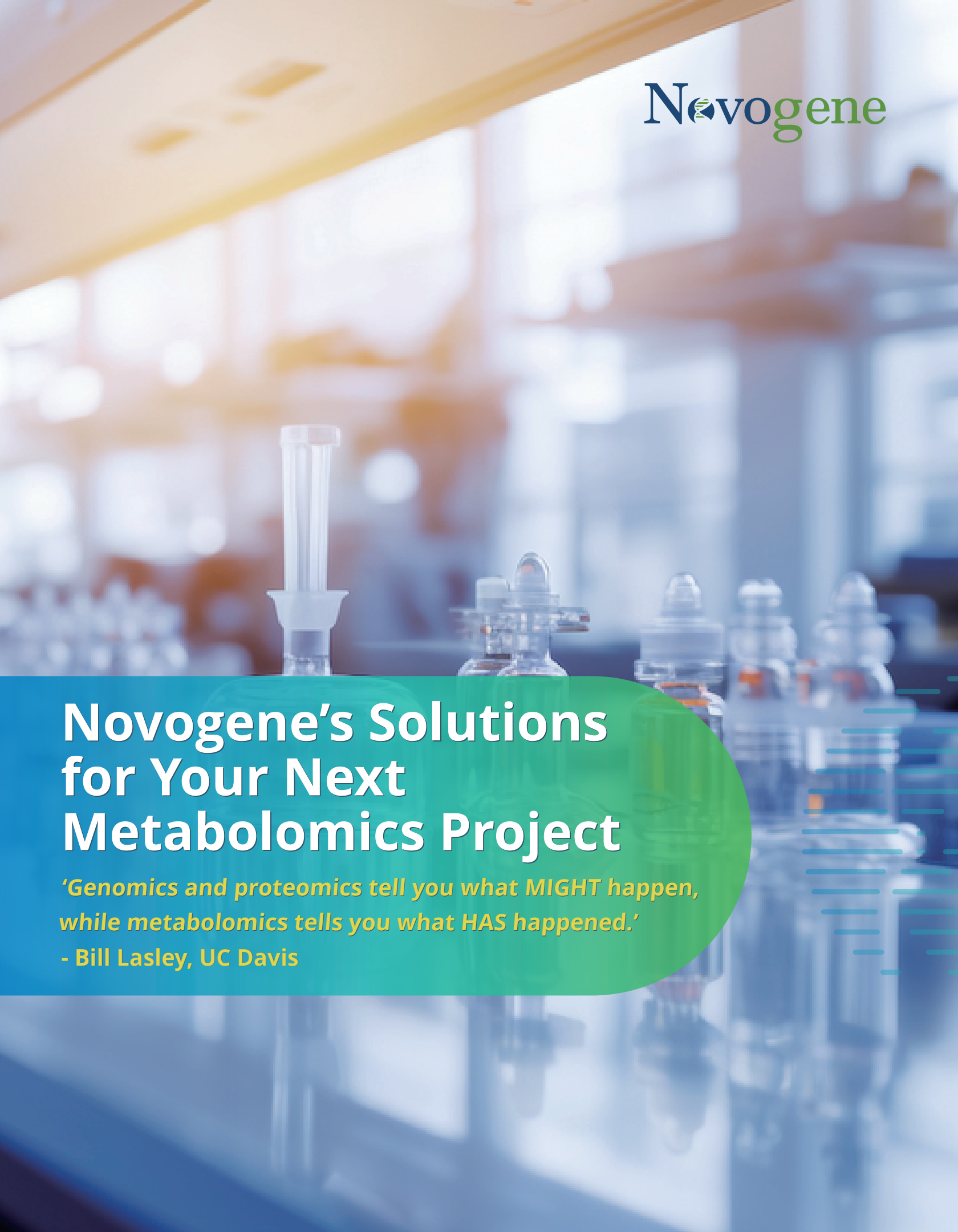


Novogene

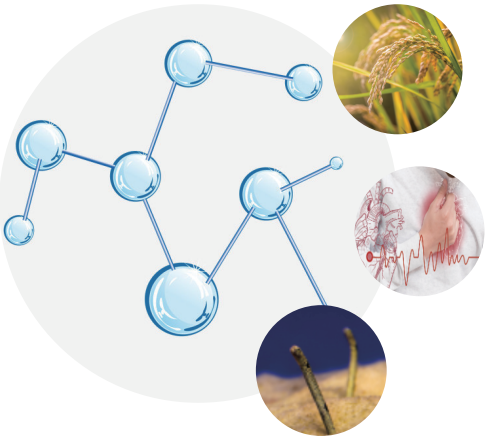
Novogene's Solutions for Your Next Metabolomics Project

'Genomics and proteomics tell you what MIGHT happen, while metabolomics tells you what HAS happened.'

- Bill Lasley, UC Davis

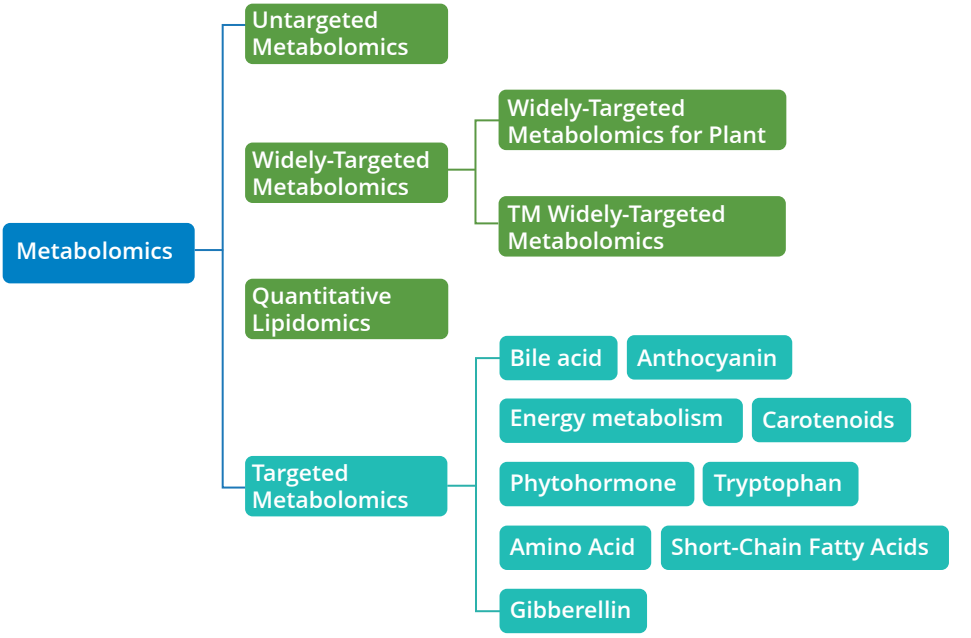
Introduction

Metabolomics is a holistic analytical approach to the study of the metabolome, and it is a powerful tool for examining the full range of changes in the metabolic responses of living systems in organisms subjected to external stimuli or genetic alterations. Empowered by multiple sets of SCIEX's high-throughput QTRAP® 6500 and 4500, Agilent's high-resolution 6545, AB Sciex TripleTOF® 6600+, and Thermo Fisher's Q Exactive HF-X platforms, Novogene provides a comprehensive portfolio of metabolomics services, covering Untargeted Metabolomics, Widely-Targeted Metabolomics, Targeted Metabolomics, and Quantitative Lipidomics.



Applications

Novogene's Metabolomics Services



Extensive acquisition of metabolites is harnessed to discover new metabolites.

Accurate detection of metabolites, which is commonly used to verify and quantify metabolites.

Which Service Suits Better for Your Research

Service Type	Technical Features	Service Highlights
Untargeted Metabolomics	Unbiased simultaneous detection and analysis of all small molecule metabolites	• Unbiased, and high throughput • No special pre-treatment of samples with a single injection
Widely-Targeted Metabolomics for plants	High throughput detection of certain classes of metabolites	• Detect low abundance metabolites with high sensitivity • High accuracy and reproducibility
Targeted Metabolomics	Specifically targeting one or more pathways	• High sensitivity and absolute quantification
Quantitative Lipidomics	Focus on studying the alterations and functions of lipid molecules in various biological processes	• High throughput • Targeting 6 major classes of lipids

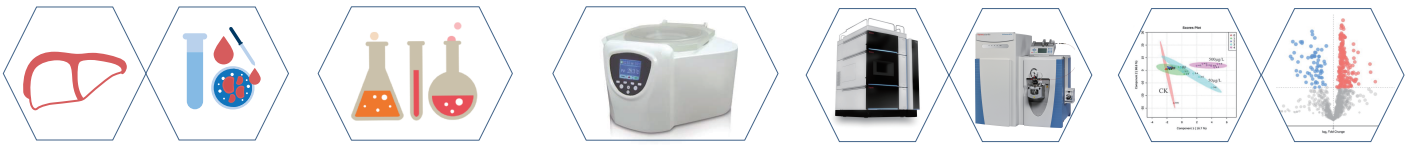
Untargeted Metabolomics

Introduction

Untargeted metabolomics detects all metabolites in biological samples in an unbiased manner, allowing for the screening of differential metabolites in control and experimental groups. Pathway analysis is then performed to further elucidate the biological roles played by differential metabolites in their respective metabolic pathways.

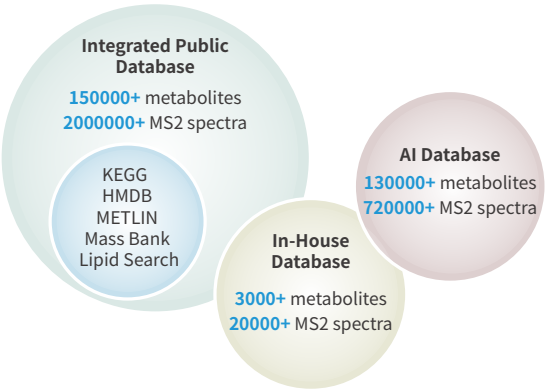
Project Workflow

Sample Collection » Metabolite Extraction » Concentration » LC-MS » Data Analysis



Database

Database is an important resource for metabolomics, as it can store, manage, and analyze large amounts of metabolomic data, as well as provide information on the chemical structures, properties, functions, and spectra of metabolites. Our database integrates both public databases, Novogene's in-house database, and the AI predictive structural database, encompassing over 280,000 metabolites.

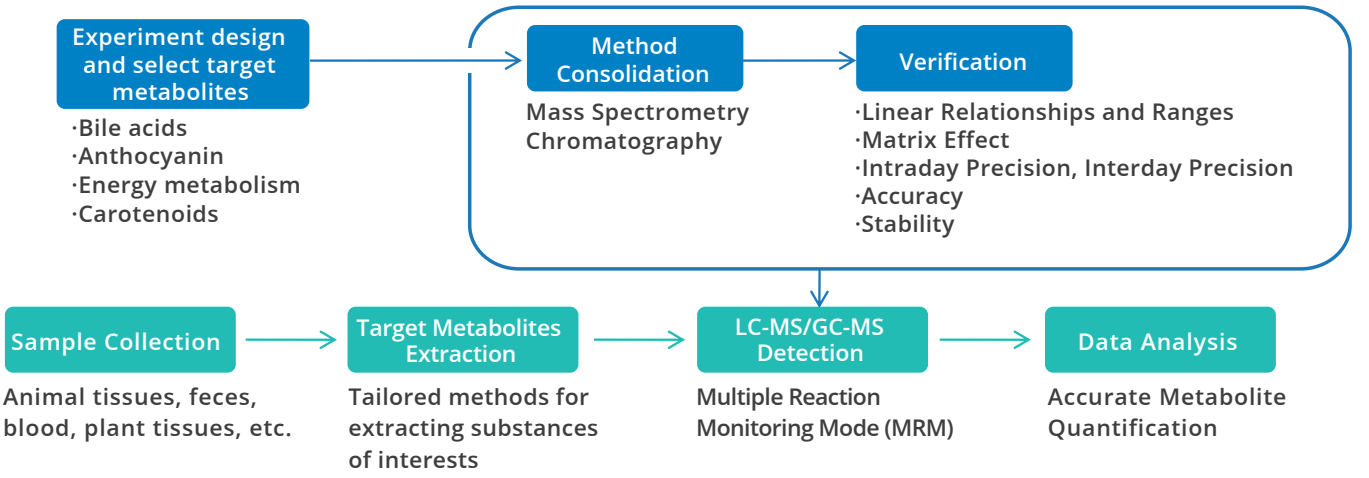


Targeted Metabolomics

Introduction

Targeted Metabolomics focuses on specific or all metabolites involved in certain pathways. The target compounds are analyzed qualitatively and quantitatively using the multiple reaction monitoring (MRM) scanning technology. Comparing to untargeted metabolomics, it is characterized by high specificity, high sensitivity, and accurate quantification. Key metabolic molecular markers identified through untargeted metabolomics can be further validated using targeted metabolomics. It is also possible to directly target a certain class of metabolites.

Project Workflow



Metabolite Category

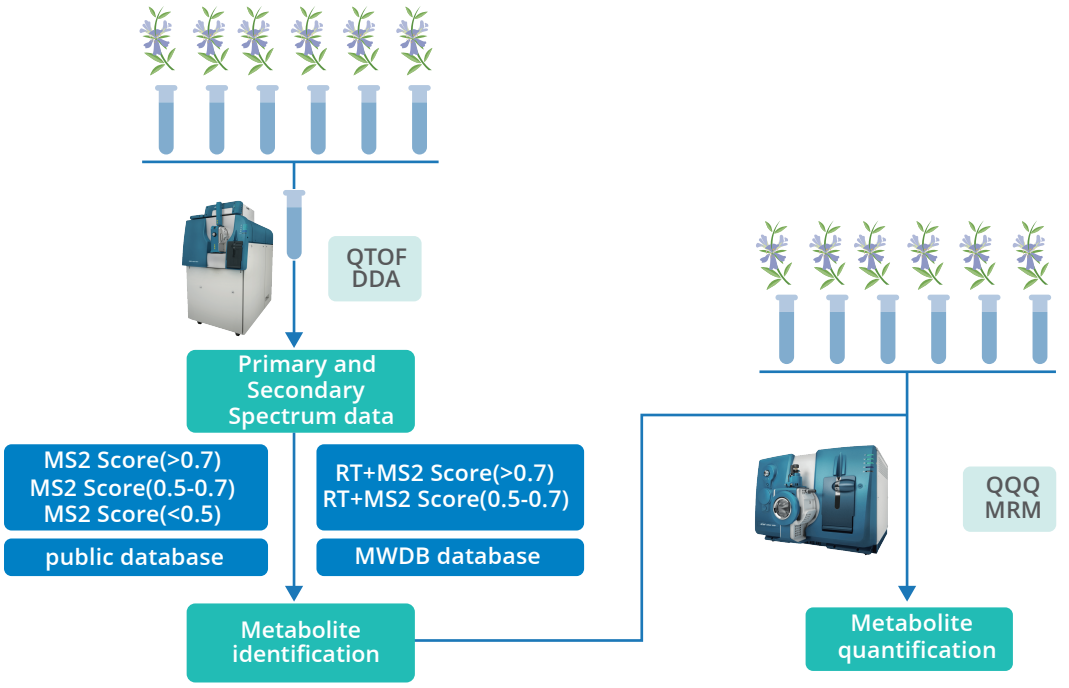
Product Classifications	Number	Representative compounds
Carotenoids	68	α-carotene, lycopene, γ-carotene, β-carotene, Phytofluene, etc.
Anthocyanin	108	Petunidin-3-O-glucoside, Delphinidin-3,5-O-diglucoside, Afzelin, Chalcone, Naringenin, etc.
Bile acid	65	Lithocholic acid, Taurolithocholic acid-3-sulfate, 3-Oxodeoxycholic acid, Cholic acid, etc.
Energy Metabolism	68	Pyruvic acid, Serine, Lysine, Succinic Acid, Glutamine, Citric acid, etc.
Phytohormone	84	Abscisic acid, ABA-glucosyl ester, 3-Indoleacetonitrile, Tryptamine, Kinetin, etc.
.....		.....

Widely-Targeted Metabolomics for Plant

Introduction

Widely-Targeted Metabolomics incorporates the advantages of high throughput of Untargeted Metabolomics with the high accuracy and sensitivity of Targeted Metabolomics to provide high-throughput identification and quantification of a wide variety of metabolites. It is widely used in plant metabolism research, where the number of metabolites far exceeds that in animals. With our tailored in-house database, Widely-Targeted Metabolomics enables the accurate identification of more than 30000 metabolites.

Project Workflow



Metabolite Category

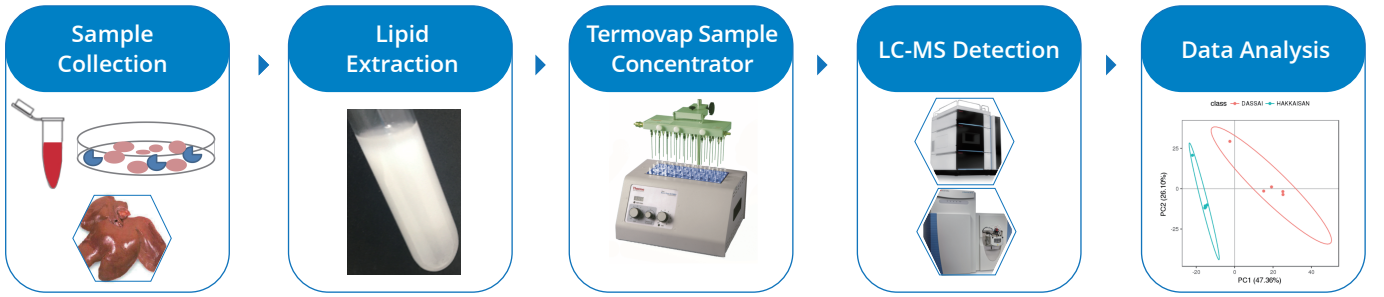
Types	Number	Representative compounds
Flavonoids	3700+	Rutin, Phloretin, Phelligrin A, Hesperetin, Licorice glycoside A, Pelargonidin-3-O-glucoside, Ginkgetin, Formononetin, Theaflavin
Phenolic acids	2100+	Chlorogenic acid, Momordicoside A, Oleuropein, Salvianolic acid A, Tatariside A, Veratric acid, Salidroside, Parishin B, Magnoloside A, Vanillic acid
Alkaloids	7000+	α-Solanine, Verticine, Nuciferine, Stachydrine, Matrine, Camptothecin, Arecoline, DIMBOA, Avenanthramide A, Lycorenine
Terpenoids	8000+	Artemisinine, Genipin, Paclitaxel, Wilforlide A, Protopanaxdiol, Saikosaponin A, Cucurbitacin B, Crocin I, Cyclocarioside I , Ecliptasaponin A
Quinones	700+	Emodin, Obtusin, Lapachone, Shikonin, Tectograndone, Morindaparvin A, Aloesin,5-Hydroxydigitolutein, Trijuganone A
Steroid	1300+	Asparagoside C, Polyphyllin I, Timosaponin A-III, Gracillin, Sarsasapogenin, Tigogenin, Digitonin,Oleandrin
Tannins	240+	Ellagic acid, Gemin D, Casuariin, Punicalin, Chebulagic acid, 1,3,6-Tri-O-galloylglucose, Chebulanin, Tellimagrandin I
Ligans	1000+	Honokiol, Syringaresinol, Arctigenin, Pinoresinol, Schisanhenol, Sesamin, Chestnutlignansoide, Trachelogenin, Fargesin, Isolariciresinol
Glucosinolates	150+	Sulforaphane, Gluconasturtiin, Sinalbin, Glucocheirolin, Glucoraphanin, 4-Hydroxy-3-indolylmethyl glucosinolate, Sinigrin, 4-Methylsulfinyl-3-Butenyl Glucosinolate
Coumarins	800+	Umbelliprenin, Psoralen, Glycycoumarin, Xanthotoxol, Scopolin, Bengenin, Bergapten, Decursinol, Dihydrocoumarin
Organic acids	270+	Succinic acid, Malic acid, Citric Acid, Quinic Acid, Abscisic acid, Tartaric acid, Shikimic acid, Aconitic Acid, Salicylic acid, Cinnamic acid, Maleic acid
Vitamins	50+	Vitamin C, Vitamin B2, Vitamin A1, Vitamin U, Ginkgotoxin, Nicotinic acid, Nicotinamide, Retinol, Vitamin D3, Tocotrienol
Amino acids and derivatives	540+	Tryptophan, Theanine, Beauvericin, Dencichin, Heterophyllin, Saccharopine, Alliin, Dopa, S-Adenosylmethionine, γ-Glu-Cys
Nucleotides and derivatives	120+	Adenine, Cytosine, Thymine, Inosine, Eritadenine, Xanthosine, Cordycepin, Sepiapterin,Adenosine 5'-monophosphate
Saccharides and Alcohols	340+	Glucose, Fructose, Sucrose, Fucose, Xylitol, Rhamnose, Maltose, Raffinose, Allitol, Mannitol
Lipids	500+	Linolenic acid, 4-Hydroxysphinganine, Lauric acid, Cerulenin,Myristic Acid, Palmitic acid, Arachidonic Acid, Stearic Acid
Others	3200+	Aflatoxin B1, Secoxyloganin, Kavain, Terreic acid, Mansonone E, Litchiol A, Myricanol, Safranal, Bruceine A, Gambogic acid
Sum up	30000+	

Quantitative Lipidomics

Introduction

Lipid molecules play a crucial role in living organisms, making lipidomics one of the most important branches of metabolomics. This high-throughput approach enables the simultaneous identification and absolute quantification of six types of lipids in a single run. It is aimed at analyzing the changes and functions of these substances in various biological processes and elucidating the biological phenomena and mechanisms of life activities.

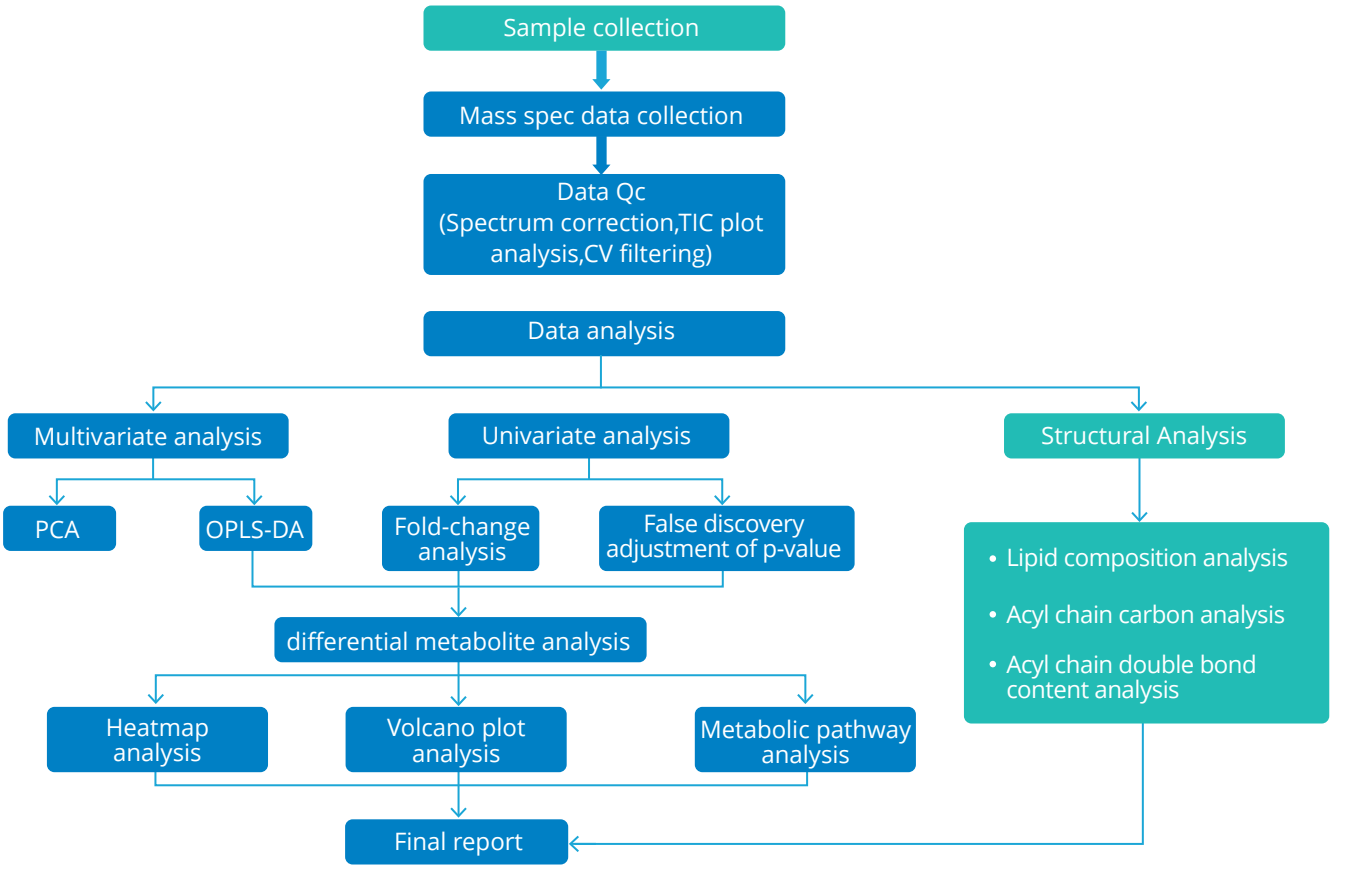
Project Workflow



Metabolite Category

Quantitative Lipidomics Database		
Class I	Class II	Number
Fatty acyl group (FA)	CAR, FFA, Eicosanoid, FAHFA	270
Glycerophospholipids (GP)	LPC, LPC-O, LPE, LPE-P, LPG, LPS, PC, PCO, PE, PE-P, PE-O, PG, PS, LPI, PI, LPA, PA, PMeOH, BMP, HMBP, LNAPE	1015
Sphingolipid (SL)	SPH, CerP, HexCer, SM, Cer, Cert	828
Glycerolipids (GL)	DG, DG-O, MG, TG, TG-O, MGDG, DGDG	1015
Sterol lipids (ST)	Cho, CE, BA, CASE	122
Isopentenolipids (PR)	CoQ	3
In total		4000+

Metabolomics Analysis Workflow



Note: Structural Analysis is for Lipidomics projects only.

Mass Spectrometry Platforms

Novogene holds multiple sets of SCIEX's high-throughput QTRAP® 6500 and 4500, Agilent's high-resolution 6545, AB Sciex TripleTOF® 6600+, and Thermo Fisher's Q Exactive HF-X platforms to provide high-quality Metabolomics services.

SCIEX QTRAP® 6500+/4500

AB Sciex TripleTOF® 6600+

Agilent 6545 Q-TOF LC-MS

Q ExactiveHF-X

Bruker TimsTof Pro

Bruker TimsTof FleX

Publications Powered by Novogene

Journal	Article	Service Type
Plant Biotechnology Journal	A novel R2R3-MYB transcription factor FaMYB5 positively regulates anthocyanin and proanthocyanidin biosynthesis in cultivated strawberries (Fragaria × ananassa)	Widely-Targeted Metabolomics+Targeted Metabolomics
Advanced Science	Exosome Release Delays Senescence by Disposing of Obsolete Biomolecules	Untargeted Metabolomics
Immunity	Multi-omics blood atlas reveals unique features of immune and platelet responses to SARS-CoV-2 Omicron breakthrough infection	Untargeted Metabolomics+ Proteomics
Carbohydrate Polymers	Salvia miltiorrhiza polysaccharide and its related metabolite 5-methoxyin-dole-3-carboxaldehyde ameliorate experimental colitis by regulating Nrf2/Keap1 signaling pathway	Untargeted Metabolomics

Novogene is committed to be

Your Trusted Genomics Partner

- Trusted International Corporation
- Trusted Comprehensive Experience
- Trusted Expertise & Technology
- Trusted Service & Standardized Procedures
- Trusted Delivery Quality & Efficiency

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