

## COURSE - II ADVANCE TRAINING IN FORENSIC SCIENCE & LAW

**The overall goal of the training program in biotechnology** can lead to a multitude of careers in botany, genetics, medicine and biotechnology. While entry-level positions can be achieved with a bachelor's degree, greater levels of education afford more opportunities - specifically with regards to research and teaching opportunities.



### Scope of training :

- Research & Development
- Molecular Diagnostic Lab
- Food & Beverage Industry
- Pharmaceutical Industry
- Herbal & Nutraceuticals Industry
- Forensic Labs

### Advantage -

- Industry Oriented Design
- Spirit of the training is to make you employable
- Rigorous Hands on Learning
- Capacity Building
- State of art research facility
- Flexibility of Time & Working Hours

### Note :

1. Kindly Clear All doubts regarding Research Facilities, Training Syllabus , Boarding, Lodging etc.
2. After satisfaction from all informations , initiate your process and get registered.
3. We will send bank details after receiving of your documents.
4. Admission Fee once paid is non-refundable and non transferable under any circumstances.
5. We do not guarantee the issuing VISA after the above payment, which is solely the decision of VISA officer in Indian Consulate in your country.

## TRAINING SYLLABUS

### UNIT – 1 BASICS OF FORENSIC LABORATORY

Basics of Forensic Laboratory: : Evidence Collection methodology , Evidence containers , Lab safety and Procedures : Biological lab Safety , Chemistry Lab Safety , Forensic Record Maintenance : Understand the importance of the maintenance of forensic records from crime science to court , Forensic Record Formats , Documentation of Scientific evidence : Draft petition with the admission of scientific evidence , prosecution strategy ,

### UNIT – 2 HANDLING OF FORENSIC SAMPLES

General Procedures of Sample Handling : Types of Evidence Examined ,Planning the Examination Evidence Processing , Note Taking & Report Writing SOP for Evidence Collection : Collection of Blood , Collection of Hairs & Fibers , Seminal Fluid Collection , Collection of Body Fluids , Evidence Collection Guidelines Evidence Packaging Guidelines.

**Real Time PCR Technology** – Introduction to Real Time PCR , Primer Designing for Real Time PCR , Application of Real Time PCR in Food Genetics , Real Time PCR Run For Food Samples , Data Analysis

**Preparation of Extract** - Blood Stains , Preparation of Extract from Calcified Tissues , Preparation of Extract from Soft Tissues. Precipitin Tube Method , Double Diffusion , Cross Over Electrophoresis , Documentation of Forensic Samples

### UNIT – 3 OPTIMISATION OF NUCLEIC ACIDS EXTRACTION TECHNIQUES FROM FORENSIC SAMPLES

**Extraction of DNA for Forensic Analysis** - DNA, RNA, Mitochondrial DNA ( Any probative biological sample that has been stored dry or frozen, regardless of age, may be considered for DNA analysis Quantitative & Qualitative Analysis of Nucleic Acid - DNA Electrophoresis , Gel Docking or imaging and spectrometer. Purification of Nucleic Acids – Column Purification , Digestion etc. Forensic Sample For Analysis - Hair , Nail , Sputum , Blood , Plant , Microorganism etc.

### UNIT 4 - ANALYSIS OF FORENSIC SAMPLES BY PCR AND REAL TIME PCR

**Basic Bioinformatics Tools** - Primer Designing, Vectors , Selection of Restriction Sites, Virtual PCR, Bioinformatics tools & Techniques , Gel Analysis Software , Vector Selection Software, Q-PCR Primer designing Tool , Software to run Real Time PCR , Data Analysis

**DNA Profiling** - Preparation of reaction mixture and its safety for cross contamination , Optimisation of PCR Reaction – Melting Point , GC Content , Concentrations and Cycles , Sample run , PCR analysis & DNA bar coding, Dendrogram Generation, Similarity & Dissimilarity Matrix , Data Analysis

**cDNA Construction** Purification of mRNA from total RNA , first strand cDNA synthesis or construction of cDNA

#### Real Time PCR Analysis

Introduction to Real-time PCR & Applications , Real-time PCR reaction setup , Construction of a standard curve: Bio-statistics principles; Linear regression , Standard melt curve analysis ,High resolution melt curve analysis . Analysis of SYBR Green real-time PCR results

## **UNIT 5 - ISOLATION , PURIFICATION AND ANALYSIS OF TOXINS**

**Classification of Toxins** - Antibiotics , Drugs , Acids , Snake Venoms , Plants Toxins , Heavy Metals ,Mineral Oils Organic Toxic Compounds – Acetaldehyde , Acetone , Benzene , Alcohol , Chloroform , Phenol etc.etc.

**Extraction of Toxins** - Different extraction methods for volatile , semi volatile and non volatile samples through digestion , soxhlet extraction , distillation , Vacuum Rotary Evaporator , Solid Phase Micro Extraction etc.

**Chromatography Separation of Toxins** - Column Chromatography , TLC , HPLC , Gas Chromatography , Solid Phase Extraction etc.

## **UNIT – 6 EXAMINATION OF FIRE / ARSON CASES**

**Extraction of Fire / Arson Forensic Analysis** - Detection and identification of inflammable materials or their residues in the exhibits of fire/arson cases like ; petrol, kerosene, diesel, alcohols, thinners, solvents etc.

**Sample Preparation and Gas Chromatography** : Method Development for the analysis of petrol, kerosene, diesel, alcohols, thinners, solvents etc.

## **UNIT - 7 EXAMINATION OF CEMENT , MORTAR AND CONCRETE**

**Sampling Procedure** - Collection procedures of forensic samples of cement , concrete & mortar

**Chemical Assay** : Thymolphthalein Test of cement , Determination of `Calcium` by EDTA Titration , Direct Cement % by acid titration , Testing of Mortar by Titration & EDTA

## **UNIT 8 – ANALYSIS OF CHEMICALS IN TRAP CASES**

Detection and identification of phenolphthalein, sodium ions, carbonate ions, calcium ions, anthracene etc

**Test for Phenolphthalein** : Chemical Assay , Folin-Ciocalteu's reagent test , Spectroscopic Determination , Extraction and TLC of Phenolphthalein , HPLC Analysis.

**Separation and purification of Anthracene** : TLC , UV and HPLC Analysis of anthracene

## **UNIT 9 – ANALYSIS OF ALCOHOL IN LIQUOR / DRINKS**

Analysis of various types of alcoholic drinks/liquor in crime exhibits. Qualitative analysis of Liquor - Iodoform Test , Dichromate Test , Chromotropic Acid Test for methanol .

**Quantitative analysis** of alcohols by Spectroscopy , TLC , HPLC & Gas Chromatography.

## **UNIT 10 – ANALYSIS OF FATS AND OILS**

**Analysis and characterisation of various** oils and fats for adulteration Qualitative analysis of Liquor – Chemical test for different oils and fats. Quantitative analysis of alcohols by Spectroscopy , TLC , HPLC & Gas Chromatography

**Fee Structure** : USD 1,500 /-

**Duration** : 250 Hours ( 20 to 30 Days ) **Timings** : Monday - Saturday ( 8 A.M to 8 P.M )

## HOW TO APPLY –

### Details of For Registration :

1. Valid Passport
2. Filled **Registration form** with photograph ( Given in Last Page of Brochure )
3. Recommendation letter from Head of the Institution
4. Any Identity card issued by the Institution or Govt.
5. **Send all documents at** : [info@allelelifesciences.com](mailto:info@allelelifesciences.com) for issuance of the invitation letter and pay registration fee ( USD 50 ) through Bank or wire Transfer
6. Send approval letter of your institution and valid VISA at : [info@allelelifesciences.com](mailto:info@allelelifesciences.com)
7. **Pay Training Fee USD 1500** through Bank or Wire Transfer or at the first day of joining the training program in India

## Registration Form

Name of Training Program :

Expected Date of Joining :

Candidate Details :

Name: .....

Father's Name: .....

Address : .....

Contact No : .....

Email: .....

Institution : .....

Qualification : .....

### TERMS & CONDITIONS

1. The admission to training / internship programs will be confirmed after the payment of registration fee along with documents.
2. The registration fee deposited is completely non refundable.
3. The industrial training fee includes the cost of chemical , reagents and study material costs.
4. I will deposit the service charges as decided by the company at the time of joining date of training program.
5. Students have to bear their own boarding/lodging /conveyance charges. We facilitate students in finding proper paying guest arrangements.
6. The trainees will have to bring their own lab coat and wear them all the time in the campus.
7. Trainees are selected on first come first serve basis
8. Trainees will maintain adequate discipline inside the lab premises.
9. Company will not be responsible for any medical, legal issues during the internship tenure and FRRO Registration in India.

### DECLARATION

I \_\_\_\_\_ from \_\_\_\_\_  
hereby declare that all statement/information given in the application form are true to the best of my knowledge and belief . I will strictly abide by the norms/lab etiquette during the training

Signature

Place: \_\_\_\_\_

Date: \_\_\_\_\_

**For office use only**

## Instruments Capabilities

**Our State of art facility** is located in Industrial Area of Noida (NCR) . The lab / research facility is Total : 6000 Sq Feet

<b>Affymatrix &amp; Agilent Microarray Platform</b>	Gene Expression Studies, Biomarker, Sequencing
<b>Real Time PCR ( ABI )</b>	Gene Expression, Sequence Detection
<b>PCR ( ABI, Biorad , Eurofins ) - 5 in numbers</b>	Amplification of nucleic acids
<b>Bioanalyser &amp; Spectrophotometer</b>	Quantification of Nucleic Acids
<b>Gel Documentation System</b>	Visualisation of Nucleic Acids, PCR Products etc.
<b>Electrophoresis &amp; Power Supply ( Biorad ) - 7 Sets</b>	Separation of Nucleic Acids & Other Arrays
<b>DNA Concentrator ( Thermo Speedvac )</b>	Nucleic Acid Extraction
<b>Centrifuge, High Speed Centrifuge - 8 Nos</b>	Sample Preparation
<b>PCR Station and other accessories</b>	

<b>Biorad Profinia Affinity Chromatography</b>	Affinity Chromatography - IMAC, GST, Antibody
<b>Biorad Biologic Low Pressure Chromatography</b>	Size Exclusion, Ion Exchange, Affinity etc.
<b>Preparative HPLC ( Thermo ) , Agilent 1100</b>	Bulk Protein Purification & Analysis
<b>GE Amersham 2-D Electrophoresis System</b>	Protein Characterisation
<b>Immunoblot, SDS-PAGE , Biorad HV Powerpac</b>	Visualisation of Nucleic Acids, PCR Products etc.
<b>Mass Spectrometry , ELISA, Immunoassay</b>	Protein Identification
<b>Cryo Preservation Facility &amp; Common Facility</b>	Sample Storage & Preparation

<b>Agilent HPLC System - PDA, FLD &amp; ECD Detector</b>	Separation and analysis of molecules
<b>Agilent GC with FID &amp; FPD Detectors</b>	Separation and analysis of molecules
<b>Thermo Prep HPLC with Dual Pump &amp; UV-Vis</b>	Bulk Purification & Analysis
<b>Shimadzu GC with FID &amp; NPD Detector</b>	Separation and analysis of molecules
<b>Triple Quad GC-MS System ( Agilent )</b>	Analysis of Semi Volatile & Volatile Compound
<b>LC-MS-MS ( API Sciex )</b>	Analysis of Non Volatile Compound
<b>Varian Carry Spectrophotometer</b>	Analytical Tool for various purpose
<b>Thermo Helios Spectrophotometer</b>	Analytical Tool for various purpose
<b>Vacuum Rotary Evaporator ( Buchi )</b>	Sample Preparation

## Other Analytical Chemistry Equipments :

Refractometer , Flame Photometer ( Toshniwal), Karl Fisher Titrator (Sistrionics), Potentiometer, Polarimeter , Tintometer ,Viscometer , Kjeldahl Distillation Unit , Kjeldahl Digestion Unit , Ion Selective for Fluoride Analysis ( Thermo Orion ) , Nephelometer , Soxhlet Extraction , Rotatory Vaccum Evaporator with chiller , etc.



**Microbiology & Cell Culture Facility :** Vertical Laminar Air Flow ( 4x2x2 ) , Horizontal Laminar Air Flow ( 2x2x2 ) B.O.D. Incubator ( Julabo ) , CO<sub>2</sub> Incubator ( Jauan ) , Orbital Incubator Shaker, UV Chamber , Incubator, Colony Counter , Colorimeter , Muffle Furnace , Hot Air Oven , Desiccators, Binocular Microscopes and , Lypholizer

**Biochemistry / Organic Synthesis Chemistry Lab :** Spectrophotometer ( Thermo Heleus Alpha ) , Analytical Balance ( Sartorius ) , Ph Meter ( Thermo Orion ) , Ion Selective (Thermo Orion) , Conductivity Meter ( Thermo Orion ) , Dissolved Oxygen Meter ( Thermo Orion ) , Turbidity Meter, Autoclaves, Hot Air Oven , Hot Plate , Magnetic Stirrers , Pipette Washer , Shaking Machine , Water Bath , Colorimeter , Flame Photometer , etc.

**Lab Water Purification :** Millipore Milli Q System

**Clinical Biology Lab :** Haematology Analyser , Automatic Immunoassay, Haematology HPLC Biorad Variant II



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