

## ORGANIC ACIDS IN URINE

In this test, abnormalities in metabolism of organic acids are measured. The test provides information about metabolites of neurotransmitters, amino acids, fatty acids, energy production (citric acid cycle) and the functioning of certain vitamins and minerals. Besides metabolites of human origin, also certain toxic metabolites of pathogenic micro-organisms that live in the human gut are measured (e.g., candida and clostridia). The following metabolites are determined (only as a panel):

### Yeast/ Fungal markers

Citramalic  
5-hydroxymethyl-2 furoic  
3-oxoglutaric  
Furan -2,5-dicarboxylic  
Furancarboxylglycine  
Tartaric  
Arabinose  
Carboxycitric

### Malabsorption and bacterial markers

2-hydroxyphenylacetic  
4-hydroxyphenylacetic  
Hippuric  
3-indoleacetic  
HPHPA (Clostridia marker)

### Oxalate metabolites

Glyceric  
Glycolic  
Oxalic

### Glycolytic cycle metabolites

Lactic  
Pyruvic  
2-hydroxybutyric

### Krebs Cycle metabolites

Succinic  
Fumaric  
Malic

2-oxoglutaric  
Aconitic  
Citric

### Neurotransmitter metabolites

HVA (homovanillic)  
VMA (Vanillylmandelic)  
5-hydroxyindoleacetic (5-HIAA)  
Quinolinic  
Kynurenic

### Pyrimidine metabolites

Uracil  
Thymine

### Ketone and fatty acid oxidation

3-hydroxybutyric  
Acetoacetic  
4-hydroxybutyric  
Ethylmalonic  
Methylsuccinic  
Adipic  
Suberic  
Sebacic

### Nutritional markers

Methylmalonic (vitamin B12 marker)  
Pyridoxic (vitamin B6)

Pantothenic (vitamin B5)  
Glutaric (vitamin B2 marker)  
3-hydroxy-3-methylglutaric (Co Q10 marker)  
N-acetylcysteine (glutathion precursor)  
Methylcitric (vitamin B7/Biotin marker)

### Indicators of detoxification

Pyroglutamic  
Orotic  
2-hydroxyhippuric

### Amino acid metabolites

2-hydroxyisovaleric  
2-oxoisovaleric  
3-methyl-2-oxovaleric  
2-hydroxyisocaproic  
2-oxoisocaproic  
2-oxo-4-methylbutyric  
Mandelic  
Phenyllactic  
Phenylpyruvic  
Homogentisic  
4-hydroxyphenyllactic  
N-acetylaspartic  
Malonic  
3-methylglutaric

## TEST INDICATIONS

Unexplained severe, unusual or recurrent clinical symptoms  
Unexplained birth defects and SIDS (sudden infants death syndrome)  
Physical and/or developmental retardation  
Frequent infections  
Immunodeficiency

Alopecia and/or severe dermatitis  
Neurological symptoms  
Unexplained periods of nausea and vomiting  
Peculiar body odor or urine odor or abnormally colored urine  
Psychosis, Autism and other severely abnormal Behavior

## COMPLEMENTARY TESTS:

Amino acids (in urine or blood)  
Neurotransmitters (in platelets or urine)  
Faeces test

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