Glycoengineering and Biologic Modification Training Course

Professional Development Training Course Outline

Category	Biotechnology and Pharmaceutical Development	**Duration**	10 Days
Base Fee	$4,000 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Glycoengineering and Biologic Modification have emerged as pivotal fields in biopharmaceutical development, focusing on the intricate processes that modify proteins and other biologics at the molecular level. These modifications can significantly enhance the efficacy, stability, and therapeutic potential of biologic drugs. Glycoengineering and Biologic Modification Training Course is designed to equip professionals with in-depth knowledge and hands-on experience in these revolutionary techniques. The course covers a wide array of topics, including glycan structures, enzymatic modification, protein engineering, and cutting-edge technologies in biologic production. With the rising demand for personalized medicine and targeted therapies, this course is essential for professionals looking to advance in the field of biotechnology, pharmaceutical development, and molecular biology.

The training offers a comprehensive overview of the current trends, tools, and strategies used to modify biologics, ensuring participants stay at the forefront of innovation in the pharmaceutical and biotechnology sectors. Through expert-led lectures, interactive case studies, and practical applications, participants will gain a holistic understanding of glycosylation pathways, the role of glycan structures in drug design, and the impact of biologic modification on therapeutic outcomes. By the end of the program, learners will be well-positioned to contribute to the creation of more efficient, targeted, and safe biologic therapies.

Programme Curriculum

Glycoengineering and Biologic Modification Training Course

Introduction

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Course Objectives

1. Understand the core principles of glycoengineering and biologic modification in biopharmaceuticals.
2. Learn the fundamental processes of protein glycosylation and its impact on drug efficacy.
3. Master the use of enzymatic tools and genetic modifications for glycan structure alterations.
4. Explore the latest trends in glycoengineering, including gene editing and CRISPR technologies.
5. Gain proficiency in glycan analysis techniques and methods, such as mass spectrometry.
6. Discover the applications of glycoengineering in the development of biosimilars and monoclonal antibodies.
7. Understand the regulatory challenges associated with biologic modification and glycosylation.
8. Study the influence of glycosylation on protein folding, stability, and immune response.
9. Examine the role of glycoengineering in improving drug delivery systems.
10. Analyze the impact of biologic modifications on the safety and efficacy profiles of therapeutic proteins.
11. Learn about the future trends in glycoengineering, including biopharmaceutical innovations and precision medicine.
12. Understand the key ethical considerations in modifying biologics for therapeutic use.
13. Develop practical skills for designing and conducting experiments in biologic modification and glycoengineering.

Target Audience

1. Biotech professionals
2. Pharmaceutical researchers and scientists
3. Genetic engineers and molecular biologists
4. Regulatory affairs specialists in biopharmaceuticals
5. Drug development managers and coordinators
6. Biotechnology and biopharmaceutical students
7. Medical and healthcare researchers focusing on biologic treatments
8. Clinical trial specialists working with biologic drugs

Modules Overview

Introduction to Glycoengineering and Biologic Modification

- Basic concepts in glycoengineering
- History and development of biologic modification
- Key techniques in glycosylation
- Overview of biologic products
- **Case study:** Challenges in biologic modification

Understanding Protein Glycosylation

- Glycosylation pathways in eukaryotes
- Glycans and their biological significance
- N- and O-glycosylation
- **Case study:** Glycosylation patterns in recombinant proteins
- Tools for analyzing glycan structures

Enzymatic Tools for Glycoengineering

- Glycosyltransferases and glycosidases
- Enzyme-based glycan modification
- Expression systems for glycoengineered proteins
- **Case study:** Engineering antibodies with optimized glycosylation
- Future directions for enzymatic glycoengineering

Gene Editing Technologies in Glycoengineering

- CRISPR/Cas9 for glycosylation modification
- Applications of gene editing in biologics
- Ethical considerations in gene editing
- **Case study:** Gene-edited cell lines for biologic production
- Regulatory implications of gene editing

Mass Spectrometry in Glycan Analysis

- Introduction to mass spectrometry techniques
- Analyzing glycan structures with mass spectrometry
- Comparative analysis of glycosylation profiles
- **Case study:** Identifying glycosylation defects in therapeutic proteins
- Future trends in glycan analysis technology

Biologic Modification in Monoclonal Antibody Development

- Glycosylation and its impact on monoclonal antibodies
- Strategies for optimizing antibody glycosylation
- **Case study:** FDA-approved monoclonal antibodies
- Comparison between native and modified antibodies
- Future directions in monoclonal antibody development

Biosimilars and Biologic Modification

- Defining biosimilars in biopharmaceuticals

- Challenges in biosimilar development
- Role of glycoengineering in biosimilars
- **Case study:** Successful biosimilar glycoengineering
- Regulatory challenges for biosimilars

Biologic Production Systems

- Expression systems used in biologic modification
- Prokaryotic vs. eukaryotic expression systems
- Glycoengineering in CHO cells
- **Case study:** Optimizing production in mammalian cells
- Scaling-up biologic production for commercialization

Glycosylation and Drug Delivery Systems

- Role of glycosylation in drug targeting
- Modifying glycan structures for enhanced delivery
- **Case study:** Glycosylation in targeted drug delivery
- Improving therapeutic efficiency through glycoengineering
- Future trends in drug delivery systems

Biologics and Immunogenicity

- Glycosylation and immune system interactions
- Impact of glycoengineering on immunogenicity
- **Case study**: Immunogenic responses in biologics
- Strategies to reduce immunogenicity
- Regulatory concerns regarding immunogenicity

Regulatory and Ethical Aspects of Biologic Modification

- Global regulatory frameworks for biologics
- Ethical concerns in glycoengineering
- **Case study:** Regulatory approval of modified biologics
- Compliance with FDA, EMA, and ICH guidelines
- The future of biologics regulation

Future Trends in Glycoengineering

- Emerging technologies in glycoengineering
- Personalized medicine and biologic therapies
- The role of artificial intelligence in glycoengineering
- **Case study:** AI-driven glycosylation optimization
- Industry forecasts for glycoengineering advancements

Practical Applications in Biologic Modification

- Hands-on experiments in glycoengineering
- Optimizing recombinant protein glycosylation
- Case study: Modification of therapeutic enzymes
- Troubleshooting in biologic modification processes
- Applying training to real-world projects

Biotechnological Innovations in Glycoengineering

- Cutting-edge techniques in biotechnological production
- Integration of glycoengineering with synthetic biology
- **Case study**: Advances in glycosylation for vaccines
- The intersection of biotech and pharma
- Future outlook for biotech innovations

Career Pathways in Glycoengineering and Biologic Modification

- Identifying career opportunities in biopharmaceuticals
- Networking and building industry connections
- Continuing education and professional development
- Case study: Success stories in glycoengineering careers
- Preparing for the future of biopharmaceuticals

Training Methodology

- Expert-led lectures and seminars
- Case studies from industry leaders
- Hands-on workshops and practical sessions
- Collaborative group discussions and problem-solving
- Online assessments and interactive quizzes

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call +254769199797

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	04 Dec 2026	Online	$2,000
23 Nov 2026	04 Dec 2026	Physical	$3,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$9,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$12,000

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