Lipid Analysis

Short-Chain Fatty Acids

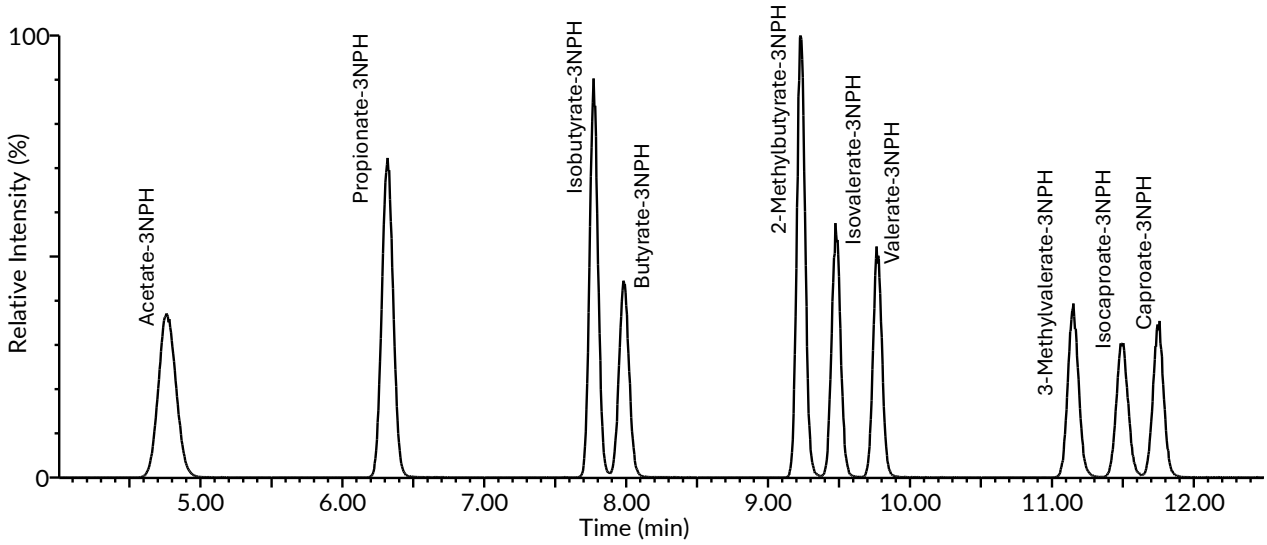
Short-chain fatty acids (SCFAs) are saturated carboxylic acids containing six carbons or less. They are produced by gut microbiota as they ferment undigested carbohydrates that travel through the intestine and act as an energy source for intestinal cells in the colon. SCFAs contribute in several important ways to health, including reduced inflammation, type 2 diabetes, cardiovascular disease, and obesity. Modifications in diet or microbiota composition influence SCFA production by gut microbiota. The detection and analysis by mass spectrometry permits monitoring a panel of straight-chain and branched SCFAs, allowing researchers to investigate these molecular fingerprints in various health applications.

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 SCFA analyte panel covering the 10 most common SCFAs, ranging in length from two to six carbons, in urine, plasma, colon, or other biological fluids or tissues.

Common Name	IUPAC Name	Carbon Number
Acetic Acid	Ethanoic Acid	2
Propionic Acid	Propanoic Acid	3
Butyric Acid	Butanoic Acid	4
Isobutyric Acid	2-Methylpropanoic Acid	4
α-Methylbutyric Acid	2-Methylbutanoic Acid	5
Isovaleric Acid	3-Methylbutanoic Acid	5
Valeric Acid	Pentanoic Acid	5
3-Methylvaleric Acid	3-Methylpentanoic Acid	6
Caproic Acid	Hexanoic Acid	6
Isocaproic Acid	4-Methylpentanoic Acid	6



LC-MS chromatogram traces of 10 derivatized SCFA standards.

Our Approach

An efficient protein precipitation protocol, followed by derivatization with 3-nitrophenylhydrazine (3NPH) and solid-phase extraction has been developed. The method has been tested from as little as 50 µl plasma or 5 mg tissue.

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

Calibration curves prepared from authentic standards and the addition of isotope-labeled internal standards help achieve accurate and precise absolute quantitation of the 10 SCFAs 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.
- Collaborative, flexible approach. The method can be customized to include, remove or substitute analytes, or to be used with samples other than plasma. Inquire for specific details.

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

Cayman Chemical · 1180 East Ellsworth Road · Ann Arbor, MI, 48108 · (800) 364-9897