

Untargeted Medical Metabolomics Service Overview



Service Description

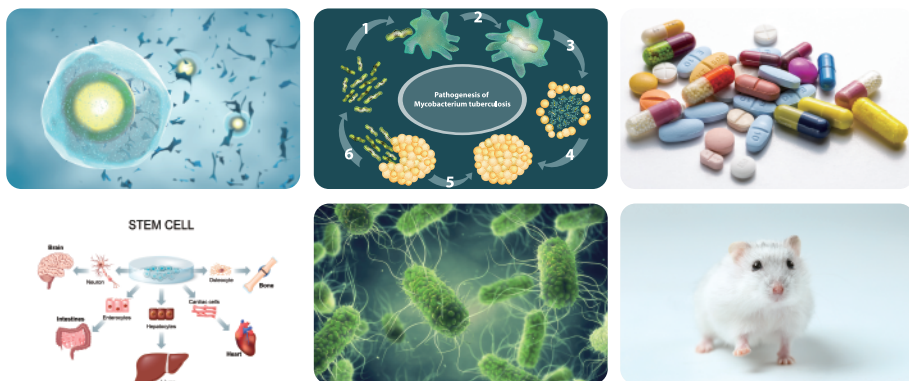
The metabolome refers to the collection of all small molecule metabolites (< 1500 Da) in cells, tissues, organs or biological organisms, metabolites produced by microorganisms, and all exogenous substances from heterologous organisms.

Metabolomics is a research method comprising qualitative and quantitative analysis of all metabolites in an organism. It involves the comparison of the metabolome between control and test groups (for example, a specific gene mutation or environmental change), screening of differential metabolites by statistical analysis, and metabolic pathway analysis of differential metabolites, to identify differences between metabolites and physiological/pathological changes.

Untargeted Metabolomics is an important branch of metabolomics and designed to obtain a metabolite profile and screen for differentially-expressed molecules in the sample. In turn, untargeted medical metabolomics is an important branch of untargeted metabolomics. As many metabolites from different cell samples, microbial samples, animal samples or clinical samples as possible are measured and compared between control and test groups without bias.

BGI has extensive experience in the field of untargeted medical metabolomics with well-developed reliable workflows using market leading technologies and a bioinformatics infrastructure that is second to none.

Research Applications



- Disease biomarkers research
- Pathogenesis and prognosis study on diseases
- Drug compound identification, toxicity assessment and drug efficacy evaluation
- Regulation mechanism of tissue development
- Microbial infection and its pathogenesis
- Animal special behavior mechanism and food/medicinal value research

Technology Platforms



QE-HFX



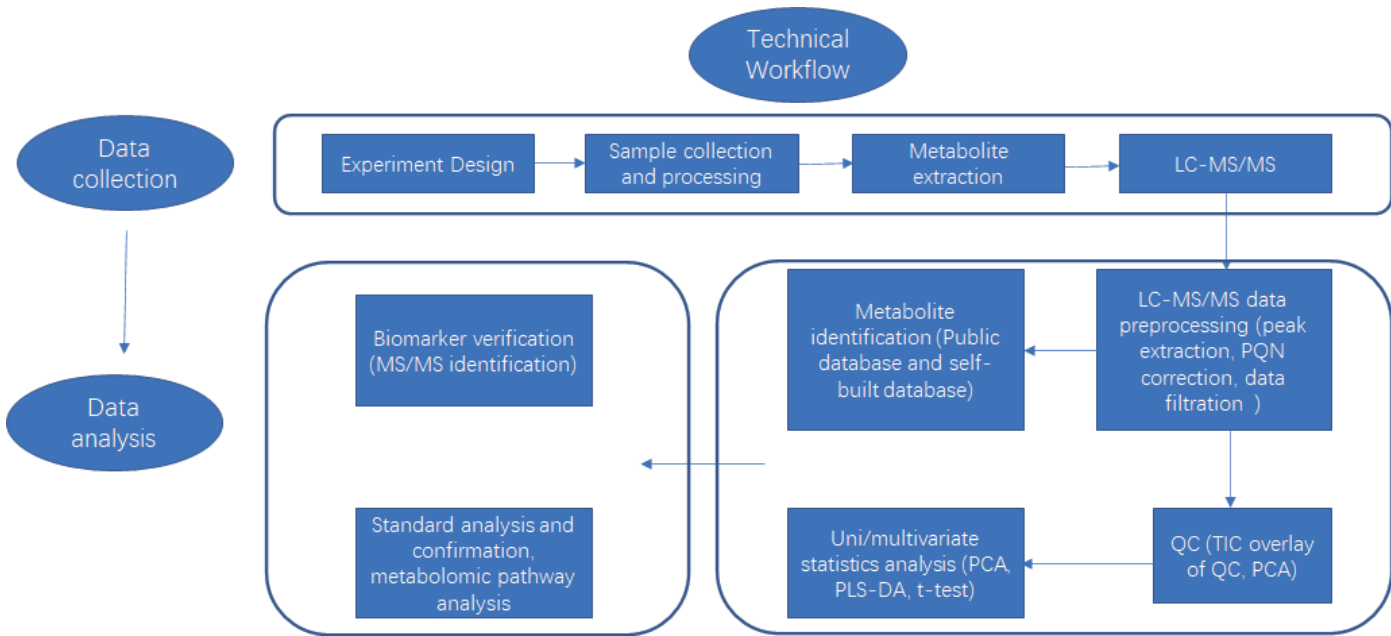
Vanquish UHPLC

- Column: BEH C18 & BEH Amide

Service Advantages

State-of-the-art LC-MS/MS systems	Rich large sample experience	High-precision identification results	Strict quality control system
<ul style="list-style-type: none">• Thermo Q Exactive™ HF-X• Resolution up to 24,000, ensuring high spectral quality and accurate results	<ul style="list-style-type: none">• High throughput automated sample preparation• Real-time monitoring instrument detection process	<ul style="list-style-type: none">• Self-built standard library + Thermo mzcloud (4000+)• 100% identification is achieved through the standards• Identification credibility rating	<ul style="list-style-type: none">• Strict protocols governing the whole workflow• Double quality control proceess of isotopic internal standard and QC samples

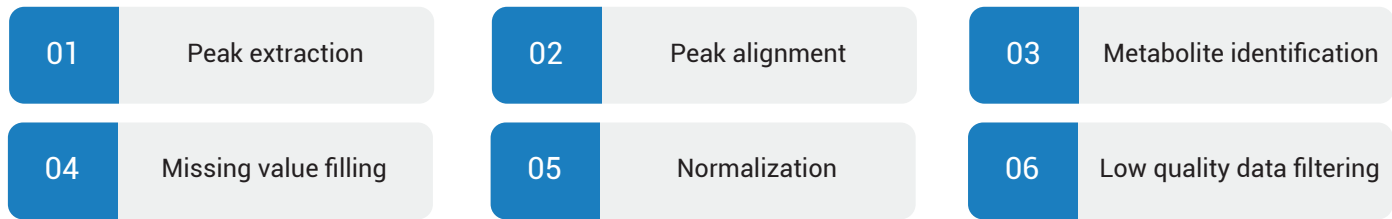
Untargeted Medical Metabolomics Workflow



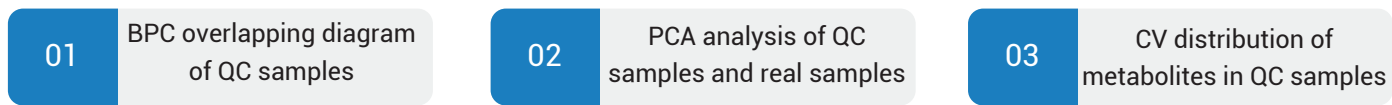
Bioinformatics Analysis Workflow

Standard:

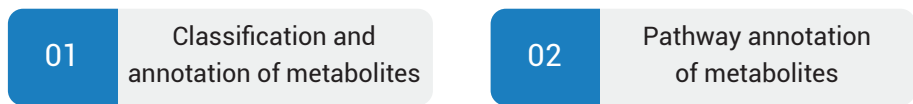
1.1 Data Processing



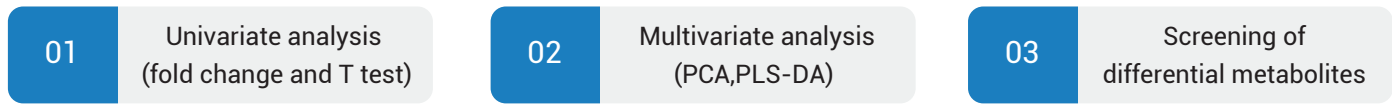
1.2 Data Quality Control



1.3 Annotation of Metabolites



1.4 Statistical Analysis and Screening of Differential Metabolites



1.5 Cluster Analysis and Correlation Analysis of Differential Metabolites

1.6 Enrichment Analysis of Metabolic Pathways of Differential Metabolites

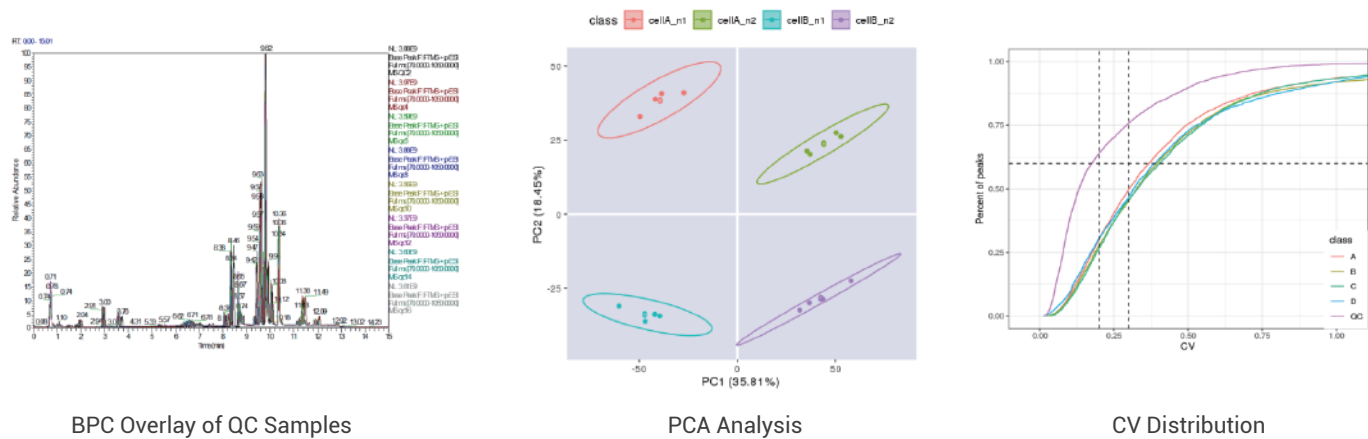
Customized:

16S/Metagenome + metabolome correlation analysis

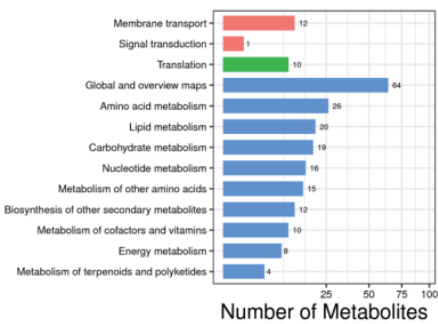
Transcriptome + metabolome correlation analysis

Proteome + metabolome correlation analysis

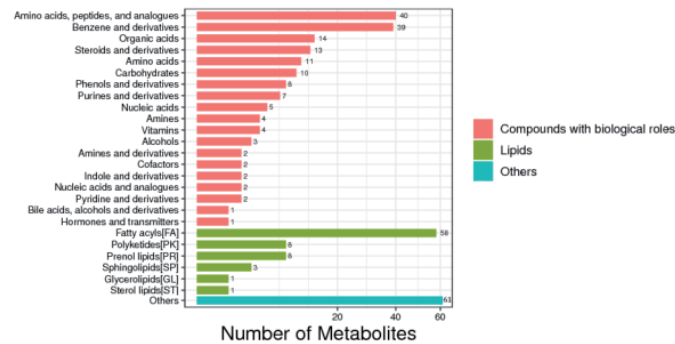
Examples of Data QC Analysis - Stability and Repeatability



Examples of Annotation of Metabolites

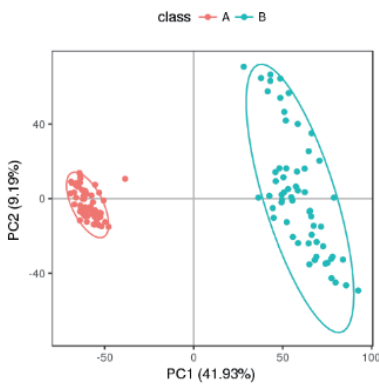


Metabolite Classification Bar Chart

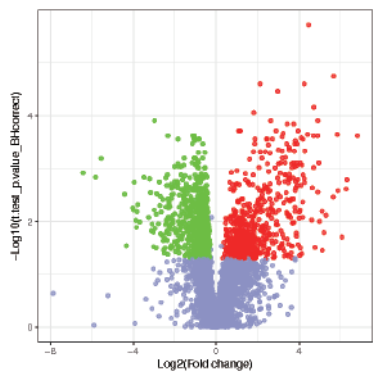


KEGG Function Comment Bar Chart

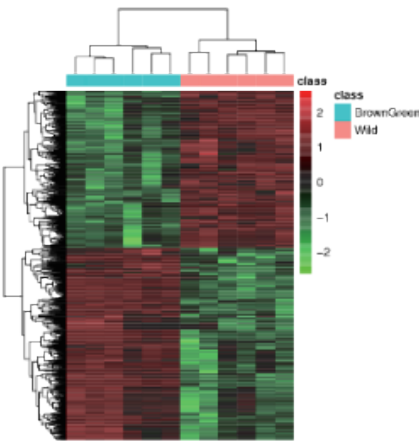
Examples of Statistical Analysis of Differential Metabolites



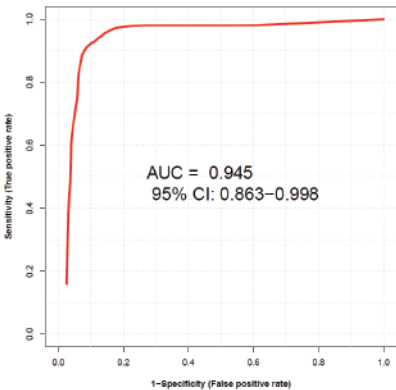
Score Graph of PLS-DA



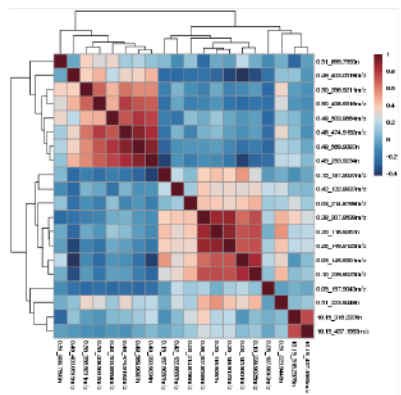
Volcano Plot



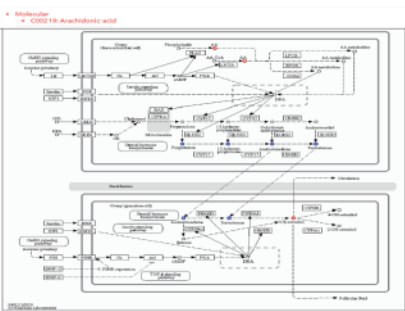
Cluster Analysis



ROC Curve



Metabolite Correlation Analysis



KEGG Metabolic Pathway

General Sample Requirements

SAMPLE TYPE	RECOMMENDED SAMPLE AMOUNT	MINIMUM SAMPLE AMOUNT
Serum, plasma,urine	≥ 300 µL	≥ 100 µL
Animal and clinical tissues	≥ 200 mg	≥ 25 mg
Feces and intestinal contents	≥ 200 mg	≥ 25 mg
Cell	≥ 1×10 ⁷	≥ 5×10 ⁶
Microorganism	≥ 1×10 ⁷ or ≥ 100 mg	≥ 5×10 ⁶ or ≥25 mg
Culture medium, fermentation medium	≥ 1 mL	≥ 100 µL
Plant tissue	≥ 1 g	≥ 100 mg
Milk	≥ 1 mL	≥ 100 uL
Other body fluids (amniotic fluid, saliva, hemolymph, cerebrospinal fluid, etc.)	≥ 300 µL	≥ 100 µL

Turn Around Time

Sample size: 1-50, 3-5 weeks



Request for Information or Quotation

Contact your BGI account representative for the most affordable rates in the industry and to discuss how we can meet your specific project requirements or for expert advice on experiment design, from sample to bioinformatics.

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We Sequence, You Discover