

## Internship in Enzyme Engineering & Production

Enzyme engineering deals with enhancement of enzyme activity of existing enzyme or inducing a new enzyme activity .

The overall goal of the **Training in Enzyme Engineering & Production** is to give the students more fundamental and practical knowledge about general rules for optimization, modeling and design of enzymatic processes.

### SCOPE OF THE TRAINING -

**Bio- Pharmaceuticals** : Mass-produce insulin, human growth hormones, human albumin, monoclonal antibodies, vaccines, and many other drugs.

**Industrial Enzyme** : Organisms are genetically engineered to discover the functions of certain genes.

**Industrial Applications** - Mass production of proteins can be produced by growing the transformed organism in bioreactors using fermentation, then purifying the protein

### TRAINING SYLLABUS

#### UNIT – 1 : An introduction to enzyme engineering

Basics of Enzyme Engineering , Lab safety and Procedures , Record Maintenance, Handling of Equipments , Sterilization Techniques , Preparation of Chemical & Reagents

The current status and perspective of enzyme technologies in the pharmaceutical industry

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#### UNIT – 2 Production of Enzyme

Enzyme source selection, Strain Development, Growth requirement procedures, Submerged Fermentation, Solid State Fermentation. Extraction of Enzyme from different sources.

#### Facilities Required For Unit – 2 :

Culture Facility – Biosafety Cabinet , BOD , Incubator , Incubator Shaker , Microscope etc. Refrigerated Centrifuge , High Speed Refrigerated Centrifuge , Dry Bath , Water Bath , Fermentation Vessels etc.

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### **UNIT 3 - Kinetics & optimization of Enzyme of Enzyme**

Effect of Ph, Effect of Temperature , Effect of substrate concentration on the activity , Effect of enzyme concentration on the activity , Kinetic Analysis , Determination of Kmax & Vmax , Enzyme Inhibitors , Enzyme Activators .

**Facilities Required** - Spectrophotometer , Simulation Software etc.

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### **UNIT 4 - Production & Purification of Enzyme**

Production of Enzyme - Solid State or Submerged Fermentation , Centrifugation, Dialysis, Ultrafiltration, size exclusion Chromatography, ion exchange chromatography, High Pressure Liquid Chromatography, Purification through Electrophoresis .

**Facilities Required for Unit – 4 :** Fermentation Vessels , Purification Columns , Fast Protein Liquid Chromatography , Preparative HPLC , High Speed Refrigerated Centrifuge etc.

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### **UNIT 5 – Enzyme Estimation & Characterization**

Enzyme estimation by spectrophotometry , High Pressure Liquid Chromatography , SDS-PAGE, Native PAGE, Zymography

**Facilities Required for Unit – 5 :** Spectrophotometer , HPLC , Vertical Electrophoresis etc.

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

- Enzyme Production through microbial source
  - Enzyme Production through any other biological source
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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 10,000 / - ( For 30 Days Training )  
Rs 12,000 /- ( 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.

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### 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 -

#### 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