

<b>Final Report Date:</b>	06-22-2020 15:11	<b>Specimen Collected:</b>	06-21-2020 15:11
<b>Accession ID:</b>	2006220003	<b>Specimen Received:</b>	06-22-2020 09:11

LAST NAME	FIRST NAME	GENDER	DATE OF BIRTH	ACCESSION ID	DATE OF SERVICE
PATIENT	TEST2	MALE	1998-01-09	2006220003	06-21-2020 15:11

PATIENT	PROVIDER
Name: TEST2 PATIENT Date of Birth: 1998-01-09 Gender: Male Age: 22 <hr/> Fasting: FASTING	Practice Name: Vibrant IT4 Practice Provider Name: Demo Client, DDD (999994) Street Address: TEST STREET City: TEST CITY State: KY Zip #: 42437 Telephone #: Fax #: 000-000-0000

**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.

**The 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.

**Interpretation of Report:** The report begins with the summary page which lists only the organic acids whose levels are high in the reference range. Following this section is the complete list of the organic acids which are represented normalized to urinary creatinine, in a tabular form to enable a full overview along with the reference ranges. The level of the organic acid has a green or red highlight around the cell indicating Mild or High risk relative to the corresponding organic acid.. Additionally, the previous value 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 at [www.vibrant-wellness.com](http://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 physician/dietitian for medication, treatment, or lifestyle management. This product is not intended to diagnose, treat, or cure any disease.

Please Note - It is important that you discuss any modifications to your diet, exercise and nutritional supplementation with your physician before making any changes.

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## Organic Acids Summary

### Organic Acids - Abnormal

Test Name	In Control	High	Current Level	Previous Level 06/22/2020
Tricarballic acid (mmol/mol)	≤0.50	≥0.51	1.20	0.49
3-Indoleacetic acid (IAA) (mmol/mol)	≤12.67	≥12.68	22.00	9.00
Pyruvic acid (mmol/mol)	≤9.40	≥9.41	12.00	5.30
Citric acid (mmol/mol)	≤498.80	≥498.81	950.00	80.00
Phosphoric acid (mmol/mol)	1000~5000	≤999 ≥5001	68	75
Quinolinic acid/5-HIAA Ratio	0.32~1.10	≤0.31 ≥1.11	0.29	0.39

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## Organic Acids Complete List

### Yeast and Fungal Markers

Test Name (mmol/mol)	In Control	High	Current Level	Previous Level (06/22/2020)
Citramalic acid	≤3.80	≥3.81	3.20	2.60
5-Hydroxymethyl-furoic acid	≤13.40	≥13.41	0.48	12.00
3-Oxoglutaric acid	≤0.31	≥0.32	0.14	0.03
Furan-2,5-dicarboxylic acid	≤16.70	≥16.71	3.30	12.00
Furancarboxylglycine	≤1.82	≥1.83	0.22	0.86
Tartaric acid	≤4.47	≥4.48	1.70	2.80
Arabinose	≤30.00	≥30.01	0.39	15.00
Carboxycitric acid	≤30.00	≥30.01	28.00	2.50
Tricarballic acid	≤0.50	≥0.51	1.20	0.49

#### Comments

#### Tricarballic acid

Tricarballic acid is an indicator of elevated yeast/fungal overgrowth in the GI tract. It is a chemical byproduct released from fumonisins during passage through the gastrointestinal tract. Fumonisin are fungal toxins produced primarily by *F. verticillioides*. Elevated levels can be caused by the intake of corn or corn-based food contaminated with fumonisins. Multi-strain probiotics can be supplemented to improve the condition. Consider the mycotoxins test to check for other toxin exposures that could co-occur.

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## Bacterial Markers

Test Name (mmol/mol)	In Control	High	Current Level	Previous Level (06/22/2020)
Hippuric acid	≤607.00	≥607.01	380.00	370.00
2-Hydroxyphenylacetic acid	0.05~0.69	≤0.04 ≥0.70	0.64	0.22
4-Hydroxybenzoic acid	≤1.30	≥1.31	0.86	0.42
4-Hydroxyhippuric acid	0.74~16.98	≤0.73 ≥16.99	16.00	16.00
DHPPA (dihydroxyphenylpropionic acid)	≤0.44	≥0.45	0.41	0.35

## Clostridia Bacterial Markers

Test Name (mmol/mol)	In Control	High	Current Level	Previous Level (06/22/2020)
4-Hydroxyphenylacetic acid	≤20.10	≥20.11	16.00	7.20
HPHPA (3-(3-hydroxyphenyl)-3-hydroxypropionic acid)	≤227.00	≥227.01	11.00	5.70
4-Cresol	≤74.88	≥74.89	55.00	69.00
3-Indoleacetic acid (IAA)	≤12.67	≥12.68	22.00	9.00

### Comments

#### 3-Indoleacetic acid (IAA)

3-Indoleacetic acid (IAA) is a breakdown product of tryptophan metabolism. Higher levels of IAA are associated with bacteria from Clostridia species including *C. stricklandii*, *C. lituseburense*, *C. subterminale*, and *C. putrefaciens*. IAA can be found in *Agrobacterium*, *Azospirillum*, *Bacillus*, *Bradyrhizobium*, *Clostridium*, *Enterobacter*, *Pantoea*, *Pseudomonas*, *Rhizobium*. IAA frequently occurs at low levels in urine and has been found in elevated levels in the urine of patients with phenylketonuria. IAA has also been identified as a uremic toxin according to the European Uremic Toxin Working Group.

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### Oxalate Metabolites

Test Name (mmol/mol)	In Control	High	Current Level	Previous Level (06/22/2020)
Glyceric acid	0.74~7.40	≤0.73 ≥7.41	2.60	2.40
Glycolic acid	12.60~128.70	≤12.59 ≥128.71	31.00	18.00
Oxalic acid	6.17~110.52	≤6.16 ≥110.53	110.00	75.00

### Glycolytic Cycle Metabolites

Test Name (mmol/mol)	In Control	High	Current Level	Previous Level (06/22/2020)
Lactic acid	≤50.40	≥50.41	4.00	0.50
Pyruvic acid	≤9.40	≥9.41	12.00	5.30

#### Comments

#### Pyruvic acid

Pyruvic acid is an intermediate compound in the metabolism of carbohydrates, proteins, and fats. Pyruvic acid is found to be associated with Fumarase deficiency, which is an inborn error of metabolism. It is also a metabolite of *Corynebacterium*. Elevated levels of pyruvic acid are associated with vigorous exercise, bacterial overgrowth of the GI tract, shock, poor perfusion, B-vitamin deficiency, mitochondrial dysfunction or damage, and anemia, among others. High pyruvic acid indicates the possibility of an inborn error of metabolism when the value exceeds 100 mmol/mol creatinine.

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## Mitochondrial Markers - Krebs Cycle Metabolites

Test Name (mmol/mol)	In Control	High	Current Level	Previous Level (06/22/2020)
Succinic acid	≤9.40	≥9.41	1.50	0.39
Fumaric acid	≤0.91	≥0.92	0.76	0.40
Malic acid	0.08~1.74	≤0.07 ≥1.75	1.70	1.60
2-Oxoglutaric acid	≤34.77	≥34.78	17.00	1.90
Aconitic acid	6.10~27.90	≤6.09 ≥27.91	20.00	17.00
Citric acid	≤498.80	≥498.81	950.00	80.00

### Comments

#### Citric acid

Citric acid is used to help evaluate the risk for kidney stones or to help diagnose other health conditions. Low levels of citric acid are risk factors for kidney stones. High levels of citric acid may be due to increased intake of citric acid-containing foods or result from intestinal yeast-producing citric acid, or perhaps inhibiting the human citric acid cycle. Increased citric acid may also indicate depletion of glutathione, which is required for the enzyme, aconitase to metabolize both aconitic and citric acids.

## Mitochondrial Markers - Amino Acid Metabolites

Test Name (mmol/mol)	In Control	High	Current Level	Previous Level (06/22/2020)
3-Methylglutaric acid	≤0.75	≥0.76	0.32	0.54
3-Methylglutaconic	≤6.20	≥6.21	1.20	2.50
3-Hydroxyglutaric acid	≤4.90	≥4.91	1.30	1.60

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### Pyrimidine Metabolites - Folate Metabolism

Test Name (mmol/mol)	In Control	High	Current Level	Previous Level (06/22/2020)
Uracil	≤9.40	≥9.41	5.10	3.10
Thymine	≤0.63	≥0.64	0.14	0.40

### Ketone and Fatty Acid Oxidation

Test Name (mmol/mol)	In Control	High	Current Level	Previous Level (06/22/2020)
3-Hydroxybutyric acid	≤3.50	≥3.51	0.12	1.40
Acetoacetic acid	≤9.60	≥9.61	1.70	0.49
4-Hydroxybutyric acid	≤4.57	≥4.58	0.64	4.50
Adipic acid	0.04~3.90	≤0.03 ≥3.91	1.70	2.00
Suberic acid	0.16~2.18	≤0.15 ≥2.19	0.44	1.80
Sebacic acid	≤0.23	≥0.24	0.01	0.09
Ethylmalonic acid	0.47~2.74	≤0.46 ≥2.75	1.60	1.30
Methylsuccinic acid	0.13~2.14	≤0.12 ≥2.15	1.40	1.10

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## Nutritional Markers

Test Name (mmol/mol)	In Control	High	Current Level	Previous Level (06/22/2020)
Methylmalonic acid (Vitamin B12)	≤2.21	≥2.22	2.10	0.73
Pyridoxic acid (Vitamin B6)	≤34.00	≥34.01	25.00	23.00
Pantothenic acid (Vitamin B5)	≤9.91	≥9.92	8.30	6.80
Glutaric acid (Vitamin B2)	0.03~0.38	≤0.02 ≥0.39	0.32	0.19
Ascorbic acid (Vitamin C)	12.20~179.25	≤12.19 ≥179.26	170.00	160.00
3-Hydroxy-3-methylglutaric	0.14~38.95	≤0.13 ≥38.96	25.00	16.00
N-Acetylcysteine acid	≤0.26	≥0.27	0.20	0.18
Methylcitric acid (Vitamin H)	0.15~2.96	≤0.14 ≥2.97	0.60	1.60

## Glutathione

Test Name (mmol/mol)	In Control	High	Current Level	Previous Level (06/22/2020)
Pyroglutamic acid	10.14~32.45	≤10.13 ≥32.46	24.00	30.00
2-Hydroxybutyric acid	0.06~1.58	≤0.05 ≥1.59	1.30	0.87



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### Ammonia Excess

Test Name (mmol/mol)	In Control	High	Current Level	Previous Level (06/22/2020)
Orotic acid	0.08~0.52	≤0.07 ≥0.53	0.45	0.32

### Aspartame, Salicylates, or GI bacteria

Test Name (mmol/mol)	In Control	High	Current Level	Previous Level (06/22/2020)
2-Hydroxyhippuric acid	≤1.42	≥1.43	1.10	1.10

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## Amino Acid Metabolites

Test Name (mmol/mol)	In Control	High	Current Level	Previous Level (06/22/2020)
2-Hydroxyisovaleric acid	≤0.40	≥0.41	0.02	<0.01
2-Oxoisovaleric	≤2.00	≥2.01	1.60	1.00
3-Methyl-2-oxovaleric acid	≤2.60	≥2.61	2.20	0.11
2-Hydroxyisocaproic acid	≤0.88	≥0.89	0.35	0.42
2-Oxoisocaproic acid	≤0.41	≥0.42	0.04	0.36
2-Oxo-4-methylbutyric acid	≤0.18	≥0.19	0.14	0.15
Mandelic acid	≤0.24	≥0.25	0.21	0.19
Phenyllactic acid	≤0.21	≥0.22	0.14	0.06
Phenylpyruvic acid	0.23~2.20	≤0.22 ≥2.21	2.10	0.88
Homogentisic acid	≤0.35	≥0.36	0.18	0.17
4-Hydroxyphenyllactic acid	≤0.84	≥0.85	0.29	0.82
N-Acetylaspartic acid	≤3.90	≥3.91	2.90	3.50
Malonic acid	≤9.80	≥9.81	5.20	8.00

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### Mineral Metabolites

Test Name (mmol/mol)	In Control	High	Current Level	Previous Level (06/22/2020)
Phosphoric acid	1000~5000	≤999 ≥5001	68	75

 **Comments**

#### Phosphoric acid

Phosphate plays important roles in building teeth and bones together with mineral calcium. It is also indicative of nerve functions and kidney status. Urinary test can provide insights into kidney problems and endocrine disorders. High levels of phosphate can be from processed foods such as sodas, candy, ice cream, chocolate, mayonnaise, frozen pizza, commercially baked goods, and meats. Other severe diseases that may contribute to elevation include hyperparathyroidism, renal tubular damage, and metabolic acidosis. Low levels of phosphate can be due to vitamin D deficiency.

### Urine Creatinine

Test Name (mmol/mol)	In Control	High	Current Level	Previous Level (06/22/2020)
Creatinine	0.25~2.16	≤0.24 ≥2.17	0.31	0.27

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### Neurotransmitter Metabolism - Phenylalanine and Tyrosine Metabolites

Test Name (mcg/g)	In Control	High	Current Level	Previous Level (06/22/2020)
Homovanillic acid (HVA)	3535.00~8455.00	≤3534.99 ≥8455.01	4600.00	4800.00
Vanillylmandelic acid (VMA)	2411.20~5047.80	≤2411.19 ≥5047.81	4000.00	4000.00
Dihydroxyphenylacetic acid (DOPAC)	577.30~1655.50	≤577.29 ≥1655.51	770.00	880.00

### Neurotransmitter Metabolism - Tryptophan Metabolites

Test Name (mcg/g)	In Control	High	Current Level	Previous Level (06/22/2020)
5-Hydroxyindoleacetic acid (5-HIAA)	1711.00~9788.00	≤1710.99 ≥9788.01	3500.00	4100.00
Quinolinic acid	610.30~2432.90	≤610.29 ≥2432.91	1000.00	1600.00
Kynurenic acid	125.60~991.30	≤125.59 ≥991.31	620.00	710.00

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## Neurotransmitter Metabolism - Ratios

Test Name	In Control	High	Current Level	Previous Level (06/22/2020)
Quinolinic acid/5-HIAA Ratio	0.32~1.10	≤0.31 ≥1.11	0.29	0.39
HVA/VMA Ratio	0.74~1.88	≤0.73 ≥1.89	1.10	1.20
HVA/DOPAC Ratio	2.60~8.30	≤2.59 ≥8.31	5.90	5.40

### Comments

#### Quinolinic acid/5-HIAA Ratio

A high ratio of quinolinic acid to the metabolite 5-hydroxyindole-acetic acid indicates excessive inflammation, which will age and damage the brain. High levels of these markers could be due to recurrent infections, including persistent infections in the gut, immune overstimulation, too high tryptophan intake, excessive adrenal production of cortisol (stress), sleep deprivation, and frequent exposure to phthalates (chemical used in plastics and many household items).

## Risk and Limitations

This test has been developed and its performance characteristics determined 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 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 physician's clinical assessment.

Organic acids panel testing is performed at Vibrant America, a CLIA certified laboratory and utilizes ISO-13485 developed technology. 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 organic acid due to circumstances beyond Vibrant's control. Vibrant may re-test a sample in order 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.

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