

Metabolomics Workshop

–Metabolomics by LC-MS: From Basics to Applications–

Friday, June 21, 2024, 3 – 5 pm

Osaka University, Biosystems Building 2F Seminar Room

Speakers



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Agenda

Part 1, 3:00 – 3:40

- Introduction to Metabolomics by LC-MS: Theory and Practice
- Targeted and Untargeted Metabolomics in Health and Disease

Break: 3:40 – 3:50

Part 2, 3:50 – 4:30

- Introduction to Metabolomics Data
- Ensuring Data Quality and Reproducibility
- Downstream Analysis
- Data Visualization Techniques

Q&A: 4:30

Motivation

In recent years, the burgeoning field of metabolomics has greatly enhanced our understanding of biological systems, extending its utility well beyond any single discipline. Central to this field is LC-MS (Liquid Chromatography-Mass Spectrometry), a powerful analytical technique that separates chemicals before identifying and quantifying them with unmatched precision. This workshop invites you to immerse yourself in the transformative power of metabolomics and LC-MS, technologies that are reshaping scientific inquiry and clinical practice alike. Designed for the inquisitive mind, this workshop requires no prerequisite knowledge beyond a general curiosity about emerging technologies.

Scope

We will kick off with an Introduction to Metabolomics focused on LC-MS analysis basics and practice. We will put the technology in perspective by showcasing how it is applied to solve fundamental and clinically relevant biological questions. Then we will go deeper into specifics of Metabolomics Data, exploring its unique characteristics and the challenges faced in its analysis. Next, we'll delve into strategies to ensuring Data Quality and Reproducibility, where you'll learn best practices for experimental design, sample preparation, and quality control. Discover the importance of the FAIR principles and standardized data formats to maintain robust and reliable data. In our Downstream Analysis session, we'll cover essential techniques for data preprocessing and normalization, addressing missing data, and correcting batch effects. We'll introduce powerful metabolomics tools and demonstrate how network analysis can uncover intricate metabolic interactions. Finally, our Data Visualization Techniques segment will show you how to transform complex metabolomics data into clear, informative, and interactive visual representations using the latest tools and software.

Host: Masatoshi Hara, Fukagawa lab. FBS, Osaka Univ.

