

# Rajarshi Shahu College of Pharmacy, Buldana



## Department of Pharmacology *Organized*

### “Certificate Course of Techniques Used in Preclinical Research”

(04 - 09 Feb 2019)

*To establish and define an internal training program  
and to ensure the competency of pharma graduates.  
Training is the key factors for successful laboratory  
operations.*

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## **I. INTRODUCTION**

In terms of medical sciences, experimental pharmacology is a relatively new field. The experimental pharmacology of today has significantly departed from the traditional method of considering molecular and biochemical components. The discipline of experimental pharmacology has been supplemented and expanded by advances in electrophysiology, biochemistry, molecular biology, electronic or digital recording systems, and software. The main objective of course is

1. To find out a therapeutic agent suitable for human use
2. To evaluate the toxicity of drugs
3. To study the mechanism along with site of action of drug
4. To analyze the safety as well as efficacy of drugs

### **Course description:**

Techniques Used in Preclinical Research Techniques Certificate Course are created in order to learn and gain knowledge about the different animals used in experimental pharmacology, as well as animal handling techniques and various routes are used for administering drugs to rodents. In addition, topics covered in this course include an introduction to experimental pharmacology and ethical concerns with animal experimentation in accordance with CPCSEA guidelines. Importantly, the certificate program covers the various drug screening methods used in preclinical research by using relevant animal models.

### **Course objectives:**

This course is intended to provide students with the information, abilities, and understanding necessary to operate and care for the tools and methods utilized in experimental pharmacology laboratories. Teach and train the student to solve issues relating to equipment used in drug screening, such as an actophotometer, a hot plate, a tail flick apparatus, plethysmometer, and other instruments. Giving the students a comprehension of fundamental conceptual principles, working knowledge, and practical knowledge that includes process as well as the purpose and logic needed to operate laboratory equipment.

## Certificate Course of Techniques Used in Preclinical Research .

The main objectives are to accurately model in animals, the desired biological effect of a drug in order to predict treatment outcome in patient.

- To identify and characterize all toxicities in drugs used in preclinical studies
- To evaluate the safety and efficacy of drugs
- To promote the rational drug therapy in experimental animals
- To learn and understand the techniques and skill used for animal handling and drug administration in experimental animals
- To teach the student to operate the instruments.
- To teach the student to set up and calibrate instruments used in the laboratory.
- To emphasize the rational and efficient use of instrument

### **Scope:**

This training procedure is used to ensure that training has taken place with each student for procedures and methods that the student performs. The procedure applies to project work training, research work training, on job training & the course is documented.

## II. SYLLABUS

### Module 1. Introduction of experimental pharmacology: An ethical issues in an animal experimentation

- Basic equipment used in experimental pharmacology
- Experimental animals (Physiological data on laboratory animals)
- Animal house facility
- Ethical Requirement as per CPCSEA norms
- Institutional Animals Ethical Committee (IAEC)

### Module 2. Introduction of various animals used in pharmacology education & research: The updated scenario

- Introduction
- Different Species are used in Experimental Study Rat , Mouse , rabbit, Hamster, Cat, Frog, dog, Monkey
- Experimental Use:
- Alternative to animals Eg: Zebrafish
- 3R's principle

### Module 3. Techniques in Animal handling and routes of drug administration in experimental animals

- Introduction
- Handling of mice & rat
- Preparation of sample & dose calculation
- **Parenteral route**
  - Intraperitoneal (i.p.)
  - Intramuscular (I.M.)
  - Subcutaneous
  - Intravenous
- **Oral route**

### Module 4. Introduction to In -vivo & In-vitro Pharmacology & Demonstration of Actophotometer

- Theory
- Objective & scope
- Animal model used for screening drugs
- Principle
- Requirement

- Procedure
- Observation
- Result
- Conclusion

**Module 5. Pharmacological screening of analgesic agent (Hot plate and Tail flick apparatus )**

- Introduction
- Classification
- Mechanism of action
- Screening techniques (In-vivo)
- Induction method of nocipetion
- Principle
- Requirement
- Procedure
- Observation
- Result
- Conclusion

**Module 6. Demonstration of Plethysmometer**

- Introduction
- Principle
- Requirement
- Calibration
- Procedure
- Observation
- Result
- Conclusion

### III. COURSE SCHEDULE

#### Day 1 Monday Feb 4

- 11.00 am – 12.00 pm Inauguration and brief introduction about course
- 12:00 pm – 04:00 pm Introduction to experimental pharmacology

#### Day 2 Tuesday Feb 5

11:00 am – 04:00 pm Introduction of various animal used in experimental pharmacology

#### Day 3 Wednesday Feb 6

- 11:00 am – 04:00 pm Animal handling and various route of drug administration in experimental animals

#### Day 4 Thursday Feb 7

- 11:00 am – 04:00 pm Introduction to In-vivo & In-vitro Pharmacology & Demonstration of Actophotometer

#### Day 5 Friday Feb 8

- 11:00 – 04:00 pm Pharmacological screening of analgesic agent (Hot plate and Tail flick apparatus )

#### Day 6 Saturday Feb 9

- 11:00 – 04:00 pm Demonstration of Plethysmometer