



Metabolomic
Analysis

Dr. Dimitris Tsoukalas MD, PhD
Scientific Director

METABOLOMIC ANALYSIS ORGANIC ACIDS ANALYSIS

- Krebs Cycle
- Carbohydrate Metabolism
- Oxidative stress
- B-Complex Vitamin markers
- Neurotransmitter Metabolism
- Omega 3 and Omega 6 Fatty acids
- Methylation cofactor marker
- Microbiome Markers
- Protein Metabolism
- Ketone-Fatty Acids Oxidation
- Vitamin C
- Vitamin E and β -Carotene
- Vitamin D (25-OH)
- 5-Methyltetrahydrofolate



Laboratory Accreditation
ISO 17025 / 15189

Switzerland - Italy - Greece

Koumpari 5 str. Athens Greece
Tel: +302103611054



METABOLOMIC MEDICINE®
HEALTH CLINICS-AUTOIMMUNE AND CHRONIC DISEASES

Email: info@metabolomicmedicine.com
www.drtsoukalas.com

Name:

Date:

Age:

Sex:

Metabolomic Analysis
ORGANIC ACIDS ANALYSIS

Test	Result	Reference value	Percentile
------	--------	-----------------	------------

Krebs cycle

Citric	43.00	mmol/mol Crea	19 - 475	5.26%
Aconitic	29.10	mmol/mol Crea	2.7 - 44	63.92%
Isocitric	3.40	mmol/mol Crea	1.8 - 10	19.51%
2-ketoglutaric	2.90	mmol/mol Crea	2.1 - 36	2.36%
Succinic	7.10	mmol/mol Crea	1.2 - 15	42.75%
Fumaric		mmol/mol Crea	0 - 1.8	
Malic		mmol/mol Crea	0 - 2	
3-Hydroxy 3-methylglutaric	2.30	mmol/mol Crea	1 - 4.2	40.62%

Carbohydrate Metabolism

Lactic	5.00	mmol/mol Crea	0 - 50	10.00%
Pyruvic	5.10	mmol/mol Crea	0 - 19	26.84%
3-Hydroxybutyric	1.80	mmol/mol Crea	0 - 2	90.00%

Oxidative stress

Pyroglutamic	56.40	mmol/mol Crea	5.9 - 55	
2-Hydroxybutyric	1.10	mmol/mol Crea	0 - 3	36.67%
2-Hydroxyisobutyric	15.30	mmol/mol Crea	0 - 5	
Citric	43.00	mmol/mol Crea	19 - 475	5.26%
Aconitic	29.10	mmol/mol Crea	2.7 - 44	63.92%

Name:

Date:

Age:

Sex:

Metabolomic Analysis
ORGANIC ACIDS ANALYSIS

Test	Result	Reference value	Percentile
------	--------	-----------------	------------

B-Complex Vitamin markers
(B1,B2,B3,B5,B7)

Methylsuccinic	2.10	mmol/mol Crea	0 - 2.6	80.77%
Glyceric	1.60	mmol/mol Crea	0 - 2	80.00%
2-Ketoisovaleric		mmol/mol Crea	0 - 1	
2-Ketoisocaproic		mmol/mol Crea	0 - 1	
2-Keto 3-methylvaleric		mmol/mol Crea	0 - 1	
3-Hydroxyisovaleric	25.00	mmol/mol Crea	0 - 11	
Methylcitric		mmol/mol Crea	0 - 2	

Methylation B12 Cofactor marker

Methylmalonic	1.10	mmol/mol Crea	0 - 1.4	78.57%
-------------------------	------	---------------	---------	--------

Neurotransmitter Metabolites

Homovanillic	2.40	mmol/mol Crea	0.9 - 5.5	32.61%
5-Hydroxyindoleacetic	4.50	mmol/mol Crea	0.9 - 7.2	57.14%
Vanillilmandelic	1.40	mmol/mol Crea	0.9 - 15	3.55%
2-Hydroxyisobutyric	15.30	mmol/mol Crea	0 - 5	

Name:

Date:

Age:

Sex:

Metabolomic Analysis
ORGANIC ACIDS ANALYSIS

Test	Result	Reference value	Percentile
------	--------	-----------------	------------

Microbiome markers

3-Hydroxyisovaleric	25.00	mmol/mol Crea	0 - 11	
4-Hydroxyphenylacetic	24.20	mmol/mol Crea	0 - 8	
Orotic		mmol/mol Crea	0 - 1.2	
Hippuric		mmol/mol Crea	0 - 613	

Protein Metabolism

Glycolic	52.10	mmol/mol Crea	18 - 55	92.16%
Oxalic	4.30	mmol/mol Crea	0 - 5	86.00%
Glyceric	1.60	mmol/mol Crea	0 - 2	80.00%

Ketone Bodies & Fatty Acid Oxidation

2-Hydroxyisobutyric	15.30	mmol/mol Crea	0 - 5	
3-Hydroxybutyric	1.80	mmol/mol Crea	0 - 2	90.00%
Acetoacetic		mmol/mol Crea	0 - 10	
Ethylmalonic	2.50	mmol/mol Crea	0.4 - 4.2	55.26%
Methylsuccinic	2.10	mmol/mol Crea	0 - 2.6	80.77%
Adipic		mmol/mol Crea	0 - 15	
Suberic		mmol/mol Crea	0 - 2.9	
Sebasic		mmol/mol Crea	0 - 3.2	

Laboratory team:**E. Papaconstantinou, Dr A. Mylona, Dr E. Paramera, D. Katakouzinou, K. Doulfi****Name:****Date:****Age:****Sex:****Metabolomic Analysis
ORGANIC ACIDS ANALYSIS**

Test	Result	Reference value	Percentile
------	--------	-----------------	------------

Vitamin C

Adipic	mmol/mol Crea	0 - 15
4-Hydroxyphenylpyruvic	mmol/mol Crea	0 - 6
p-Hydroxyphenyllactate	mmol/mol Crea	0 - 1

Vitamin E and β -Carotene

Adipic	mmol/mol Crea	0 - 15	
3-Hydroxy 3-methylglutaric	2.30	mmol/mol Crea	1 - 4.2
4-Hydroxyphenylpyruvic	mmol/mol Crea	0 - 6	
p-Hydroxyphenyllactate	mmol/mol Crea	0 - 1	

40.62%

Notes

Results are expressed as mmol/mol Creatinine of Urine. In the case where no concentration of a metabolite is reported then his level is below of the limit of detection (1 mmol/mol Creatinine).

Values above the desired limits are indicated in red.

Values below the desired limits are indicated in blue.

Lab supervisor

Energy Production (Krebs Cycle)

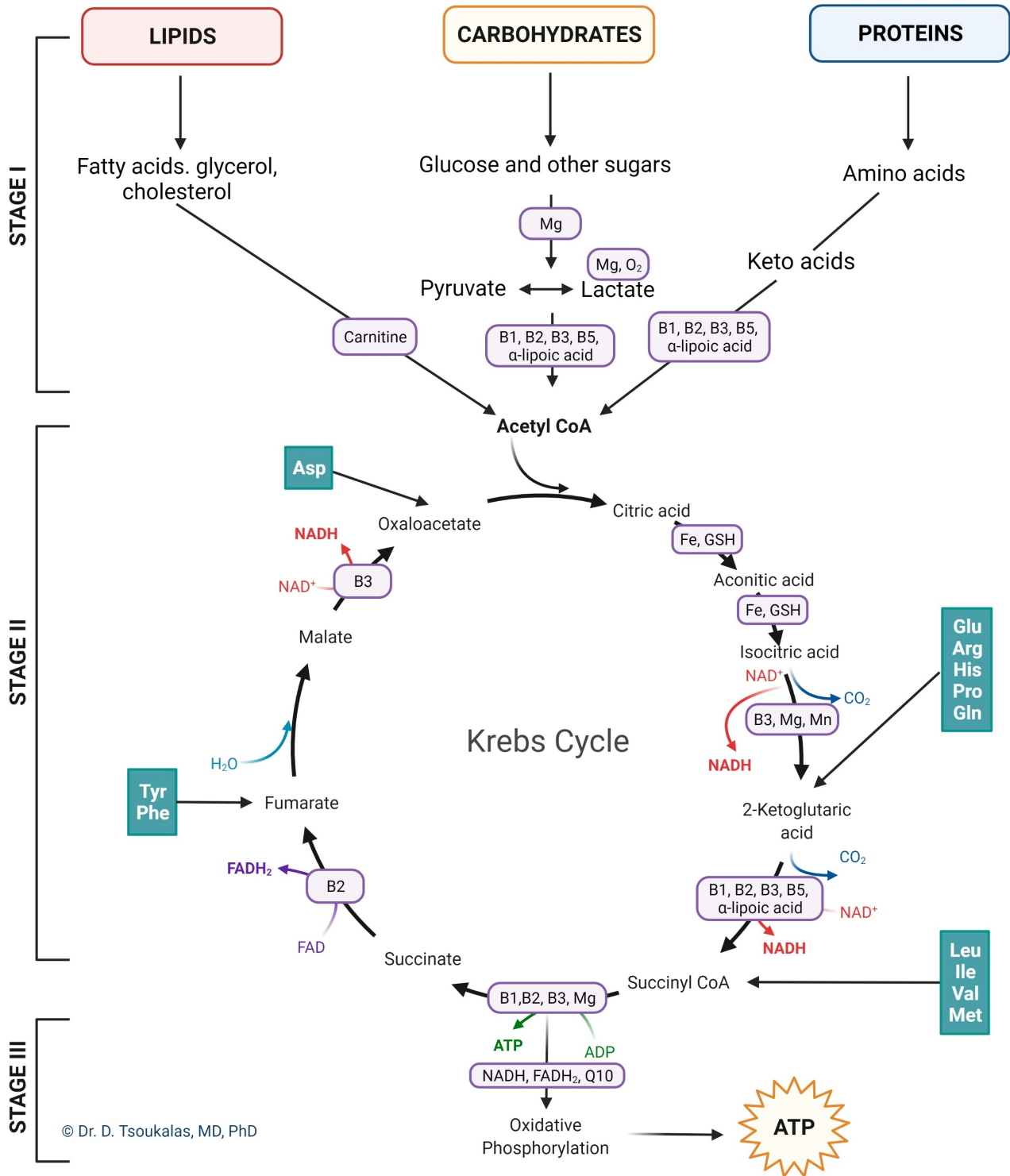


Figure 1: Citric acid cycle or Krebs Cycle for energy production