Internship in Zoology 2026

Department of Zoology and Advanced Centre for Regenerative Biology and Stem Cell Research in Cutaneous Biology (AcREM-Stem)
University of Kerala, Kariavattom Campus, 695581

Courses Offered:

Internship in Modern Biological Research and Model Organisms

Credit: 2

Duration: 60 Hrs

Days: 12 Days

Target Participants

- Studying Four-Year Undergraduate Program (FYUGP) in Life Sciences and allied subjects/related disciplines.
- Beginners interested in research careers in biology

Enrollment: Applicants should be enrolled by filling up the Google Form Link: https://docs.google.com/forms/d/e/1FAIpQLSdQp9LVinhQ0GwUx-ExsHe0yrYvAkwGsP28e0oEoZPRC8A1DQ/viewform?usp=publish-editor

Coordinators:

1. **Dr. P Sreejith**
   Assistant Professor and Head, Department of Zoology, University of Kerala & Director, Advanced Centre for Regenerative Medicine and Stem Cell Research in Cutaneous Biology (AcREM-Stem)
2. **Dr. Najeeb S.**
3. **Dr. Gayathri Sundar**
4. **Anagha S. Nair**

Contact: 8289869372, 9496330145

Introduction

The AcREM-Stem internship programme is designed to introduce FYUGP Life Science and allied subject students to the dynamic environment of modern biological research laboratories. It provides a structured platform for students to gain first-hand exposure to fundamental laboratory techniques, contemporary research tools, and widely used model organisms in life science research. The programme aims to bridge the gap between theoretical knowledge and practical application by offering training in basic molecular biology, cell culture, microscopy, and experimental methodologies. Through guided laboratory sessions and demonstrations, students will develop essential technical skills and an understanding of standard research

practices. In addition, participants will have the opportunity to interact with experienced researchers and faculty members, gaining insights into ongoing research, scientific problem-solving, and career pathways in the biological sciences. The internship also introduces students to the principles of research design, literature review, and proposal development, thereby promoting scientific thinking and inspiring future research goals.

Overall, this training programme is intended to build a strong foundation in experimental biology, inspire curiosity, and prepare students for advanced studies and careers in life sciences.

Objectives of the Internship

- Introduce students to modern biological research laboratories
- Familiarize them with basic research methodology
- Provide exposure to alternative animal models
- Demonstrate basic molecular and cell biology techniques
- Develop scientific thinking and research planning skills
- Encourage students toward future research careers

Course structure

Module 1 - Orientation and Research Awareness (6 Hrs)

- Welcome Session
- Interaction with Research Professors
- Introduction to the University and Research Centre
- Topic 1: Research culture in biology (1 Hrs)
- Topic 2: Role of model organisms (2 Hrs)
- Topic 3: Regenerative biology and stem cells (1 Hrs)
- Topic 4: Cutaneous biology research (2 Hrs)

Students will interact with faculty and researchers at the University of Kerala.

Module 2 - Laboratory Safety and Basic Techniques (4 Hrs)

- Laboratory safety rules, Good laboratory practices, Chemical safety, Biosafety basics (2 Hr)
- Hands-on demonstration: Pipetting techniques, Sterile techniques, Media preparation, Autoclave sterilization (2 Hr)

Module 3 – Animal Cell Culture Introduction (10 Hr)

This module introduces students to the basic concepts and techniques of animal cell culture. Students will learn how to handle cells, maintain sterile conditions, and perform simple experiments to study cell growth, viability, and death

Objectives	Learning Outcomes
• To introduce students to animal cell culture principles • To train students in basic aseptic techniques • To familiarize students with cell culture laboratory equipment • To demonstrate handling and observation of cultured cells	• Understand the concept of in vitro cell culture • Identify basic cell culture equipment • Perform simple aseptic handling techniques • Observe and interpret cell morphology under microscope

- **Introduction to Cell Culture:** Types of cell culture (primary vs cell lines), Adherent vs suspension cells, Overview of commonly used cell lines (e.g., skin, neuronal, cancer), Laboratory safety and aseptic techniques
- **Laboratory Setup and Equipment:** Laminar Air Flow (LAF) usage, CO_2 incubator function, Inverted microscope handling, Media preparation and sterilization
- **Basic Cell Culture Techniques:** Thawing of cryopreserved cells (demonstration), Cell seeding and subculturing (passaging), Media preparation and media change, Freezing Cells (Cryopreservation) and observation of cell morphology under microscope**.**
- **Cell Counting:** Introduction to cell counting methods, Use of hemocytometer, Calculation of cell concentration.

- **Basic Cell Culture Experiments:** Cell Viability Assay, Effect of Treatment on Cells (Demonstration).

Module 4 - Introduction to Model Organisms in Biological Research (15 Hrs)

This module introduces students to commonly used model organisms in biological research. Students will learn how simple organisms are used to study development, regeneration, genetics, and behavior through basic observation and experiments.

Objectives	Learning Outcomes
• Understand the importance of model organisms in research • Identify different model organisms and their applications • Perform simple observational and experimental studies • Record and interpret biological observations • Develop basic experimental skills	• Gain hands-on experience with live model organisms • Understand basic biological processes like development, regeneration, and behaviour • Develop observational and analytical skills • Learn to maintain lab records and interpret results

1. **Zebrafish (4 Hrs)**
    - Introduction to zebrafish as a vertebrate model
    - Embryonic development stages
    - Importance of transparent embryos in research

Observation of Zebrafish Embryo Development: Place embryos in a petri dish, observe under a stereo microscope, and identify developmental stages

2. **Hydra (3 Hrs)**
    - Regeneration biology
    - Body organization of the hydra

Practical Experiment (Demonstration): Regeneration biology Hydra Culturing and Maintenance, Tissue Manipulations (Hydra bisection, trisection, and regeneration)

3. **Drosophila (4 Hrs)**
    - Drosophila as a genetic model
    - Life cycle and inheritance

Practical Experiment (Demonstration):
Sex identification: Observe flies under a stereo microscope, and identify male and female flies
Morphology observation: Wings, Eyes, and Body segmentation

4. **C. elegans (4 Hrs)**
    - Nematode model in aging research
    - Simple nervous system and behaviour

Practical Experiment (Demonstration): Movement (Locomotion) Assay: Place worms on an agar plate, Observe movement under a microscope, Record movement pattern

Module 5 - Molecular, Histological, Phytochemical and Microbiological Techniques (15 Hrs)

This module introduces students to fundamental techniques in molecular biology, histology, and microbiology. Students will gain hands-on experience in basic experimental procedures used for studying DNA, RNA, tissues, and microorganisms

Objectives	Learning Outcomes
• Understand basic molecular biology techniques • Perform simple nucleic acid isolation procedures • Understand principles of PCR and electrophoresis • Learn basic histological processing and staining • Gain introductory knowledge in microbiological techniques and Phytochemical analyses • Operate basic laboratory instruments	• Develop basic laboratory skills in molecular and histological methods • Understand how biological samples are processed and analyzed • Gain exposure to microbiological handling, sterilization and phytochemical screenings • Learn to interpret basic experimental results

- **Molecular Biology:** Introduction to DNA and RNA, Principles of nucleic acid extraction, Introduction to PCR (Polymerase Chain Reaction), Basics of agarose gel electrophoresis
- **Histology**: Introduction to tissue structure, Importance of histology in biology. Procedures: Tissue Fixation, Tissue Sectioning, Histological Staining and Microscopic Observation.
- **Microbiology Basics:** Introduction to microorganisms, Sterilization techniques, Aseptic handling
  Procedures: Media Preparation, Sterilization Techniques, Microbial Culture (Demonstration), and Colony Observation.
- **Phytochemical Analysis:** Introduction to medicinal plant extracts, Preparation of plant extract (aqueous/alcoholic), Basic spectrophotometric analysis

Module 6 - Research Methodology Training (10 Hrs)

- Students will learn how research projects are developed.
  Topics include: Literature Review,
  How to search scientific literature using: PubMed, Google Scholar
- Research Proposal Writing
  Students will learn how to write: Research title, Objectives, Methodology
  Expected outcomes, Experimental Planning,
- Students will learn: Hypothesis formulation, Experimental design, Data recording and Data interpretation

Career Guidance

- Careers in biological research, Higher education opportunities, Research fellowships, Laboratory careers.
- Students will learn about careers in: Biotechnology, Biomedical research and academic research

Evaluation

- Participation
- Lab notebook maintenance
- Mini research proposal
- Presentation

Expected Learning Outcomes

- Understand biological laboratory environments
- Gain familiarity with model organisms
- Learn basic experimental techniques
- Develop scientific thinking
- Gain motivation to pursue research careers

12- Day Internship Schedule

Day 1 - Orientation, introduction to the centre, research overview

Day 2 - Laboratory safety training and introduction to instruments

Day 3 - Introduction to cell culture

Day 4 - Observation of mammalian cell lines under the microscope

Day 5 -Introduction to the zebrafish model organism

Day 6- Phytochemical Analysis

Day 7 - Model Organisms: Hydra & Drosophila

Day 8 - Model Organism: C. elegans

Day 9- Molecular Biology Techniques

Day 10 - Histology & Microbiology

Day 11 - Research Methodology

Day 12 - Student Presentation & Evaluation