Glycoengineering — Biotherapeutics & Cell-Surface Editing — Hands-on

Learn how to deliberately reprogram glycosylation on antibodies, cell therapies and other biologics. This module covers cell-line and enzyme based glycoengineering, chemoenzymatic remodeling, metabolic oligosaccharide engineering (MOE) and analytical readouts, enabling you to design, execute and interpret glycoengineering strategies for potency, safety, targeting and CQA control.

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Session Index

Session 1

Fee: Rs 8800 Apply Now

Principles of Glycoengineering for Biotherapeutics

Why glycoengineering? From natural variability to designed glycoforms

potency, half-life and safety **reduced immunogenicity** **targeting and tissue distribution**

Design space of glycoengineering interventions

terminal sialylation and fucosylation tuning branching, galactosylation and bisecting GlcNAc selection of target glyco metrics

Overview of glycoengineering toolkits

cell-line and pathway engineering chemoenzymatic remodeling metabolic oligosaccharide engineering (MOE)

Session 2

Fee: Rs 11800 Apply Now

Cell-Line & Enzyme Based Glycoengineering Strategies

Host cell engineering for desired glycoforms

CHO and HEK cell-line glycosylation backgrounds knockout/knock-in of glycosyltransferases feeding strategies and media supplements

Chemoenzymatic remodeling of glycans on purified biologics

endoglycosidase trimming and rebuilding sialyltransferases and fucosyltransferases batch-to-batch control and scalability

Analytics as feedback for process optimization

intact mass and subunit analysis released glycan and glycopeptide metrics linking process levers to glyco outputs

Session 3

Fee: Rs 14800 Apply Now

Cell-Surface Editing, MOE & Functional Readouts

Metabolic oligosaccharide engineering (MOE) on live cells

unnatural monosaccharide precursors bioorthogonal tags and click handles labeling and imaging of

engineered glycans

Cell-surface editing for targeting and immune modulation

display of ligands and receptors via glycans **tuning adhesion, trafficking and homing** **applications in CAR-T and cell therapies**

Functional readouts and basic data analysis

lectin binding and flow cytometry **cell-based potency and signaling assays** **linking glyco edits to phenotypic shifts**

Session 4

Fee: Rs 18800 Apply Now

Mini Capstone: Glycoengineering Design & CQA Plan

Define a glycoengineering goal for a biologic or cell therapy

from desired function to glyco targets

Outline intervention strategy and analytics package

cell-line / enzyme / MOE options **key LC-MS and cell-based readouts** **risk and feasibility considerations**

Deliverables: design brief, CQA panel and reporting template

tabulated glyco CQAs and ranges **figures for development reports** **short narrative for project teams**