Lipidomics — Classification, Fragmentation & Quant — Hands-on

Learn how to design and execute lipidomics workflows that produce interpretable, quantitative lipid profiles. This module covers lipid class nomenclature, data structures, acquisition and fragmentation strategies and quantitative methods so that you can generate reproducible lipid panels for discovery, mechanistic and translational studies.

Lipidomics — Classification, Fragmentation & Quant

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Session Index

Session 1

Fee: Rs 8800 Apply Now

Lipid Classes, Nomenclature & Data Structures

Lipid categories, classes and molecular species

glycerophospholipids, sphingolipids | **glycerolipids, sterols, eicosanoids** | **LIPID MAPS hierarchy**

Nomenclature and reporting conventions

sum composition vs molecular species | **acyl chain notation (C:DB/O)** | **sn position and isomer issues**

Lipidomics data matrices and annotation formats

feature tables vs curated lipid IDs | class level vs species level outputs | export formats for downstream analysis

Session 2

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Acquisition & Fragmentation Patterns

Chromatography and ionization for lipid classes

normal phase vs reverse phase vs HILIC | ESI positive and negative modes | class specific retention behavior

Class specific MS/MS fragmentation signatures

headgroup fragments (PC, PE, PI etc.) | neutral losses and acyl chain fragments | diagnostic fragments for sphingolipids

Acquisition strategies for discovery and panels

DDA vs DIA in lipidomics | MRM/PRM for targeted lipids | balancing coverage and duty cycle

Session 3

Fee: Rs 14800 Apply Now

Quantitative Lipidomics & Calibration

Internal standards and response factors

class matched and surrogate standards | spike in strategies and timing | matrix effects and correction

Absolute and relative quantitation workflows

calibration curves and linear ranges | limits of detection and quantitation | normalization and reporting units

QC, batch assessment and data acceptance

pooled QC, reference samples and SRMs **RSD thresholds and drift checks** **criteria for excluding runs and features**

Session 4

Fee: Rs 18800 Apply Now

Mini Capstone: Lipid Panel & Report

Designing a targeted or semi targeted lipid panel

selection by biology, coverage and feasibility

End to end workflow on a teaching dataset

from raw data to quantified lipids **summary tables and QC plots** **class level and species level views**

Deliverables: lipid panel table, QC summary & methods text

panel definition and calibration details **exported tables for statistics** **ready to edit methods and results template**