

University of Louisville
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Literature Seminar

When: November 12, 2020

Time: 2:30 PM

Location: Microsoft TEAMS

Liquid chromatography-Mass spectrometry based lipidomics study

Abstract

As lipid plays a vital role in cellular barrier, signal conduction, substance transport and energy transport, it has important biological significance.[1] Lipidomics provides detailed characterization of lipids and is extensively used in biomarker discovery, mechanism studies of cardiovascular disease,[2] diabetes,[3] cancer, alzheimer's disease.[4] Due to the enormous sample complexity and wide variety of physical properties that different classes of lipids possess, the analysis of them in biological tissues and fluids remains a challenge.[5] Direct infusion MS-based shotgun lipidomics is widely used technology. Mass spectrometry (MS) is usually hyphenated to chromatographic separation to reduce the analyte complexity at the detection moment. [5] Pseudotargeted 2DLC-MS method can be used for the simultaneous coverage of metabolome and lipidome and later applied to investigate differential metabolites and lipids in biological samples.

References

1. Wenk, M.R., Lipidomics: new tools and applications. *Cell*, 2010. 143(6): p. 888-895.
2. Stegemann, C., et al., Lipidomics profiling and risk of cardiovascular disease in the prospective population-based Bruneck study. *Circulation*, 2014. 129(18): p. 1821-1831.
3. Rhee, E.P., et al., Lipid profiling identifies a triacylglycerol signature of insulin resistance and improves diabetes prediction in humans. *The Journal of clinical investigation*, 2011. 121(4): p. 1402-1411.
4. Grimm, M.O., D.M. Michaelson, and T. Hartmann, Omega-3 fatty acids, lipids, and apoE lipidation in Alzheimer's disease: a rationale for multi-nutrient dementia prevention. *Journal of Lipid Research*, 2017. 58(11): p. 2083-2101.
5. Narváez-Rivas, M., et al., Off-line mixed-mode liquid chromatography coupled with reversed phase high performance liquid chromatography-high resolution mass spectrometry to improve coverage in lipidomics analysis. *Anal Chim Acta*, 2017. 954: p. 140-150.