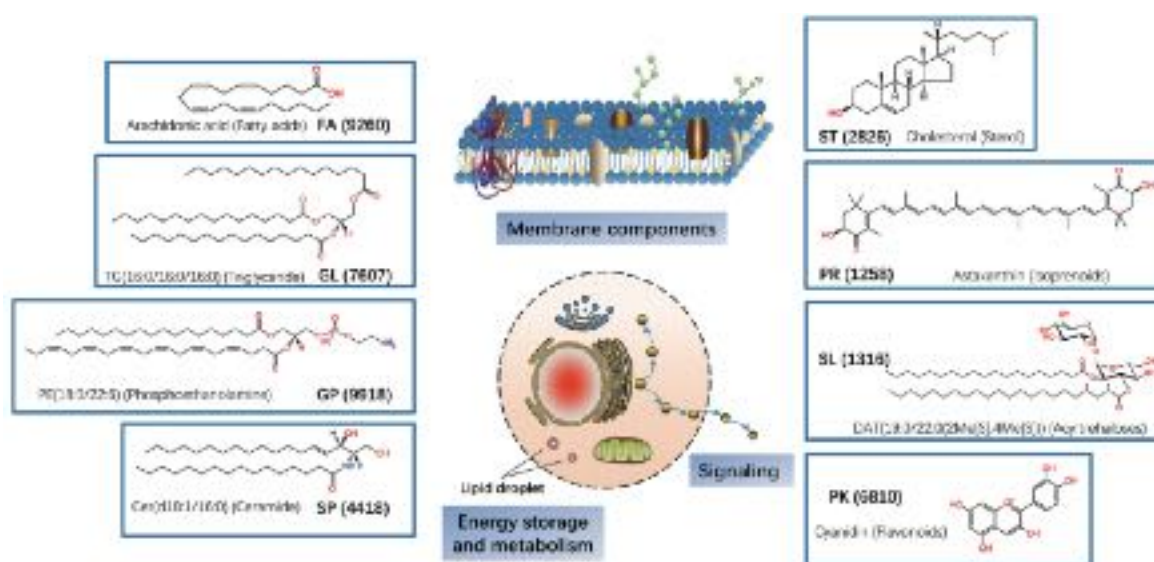


# Lipidomics Service Overview

## Service Description

Lipids are essential metabolites that have many key cellular functions and which can be analysed to gain insight into the metabolic state of cells. The number of lipid molecules in a cell, collectively called the lipidome, is estimated to be in the tens to hundreds of thousands.

According to the classification system proposed by the Lipid Metabolites and Pathways Strategy (LIPID MAPS) project, lipids are divided into eight classes: fatty acyls (FA), glycerolipids (GL), glycerophospholipids (GP), sphingolipids (SP), sterol lipids (ST), prenol lipids (PR), saccharolipids (SL), and polyketides (PK), covering a total of 43,413 lipid molecular species.



The common structures and main functions of eight lipid classes

Sun T, et al., Mass spectrometry-based lipidomics in food science and nutritional health: A comprehensive review, (2020)

Lipidomics is a new branch of metabolomics, which analyzes the compositions and content changes of lipids (major categories, subclasses and molecular types) in biological samples such as cells, tissues, organs or body fluids. Mass spectrometry based lipidomics (LC-MS), involves the comparison of the lipidome between control and test groups in order to screen differential lipids by statistical analysis, so as to identify differences between lipid metabolism and physiological/pathological changes.

We have experience in the field of lipidomics with well-developed reliable workflows using innovative technologies and a bioinformatics infrastructure.

## Research Applications



- Disease biomarkers research
- Pathogenesis and prognosis study on diseases
- Drug target research
- Animal special behavior mechanism and food/medicinal value research
- Plant growth and development research
- Plant disease resistance and insect resistance research
- Microbial drug resistance mechanism

Technology Platforms



Waters CSH C18 column



Waters ACQUITY UPLC

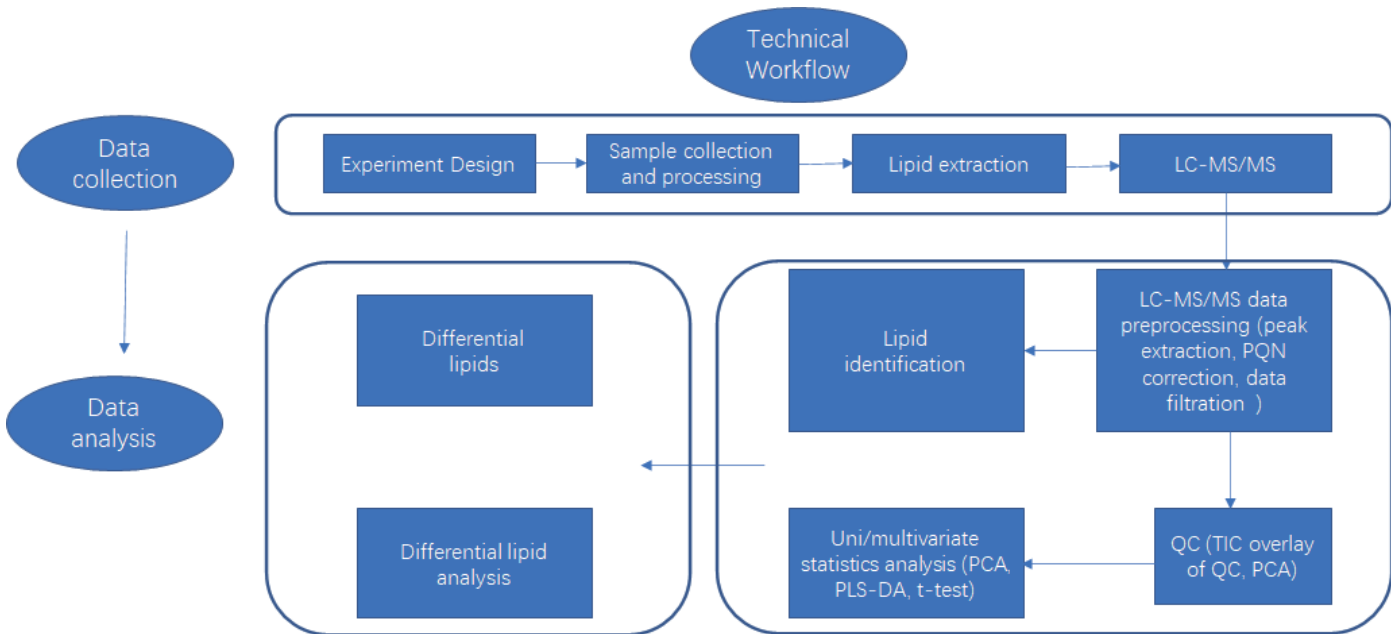


Thermo Q Exactive/Q Exactive HF-X

Service Advantages

State-of-the-art LC-MS/MS systems	Large scale and high volume sample experience	High-precision identification results	Strict quality control system
<ul style="list-style-type: none"><li>• Thermo Q Exactive/HF</li><li>• Resolution up to 24,000, ensuring high spectral quality and accurate results</li></ul>	<ul style="list-style-type: none"><li>• Sample preparation at a capacity of up to 1000+ per day</li><li>• Large scale project experience with 1000 of samples</li></ul>	<ul style="list-style-type: none"><li>• LipidSearch database (1.7 million lipid ions)</li><li>• 100% identification is achieved through the standards</li><li>• Identification credibility rating</li></ul>	<ul style="list-style-type: none"><li>• Strict protocols governing the whole workflow</li><li>• Double quality control process of isotopic internal standard and QC samples</li></ul>

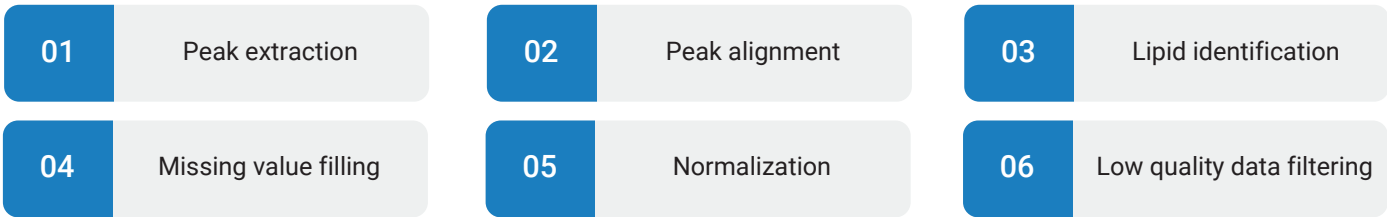
Lipidomics Workflow



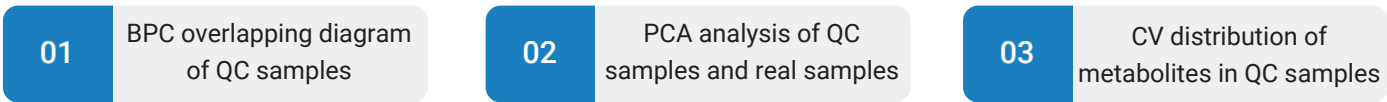
Bioinformatics Analysis Workflow

Standard:

1.1 Data Processing

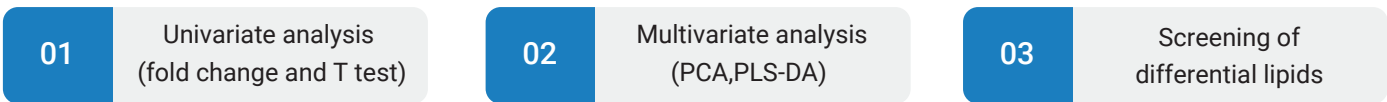


1.2 Data Quality Control

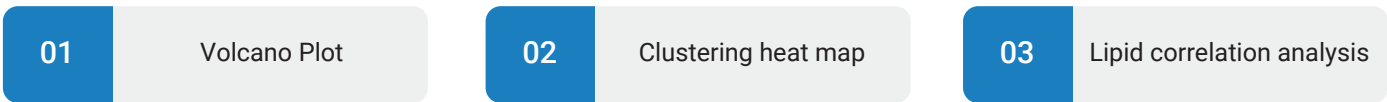


1.3 Statistical and Relative Quantitative Analysis of Lipid Classes

1.4 Statistical Analysis and Screening of Differential Lipids



1.5 Differential Lipid Analysis



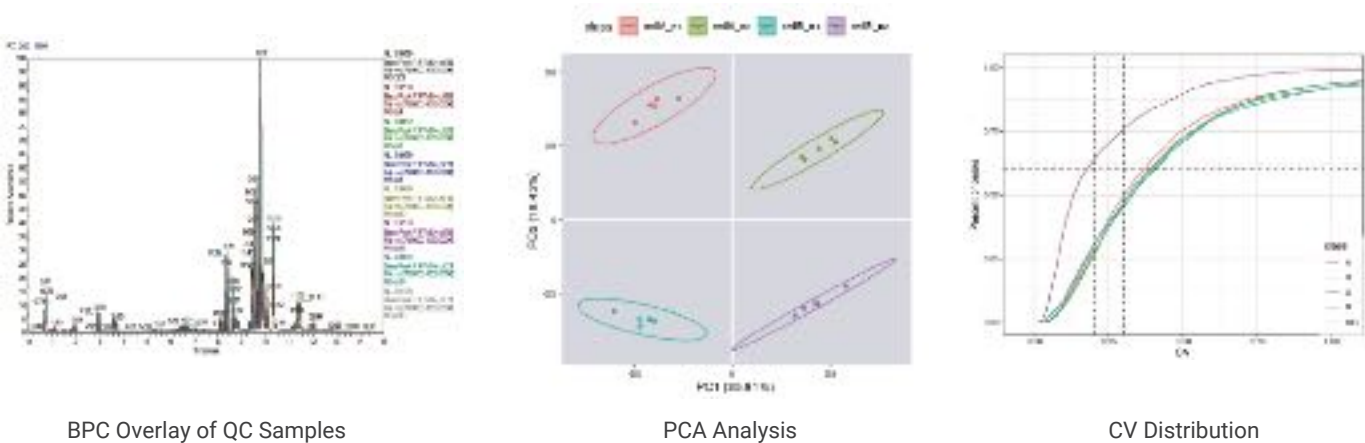
Customized Solution:

16S/Metagenome + lipidome correlation analysis

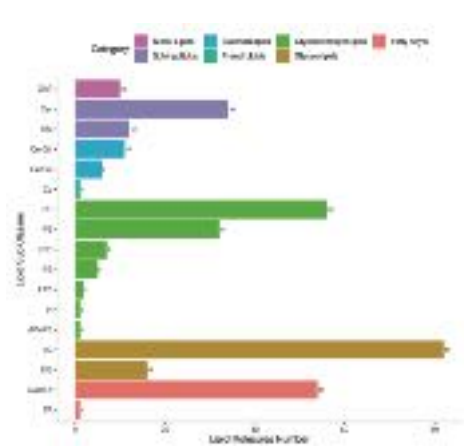
Transcriptome + lipidome correlation analysis

Proteome + lipidome correlation analysis

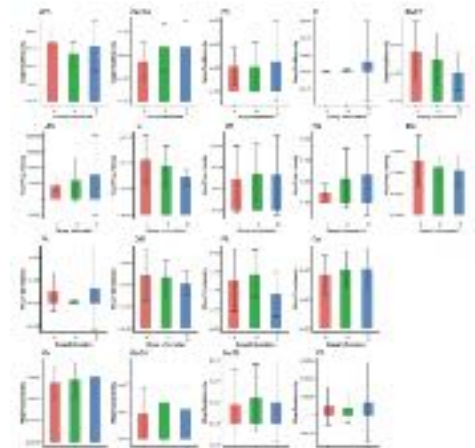
Examples of Data QC Analysis - Stability and Repeatability



Examples of Statistical and Relative Quantitative Analysis of Lipid Classes

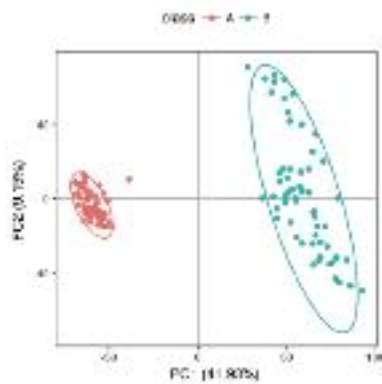


Statistical Chart of Lipid Sub Classes

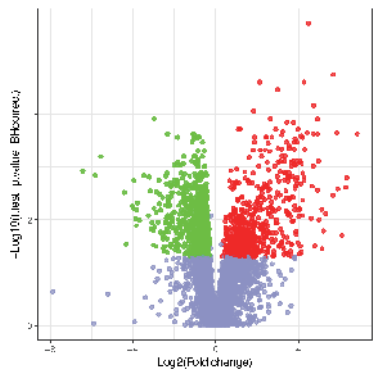


Detected Changes in Lipid Sub Class

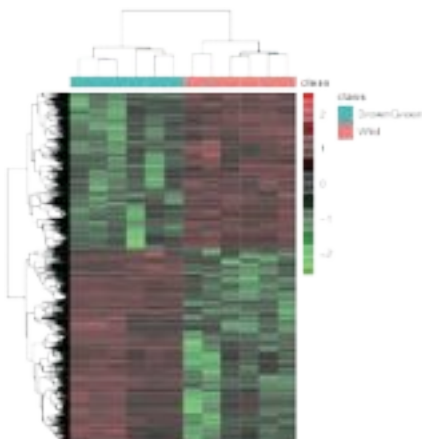
Examples of Statistical Analysis of Differential Lipids



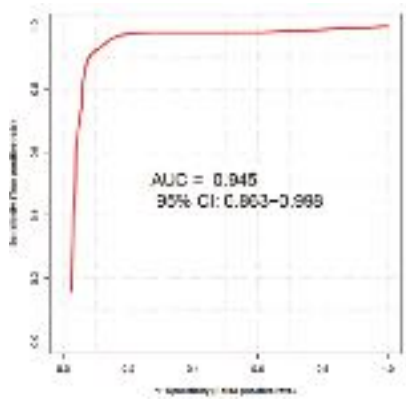
Score Graph of PLS-DA



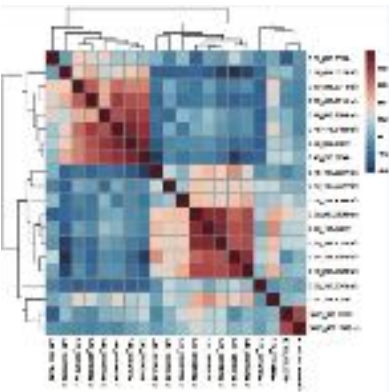
Volcano Plot



Cluster Analysis



ROC Curve



Lipid Correlation Analysis

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 <sup>7</sup>	≥ 5×10 <sup>6</sup>
Microorganism	≥ 1×10 <sup>7</sup> or ≥ 200 mg	≥ 5×10 <sup>6</sup> or ≥ 25 mg
Culture medium, fermentation medium	≥ 1 mL	≥ 100 µL
Plant tissue	≥ 1 g	≥ 100 mg
Milk	≥ 1 mL	≥ 100 µL
Other body fluids (amniotic fluid, saliva, hemolymph, cerebrospinal fluid, etc.)	≥ 300 µL	≥ 100 µL

Turn Around Time

Sample size: 1-50, 3-5 weeks



### To learn more

If you have any questions or would like to discuss how our services can help you with your research, please don't hesitate to contact us at [P\\_contact@innomics.com](mailto:P_contact@innomics.com). We look forward to hearing from you!

### The Laboratory Address

Innomics Inc.  
2904 Orchard Pkwy  
San Jose, CA 95134  
USA

For Research Use Only. Not for use in diagnostic procedures (except as specifically noted).

Copyright© Innomics Inc. 2023. All trademarks are the property of Innomics Inc. or their respective owners. This material contains information on products targeted to a wide range of audiences and could contain product details or information otherwise not accessible or valid in your country. Please be aware that we do not take any responsibility for accessing such information, which may not comply with any legal process, regulation, registration, or usage in the country of your origin. Please get in touch with a representative for regional availability. The company reserves the right of final interpretation.