Multi-Omics Integration — Metabolome with Genome/Proteome — Hands-on

Learn how to connect metabolomics readouts with genomic and proteomic layers to tell coherent biological stories. This module covers identifiers and mappings, study design, matrix harmonisation, statistical integration and pathway or network based multi omics visualisation so that you can move from separate omics tables to integrated, mechanism oriented insights.

Multi-Omics Integration — Metabolome with Genome/Proteome

Help Desk · WhatsApp

Session Index

Session 1

Fee: Rs 8800 Apply Now

Multi Omics Concepts, IDs & Study Design

Omics layers and biological questions for integration

genome, transcriptome, proteome, metabolome **mechanism and biomarker discovery** **time course and intervention designs**

Identifiers, feature mappings and annotation resources

genes, proteins and metabolites cross references

Ensembl, UniProt, KEGG, ChEBI | ID mapping pitfalls and ambiguity

Study design and metadata for multi omics projects

sample pairing and matched designs | technical vs biological replication | metadata models and FAIR principles

Session 2

Fee: Rs 11800 Apply Now

Data Harmonisation & Statistical Integration

Normalisation, scaling and batch handling across layers

unit, range and distribution differences | per layer vs joint normalisation | batch correction concepts

Correlation and association based integration

pairwise gene metabolite or protein metabolite links | partial correlations and confounders | network edges from association matrices

Low dimensional multi omics methods (overview)

multi block PCA and PLS based approaches | cluster and module detection across layers | pragmatic choices for small and medium studies

Session 3

Fee: Rs 14800 Apply Now

Pathway, Network & Systems Level Views

Joint pathway and enrichment based integration

mapping genes, proteins and metabolites to pathways | overlaying multi layer changes on KEGG or Reactome | pathway level effect size and significance

Network based visualisation of multi omics links

bipartite and tripartite networks **modules and communities across layers** **prioritising hubs and key regulators**

Connecting to models and systems level resources

projection onto metabolic network or GEMs **overlay with signalling or regulatory networks** **ideas for follow up modelling or validation**

Session 4

Fee: Rs 18800 Apply Now

Mini Capstone: Integrated Multi Omics Storyboard

Building an integrated view on a teaching dataset

paired metabolomics with transcriptomics or proteomics

Visual summaries for teams and decision makers

joint pathway and network diagrams **multi layer heatmaps and modules** **clear narrative linking omics to phenotype**

Deliverables: integrated figures, tables & methods text

combined sample level matrix with metadata **key plots for publication or slides** **ready to edit multi omics methods and results**