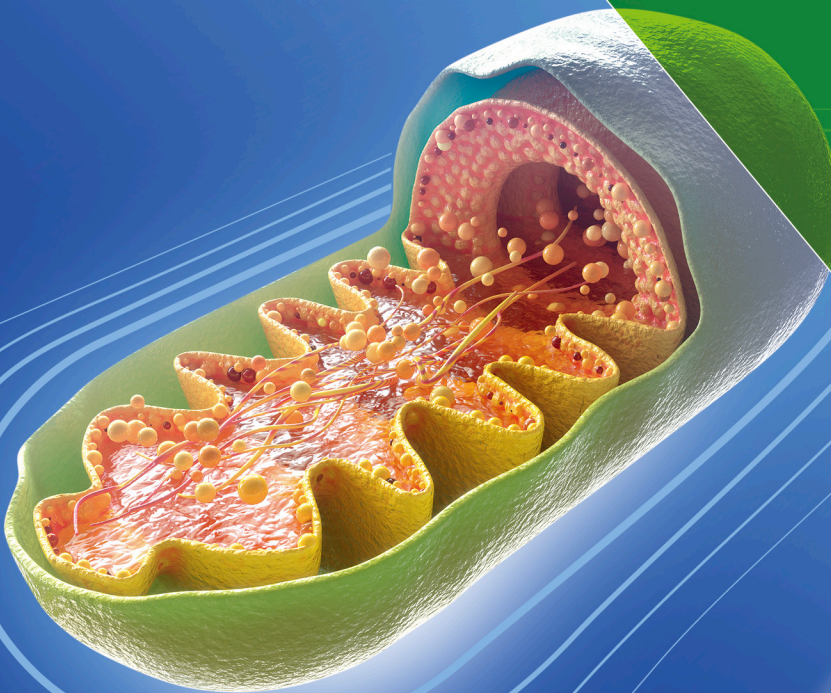


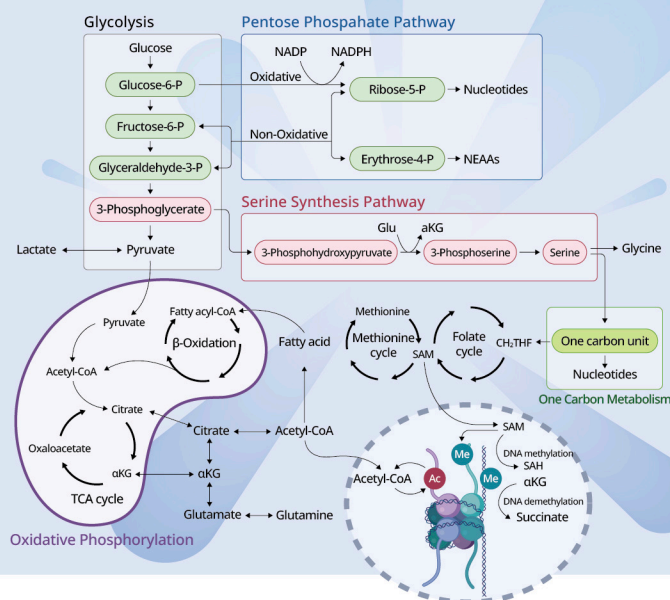
Energy
Targeted
Metabolomics



Technology Introduction

Energy metabolism is the process of generating energy (ATP) from nutrients such as glucose and fatty acids through pathways such as the glycolysis pathway, the tricarboxylic acid cycle, and the pentose phosphate pathway. Metware Biotechnology's Energy Metabolism Targeted Metabolomics obtains absolute quantitative results on **68** energy related metabolites from various fluid and tissue samples.

DOI: 10.1016/j.cmet.2020.04.022. Epub 2020 May 19



Application



Biomarker screening

Screen important differential metabolites from cohorts and build diagnostic models from biomarkers.



Functional studies

Reveal metabolic changes associated with the observed phenotype.



Mechanism research

Validate mechanism of energy metabolism from your biological system.

Product Superiority



Absolute quantification

68 standard curves, $r > 0.99$.



High sensitivity

ng/ml concentration can be detected.



Wide coverage

the panel covers 68 compounds in the three major pathways.

Database

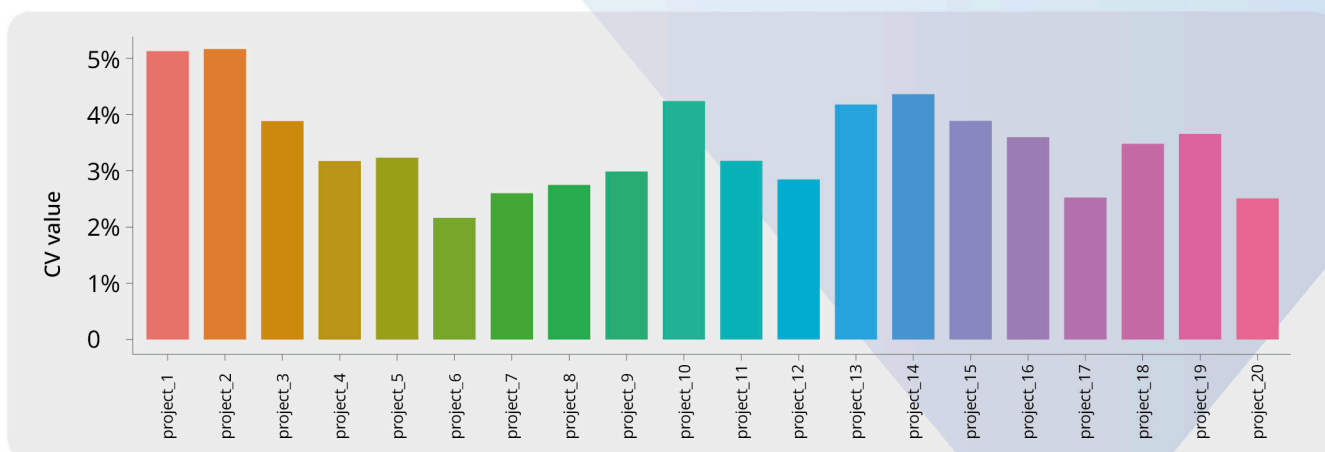
/ Partial Display /

Type	No. of Compounds	Representative compounds
Amino Acids	15	Malic acid, Itaconic acid, L-Aspartate, Glutamine...
TCA cycle	34	Citric acid, Isocitric acid, Acetyl-CoA, Alpha-Ketoglutaric Acid...
PPP pathway	26	D-Ribulose 5-phosphate, Xylulose-5-phosphate, Sedoheptulose 7-phosphate, 6-Phosphogluconic acid...
Glycolysis pathway	21	D(+)-Glucose, 3-phosphoglycerate, Glyceraldehyde 3-phosphate, D-Fructose 6-phosphate...

*The total compounds in the panel is 68. A compound could be categorized in more than one pathway.

High Stability

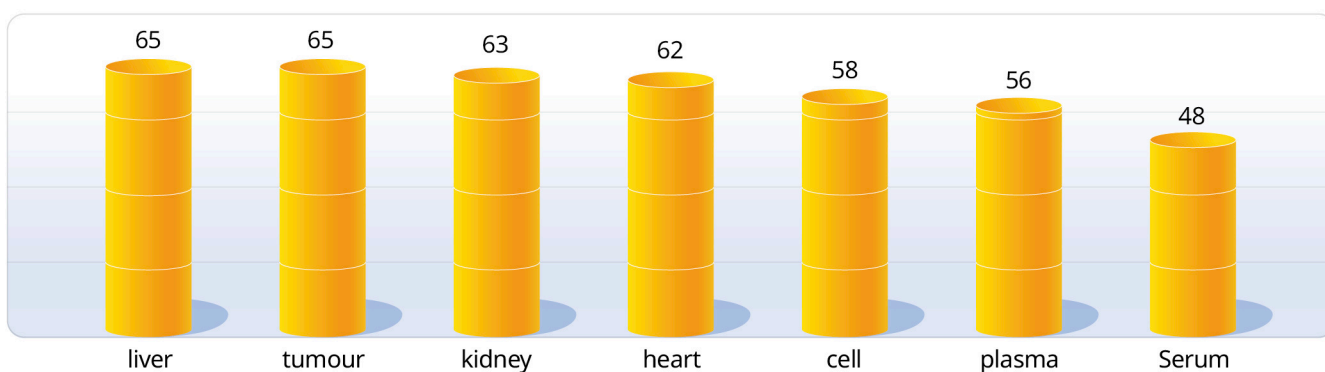
Highly stable detection was observed for the energy metabolome. The detected metabolites showed a coefficient of variation (CV) of less than 6% in mixed QC samples.



Coefficient of Variation of energy metabolites detected over 20 projects

Project Experience

A total of 68 metabolites could be detected from various tissue samples, with an average detection of 59 metabolites.



Average detected metabolites in different tissue and sample types.

Selected Publications

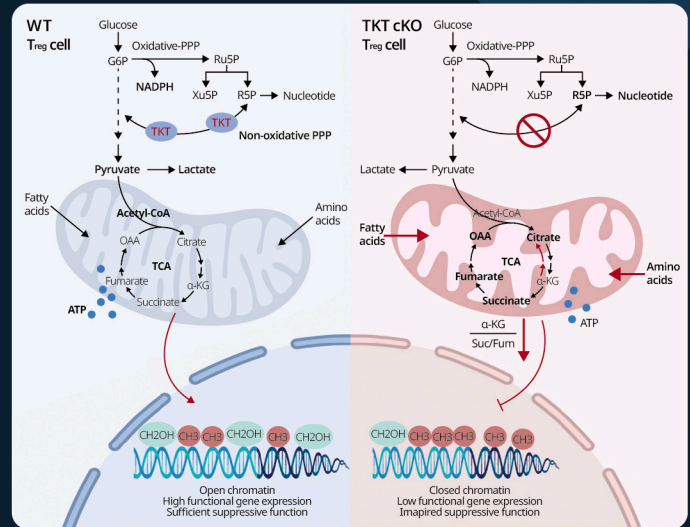
Year	Journal	Title
2022	EMBO Molecular Medicine	S1P defects cause a new entity of cataract, alopecia, oral mucosal disorder, and psoriasis-like syndrome
2022	Nature Metabolism	Non-oxidative pentose phosphate pathway controls regulatory T cell function by integrating metabolism and epigenetics
2023	Comparative Biochemistry and Physiology. Toxicology & Pharmacology	Effect of heat and hypoxia stress on mitochondrion and energy metabolism in the gill of hard clam

nature metabolism

Non-oxidative pentose phosphate pathway controls regulatory T cell function by integrating metabolism and epigenetics

Abstract

- The authors reveal an important role of the non-oxidative pentose phosphate pathway (PPP) in regulating regulatory T cells (T_{reg}) function to prevent autoimmunity using a T_{reg} -specific transketolase (TKT)-deficient mouse model.
- The non-oxidative PPP balance carbon flows from glucose, fatty acids and amino acids into the TCA cycle and controlled NADPH biosynthesis in T_{reg} cells. Restriction of glucose-derived carbons boosts amino acid and fatty acid catabolism while leading to massive oxidative phosphorylation and impaired mitochondrial fitness in TKT-deficient T_{reg} cells.



Sample Requirements

Sample Type	Sample	Recommended Sample	Minimum Sample	Biological Replicate
Liquid	Plasma, serum, hemolymph, milk, egg white	100µL	20µL	human ≥30 animal ≥8
	Cerebrospinal fluid, tear fluid, interstitial fluid, uterine fluid, pancreatic fluid and bile, pleural effusion, follicular fluid, corpse fluid, culture medium	100µL	20µL	
	seminal plasma, amniotic fluid, prostate fluid, rumen fluid, respiratory condensate, gastric lavage fluid, alveolar lavage fluid, urine, sweat, saliva, sputum	500µL	100µL	
Tissue	Animal tissue, placenta, thrombus, fish skin, mycelium, nematode	100mg	20mg	
	whole body, aircraft (wings), pupae	500mg	20mg	
	Zebrafish organs, insect organs	20	10	
Cell	Adherent cells	1*10 ⁶	5*10 ⁵	
	Escherichia coli and other microorganisms	1*10 ¹⁰	5*10 ⁸	
Feces	Feces, Intestinal contents	200mg (wet weight)	50mg (wet weight)	

METWARE BIO

Innovative Metabolomics Insights for Better Health



Contact Us

support-global@metwarebio.com

+1 (781) 975-1541
8A Henshaw St., Woburn, MA 01801, USA
www.metwarebio.com