

Biomarker Discovery — Panels & Clinical Validation — Hands-on

Bridge discovery and translation by designing realistic biomarker studies and panel workflows. This module focuses on how to select and evaluate metabolite (and multi-omics) candidates, build biomarker panels, interpret diagnostic performance metrics, and plan technical/clinical validation so that your results are ready for real-world decision support.

Biomarker Discovery — Panels & Clinical Validation

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Session 1

Fee: Rs 8800 [Apply Now](#)

Biomarker Study Design & Clinical Context

What makes a good biomarker and biomarker panel (concepts)

[prognostic vs diagnostic vs predictive](#) [clinical question and use case clarity](#) [single markers vs panels](#)

Cohort and study design for biomarker discovery

[case-control vs longitudinal ideas](#) [sample size and](#)

enrichment thinking **confounders and stratification**

Discovery vs validation phases and data partitioning

training / validation / test splits **internal vs external**
validation concepts **avoiding information leakage**

Session 2

Fee: Rs 11800 Apply Now

Candidate Discovery, Panels & Performance Metrics

From differential metabolites to candidate biomarkers

effect sizes and stability **biological plausibility**
concepts **shortlisting candidates systematically**

Building panels and simple multivariable models (concept level)

combining markers for improved performance
overfitting awareness and parsimony **cross-**
validation ideas

Diagnostic performance metrics and interpretation

sensitivity, specificity, accuracy **ROC curves and**
AUC concepts **PPV, NPV and prevalence impact**

Session 3

Fee: Rs 14800 Apply Now

Technical Validation & Clinical Readiness Concepts

Technical validation and assay performance (concepts)

precision and repeatability **LLOQ, ULOQ, linearity**
ideas **matrix effects awareness**

Cut-offs, risk scores and clinical decision thresholds

Youden index style cut-point ideas **risk stratification**
into groups **trade-offs between sensitivity and**

specificity

Independent validation cohorts and generalisability (high level)

multi-center and multi-ethnic ideas **sample handling**
consistency **reporting limitations transparently**

Session 4

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Mini Capstone: Biomarker Panel Report & Checklist

Summarising a toy biomarker panel from discovery to validation

Theory + Practical

Preparing a concise biomarker panel summary for stakeholders

marker list and panel description **key performance**
metrics table **intended use and next steps**

Deliverables: biomarker panel sheet, metrics table & validation checklist

panel summary (PDF/HTML) **performance metrics**
table (CSV/TSV) **clinical validation readiness**
checklist