

Environmental Metagenomics: Toxicity & Risk Assessment — Hands-on

Translate environmental metagenomes into defensible toxicity and risk insights. This module builds end-to-end workflows linking sequencing data with contaminant context, functional/xenobiotic pathways, AMR/metal-resistance markers, and quantitative risk screens. You will fuse chemistry/metadata with metagenomic features, compute effect-based and mixture indices, and produce stakeholder-ready maps, scorecards, and reports.

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Session 1 — Sampling, CECs & Metadata for Risk Session 2 — Shotgun Profiling, ARGs & Pathways Session 3 — Effect-Based & Mixture Risk Indices Session 4 — Maps, Scorecards & Reporting

Session 1

Fee: Rs 8800 Apply Now

Sampling, CECs & Metadata for Risk

Use-cases & matrices

**surface/ground/WWTP/industrial
sediments/biofilms/sludge grab vs composite/time
series**

CECs & co-exposures

PFAS/PAHs/pesticides/pharma metals
(Hg/Cd/As/Cu/Zn) nutrients & physico-chem

Metadata & standards

MIXS/ENVO fields QA/QC blanks & spikes chain-of-custody & SOPs

Session 2

Fee: Rs 11800 Apply Now

Shotgun Profiling, ARGs & Xenobiotic Pathways

Taxonomic & functional profiling

kraken2/centrifuge/MetaPhlAn
HUMAnN/DRAM/eggNOG KEGG BRITE/MetaCyc
(xenobiotics)

ARGs, MRGs & virulome

CARD/ResFinder/AMR++ metal resistance
(merA/czc/cop) VFDB/virulence panels

QA, compositional stats & controls

decontam & replicates CLR/balances (PhILR)
PERMANOVA caveats

Session 3

Fee: Rs 14800 Apply Now

Effect-Based & Mixture Risk Indices

Linking functions to effects

xenobiotic degradation scores stress/oxidative
response ARG hazard indices

Mixture/relative risk screens

HI/EAR-style composites benchmarks/trigger levels
uncertainty & sensitivity

Data fusion with chemistry/WS

**LC-MS/GC-MS joins WBE/flow-normalization
confounders & covariates**

Session 4

Fee: Rs 18800 Apply Now

Geo Maps, Scorecards & Reproducible Reporting

Spatial outputs & dashboards

**QGIS/leaflet risk layers hotspots & trends alerts &
thresholds**

Scorecards & decision briefs

**ARG/MRG risk bands xenobiotic capacity scores
confidence/limitations**

Reporting & compliance

**MixS-compliant bundles ENA/SRA submissions SOPs
& audit trails**