Microbiome GWAS & Host Microbe Interactions — Hands-on

Learn how to design and run microbiome genome wide association studies (mGWAS) that connect host genetic variation with microbiome composition and function. This module covers study design, data preprocessing, association models, multiple testing and interpretation of host microbe interaction results for clinical and population cohorts.

Microbiome GWAS & Host Microbe Interactions

Help Desk · WhatsApp

Session Index

Session 1 — Microbiome GWAS Concepts & Data Types | Session 2 — Study Design, Preprocessing & Covariates | Session 3 — Association Models, MT Corrections & Plots | Session 4 — Mini Capstone: Host Microbe Association Report

Session 1

Fee: Rs 8800 Apply Now

Microbiome GWAS Concepts & Data Types

What microbiome GWAS aims to capture

host genetic control of microbiome traits **heritability and shared environment** **links to disease risk and drug response**

Data types for host and microbiome layers

genotypes and imputed variants **amplicon and**

shotgun microbiome features | taxa, pathways and alpha diversity as traits

File formats and basic QC checkpoints

PLINK style genotype data | feature tables and metadata frames | sample matching and ID harmonisation

Session 2

Fee: Rs 11800 Apply Now

Study Design, Preprocessing & Covariates

Study design for host microbe interaction projects

sample size and power considerations | population vs family based designs | case control vs quantitative trait setups

Preprocessing host genotypes and microbiome traits

SNP and sample QC for GWAS | transforming microbiome features | handling zeros and compositionality

Covariates, structure and batch effects

age, sex, BMI and lifestyle factors | principal components and ancestry | sequencing run and technical batches

Session 3

Fee: Rs 14800 Apply Now

Association Models, MT Corrections & Plots

Association models for microbiome traits

linear and logistic regression for traits | mixed models for related individuals | global tests for multi trait association

Multiple testing, inflation and robustness checks

Bonferroni and FDR procedures **QQ plots and genomic inflation lambda** **sensitivity analyses and replication logic**

Visualisation of host microbe association signals

Manhattan and QQ plots **heatmaps of SNP trait effects** **locus zoom style regional plots**

Session 4

Fee: Rs 18800 Apply Now

Mini Capstone: Host Microbe Association Report

End to end microbiome GWAS on an example dataset

theory plus guided practical

Summarising key host microbe associations for stakeholders

top loci and associated taxa or pathways **linking findings to phenotypes and disease** **uncertainty, limitations and next steps**

Deliverables: summary tables, plots and written report

association results tables **R or Python analysis notebook** **PDF or HTML host microbe GWAS report**