Network Medicine, Disease Modules & Drug Repurposing — Hands-on

Learn how network medicine connects genes, pathways, phenotypes and drugs into disease modules that can be mined for repurposing and combination therapy opportunities. This module walks through network construction, disease module detection, target prioritization and network-based drug repurposing workflows using real biomedical data.

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Session Index

Session 1

Fee: Rs 8800 Apply Now

Foundations of Network Medicine & Disease Modules

Network medicine view of disease and comorbidities

interactomes and disease space **gene–gene and gene–phenotype links** **shared modules across diseases**

Disease modules and network neighborhoods

seed genes and module growth **topology based**

enrichment ideas | local vs global neighborhood views

Basic network medicine terminology & datasets

PPI networks (conceptual) | gene–disease associations | drug–target resources overview

Session 2

Fee: Rs 11800 Apply Now

Constructing & Analyzing Disease Networks

Building disease centric networks from omics and literature

DEG lists as seeds | projecting onto PPI | filtering and weighting edges

Detecting modules and key nodes

community detection overview | centrality measures and hubs | bridge nodes and bottlenecks

Pathway and tissue context for disease modules

pathway enrichment concepts | tissue specificity notes | linking to phenotype ontologies

Session 3

Fee: Rs 14800 Apply Now

Drug Target Networks & Repurposing Analytics

Drug–target networks and proximity to disease modules

mapping drugs onto interactomes | network distance concepts | polypharmacology intuition

Repurposing and combination strategy ideas

overlap and complementarity of modules | synergy hypotheses from networks | safety and off target considerations

Prioritization, scoring and simple validation checks

network based scores | cross referencing known indications | sanity checks with literature

Session 4

Fee: Rs 18800 Apply Now

Mini Capstone: Network Based Drug Repurposing Case

Pick a disease area and assemble a simple disease module

Theory plus guided practical

Overlay drug targets and generate repurposing hypotheses

single drug and combination ideas | simple network scores | quick literature cross checks

Deliverables: notebook, ranked candidates and short note

Python or R notebook | CSV of candidate rankings | PDF or HTML summary