

Microbial Glycobiology — LPS Capsules & Host Interactions — Hands-on

Explore how microbial surface glycans including lipopolysaccharide (LPS), capsules and other cell surface glycoconjugates regulate colonization, virulence and immune recognition. This module combines microbial glycobiology concepts with practical LC-MS, lectin and bioinformatics workflows to derive LPS and capsule signatures that can be linked to host response, vaccine design and diagnostics.

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Session Index

[Session 1 — Foundations of Microbial Glycobiology](#) [Session 2 — LPS and Capsules — Structure & Analytics](#) [Session 3 — Host–Pathogen Glycan Interactions & Immunity](#) [Session 4 — Mini Capstone: LPS/Capsule Glycan Signatures](#)

Session 1

Fee: Rs 8800 [Apply Now](#)

Foundations of Microbial Glycobiology

Microbial cell surface architecture and glycocalyx overview

Gram negative and Gram positive envelopes
peptidoglycan and teichoic acids context **outer membrane and periplasm basics**

Main classes of microbial surface glycans

LPS and lipooligosaccharide **capsular polysaccharides** **exopolysaccharides and biofilms**

Functional roles in colonization, protection and signaling

immune evasion and camouflage **stress resistance and environmental fitness** **interaction with microbiome and host**

Session 2

Fee: Rs 11800 Apply Now

LPS and Capsules — Structure & Analytics

LPS domains and capsule structural themes

lipid A, core and O antigen overview **capsule serotypes and K antigens** **charge, hydrophobicity and heterogeneity**

Extraction and sample preparation workflows

hot phenol and detergent based extractions **enzyme and chemical treatments** **removal of proteins and nucleic acids**

Analytical platforms for LPS and capsules

SDS PAGE and staining strategies **LC MS and MS/MS profiling options** **lectin and antibody based assays**

Session 3

Fee: Rs 14800 Apply Now

Host–Pathogen Glycan Interactions & Immunity

Pattern recognition receptors and LPS capsule sensing

TLR4 and lipid A recognition **complement pathways and capsules** **lectin pathways and collectins**

Immune evasion and virulence strategies

mimicry of host glycans **serum resistance and phagocytosis escape** **biofilm formation and persistence**

Implications for vaccines and diagnostics

conjugate vaccine antigen selection **serotyping and typing schemes** **glycan based diagnostic signatures**

Session 4

Fee: Rs 18800 Apply Now

Mini Capstone: LPS/Capsule Glycan Signatures

Build a small LPS and capsule profiling workflow

from raw data to serotype or pattern calls

Summarize microbial glycan signatures across isolates or conditions

heatmaps of LPS and capsule features **clustering of strains or samples** **linking shifts to virulence or treatment**

Deliverables and documentation set

curated LPS and capsule feature table **figures ready for infection biology reports** **short narrative on host interaction insights**