Integrative Metabolomics with Genomics / Transcriptomics / Proteomics — Hands-on

Go beyond single-omics metabolite lists and build systems-level stories. This module focuses on practical strategies to link metabolites with genes, transcripts and proteins on shared pathways, construct correlation and network views, and summarise integrated findings for manuscripts and translational projects.

Integrative Metabolomics with Genomics / Transcriptomics / Proteomics

Help Desk · WhatsApp

Session Index

Session 1

Fee: Rs 8800 Apply Now

Multi-Omics Study Design & Data Harmonization

When and why to collect metabolomics with other omics layers

mechanistic depth | **biomarker robustness** | **pathway level confidence**

Study design and sample pairing for multi-omics projects

matched samples and time points | **batch and platform effects** | **metadata and covariates**

Basic data harmonization across omics layers (concepts)

ID mapping and naming consistency **normalization and scaling alignment** **handling missingness by layer**

Session 2

Fee: Rs 11800 Apply Now

Mapping Metabolites to Genes, Proteins & Pathways

Biochemical relationships between metabolites, enzymes and genes

enzyme catalysed reactions (concepts) **gene–protein–reaction links** **pathway modules and branches**

ID mapping resources and strategies (overview)

KEGG, Reactome style IDs **Ensembl / UniProt genes and proteins** **cross reference tables and scripts**

Building simple metabolite–gene/protein mapping tables

many to many relationships **direction of regulation (concept)** **pathway aware mapping summaries**

Session 3

Fee: Rs 14800 Apply Now

Multi-Omics Integration: Correlations, Networks & Simple Models

Pairwise integration using correlation and clustering

metabolite–gene correlation matrices **correlation networks (concepts)** **module or cluster detection ideas**

Pathway and network views combining omics layers

overlaying multi-omics on pathways **node colour and**

size encodings identifying convergent signals

Simple predictive models combining metabolites and other omics

feature sets by pathway basic regularised regression concepts care with sample size and overfitting

Session 4

Fee: Rs 18800 Apply Now

Mini Capstone: Integrated Multi-Omics Storyboard & Report

Constructing an integrated multi-omics view for a toy dataset

Theory + Practical

Summarising concordant and discordant signals across layers

tables of key metabolites & genes pathway and network snapshots biological interpretation and caveats

Deliverables: integrated multi-omics storyboard & result bundle

summary report (PDF/HTML) combined results tables (CSV/TSV) pathway/network visual exports