Lipid Analysis

Sphingolipids II: Ceramides, Hexosylceramides, and Sphingomyelins

The sphingolipid (SP) category of lipids is very structurally diverse due to the multitude of combinations of sphingoid bases, N-acyl chains, and polar heads, so comprehensive analysis of all relevant sphingolipids in a biological system is not achievable with a single analytical approach. Ceramides are key precursors of all other SPs. Monohexosylceramides like glucosylceramides, dihexosylceramides like lactosylceramides, and sphingomyelins are structural lipids involved in lysosomal storage pathologies like Niemann-Pick or Gaucher diseases.

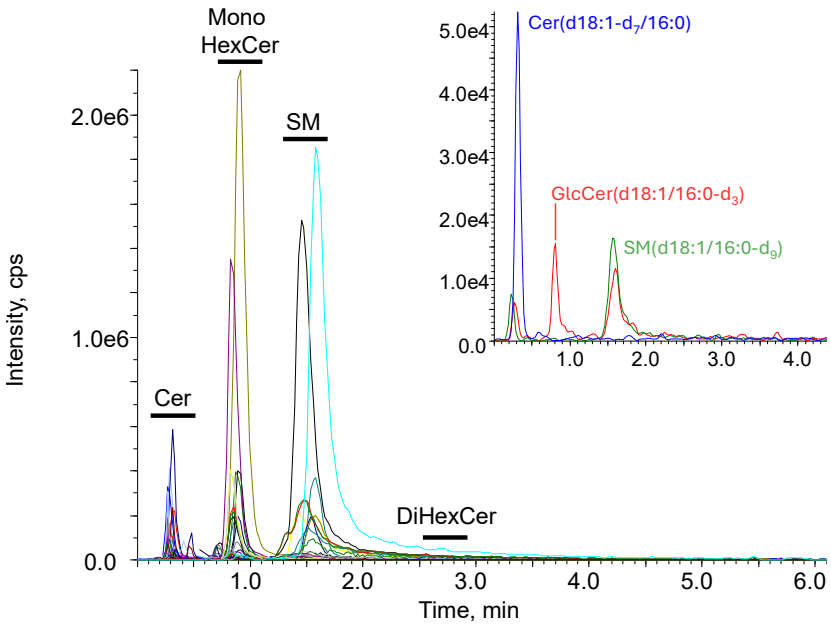
This service can be of interest to a wide variety of scientists, including researchers exploring the fundamental mechanisms of biology, clinicians looking for biomarkers or following up on a treatment, or companies testing potential therapeutic tools.

Analyte Coverage

We offer a comprehensive analytical service covering 78 sphingolipids.

Ceramides	Monohexosylceramides	Dihexosylceramides	Sphingomyelins
Cer(18:1;O2/16:0)	HexCer(18:1;O2/16:0)	Hex2Cer(18:1;O2/16:0)	SM(34:1;O2)
Cer(18:1;O2/16:1)	HexCer(18:1;O2/16:1)	Hex2Cer(18:1;O2/16:1)	SM(34:2;O2)
Cer(18:1;O2/18:0)	HexCer(18:1;O2/18:0)	Hex2Cer(18:1;O2/18:0)	SM(36:1;O2)
Cer(18:1;O2/18:1)	HexCer(18:1;O2/18:1)	Hex2Cer(18:1;O2/18:1)	SM(36:2;O2)
Cer(18:1;O2/20:0)	HexCer(18:1;O2/20:0)	Hex2Cer(18:1;O2/20:0)	SM(38:1;O2)
Cer(18:1;O2/22:0)	HexCer(18:1;O2/22:0)	Hex2Cer(18:1;O2/22:0)	SM(40:1;O2)
Cer(18:1;O2/23:0)	HexCer(18:1;O2/23:0)	Hex2Cer(18:1;O2/23:0)	SM(41:1;O2)
Cer(18:1;O2/24:0)	HexCer(18:1;O2/24:0)	Hex2Cer(18:1;O2/24:0)	SM(42:1;O2)
Cer(18:1;O2/24:1)	HexCer(18:1;O2/24:1)	Hex2Cer(18:1;O2/24:1)	SM(42:2;O2)
Cer(18:1;O2/26:0)	HexCer(18:1;O2/26:0)	Hex2Cer(18:1;O2/26:0)	SM(44:1;O2)
Cer(18:1;O2/26:1)	HexCer(18:1;O2/26:1)	Hex2Cer(18:1;O2/26:1)	SM(44:2;O2)
Cer(18:0;O2/16:0)	HexCer(18:0;O2/16:0)	Hex2Cer(18:0;O2/16:0)	SM(34:0;O2)
Cer(18:0;O2/18:0)	HexCer(18:0;O2/18:0)	Hex2Cer(18:0;O2/18:0)	SM(36:0;O2)
Cer(18:0;O2/20:0)	HexCer(18:0;O2/20:0)	Hex2Cer(18:0;O2/20:0)	SM(38:0;O2)
Cer(18:0;O2/22:0)	HexCer(18:0;O2/22:0)	Hex2Cer(18:0;O2/22:0)	SM(40:0;O2)
Cer(18:0;O2/23:0)	HexCer(18:0;O2/23:0)	Hex2Cer(18:0;O2/23:0)	SM(41:0;O2)
Cer(18:0;O2/24:0)	HexCer(18:0;O2/24:0)	Hex2Cer(18:0;O2/24:0)	SM(42:0;O2)
Cer(18:0;O2/24:1)	HexCer(18:0;O2/24:1)	Hex2Cer(18:0;O2/24:1)	SM(44:0;O2)
Cer(18:0;O2/26:0)	HexCer(18:0;O2/26:0)	Hex2Cer(18:0;O2/26:0)	
Cer(18:0;O2/26:1)	HexCer(18:0;O2/26:1)	Hex2Cer(18:0;O2/26:1)	

If necessary, additional analytes such as phytoceramides (t18:0) or other molecular species with less common sphingoid bases (*e.g.*,. d20:1 or d18:2) or N-acyl chains (*e.g.*, hydroxylated chains) can be added or substituted.



LC-MS chromatogram traces of sphingolipids extracted from mouse liver supplemented with deuterated internal standards.

Our Approach

Samples are extracted using a liquid-liquid method that includes a saponification step to hydrolyze glycerolipids and glycerophospholipids. Our lab is equipped to handle large sample sets, and the method has been tested with as little as 100 µl plasma or 100 mg liver tissue.

Normal-phase HPLC and tandem mass spectrometry resolve all analytes and enable independent integration and quantitation.

The use of isotopically labeled internal standards helps achieve accurate and precise semiquantitation of the sphingolipids present in biological 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.
- 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 calibration curve preparation and absolute quantitation.

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

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