

## Training in Molecular Toxicology Research

**Molecular Toxicology** is the study of the effects of chemical and physical agents on genetic material . Genetic toxicology helps discern the possibility of heritable mutations, developmental defects, cancer initiation, aging and other long-term adverse genetic effects .

The trainee will also be prepared to describe indications for procedures used in medical genetics and interpret results for families.

### SCOPE OF THE TRAINING -

**Molecular geneticists** apply their extensive knowledge of molecular biology to study the function and structure of genes. They test for DNA mutations related to a range of diseases and disorders. They may also serve as consultants for clinical geneticists during the diagnoses of various disorders .

**Biochemical geneticists** identify and analyze defects that cause metabolic disorders.

**Genetic counselors** provide mental and emotional guidance to patients with genetic disorders .

## TRAINING SYLLABUS

### UNIT – 1 FUNDAMENTALS OF GENETIC TOXICOLOGY

**Diagnosis of genetic disorders:** Gather essential and accurate information about patients in whom a genetic disorder is being considered .

**Screening for genetic disorders:** Pedigree Analysis , Screen for known familial genetic disorder , Understand prenatal screening methods .

**Genetic counseling:** Understand the role of the medical geneticist in informing families about genetic disorders

**Discussion of ethical, legal, and social issues involved in genetic testing**

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### UNIT – 2 BIO-ASSAY DEVELOPMENT FOR GENETIC TOXICOLOGY

**Basics of Chromatography :** Column Chromatography , Thin Layer Chromatography , HPLC , Gas Chromatography & Mass Spectrometry.

**Bio separation Assays by HPLC** : Sample preparation , Introduction to separation techniques , SPME Separations , Method Development for mutagenesis assay

**Mutagenesis Assays by HPLC** : Analysis of genetic mutagenesis assay by HPLC

**Mutagenesis Assays by Gas Chromatography:** Analysis of genetic mutagenesis by Gas Chromatography

**Systems For Study** : Microorganism or Plants

**Facilities Required** - HPLC , FPLC , GC , Mass Spectrometry , ELISA , Specific HPLC Columns ( cyanopropyl- (CN) bonded silica ) , SPME Columns etc.

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### **UNIT 3 - BIOINFORMATICS TOOL FOR THE STUDY OF GENETIC TOXICOLOGY**

Methylation Primer Designing, Mutation Primer Designing , Selection of Restriction Sites, Virtual PCR, Bioinformatics tools & Techniques .

**Facilities Required** - Software for primer designing

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### **UNIT 4 – STUDY OF GENETIC DAMAGE BY PCR**

Optimization of Conventional , Nested and PCR , PCR Multiplexing Methods , Run of Conventional PCR , Data Analysis .

**Mutation Analysis** : . Extraction of Nucleic Acid , Optimization of method for mutation detection in biological sample .

**Methylation in DNA** : Bisulfite modification of DNA , Bisulfite modification in nanogram quantities of DNA , DNA Methylation PCR array

**Methylation Specific PCR Technology:** PCR & Applications, Optimization of PCR, Troubleshooting in PCR applications , Single Nucleotide Prime Extension

**Facilities Required for Unit – 4** : Refrigerated Centrifuge , High Speed Refrigerated Centrifuge , DNA Speedvac Concentrator , Spectrophotometer ,Vortex Mixer , Dry Bath , Water Bath , Electrophoresis , Power Supply , Bio- safety Cabinet for RNA handling , Gel Documentation System . Thermocycler , Gradient Thermocycler , PCR Cabinet , PCR pipettes , Ice Flakes ,etc.

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**Research Elective For Project Work** : Participants may choose one area of interest -

- Mutagenesis
  - DNA Methylation
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### **INFORMATION TO APPLY FOR THE PROGRAM**

#### **WHO MAY JOIN ?**

Students From Biotechnology , Microbiology , Biochemistry , Life Science , Chemistry , Pharmacy , Forensic Science , Food Science etc.

**SELECTION CRITERIA** : First come first serve

**FEE FOR TRAINING PROGRAM** : Rs 12,000 / - ( For 30 Days Training )  
Rs 14,000 /- ( For 45 Days Training + Project Work )

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#### **APPROVAL OF THE TRAINING PROGRAM :**

This training program is designed and approved by the organization Scientific Advisory Committee.

#### **HOW TO APPLY –**

##### **Details of Documents :**

1. Any identity proof along with University / College Identity Card
2. Filled Registration form of **Allele Life Sciences Pvt. Ltd.** with photograph
2. Registration fee will be Rs 1000 / -
3. Registration fee may be paid through cheque / Demand Draft or On Line Transfer :

Cheque or Demand Draft will be in favor of “ **Allele Life Sciences Pvt. Ltd.** ” payable at Noida or Service Branch

##### **Details for on line Payment :**

Kindly write us for bank or UPI Details at : [allelelifesciences@gmail.com](mailto:allelelifesciences@gmail.com)

For on Line Registration Send scan copy of all documents at : [allelelifesciences@gmail.com](mailto:allelelifesciences@gmail.com)

**Note : Kindly send the receipt of the registration fee along with scan documents.**

**Those who pay through cheque or DD send all documents at following address :**

**Allele Life Sciences Pvt. Ltd.**

C - 59 , Sector - 10 , Noida

Uttar Pradesh - 201301 , IN

Ph.No : + 91-9891179928

**Note :** We will send confirmation at your email address within 7 days.

**For Any other query mail at : [allelelifesciences@gmail.com](mailto:allelelifesciences@gmail.com) or Call at – 09891179928**

**Registration Form is Given at next page**

Photograph

## Registration Form

Name of Training Program :

Expected Date of Joining :

### Candidate Details :

Name: Mr./Ms. \_\_\_\_\_

Father's Name: \_\_\_\_\_

Address : \_\_\_\_\_

Contact No. : \_\_\_\_\_ Mobile No.: \_\_\_\_\_

Email: \_\_\_\_\_

Institution -

Qualification -

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### 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.

### 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**