Aakriti Biotechnology Skill Development Programs

Modules for Dissertation Program

At Aakriti Biotechnology, we understand the importance of practical exposure in shaping the skills and knowledge of aspiring biotechnologists. By providing students with the chance to work on real-world projects at our state-of-the-art laboratory, we aim to bridge the gap between academia and industry while nurturing their growth as future leaders in the field.

Basic Wet Lab Training Modules

Fee: Rs 2,000/- (unless specified)
Duration – 1 month

Molecular Biology

- Basic concept of working in Molecular Biology Laboratory
- Good Laboratory Practices and General Safety Instructions
- Principle and Handling of Laboratory Equipment, Basics of Calculations (Molarity and Normality)
- Buffers and Reagent Preparation
- Process of Sterilization Techniques
- Preparation of Media
- Overview of genomic DNA
- Principal, Standard operating procedure and application of spectrophotometer
- Types of extraction
- Extraction of genomic DNA from Bacteria
- Extraction of genomic DNA from Plant
- Isolation & Purification of Plasmid DNA
- Types of electrophoresis
- Qualitative Analysis of DNA-Agarose Gel Electrophoresis
- Quantitative Estimation of the genomic DNA.

Polymerase Chain Reaction

Fee: Rs 4,000/-

- Principle and basic concept of PCR and its applications
- Basic concept of working in a PCR lab
- Good Laboratory Practices and General Safety Instructions
- Principle and Handling of Laboratory Equipments
- Basics of Calculations of concentrations
- PCR setup
- Result analysis
- Principle of high-throughput experimentation

Microbiology

- Basic concept of working in Microbiology Laboratory
- Good Laboratory Practices and General Safety Instructions
- Principle and Handling of Laboratory Equipment
- Basics of Calculations (Molarity and Normality)
- Buffers and Reagent Preparation
- Process of Sterilization Techniques, Basic principles, standard operating procedure (SOP) and application of instruments (Autoclave, pH meter, Laminar air flow, incubator, microscope and other Microbiological Laboratory Instruments like Micropipettes, Petri plates, Spreaders, Inoculation Loop etc.),
- Identification and Classification of Microbes
- Extraction of Genomic DNA from Microbes
- Isolation and Screening of Microorganisms on the basis of Gram staining
- Preparation of different types of media

- Serial Dilution techniques, Isolation of bacteria from soil
- Isolation and Culturing of Microbes from Water Sample
- Isolation of pure bacterial colonies
- Slant Preparation & Sub Culturing of Microbes
- Gram staining
- Antibiotic susceptibility test of bacterial resistance, Zone of clearance, zone of inhibition.
- Methylene Blue Reductase Test in Milk.

Biochemistry

- Basic of Biochemistry
- Good Laboratory Practices and General Safety Instructions
- Principle and Handling of Laboratory Equipment
- Basics of Calculations (Molarity and Normality)
- Buffers and Reagent Preparation
- Process of Sterilization Techniques
- Basic concept of Identification of Carbohydrate, Protein and Fat, Principal, Standard operating procedure and application of spectrophotometer
- Estimation of protein by Lowry method (Preparation of Standard Curve and Estimation)
- Estimation of protein by Bradford method (Preparation of Standard Curve and Estimation)
- Principal of DNS reagent
- Quantitative estimation of Carbohydrate, standard graph preparation and data interpretation
- Estimation of Nucleic Acid (Preparation of Standard Curve and Estimation)
- Separation of amino acids – Thin layer chromatography
- To perform the isoelectric precipitation of protein
- Phytochemical analysis

Advance Modules for Project Work/Dissertation

Techniques based training **Fee: Rs 3,500**

- Bio-Instrumentation for Wet Lab.
- Media Preparation & Culturing ofMicrobes.
- Gram's staining
- Sterilization techniques
- Pour plate technique
- Spread plate technique
- Streak plate technique
- Establishment of Pure Culture ofMicrobes.
- Preservation of bacteria.
- Antibiotics Sensitivity Test.
- Minimum Inhibitory Concentration (MIC) Test.
- Genomic DNA Isolation
- DNA quantification
- Agarose Gel Electrophoresis for Genomic DNA.
- Qualitative Analysis of Nucleic Acid.
- Extraction of phytochemical
- Plant extracts preparation.
- Paper Chromatography

MODULES FOR 1 MONTH

1. **Plant Tissue Culture** **Fee: Rs 2,500**
   - Theoretical Explanation
   - Media Preparation
   - Explant Preparation
   - Sterilization Techniques
   - Sub culturing

2. Phytochemical Analysis **Fee: Rs 2,500**

- Plant Extract Preparation
- Alkaloid Test
- Flavanoid Test
- Saponin Test
- Glycoside Test
- Tanin Test
- Steroid Test
- Protein Test

3. Phytochemical Analysis using Soxhlet Apparatus **Fee: Rs 4,000**

- Plant Extract Preparation
- Alkaloid Test
- Flavanoid Test
- Saponin Test
- Glycoside Test
- Tanin Test
- Steroid Test
- Protein Test

4. Antimicrobial activity and MIC **Fee: Rs 5,000/-**

- Test sample preparation
- Bacterial culture
- Pure culture establishment
- Serial dilution
- Antimicrobial activity test and analysis
- Minimum Inhibitory Concentration Test

5. Microbiology **Fee: Rs 6,000/-**

- Isolation from bacteria from soil
- Serial dilution
- Media preparation
- Plating techniques
- Inoculation of bacteria
- Preparation of glycerol stock
- Preparation of stab culture
- DNA Isolation
- Agarose gel electrophoresis

6. PCR Optimization **Fee: Rs 8,000/-**

- DNA Isolation
- Purification and Quantification
- Agarose Gel Electrophoresis
- Principle and basics of PCR
- Reaction and optimization
- Analysis of Result

MODULES FOR 2 MONTH

7. Bacterial Transformation **Fee: Rs 4,000/-**

- Basic microbiology techniques
- Establishment of pure culture
- Media preparation
- Plating techniques
- Inoculation of bacteria
- Transformation
- Screening of positive clones
- Plasmid Isolation
- Agarose gel electrophoresis

8. Thin Layer Chromatography **Fee: Rs 4,500/-**

- Sample preparation
- Extraction of components using Soxhlet Apparatus
- Extraction by cold method
- Silica Gel plate preparation
- TLC and analysis

9. Molecular Cloning **Fee: Rs 10,000**

- Basic microbiology techniques
- Establishment of pure culture
- Inoculation of bacteria
- DNA isolation
- Plasmid isolation
- Vector preparation
- Gene of interest ligation
- Transformation
- Screening of positive clones
- Agarose gel electrophoresis

MODULES FOR 4-6 MONTHS

10. 16S rRNA/ITS based identification of microbes **Fee: Rs 10,000/-**

- Isolation of genomic DNA
- Purification and Quantification
- Agarose Gel Electrophoresis
- Principle and basics of PCR
- Principle of 16S rRNA sequence
- Sequencing of the PCR product
- Analysis of Result
- Generation of Phylogenetic tree

11. DNA Fingerprinting **Fee: Rs 18,000/-**

- Isolation of genomic DNA
- Purification and Quantification
- Agarose Gel Electrophoresis
- Principle and basics of PCR
- Principle of RAPD
- PCR with RAPD primers
- Analysis of Result
- Generation of Phylogenetic tree

12. cDNA Synthesis **Fee: Rs 30,000/-**

- RNA Isolation
- RNA Purification and Quantification
- cDNA Synthesis using Reverse Transcriptase enzyme
- cDNA quality check using PCR

13. PAGE and Silver Staining **Fee: Rs 30,000/-**

- DNA Isolation
- DNA purification and estimation
- PCR using RAPD Primers
- Polyacrylamide Gel Electrophoresis
- Silver Staining of the gel

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