

## Resistome & AMR Gene Surveillance — Hands-on

Learn how to go from raw metagenomic reads to reproducible resistome profiles for clinical, environmental and industrial samples. This module covers AMR gene databases, read mapping and assembly based workflows, abundance normalisation, co occurrence analysis and reporting for surveillance and risk assessment.

# Resistome & AMR Gene Surveillance

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### Session Index

Session 1 — Resistome Concepts, Databases & Study Design | Session 2 — Read Processing, AMR Gene Calling & QC | Session 3 — Normalisation, Co Occurrence & Risk Metrics | Session 4 — Mini Capstone: AMR Surveillance Dashboard

### Session 1

**Fee: Rs 8800** Apply Now

## Resistome Concepts, Databases & Study Design

Resistome and AMR surveillance basics

**resistome vs microbiome** | **intrinsic vs acquired resistance** | **One Health and wastewater based epidemiology**

AMR gene databases and ontologies

**CARD and ResFinder** | **MEGARes, ARG OAP style resources** | **drug class and mechanism annotation**

Study design for resistome analysis

sample types and matrices | paired clinical and environmental sampling | replicates and temporal designs for trends

## Session 2

Fee: Rs 11800 | Apply Now

### Read Processing, AMR Gene Calling & QC

Preprocessing and host read removal for AMR analysis

quality trimming and filtering | human read removal and ethics | contamination risk in low biomass samples

Read mapping and assembly based AMR workflows

short read mapping to AMR gene catalogues | assembly followed by AMR gene scanning | blast, DIAMOND and AMRFinder style tools

Quality control and filtering of AMR hits

coverage and identity thresholds | removal of spurious low evidence hits | exporting gene by sample matrices

## Session 3

Fee: Rs 14800 | Apply Now

### Normalisation, Co Occurrence & Risk Metrics

Normalising AMR gene abundance

reads per kilobase per million style metrics | normalisation to 16S or housekeeping genes | compositional aware approaches

Co occurrence and resistome structure analysis

gene by gene and gene by taxa networks | multi drug resistance patterns | linking AMR genes to mobile

## elements

Surveillance metrics and trend analysis

resistome richness and diversity indices relative abundance of key drug classes simple risk scores and thresholds

## Session 4

Fee: Rs 18800 Apply Now

### Mini Capstone: AMR Surveillance Dashboard

End to end resistome workflow for a small study

theory plus guided practical

Summarising AMR patterns for stakeholders

heatmaps by drug class and mechanism time series trends for key indicators simple dashboard ready tables and plots

Deliverables: AMR gene matrix, scripts and report

sample by AMR gene abundance table R or Python analysis notebook PDF or HTML AMR surveillance summary