

## Glycan Biosynthesis Pathways and Glycoenzymes — Hands-on

Gain a pathway level view of how glycans are built and remodeled in cells. This module walks through ER and Golgi glycan biosynthesis, the organization of glycosyltransferases and glycosidases, donor substrates, and how genetic or process level changes in glycoenzymes alter glycoprotein and glycolipid profiles in health, disease and bioprocessing.

# Glycan Biosynthesis Pathways and Glycoenzymes

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### Session 1

**Fee: Rs 8800** [Apply Now](#)

## Fundamentals of Glycan Biosynthesis

Cellular landscape of glycan biosynthesis

[ER and Golgi compartments](#) [lumen, membrane and cytosolic sides](#) [secretory pathway overview](#)

Sugar nucleotide donors and transporters

[UDP, GDP and CMP linked sugars](#) [nucleotide sugar synthesis routes](#) [Golgi transport and availability](#)

General logic of stepwise glycan assembly

**priming, elongation and capping** **branching and trimming cycles** **sequential enzyme action and order**

### **Session 2**

**Fee: Rs 11800** Apply Now

## **N-glycan, O-glycan and Glycolipid Pathways**

Core N glycan biosynthesis cascade

**lipid linked oligosaccharide assembly** **transfer to Asn motifs in ER** **trimming and processing to complex forms**

O glycan and glycosaminoglycan pathways

**mucin type O GalNAc initiation** **core extension and branching** **heparan, chondroitin and dermatan sulfate chains**

Glycolipid and ganglioside biosynthesis

**ceramide based GSL backbones** **lacto, neo lacto and ganglio series** **roles in membranes and signaling**

### **Session 3**

**Fee: Rs 14800** Apply Now

## **Glycoenzymes, Specificity and Regulation**

Glycosyltransferase families and motifs

**GT fold types and active site features** **donor and acceptor specificity** **Golgi localization and complex formation**

Glycosidases and remodeling enzymes

**ER quality control glycosidases** **lysosomal and extracellular enzymes** **turnover and salvage pathways**

Regulation, genetic defects and engineering

**congenital disorders of glycosylation** **cell line**  
**engineering for desired glycans** **pathway bottlenecks**  
**and flux points**

#### **Session 4**

**Fee: Rs 18800** Apply Now

### **Mini Capstone: Pathway Mapping and Perturbation**

Constructing a glycan biosynthesis map for a protein of interest

**Theory plus Practical**

Simulating enzyme knockdown or overexpression scenarios

**predicting impact on glycoform patterns** **linking**  
**pathway changes to phenotypes** **using simple**  
**spreadsheet or network tools**

Deliverables: pathway diagram and perturbation summary

**schematic of key glycoenzymes** **table of predicted**  
**glycan changes** **short interpretation for research or**  
**bioprocess**