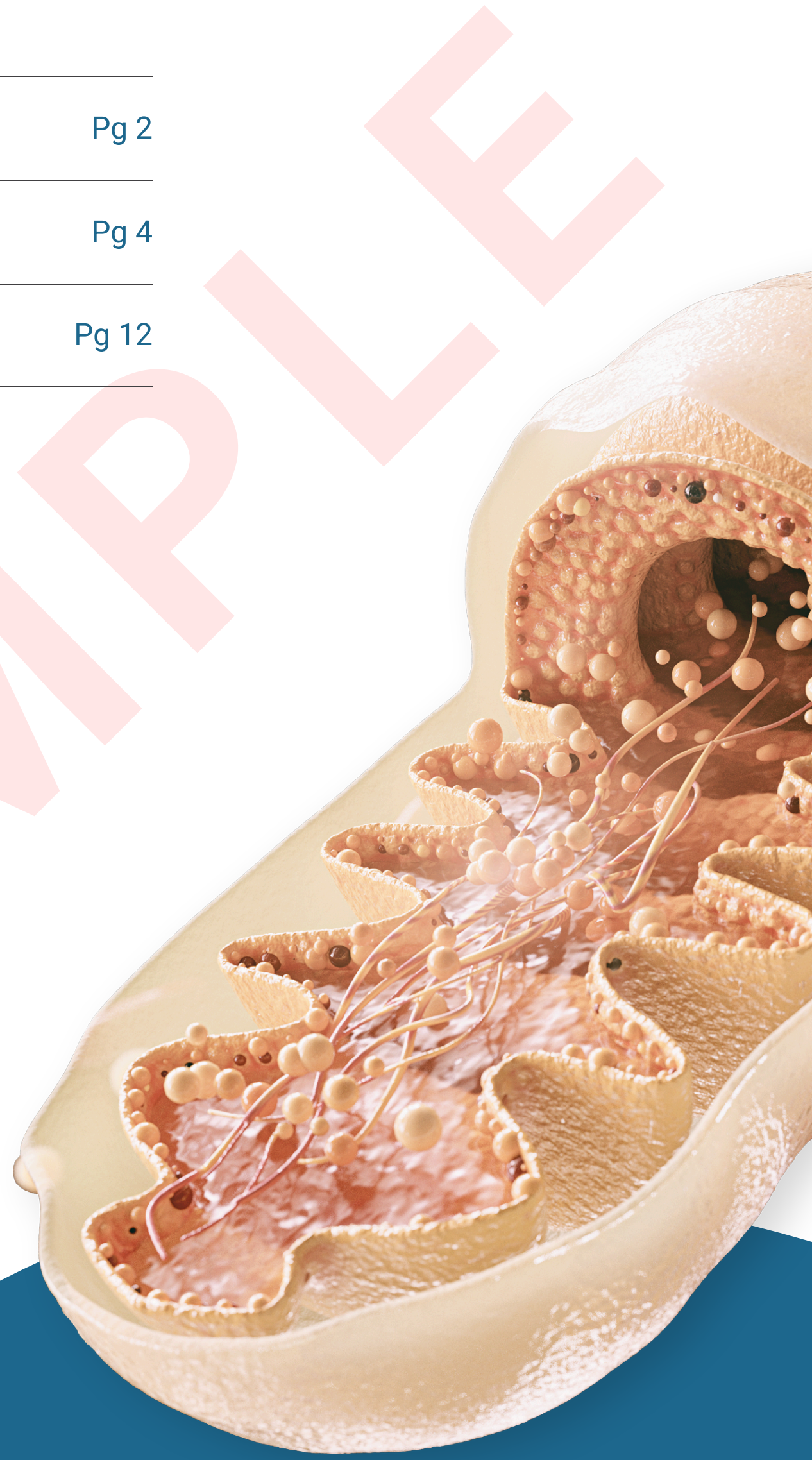
Sample Type	Collection Time	Received Time	Report	Final Report Date
Metal Free Urine	2026-01-15 10:00 (PST)	2026-01-15 16:36 (PST)	Oxidative Stress - P4 Organic Acids - P12	2026-01-16 09:29 (PST) 2026-01-16 09:29 (PST)

VibrantWellness
3521 Leonard Ct, Santa Clara, CA 95054
1-866-364-0963 | support@vibrant-america.com | www.vibrant-wellness.com

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

VibrantWellness

Cellular Zoomer



Patient Name: DEMO DEMO
Date of Birth: 11-12-1990 Accession ID: 2795895049
Service Date: 9999-12-31 15:59 (PST)

Cellular Zoomer - Summary

High

Oxidative Stress | Organic Acids

Test Name	Current	Previous	Result (75th / 95th)	Reference
2-Oxoisovaleric (mmol/mol)	2.06	10.00 (05-17-2024)	2	≤2.0
3-Hydroxyglutaric acid (mmol/mol)	5.73	10.00 (05-17-2024)	4.9	≤4.9
Quinolinic acid/5-HIAA Ratio	0.18	10.00 (05-17-2024)	0.31 / 1.1	0.32-1.1
Glutaric acid (Vitamin B2) (mmol/mol)	0.01	10.00 (05-17-2024)	0.02 / 0.38	0.03-0.38

Suboptimal

Oxidative Stress | Organic Acids

Test Name	Current	Previous	Result (75th / 95th)	Reference
Nε -carboxyethyllysine (CEL) (ug/g)	51.97		19.5 / 91	≤19.5
Nε-(carboxymethyl)lysine (CML) (ug/g)	17.74		15.87 / 70.3	≤15.87
8-Hydroxyguanine (ug/g)	39.72		16 / 49.4	≤16.0
Glutathione 4-hydroxynonenal (GS-HNE) (ug/g)	0.31		0.3 / 2.5	≤0.3
Malondialdehyde (ug/g)	82.24		72.87 / 163.53	≤72.87
3-Bromotyrosine (ug/g)	185.19		167.53 / 349.6	≤167.53
3-Chlorotyrosine (ug/g)	5.78		3.43 / 9.92	≤3.43
Dityrosine (ug/g)	3.68		1.31 / 5	≤1.31
8-Nitroguanine (ug/g)	34.68		33.45 / 107.47	≤33.45

Creatinine

No markers are outside the normal reference range

Oxidative Stress

INTRODUCTION

Vibrant Wellness is pleased to present to you, 'Oxidative Damage Markers', to help you make healthy lifestyle, dietary and treatment choices in consultation with your healthcare provider. It is intended to be used as a tool to encourage a general state of health and well-being.

The Vibrant 'Oxidative Damage Markers' Panel is a test to identify and quantify the level of a large set of oxidative stress damage markers. The panel is designed to evaluate oxidative stress by measuring the levels of damage caused by oxidative species resulting from the impact of ROS and RNS on lipids, DNA, RNA and proteins. Reference ranges were determined using urine samples from 1000 apparently healthy individuals.

Methodology:

The Vibrant Oxidative Damage Markers panel uses tandem mass spectrometry methodology (LC-MS/MS) for quantitative detection of damage markers in urine samples. Urine creatinine is measured using a kinetic colorimetric assay based on the Jaffé method. All damage 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 the damage markers whose levels are high or moderate based on the reference range. This is followed by a graphical representation of the overall oxidative damage score which is calculated using the results from all urine damage markers tested applied to a linear regression model. The score in green represents a normal score based on 50th percentile population, the score in yellow represents a moderate score based on 90th percentile and the score in red represent a high score based on the relatively healthy population. Additionally, the previous value is also indicated to help check for improvements every time the test is ordered. Following this section is the complete list of the damage markers results and their absolute levels are normalized with respect to Creatinine in a histogram format to enable a full overview along with the reference ranges. The level of the analyte with reference range is shown with three shades of color – Green, Yellow and Red. The result in green corresponds to 0th to 75th percentile indicates mild detection of the analyte. The result in yellow corresponds to 75th to 95th percentile indicates moderate detection of the analyte whereas the result in red corresponding to greater than 95th percentile indicates high detection of the analyte.

All contents provided in the report are purely for informational purposes only and should not be considered medical advice. Any changes based on the information should made in consultation with the clinical provider.

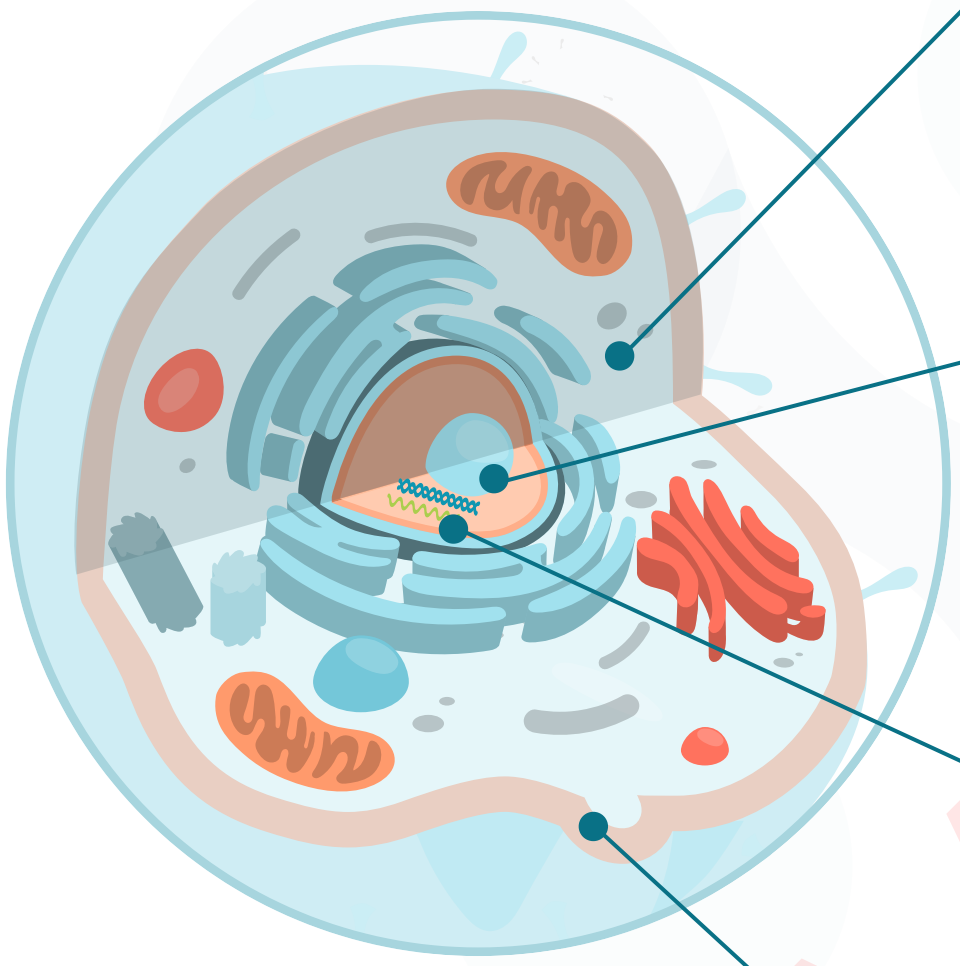
The Vibrant Wellness platform provides tools for you to track and analyze your general wellness profile. Testing for the Oxidative Stress panel is performed by Vibrant America, a CLIA certified lab CLIA#:05D2078809. Vibrant Wellness provides and makes available this report and any related services pursuant to the Terms of Use Agreement (the "Terms") on its website at www.vibrant-wellness.com. By accessing, browsing, or otherwise using the report or website or any services, you acknowledge that you have read, understood, and agree to be bound by these terms. If you do not agree to accept these terms, you shall not access, browse, or use the report or website. The statements in this report have not been evaluated by the Food and Drug Administration and are only meant to be lifestyle choices for potential risk mitigation. Please consult your healthcare provider for medication, treatment, or lifestyle management. This product is not intended to diagnose, treat, or cure any disease.

Please note:

Pediatric ranges have not been established for this test. It is important that you discuss any modifications to your diet, exercise, and nutritional supplementation with your healthcare provider before making any changes.

Oxidative Stress - Summary

Oxidative Stress Profile Summary



Protein Oxidation

- 3-Bromotyrosine
- 3-Chlorotyrosine
- Dityrosine
- Nε -carboxyethyllysine (CEL)
- Nε-(carboxymethyl)lysine (CML)

DNA Damage

- 8-Hydroxyguanine

RNA Damage

- 8-Nitroguanine

Lipid Peroxidation

- Glutathione 4-hydroxynonenal (GS-HNE)
- Malondialdehyde

Oxidative Stress - Summary

Oxidative Stress Biomarkers

Lipid Peroxidation	Current	Previous	Result (75th / 95th)	Reference
Glutathione 4-hydroxynonenal (GS-HNE) (ug/g)	0.31		0.3 / 2.5	≤2.5

Glutathione-conjugated 4-HNE (GS-HNE) serves as a marker of oxidative stress due to its formation as a consequence of lipid peroxidation, a prominent outcome of oxidative stress. 4-HNE, a toxic and stable end product of lipid peroxidation, is produced when cells are exposed to oxidative stressors. In response to elevated levels of oxidative stress, cells mount a defense mechanism to counteract the damaging effects of 4-HNE. One of the predominant mechanisms involves the conjugation of 4-HNE to glutathione (GSH) catalyzed by enzymes known as glutathione S-transferases (GSTs). This reaction results in the formation of GS-HNE. The presence of GS-HNE in cells signifies not only the occurrence of oxidative stress but also the cell's efforts to neutralize the harmful effects of 4-HNE. As such, the measurement of GS-HNE levels can provide valuable insights into the extent of oxidative stress and the cellular response to it, making it a useful biomarker for assessing oxidative stress-related conditions and their potential impact on cellular health.

Malondialdehyde (ug/g)	82.24		72.87 / 163.53	≤163.53

Malondialdehyde (MDA) is generated from the lipid peroxidation process (free radicals attack and breakdown lipids) by the peroxidation of membrane polyunsaturated fatty acids, including omega-3 (n-3) and omega-6 (n-6) fatty acids. Reactive oxygen species can cause the peroxidative breakdown of phospholipids that lead to the accumulation of MDA, thus, making MDA a biomarker of oxidative stress. MDA is also produced in the process of prostaglandin synthesis. Elevated MDA levels are seen to be associated with conditions like diabetes, sepsis, and coronary heart disease. MDA is also involved in the pathogenesis of conditions such as Alzheimer's, Parkinson's disease, cancer, diabetes, cardiovascular and liver diseases.

DNA Damage	Current	Previous	Result	Reference
8-Hydroxyguanine (ug/g)	39.72		0 / 16 / 49.4	≤49.4

Reactive oxygen species produced either endogenously or exogenously can attack nucleic acid in living cells. Guanine is the most easily oxidizable nucleic acid in the DNA. 8-Hydroxyguanine (8-OHG) is the oxidation product of guanine. It is an abundant lesion in genomic, mitochondrial, and telomeric DNA. It is considered to be a marker of oxidative damage in DNA. It is also seen to have mutagenic (capable of inducing genetic mutation) potential. The accumulation of 8-OHG is believed to gradually increase with age. As a result, 8-OHG has been associated with various age-associated pathological conditions, including tissue and organ dysfunctions, neurodegenerative and cardiovascular diseases, and aging processes.

RNA Damage	Current	Previous	Result	Reference
8-Nitroguanine (ug/g)	34.68		0 / 33.4 / 107	≤107.47

Elevated levels of nitric oxide (NO) can lead to nitrative stress. It is a phenomenon of cellular stress owing to the increased production and accumulation of damaging reactive nitrogen species (RNS). NO reacts with superoxide to form the highly reactive peroxynitrite. Peroxynitrite can then react with guanine (on the DNA) to produce nitrative the DNA lesion, 8-nitroguanine (8-NO2-G). 8-NO2-G is indicative of RNS-induced nitrative DNA damage. Chronic infection and inflammatory conditions can lead to elevated levels of 8-NO2-G. 8-NO2-G. is believed to be a mutagenic DNA lesion, which means it is capable of inducing genetic mutation. Owing to this, it is associated with various pathophysiological conditions, such as inflammation, neurodegenerative and cardiovascular diseases. Thus, urinary 8-NO2-G has risen as a marker of RNS-induced nitrative DNA damage.

Oxidative Stress - Summary

Oxidative Stress Biomarkers

Protein Oxidation Products	Current	Previous	Result (75th / 95th)	Reference
3-Bromotyrosine (ug/g)	185.19		167.53 / 349.6	≤349.6

3-Bromotyrosine (Br-Tyr) is a compound generated by the halogenation of tyrosine residues in plasma or tissue proteins. Br-Tyr synthesis is primarily catalyzed by the enzyme eosinophil peroxidase (EPO). Eosinophils, specialized white blood cells, play a central role in immune responses. When eosinophils become activated in response to various immune challenges, they release enzymes like eosinophil peroxidase (EPO). EPO is an enzyme that can generate reactive oxygen species (ROS) as part of its normal enzymatic activities during this process a subsequent production of Br-Tyr as a stable by-product occurs. Elevated levels of Br-Tyr in biological samples serve as a crucial marker of oxidative stress, particularly associated with eosinophil-driven oxidative processes. This unique characteristic positions Br-Tyr as a valuable indicator, shedding light on the extent of oxidative stress induced by eosinophil activation and its potential implications in various physiological and pathological conditions.

3-Chlorotyrosine (ug/g)	5.78		3.43 / 9.92	≤9.92

3-Chlorotyrosine is a significant marker of oxidative stress, particularly related to myeloperoxidase (MPO) activity—an enzyme found in white blood cells that plays a central role in immune response and inflammation. Elevated 3-chlorotyrosine levels indicate increased MPO-mediated oxidative stress, with potential implications for conditions like atherosclerosis, as well as various other inflammatory disorders. 3-Chlorotyrosine's uniqueness lies in its stability under heat and its resistance to artificial formation. These distinctive properties make it an excellent marker specifically for MPO-induced oxidation, providing a clear indicator of MPO activity and associated oxidative stress. A high concentration of 3-chlorotyrosine occurs in human atherosclerotic tissue, in dialysis patients, as a result of oxidative stress, and in cystic fibrosis patients who have high levels of myeloperoxidase.

Dityrosine (ug/g)	3.68		1.31 / 5	≤5

Post-translational modification (PTM) is a normal protein modification process occurring in cells. Many PTMs are dependent on environmental factors. Changes in the structure of proteins can occur when a cell is exposed to oxidative/nitrative stress. One such PTM is the change in protein–protein cross-linkage between two tyrosine molecules leading to the formation of dityrosine. This can be mediated by the oxidative species, hydroxyl radical and nitrative species, peroxynitrite and nitrosoperoxycarbonate leading to increased hydroxylation and nitration tyrosine. Thus, dityrosine is produced due to oxidative/nitrative stress under a variety of biological conditions. It may participate in lipid peroxidation which includes attacking and breaking down fats. Elevated dityrosine levels have been linked with pathologies such as eye cataracts, atherosclerosis, acute inflammation, and Alzheimer's disease. Thus, dityrosine has risen as an important biomarker for oxidative stress, especially for oxidatively modified proteins during UV and gamma-irradiation, aging, and exposure to oxygen free radicals, nitrogen dioxide, peroxynitrite, and lipid hydroperoxides.

Advanced Glycation Products	Current	Previous	Result	Reference
Nε -carboxyethyllysine (CEL) (ug/g)	51.97		0 / 19.5 / 91	≤91

Glycation is a spontaneous non-enzymatic reaction wherein free reducing sugars bind to free amino groups of proteins, DNA, and lipids. This results in the formation of advanced glycation end-products (AGE). Glycation and oxidative stress are closely linked, and they are together referred to as "glycoxidation". All steps of glycoxidation generate free radicals, some of them being common with the lipid peroxidation pathway. Owing to this, AGE has been considered a urinary biomarker of oxidative stress. The AGE product, Nε -carboxyethyllysine (CEL) is formed when methylglyoxal (formed from the oxidation of lipids and sugars) reacts with lysine. CEL interacts with AGE receptors (RAGEs) which may give rise to oxidative stress. This may even induce cellular dysfunction. Urinary levels of CEL can be used to monitor the degree of oxidative stress in the body system.

Patient Name: **DEMO DEMO**
Date of Birth: **11-12-1990** Accession ID: **2795895049**
Service Date: **2026-01-15 10:00 (PST)**

Oxidative Stress - Summary

Oxidative Stress Biomarkers

Advanced Glycation Products	Current	Previous	Result	Reference
Nε-(carboxymethyl)lysine (CML) (ug/g)	17.74		0 15.8 70.3	≤70.3

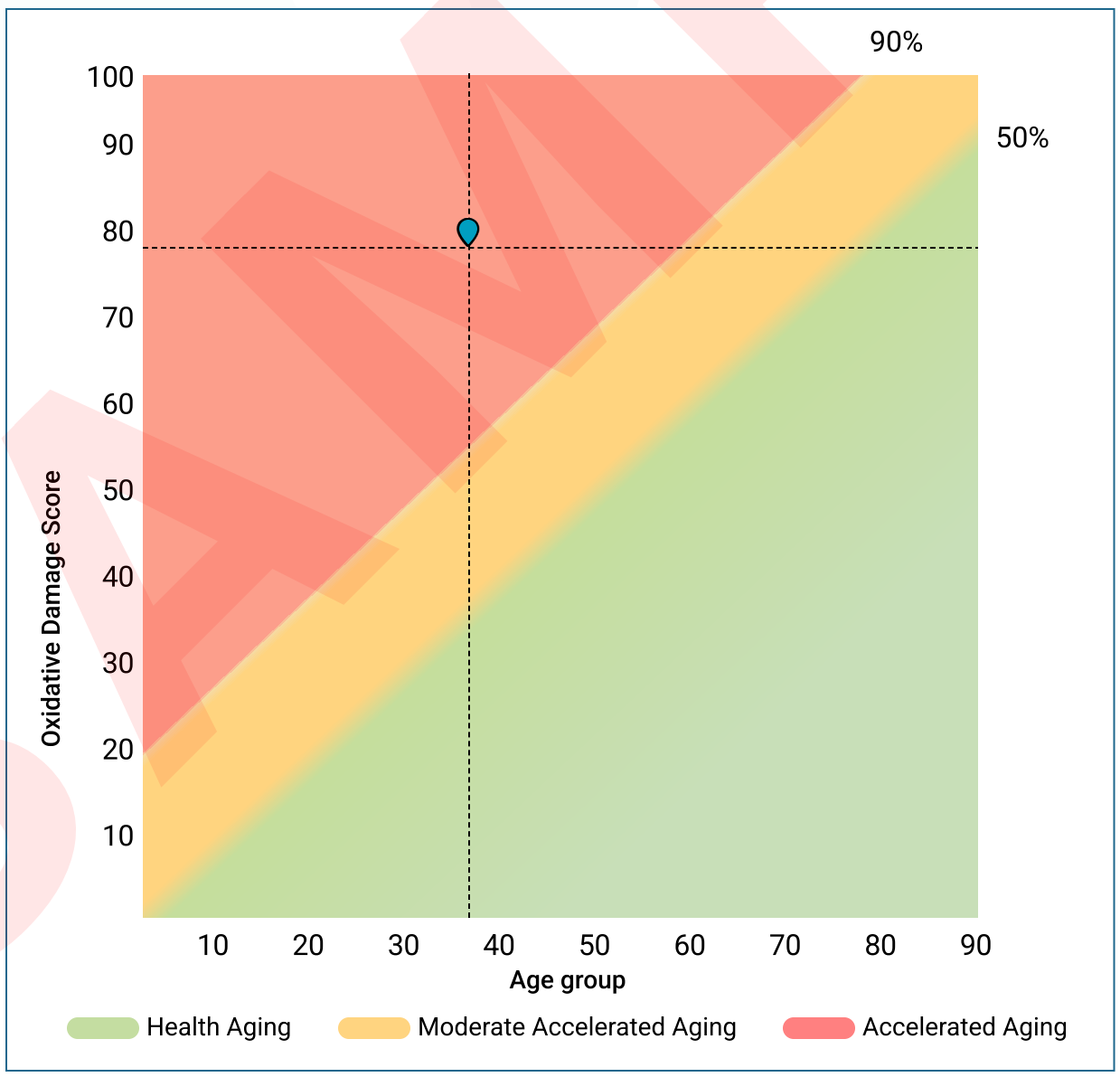
Glycation is a spontaneous non-enzymatic reaction wherein free reducing sugars bind to free amino groups of proteins, DNA, and lipids. This results in the formation of advanced glycation end-products (AGE). Glycation and oxidative stress are closely linked, and they are together referred to as "glycoxidation". All steps of glycoxidation generate free radicals, some of them being common with the lipid peroxidation pathway. Owing to this, AGE has been considered a urinary biomarker of oxidative stress. The AGE product, Nε-(caroboxymethyl)lysine (CML) is formed when glyoxal (formed from the oxidation of lipids and sugars) reacts with lysine. CML is believed to act as a chelator of redox-active copper which results in the increased oxidation of ascorbate, thereby the body's reducing antioxidant potential. Elevated levels of CML may exert stronger oxidizing potential which may lead to oxidative stress. Thus, urinary levels of CML can be used to monitor the degree of oxidative stress in the body system.

Creatinine

Test Name	Current	Previous	Result	Reference
Urine Creatinine (mg/ml)	0.65	10.00 (06-03-2024)	0 0.24 2.16	0.25-2.16

Oxidative Damage Score

Current Result Previous Result



Result

Your Given Age: 35

Your Oxidative Stress Profile looks similar to a ***79.51*** year old.

Oxidative Stress - Summary

Suggestions

Nutrients	Dosage	Purpose
Selenium	55 mcg/day	Selenium supplements reduce MDA levels by enhancing the activity of antioxidant enzymes, particularly glutathione peroxidase, which helps neutralize free radicals and prevent lipid peroxidation. Selenium supplements decrease 8-Hydroxyguanine by supporting the activity of selenoproteins, such as glutathione peroxidase, which reduce oxidative stress and limit DNA damage, including 8-Hydroxyguanine formation.
Curcumin	250 mg/day	Curcumin, a potent antioxidant, reduces MDA levels by scavenging free radicals and inhibiting lipid peroxidation, thereby decreasing the formation of MDA as a byproduct of oxidative stress. Curcumin supplements decrease 8-Nitroguanine by inhibiting the activity of inducible nitric oxide synthase (iNOS), reducing nitric oxide (NO) production, and preventing NO-mediated nitration of guanine in DNA, thereby lowering 8-Nitroguanine formation.
N-Acetyl Cysteine (NAC)	600 mg/day	N-acetyl cysteine (NAC) is known for its antioxidant properties and its role in supporting glutathione production, a crucial antioxidant enzyme in the body. While there is limited direct evidence linking NAC supplementation to the reduction of dityrosine, dityrosine formation is associated with oxidative stress and protein damage. NAC may indirectly help mitigate dityrosine formation by reducing oxidative stress. N-acetyl-L-cysteine (NAC) supplements decrease 8-Nitroguanine by providing a precursor for glutathione synthesis, a potent antioxidant, which detoxifies reactive nitrogen species and reduces oxidative damage to DNA, ultimately lowering 8-Nitroguanine levels.
Ascorbic acid	90 mg/day	Animal studies show ascorbic acid prevented tyrosine oxidation invitro.
Magnesium	400-420 mg/day	Magnesium supplementation decreases Malondialdehyde levels by acting as a cofactor for antioxidant enzymes, reducing oxidative stress and lipid peroxidation.
Vitamin E	22 IU/day	Vitamin E, a potent antioxidant, reduces MDA (Malondialdehyde) levels by neutralizing free radicals that would otherwise lead to lipid peroxidation, preventing the formation of MDA as a byproduct.

Patient Name: DEMO DEMO
Date of Birth: 11-12-1990 Accession ID: 2795895049
Service Date: 2026-01-15 10:00 (PST)

Oxidative Stress

Oxidative Stress Biomarkers

Lipid Peroxidation	Current	Previous	Result	Reference
11-β-Prostaglandin F2α (ug/g)	0.05		75th: 0.11, 95th: 0.4	≤0.4
15(R)-Prostaglandin F2α (ug/g)	<0.05		0.07, 0.22	≤0.22
8-iso-prostaglandin F2α (8-iso-PGF2α) (ug/g)	<0.05		0.1, 0.26	≤0.26
Glutathione 4-hydroxynonenal (GS-HNE) (ug/g)	0.31		0.3, 2.5	≤2.5
Malondialdehyde (ug/g)	82.24		72.87, 163.53	≤163.53

DNA Damage	Current	Previous	Result	Reference
8-Hydroxy-2 -deoxyguanosine (ug/g)	0.85		0, 1.14, 4	≤4
8-Hydroxyguanine (ug/g)	39.72		0, 16, 49.4	≤49.4
8-Hydroxyguanosine (ug/g)	24.87		0, 44.9, 95.3	≤95.3

RNA Damage	Current	Previous	Result	Reference
8-Nitroguanine (ug/g)	34.68		0, 33.4, 107	≤107.47
8-Nitroguanosine (ug/g)	431.76		0, 778, 2608	≤2608.9

Protein Oxidation Products	Current	Previous	Result	Reference
3-Bromotyrosine (ug/g)	185.19		75th: 167.53, 95th: 349.6	≤349.6
3-Chlorotyrosine (ug/g)	5.78		3.43, 9.92	≤9.92
Dityrosine (ug/g)	3.68		1.31, 5	≤5
Nitrotyrosine (ug/g)	65.21		91.32, 285.69	≤285.69

Advanced Glycation Products	Current	Previous	Result	Reference
Nε -carboxyethyllysine (CEL) (ug/g)	51.97		0, 19.5, 91	≤91
Nε-(carboxymethyl)lysine (CML) (ug/g)	17.74		0, 15.8, 70.3	≤70.3

Risk and Limitations

This test has been developed and its performance characteristics determined and validated by Vibrant America LLC., a CLIA certified lab. These assays have not been cleared or approved by the U.S. Food and Drug Administration. Vibrant Wellness provides additional contextual information on these tests and provides the report in more descriptive fashion.

Vibrant Oxidative Damage Markers panel do not demonstrate absolute positive and negative predictive values for any related illnesses. Reference ranges for the tests were established using healthy population and the values provided may not always correlate to the symptoms experienced by the tested individual. Clinical history must be incorporated into the diagnostic determination.

Oxidative Stress Damage Markers testing is performed at Vibrant America, a CLIA certified laboratory. Vibrant America has effective procedures in place to protect against technical and operational problems. However, such problems may still occur. Examples include failure to obtain the result for a specific analyte due to circumstances beyond Vibrant's control. Vibrant may re-test a sample to obtain these results but upon re-testing the results may still not be obtained. As with all medical laboratory testing, there is a small chance that the laboratory could report incorrect results. A tested individual may wish to pursue further testing to verify any results.

The information in this report is intended for educational purposes only. While every attempt has been made to provide current and accurate information, neither the author nor the publisher can be held accountable for any errors or omissions. Tested individuals may find their experience is not consistent with Vibrant's selected peer reviewed scientific research findings of relative improvement for study groups. The science in this area is still developing and many personal health factors affect diet and health. Since subjects in the scientific studies referenced in this report may have had personal health and other factors different from those of tested individuals, results from these studies may not be representative of the results experienced by tested individuals. Further, some recommendations may or may not be attainable, depending on the tested individual's physical ability or other personal health factors. A limitation of this testing is that many of these scientific studies may have been performed in selected populations only. The interpretations and recommendations are done in the context of these studies, but the results may or may not be relevant to tested individuals of different or mixed ethnicities.

Vibrant Wellness makes no claims as to the diagnostic or therapeutic use of its tests or other informational materials. Vibrant Wellness reports and other information do not constitute medical advice and are not a substitute for professional medical advice. Please consult your healthcare practitioner for questions regarding test results, or before beginning any course of medication, supplementation, or dietary changes.

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.

Organic Acids

INTRODUCTION

Vibrant Wellness is pleased to present to you, 'Organic acids', to help you make healthy lifestyle, dietary and treatment choices in consultation with your healthcare provider. It is intended to be used as a tool to encourage a general state of health and well-being.
Vibrant Organic acids is a test to identify and quantify the level of a large set of organic acids from urine. This panel is designed to provide a comprehensive assessment of metabolism products including evaluation of intestinal microbial overgrowth, detoxification, mitochondrial markers, neurotransmitter metabolism, glutathione status, fatty acid metabolism, inborn errors of metabolism.

Methodology:

The Vibrant 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 tandem mass spectrometry methodology (LC-MS/MS). Urine creatinine is measured using a kinetic colorimetric assay based on the Jaffé method. All Organic acids 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 individuals. 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 urinary 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 Vibrant Wellness platform provides tools for you to track and analyze your general wellness profile. Testing for the Organic acids panel is performed by Vibrant America, a CLIA certified lab CLIA#:05D2078809. Vibrant Wellness provides and makes available this report and any related services pursuant to the Terms of Use Agreement (the "Terms") on its website atwww.vibrant-wellness.com. By accessing, browsing, or otherwise using the report or website or any services, you acknowledge that you have read, understood, and agree to be bound by these terms. If you do not agree to these terms, you shall not access, browse, or use the report or website. The statements in this report have not been evaluated by the Food and Drug Administration and are only meant to be lifestyle choices for potential risk mitigation. Please consult your healthcare provider for medication, treatment, or lifestyle management. This product is not intended to diagnose, treat, or cure any disease.

Please note:

Pediatric ranges have not been established for this test. It is important that you discuss any modifications to your diet, exercise, and nutritional supplementation with your healthcare provider before making any changes.

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.

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.

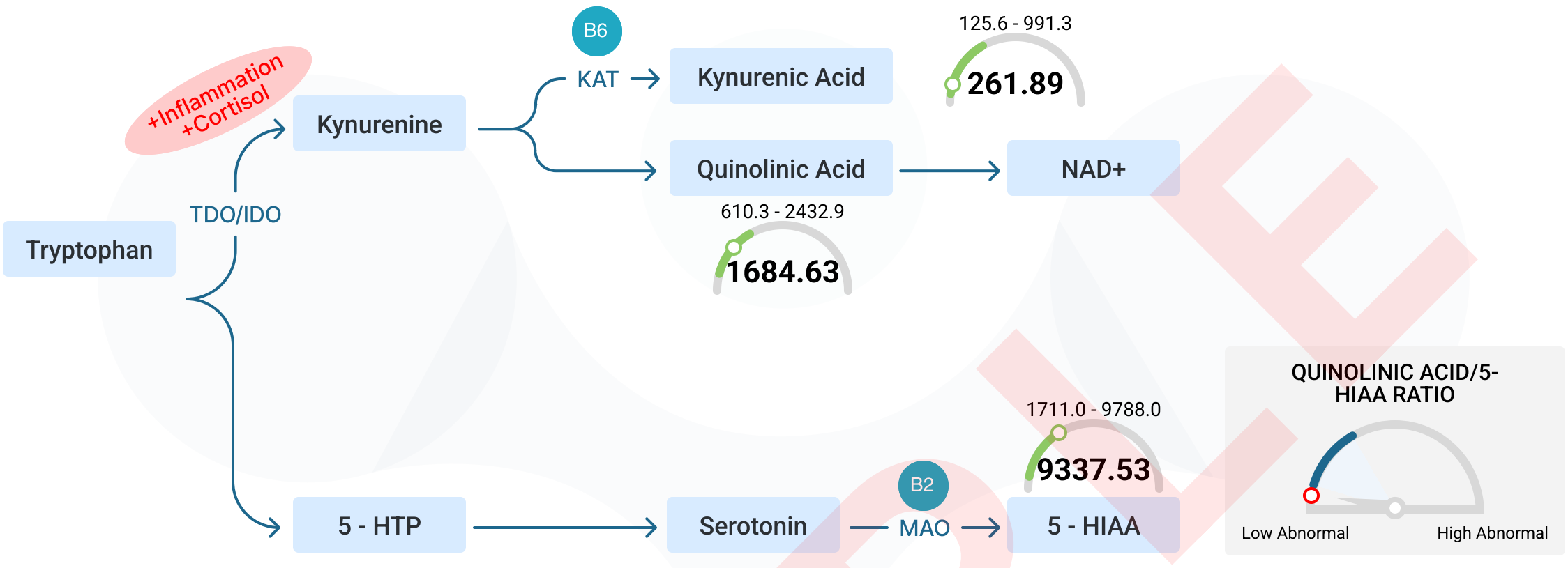
Creatinine

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

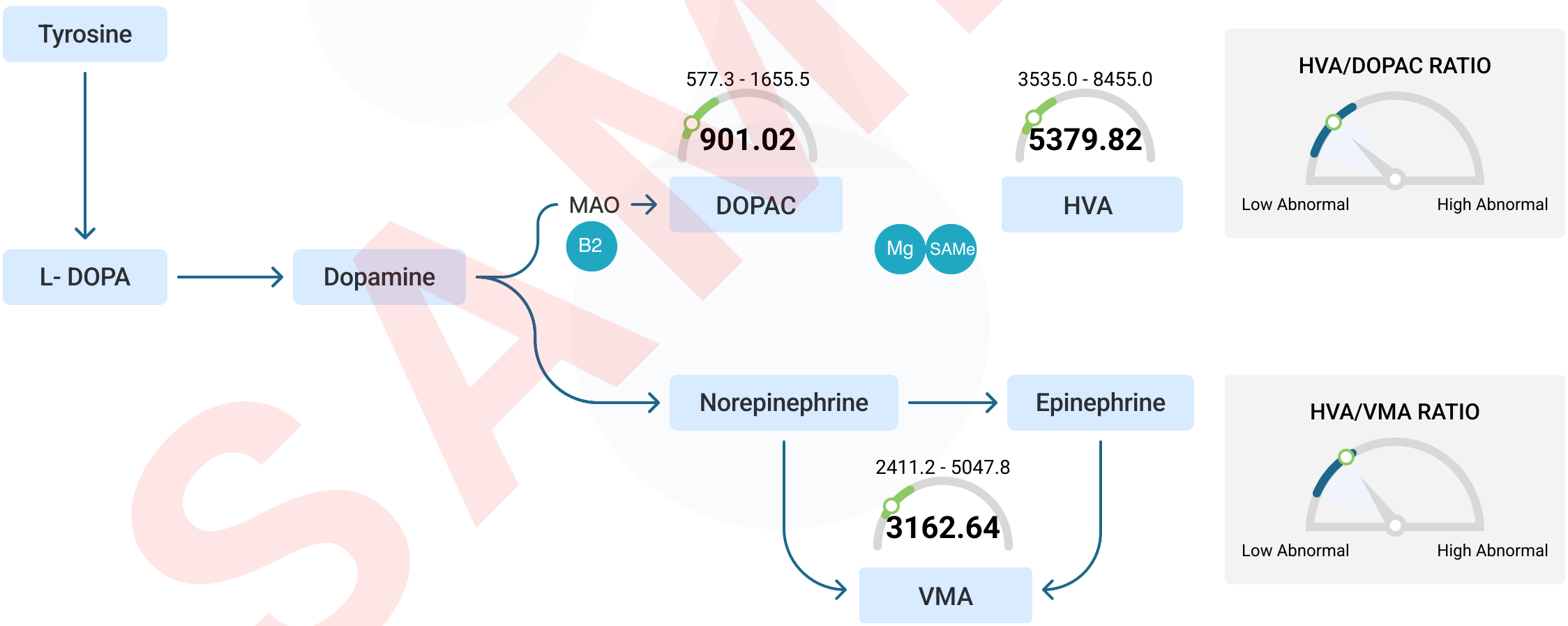
Organic Acids - Summary

AXON Terminal

Tryptophan metabolites & ratios



Catecholamine Metabolites & Ratios



Legend

High/Low | Moderate | In control | Current Value

NOTE

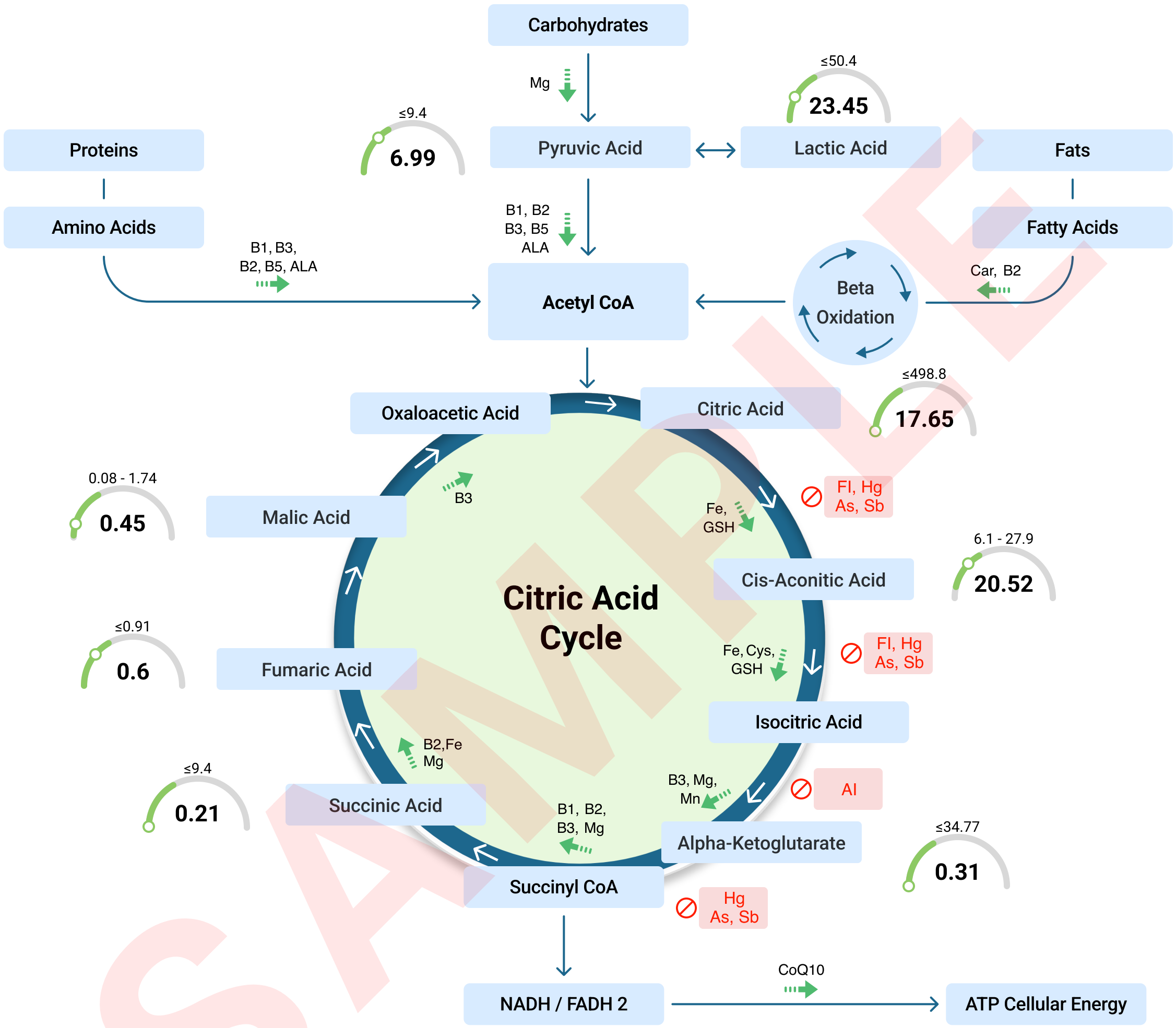
Inflammation and cortisol are inducers of the kynurenine pathway

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*

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*		

Patient Name: **DEMO DEMO**
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Organic Acids

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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Organic Acids

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

Organic Acids

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

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

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

Organic Acids

Risk and Limitations

This test has been developed and its performance characteristics determined and validated by Vibrant America LLC., a CLIA certified lab. These assays have not been cleared or approved by the U.S. Food and Drug Administration. Vibrant Wellness provides additional contextual information on these tests and provides the report in more descriptive fashion.

Organic acids panel does not demonstrate absolute positive and negative predictive values for any condition. Its clinical utility has not been fully established. Clinical history and current symptoms of the individual must be considered by the healthcare provider prior to any interventions. Test results should be used as one component of a healthcare provider's clinical assessment.

Organic acids panel testing is performed at Vibrant America, a CLIA certified laboratory. Vibrant America has effective procedures in place to protect against technical and operational problems. However, such problems may still occur. Examples include failure to obtain the result for a specific test due to circumstances beyond Vibrant's control. Vibrant may re-test a sample to obtain these results but upon re-testing the results may still not be obtained. As with all medical laboratory testing, there is a small chance that the laboratory could report incorrect results. A tested individual may wish to pursue further testing to verify any results.

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