Microbiome Network Ecology & Co Occurrence — Hands-on

Learn how to build and interpret microbiome co occurrence and interaction style networks from amplicon and metagenomic data. This module walks through correlation and graphical models, community detection, keystone taxa and stability concepts so you can convert microbiome tables into ecological network insights for clinical, environmental and industrial studies.

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Session Index

Session 1

Fee: Rs 8800 Apply Now

Microbiome Network Ecology Foundations

Networks in microbiome and microbial ecology studies

nodes as taxa, functions and samples | **edges as associations and candidate interactions** | **use cases in health, environment and industry**

Types of microbiome association networks

correlation and covariance networks | **graphical**

models and sparse inverse covariance **time ordered and bipartite style networks**

Compositionality, sparsity and confounding in networks

why naive correlations can mislead **sparsity, zero inflation and prevalence filters** **batch effects and shared environment issues**

Session 2

Fee: Rs 11800 Apply Now

Co Occurrence Network Construction Workflows

Preparing feature tables for network analysis

choosing taxonomic or functional resolution **prevalence and abundance filtering rules** **normalisation and transform options**

Correlation and composition aware association methods

Spearman and Pearson baselines **SparCC style and related methods** **graphical lasso or SPIEC style approaches**

Thresholding, multiple testing and edge confidence

p values, FDR and effect size trade offs **symmetric vs directed edge choices** **exporting networks for downstream tools**

Session 3

Fee: Rs 14800 Apply Now

Community Structure, Keystone Taxa & Stability

Network topology and community structure metrics

degree, centrality and connectivity patterns **community detection and modules** **hub, connector and peripheral nodes**

Identifying keystone and driver taxa candidates

degree and betweenness based views | module core species and connectors | linking candidates to function and metadata

Network stability, robustness and scenario style thinking

simulated node removal and perturbations | what if views for interventions and shifts | bridging networks back to ecological narratives

Session 4

Fee: Rs 18800 Apply Now

Mini Capstone: Network Analysis of a Microbiome Cohort

End to end network analysis on a real microbiome dataset

theory plus guided practical from feature table

Comparing networks across groups or time points

case vs control or treatment vs baseline | topology changes and key edge differences | simple visual summaries for stakeholders

Deliverables: network files, plots and ecological summary note

network edge and node tables for reuse | graph visualisations and key metric tables | PDF or HTML network ecology mini report