

Untargeted Metabolomics

Our pipeline focuses on the comprehensive analysis of the polar metabolome and employs two measurement modes, supported by a metabolite library containing over 500 endogenous metabolites. This method provides semiquantitative data on the metabolome, making it well-suited for system-level omics studies.

Targeted TCA cycle metabolite level determination

Measuring metabolites in the TCA (tricarboxylic acid) cycle is crucial for understanding cellular energy production and metabolic regulation, as it is a central pathway in aerobic respiration. Additionally, alterations in TCA cycle metabolites are often associated with the metabolic reprogramming of cancer cells, as this pathway is critical for supporting the rapid proliferation and survival of tumors through enhanced energy production and biosynthesis.

metabolites in this set:

- **Citrate (Citric acid)**
- **Isocitrate**
- **α -Ketoglutarate (α -KG)**
- **Succinyl-CoA**
- **Succinate**
- **Fumarate**
- **Malate**
- **Pyruvate**
- **Lactate**

Targeted amino acid level determination

Determining amino acid levels is essential for understanding protein synthesis, metabolic health, and, as amino acids serve as the building blocks for proteins and are involved in numerous cellular processes. Additionally, alterations in amino acid concentrations can signal metabolic disorders, and abiotic stress states in various model systems.

metabolites in this set:

- **Alanine (Ala)**
- **Arginine (Arg)**
- **Asparagine (Asn)**
- **Aspartic acid (Asp)**
- **Glutamic acid (Glu)**
- **Glutamine (Gln)**
- **Histidine (His)**
- **Isoleucine (Ile)**
- **Leucine (Leu)**
- **Lysine (Lys)**

- **Methionine (Met)**
- **Phenylalanine (Phe)**
- **Proline (Pro)**
- **Serine (Ser)**
- **Threonine (Thr)**
- **Tryptophan (Trp)**
- **Tyrosine (Tyr)**
- **Valine (Val)**

Energy metabolism and nucleotide phosphates

Nucleotide phosphates, such as ATP, GTP, and their derivatives, along with electron carriers like NADH and NADPH, are essential for fuel biochemical reactions, maintain homeostasis and redox reactions. Those metabolites playing key roles in cellular respiration, and the regulation of oxidative stress reactions.

- **Adenosine triphosphate (ATP)**
- **Adenosine diphosphate (ADP)**
- **Adenosine monophosphate (AMP)**
- **Guanosine triphosphate (GTP)**
- **Guanosine diphosphate (GDP)**
- **Guanosine monophosphate (GMP)**
- **Cytidine triphosphate (CTP)**
- **Cytidine diphosphate (CDP)**
- **Cytidine monophosphate (CMP)**
- **Uridine triphosphate (UTP)**
- **Uridine diphosphate (UDP)**
- **Uridine monophosphate (UMP)**
- **Nicotinamide adenine dinucleotide (NAD⁺)**
- **Reduced nicotinamide adenine dinucleotide (NADH)**
- **Nicotinamide adenine dinucleotide phosphate (NADP⁺)**
- **Reduced nicotinamide adenine dinucleotide phosphate (NADPH)**