Lipid Analysis

Untargeted Lipidomics

Lipids are essential components for all living systems. They play critical roles in physiology and pathology. Most diseases, as diverse as diabetes, cancer, atherosclerosis, or dementia, involve disruptions in lipid metabolism or in signaling by lipid mediators. Although profiling all lipids in a biological sample is complicated by the enormous diversity and concentration ranges of these molecules, the untargeted analysis of lipids across several categories, lipidomics, is an increasingly used research tool that is already advancing our understanding of this biochemical space.

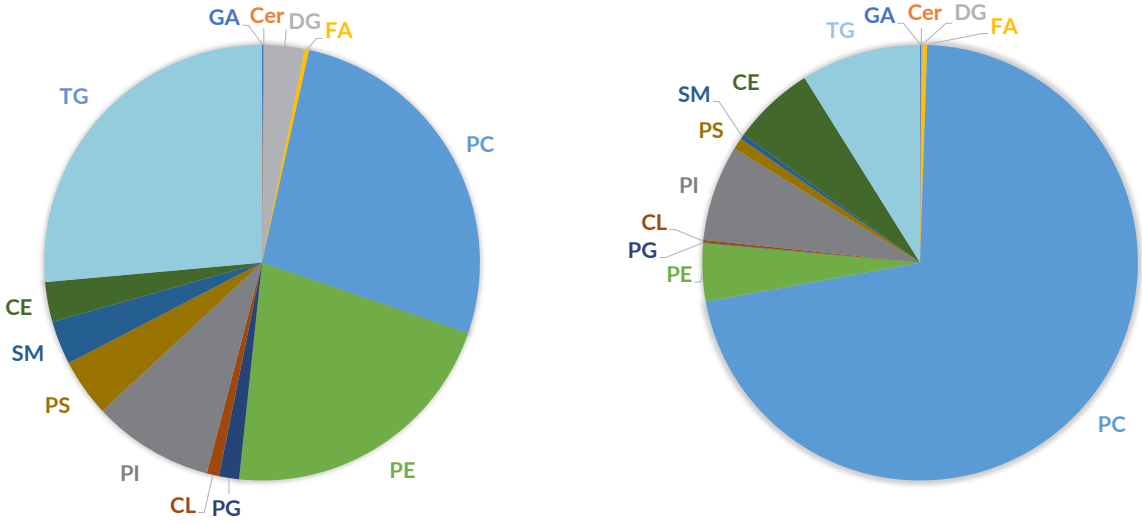
This service can be of interest to a wide variety of scientists, including researchers exploring the fundamental mechanisms of biology, clinicians looking for biomarkers or following up on a treatment, or companies testing potential therapeutic tools.

Analyte Coverage

Cayman offers a high-quality untargeted lipidomics analysis service to help make your research possible. Our extraction and LC-MS analysis delivers relative quantitation of hundreds of molecular species present in samples, such as biofluids, oils, cells, or tissues of any origin.

Examples of Lipids Detected

Category	Class or Subclass	Category	Class or Subclass
Fatty Acyls [FA]	Fatty acids (FA)	Glycerophospholipids (GP)	Phosphatidic acids (PA)
	Fatty acyl carnitines (CAR)		Phosphatidylcholines (PC)
	FAHFA		Phosphatidylethanolamines (PE)
	Wax esters (WE)		Phosphatidylglycerols (PG)
Sterols [ST]	Cholesteryl esters (CE)		Phosphatidylinositols (PI)
	Cholesterol		Phosphatidylserines (PS)
Sphingolipids [SP]	Ceramides (Cer)		Cardiolipins (CL)
	Hexosylceramides (HexCer)	Glycerolipids (GL)	Monoacylglycerols (MG)
	Gangliosides (GA)		Diacylglycerols (DG)
	Sulfatides (ST)		Triacylglycerols (TG)
	Sphingomyelins (SM)	Prenol Lipids (PR)	Ubiquinones, squalene



Pie charts showing the distribution of lipids identified using untargeted lipidomics in rat liver **(left)** and rat plasma **(right)**. Areas are proportional to the relative content of a class or subclass of lipids. Abbreviations correspond to the ones shown on the table in the front page.

Our Approach

Well-established methods are used for homogenization, lipid extraction, LC-MS, and data analysis. These methods have been tested with as little as 5 µl plasma, 1 mg tissue, or 1 million cells.

Reversed-phase HPLC allows chromatographic separation of lipid isomers with identical mass-to-charge ratios. Accurate mass and tandem mass spectrometry are combined for correct identification of lipids using state-of-the-art instrumentation and software. Identified molecular species of lipids reported at the correct structural information level as recommended by current guidelines from LIPID MAPS® and the International Lipidomics Society.

Cayman's high quality, authentic standards such as the Deuterated Lipidomics Internal Standard MaxSpec® Mixture enable the consistent addition of isotopically labeled internal standards to achieve accurate and precise relative quantitation of lipids present in samples.

Our Advantages

- Our scientists are expertly trained and have decades of collective experience in the analysis, synthesis, and evaluation of biological roles of lipids.
- State-of-the-art instrumentation, reagents, and methods for all aspects of sample preparation, lipid extraction, LC-MS analysis, and data review ensure consistent, high-quality data.
- Matrix-specific quality control samples for monitoring instrument performance. Optimized processing steps of complex data (hundreds of lipids) for fast turnaround time.
- Method is scalable, from pilot studies with a few samples to high-throughput studies with hundreds of samples.
- High-quality standards produced in-house enable accurate relative quantitation.

Contact us for more information at **www.caymanchem.com/lipidomics**

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