



Microbiology Research Training

Microbiology Research Training Module

Welcome to our Microbiology Research Training module, where innovation meets education. Our program is at the forefront of advanced microbiology, offering young aspirants a unique opportunity to delve into cutting-edge protocols and techniques. With a focus on hands-on experience and mentorship from seasoned experts, this training is designed to propel aspiring researchers into successful and impactful careers. Whether you're a recent graduate or early-career scientist, our module provides the essential skills to navigate the dynamic landscape of modern microbiology research. Join us on this journey of excellence and unlock your potential in the world of groundbreaking scientific discovery.

1. **Metagenomics and Metatranscriptomics:**

Metagenomics: Direct sequencing of DNA extracted from environmental samples, to study the collective genomes of microbial communities without the need for cultivation.

Metatranscriptomics: Studying RNA transcripts in environmental samples, providing insights into gene expression patterns within microbial communities.

2. **Single-Cell Genomics:**

Single-cell PCR or single-cell RNA sequencing to study the genetic and functional characteristics of individual microbial cells within a complex population.

3. **Synthetic Biology:**

Designing and construction of new biological entities, including synthetic microbes with custom functionalities. Techniques such as DNA synthesis, genome editing, and directed evolution.

4. **Cryo-Electron Microscopy (Cryo-EM):**

Enables the visualization of biological structures at the molecular level.

5. **Proteomics and Metabolomics:**

Techniques such as mass spectrometry are done to study the complete set of proteins (proteomics) or metabolites (metabolomics) in microbial systems, to study the functional aspects of microbial communities.

6. **Advanced Microbial Cultivation Techniques:**

High-throughput culturomics, aim to isolate and culture a broader range of microorganisms from diverse environments.

7. **Functional Genomics:**

CRISPR-based techniques based gene editing to understand the function of specific genes in microbial systems.

8. **Microfluidics:**

Microfluidic devices that are employed to create controlled environments for studying microbial growth, interactions, and behaviors at the microscale.

9. **Optical Tweezers and Microscopy:**

Techniques like optical tweezers are used to manipulate and study individual microbial cells, providing insights into their mechanical properties and behavior.

Protocol Allocations

1. 3 Months - Protocols 1, 2, 6
2. 4 Months - Protocols 1, 2, 3, 4, 6
3. 5 Months - 1, 2, 3, 4, 5, 6, 7
4. 6 Months - 1, 2, 3, 4, 5, 6, 7, 8, 9

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Fee details in Rs per student				
Fee	3 Months	4 Months	5 Months	6 Months
Individual	86,000	1,30,000	1,90,000	2,80,000
Group 2 - 4	80,000	1,20,000	1,80,000	2,70,000
Group 5 - 7	75,000	1,10,000	1,70,000	2,60,000
Group 8 - 10	70,000	1,00,000	1,60,000	2,50,000