Marine Biotechnology and Natural Product Discovery 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

Marine biotechnology is an interdisciplinary field combining biological sciences and marine environments to discover novel biological products and processes. It holds immense promise in advancing medicine, agriculture, and environmental sustainability. By exploring marine organisms, this discipline enables the extraction of natural compounds, bioactive molecules, and enzymes that have significant therapeutic and industrial potential. Natural product discovery, in particular, is at the forefront of bio-prospecting, where marine-derived resources are utilized to discover and develop innovative drugs, nutraceuticals, and sustainable solutions for global challenges. As marine ecosystems continue to be explored, marine biotechnology is revolutionizing industries from pharmaceuticals to biofuels, with a strong focus on sustainable development and ecological conservation.

Marine Biotechnology and Natural Product Discovery Training Course is designed to provide professionals and enthusiasts with a comprehensive understanding of the latest research, methodologies, and practical applications of marine biotechnology in drug discovery, environmental sustainability, and bioengineering. Participants will gain hands-on experience with techniques like marine organism collection, bioactive compound isolation, and bioinformatics, ensuring they are equipped with both the knowledge and skills to contribute to the rapidly expanding field. This course aligns with global trends towards green chemistry, natural product exploration, and sustainable resource management, offering a deep dive into a field that promises to reshape industries and ecosystems alike.

Programme Curriculum

Marine Biotechnology and Natural Product Discovery Training Course

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Course Duration

10 days

Course Objectives

1. Explore the foundations of marine biotechnology and its interdisciplinary nature.
2. Learn the methodologies for extracting and characterizing bioactive compounds.
3. Identify marine-derived compounds with pharmaceutical potential.
4. Master the collection and preservation techniques of marine organisms.
5. Understand sustainable practices in collecting marine organisms to ensure ecological balance.
6. Dive into marine microorganisms?ÇÖ potential for producing novel drugs.
7. Explore how marine biotech can contribute to ecological sustainability and pollution management.
8. Learn how to use bioinformatics tools in analyzing marine biological data.
9. Study how marine organisms can improve agricultural yields and pest control.
10. Learn about international laws and ethical issues surrounding marine biotech.
11. Understand the steps and challenges in bringing marine-based products to market.
12. Explore how marine resources are being used in biofuels and energy production.
13. Review real-world examples to understand successful applications of marine biotechnology.

Target Audience

1. Biotechnology Professionals
2. Pharmaceutical Scientists
3. Marine Biologists
4. Environmental Scientists
5. Research and Development Teams
6. Academic Institutions and Researchers
7. Agricultural Scientists
8. Entrepreneurs in Sustainable Product Development

Course Modules

Introduction to Marine Biotechnology

- Overview of marine ecosystems
- Interdisciplinary nature of marine biotechnology
- Importance of marine organisms in biotechnology
- Key trends in marine bioengineering
- Case study: Marine organism discoveries

Natural Product Discovery from Marine Organisms

- Overview of marine natural products
- Techniques in isolation and identification
- Bioactivity assays for screening compounds
- Marine organism collection methods
- Case study: Marine-derived drugs in clinical trials

Bioactive Compounds: Extraction and Characterization

- Solvent extraction techniques
- Chromatographic methods for compound separation
- Spectroscopic techniques for compound identification
- Bioactivity-guided fractionation
- Case study: Identification of marine anticancer agents

Marine Microbial Biotechnology

- Role of marine microorganisms in biotechnology
- Isolation of marine microbes and culturing techniques
- Applications in bioremediation and drug discovery
- Genetic manipulation of marine microbes
- Case study: Marine bacteria in drug discovery

Bioinformatics in Marine Biotechnology

- Introduction to bioinformatics tools
- Sequence analysis of marine organisms
- Databases for marine biotechnology
- Data mining and pattern recognition
- Case study: Genome analysis of marine species

Sustainable Practices in Marine Biotechnology

- Sustainable harvesting of marine organisms
- Ethical considerations in bio-prospecting
- Environmental impact of marine biotech
- International laws and regulations
- Case study: Sustainable fishing practices in bio-prospecting

Marine Biotechnology for Pharmaceutical Applications

- Drug discovery processes using marine sources

- Marine toxins and their therapeutic potential
- Clinical trials for marine-derived drugs
- Future directions in marine drug development
- Case study: Discovery of marine antibiotics

Marine Biotechnology in Agriculture

- Use of marine organisms in crop protection
- Marine-based fertilizers and biostimulants
- Marine microorganisms for pest control
- Bio-enhancers in agricultural practices
- Case study: Marine algae in soil improvement

Marine Biotechnology in Environmental Sustainability

- Applications in pollution management
- Bioremediation of marine and coastal ecosystems
- Wastewater treatment using marine organisms
- Bio-fuel production from marine sources
- Case study: Bioremediation of oil spills

Marine Biotechnology in Renewable Energy

- Algae as a source of biofuels
- Microbial fuel cells in energy production
- Harnessing marine resources for bioenergy
- Sustainable marine energy production technologies
- Case study: Biofuel production from marine algae

Commercialization of Marine Biotechnology

- Steps in bringing marine products to market
- Commercial challenges in marine biotech
- Licensing and partnerships in marine biotechnology
- Market analysis for marine-derived products
- Case study: Successful commercialization of marine bioproducts

Regulations and Ethics in Marine Biotechnology

- International regulations on marine bio-prospecting
- Ethical considerations in marine biotechnology
- Patent laws for marine-derived products
- Environmental protection and biotechnology ethics
- Case study: Ethics in the collection of marine resources

Case Studies in Marine Biotechnology Applications

- Overview of successful case studies
- Application of marine biotechnology in various industries
- Challenges faced and solutions implemented
- Lessons learned from real-world examples
- Future trends and case study projections

Advanced Techniques in Marine Natural Product Discovery

- Metabolomics in marine biotechnology
- High-throughput screening methods
- Advanced chromatographic and spectroscopic techniques
- Enzyme screening for natural product discovery
- Case study: High-throughput analysis of marine bioactives

The Future of Marine Biotechnology

- Emerging trends and technologies
- Opportunities for interdisciplinary collaborations
- Marine biotechnology in climate change mitigation
- Innovations in drug discovery and agricultural applications
- Case study: Marine biotechnology in sustainable development goals

Training Methodology

- Hands-on Learning: Practical, lab-based experiments and real-time data analysis.
- Interactive Sessions: Group discussions, workshops, and case study analysis.
- Expert Sessions: Webinars and guest lectures from industry leaders.
- E-learning Modules: Self-paced, online learning materials to supplement classroom sessions.
- Field Visits: On-site learning at marine research labs or coastal ecosystems to study marine organisms.

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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