

ONE-DAY COURSE, Sunday only
Lipidomic Workflows: An Introduction

Instructors



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Overview of course

This course is designed for mass spectrometrists who are new or have recently entered the lipidomics field. The course will provide an introduction to current workflows, from the experimental design stage to data dissemination, enabling those who attend to obtain the necessary information and resources to adequately design, perform, and analyze data from lipidomics experiments. It should be noted that the course will not be taught from a perspective that there is “one best approach”, as the workflow chosen is often driven by sample, matrix, and biological questions. Rather, the course will cover three widely used approaches (e.g., direct infusion, liquid chromatography, and imaging) and will describe how each can be tailored to different lipid applications and measurement requirements.

Specific topics covered in the short course include:

1. Basic overview of lipids (biology, applications, and measurement challenges)
2. Sample preparation for lipidomics experiments (pre-analytical considerations, use/choice of internal standard, lipid extraction, sample derivatization)
3. Lipidomic workflows (direct-infusion, gas and liquid chromatography, imaging)
4. Targeted and nontargeted mass spectrometric strategies for lipidomics
5. Data handling for lipidomics data sets (quantitation, software tools, structural resolution/annotation, QA/QC, and reporting of data)
6. Resources all lipidomics researchers should know, and emerging guidelines to follow.

We will cover troubleshooting: common problems for new users, how to spot problems and how to avoid/fix them. In addition, we will briefly cover new advancements/trends in the field that researchers may be unfamiliar with and/or are too afraid to ask (e.g., derivatization, supercritical fluid chromatography, ion mobility, advanced MS/MS techniques). The course will be designed to serve as a resource, that can be consumed post-course, by providing relevant publications, slides, videos, personal experiences, and real data/experiments.

Prerequisite: Attendees should have a basic knowledge of organic chemistry (lipids), chromatography, and preferably, some prior “hands on” mass spectrometry experience.