

About Gut Microbiome Metabolism

A significant portion of the metabolites in human blood circulation originate from gut microbiome. The direct metabolite exchanges (host-microbe metabolic axes) are central to the interaction between gut microbiome and host.

Many of the gut bacterial-derived metabolites are shown to play key roles in disease and health status such as diabetes, cardiovascular diseases, liver diseases, inflammation, CNS function, and immunity. A large overlap of metabolites is observed between fecal and plasma/serum samples. However, the metabolite patterns in both matrices are different due to their different physiological and metabolic processes.

Precion's microbiome panel provides a comprehensive coverage of key microbiome metabolic pathways associated with disease and health status (shown in the pathway diagram). The high-definition map can be downloaded from Precion's website (precion.com).

Applications

- Providing novel insights on how microbiome impacts host's disease and health status in clinical or experimental studies
- Evaluating the changes of the host microbiome through dietary, nutraceutical, prebiotics, probiotics, and biopharmaceutical intervention
- Assessing the homeostasis of gut health
- Discovering biomarkers associated with gut microbiome actions

Key Advantages - Reproducible Results

- Absolute quantitation of a large set of metabolites associated with gut bacterial metabolism (see table on second page). Absolute quantitation enables direct comparison with existing databases or merging datasets from different experiments
- Fully quantitative LC-MS/MS method with minimum of 6 to 8 calibrators per metabolite
- Matching stable isotope labeled internal standards for each of the 70 analytes
- Calibrator and quality control sample precision (% CV) typically <10%

Analytical Method and Instrumentation

- Analysis by LC-MS/MS
- Sciex Exion UHPLC coupled to a Sciex 5500+ Triple Quadrupole Mass Spectrometer

Sample Requirements

Small amount of sample required

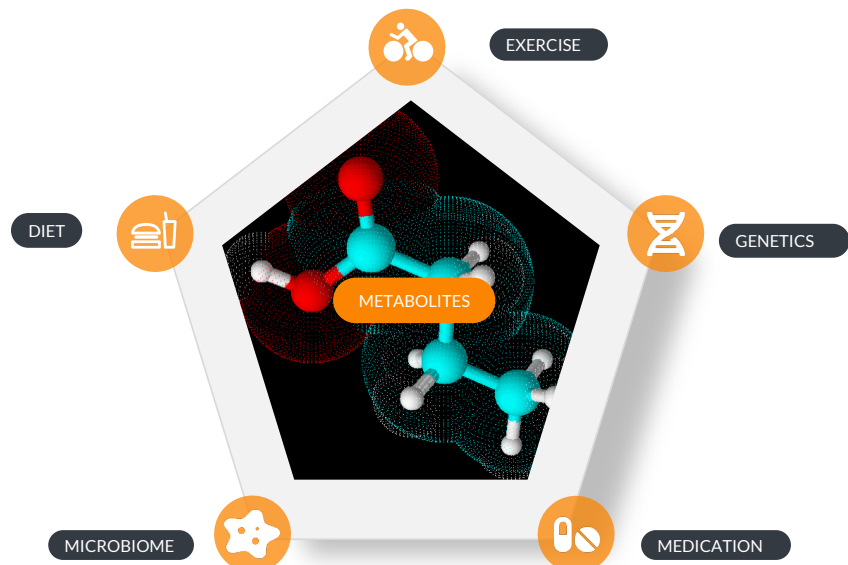
Sample Matrix	Sample Amount
Plasma/Serum	200 µL
Fecal Sample	100 mg
Bacterial Culture Supernatants	200 - 300 µL

A Focus on Metabolite Biomarkers

Chronic diseases are driven by genetic & non genetic factors, making them difficult to diagnose.

Metabolites reflect the combined effects of genetics, lifestyle, microbiome, drug actions, and disease status.

Our focus on targeting metabolites allows us to diagnose chronic diseases effectively.



Comprehensive Gut Microbiome Specific Metabolite Panel

Panel Analytes *Metabolite patterns in serum/plasma are slightly different from feces*

PRECISION™

Metabolite	Feces	Plasma/ Serum
2-methylbutyrate	✓	✓
3-hydroxyanthranilate	-	✓
3-hydroxybenzoate	✓	✓
3-hydroxyhippurate	✓	✓
3-hydroxykynurenine	-	✓
3-hydroxyphenylpropionate	✓	✓
3-methylindole	✓	-
4-ethylphenylsulfate	✓	✓
4-ethylphenol	✓	-
4-hydroxyphenylacetate	✓	✓
4-hydroxyphenylacrylate	✓	✓
4-hydroxyphenyllactate	✓	✓
4-hydroxyphenylpropionate	✓	✓
acetate	✓	✓
agmatine	✓	-
arginine	✓	✓
benzoate	✓	✓
betaine	✓	✓
butyrate	✓	✓
cadaverine	✓	-
carnitine	✓	✓
chenodeoxycholate	✓	✓
cholate	✓	✓
choline	✓	✓
cinnamoylglycine	✓	✓
citrulline	✓	-
deoxycholate	✓	✓
enterodiol	✓	-
enterolactone	✓	-
GABA	-	✓
glycochenodeoxycholate	✓	-
glycocholate	✓	-
glycoursodeoxycholate	-	✓
hexanoate	✓	✓
hippurate	✓	✓
hyocholate	-	✓
imidazole propionate	✓	✓
indole	✓	-
indole-3-acetamide	✓	-
indole-3-lactate	✓	✓
indole-3-propionate	✓	✓
indoleacetate	✓	✓

Metabolite	Feces	Plasma/ Serum
indoleacetyl glycine	✓	-
indoleacrylate	✓	✓
indolylacryloylglycine	✓	✓
indoxyl sulfate	✓	✓
inosine	✓	-
isobutyrate	✓	✓
isoleucine	✓	-
isovalerate	✓	✓
kynurenate	✓	✓
kynurenine	✓	✓
lactate	✓	-
leucine	✓	-
lithocholate	✓	✓
lysine	✓	✓
N-acetylserotonin	✓	-
ornithine	✓	✓
p-cresol	✓	-
p-cresol glucuronide	✓	✓
p-cresol sulfate	✓	✓
phenol	✓	-
phenol glucuronide	-	✓
phenol sulfate	✓	✓
phenylacetate	✓	✓
phenylacetylglutamine	✓	✓
phenylacetyl glycine	✓	✓
phenylalanine	✓	✓
phenyllactate	✓	✓
phenylpropionate	✓	✓
phenylpropionyl glycine	✓	✓
phenylpyruvate	✓	✓
propionate	✓	✓
putrescine	✓	✓
quinolinate	✓	✓
serotonin	✓	✓
trimethylamine (TMA)	✓	-
trimethylamine oxide (TMAO)	-	✓
tryptamine	✓	✓
tryptophan	✓	✓
tyramine	✓	-
tyrosine	✓	✓
ursodeoxycholate	✓	-
valerate	✓	✓
valine	✓	-