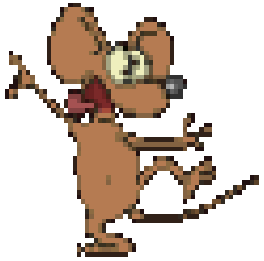

Introduction to EXPERIMENTAL PHARMACOLOGY

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Definitions:

***Pharmacology-** Science deals with the study of drug (chemical substances use for the purpose of diagnosis, prevention relief or cure of disease).

- Pharmacokinetic and Pharmacodynamics

***Clinical Pharmacology**

***Preclinical Pharmacology**

***Experimental Pharmacology**

- Drug Discovery and development

NCE/Herbal Drug

↓

Preclinical Studied

(Physicochemical Parameters, ADME, Toxicity test, Screening for Activity)

↓ IND/ FDA review

Clinical Trials

(Phase I,II,III)

(Product Formulation, Manufacturing and control)

↓ NDA (submission, FDA review, Approval and FDA action)

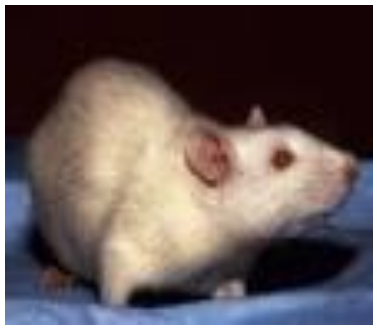
Post Marketing

(Phase IV Trials, Adverse reaction reporting)

- **Basic Equipments used**
  - Students organ bath
  - Sherrington recording drum
  - Recording levers
- **Physiological salt solutions**

Animals Used in Experimental Pharmacology

- Wistar Albino Rats (*Rattus norvegicus*)
- Swiss Albino mice (*Mus musculus*)
- Frog (*Rana tgrina*)
- Rabbit (*Oryctolagus cuniculus*)
- Guinea Pig (*Cavia porcellus*)
- Hamster
- Cat
- Monkey
- Dog



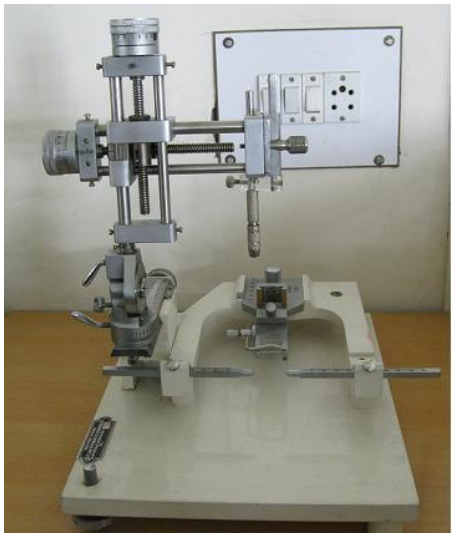
Legal Regulation for the use of Experimental Animal

- CPCSEA (Committee for the purpose of Control and Supervision of Experiments on Animals)
- IAEC (Institutional Animal Ethics Committee)

Handling and Route of administration

- Care taken during handling

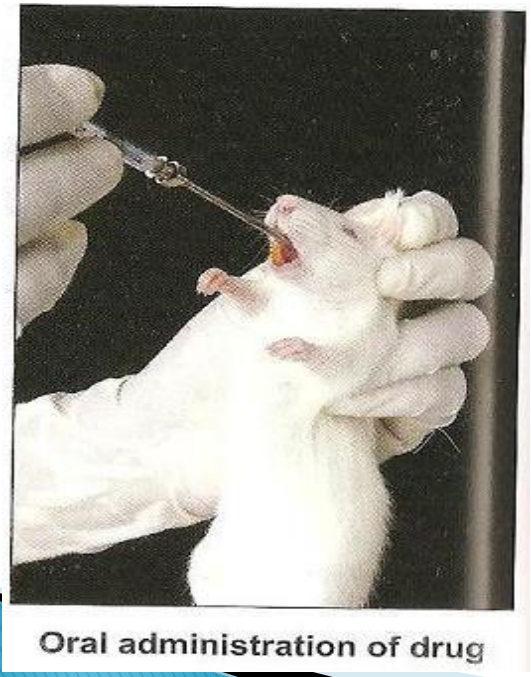
- Various Route of drug administration
  - Oral
  - Intraperitoneal (IP)
  - Subcutaneous (SC)
  - intravenous (IV)
  - Intramuscular (IM)
  - Sub-planter
  - Intra Cerebro-Venticular (ICV)



Stereotaxic Apparatus

Removal of animal by holding base of tail

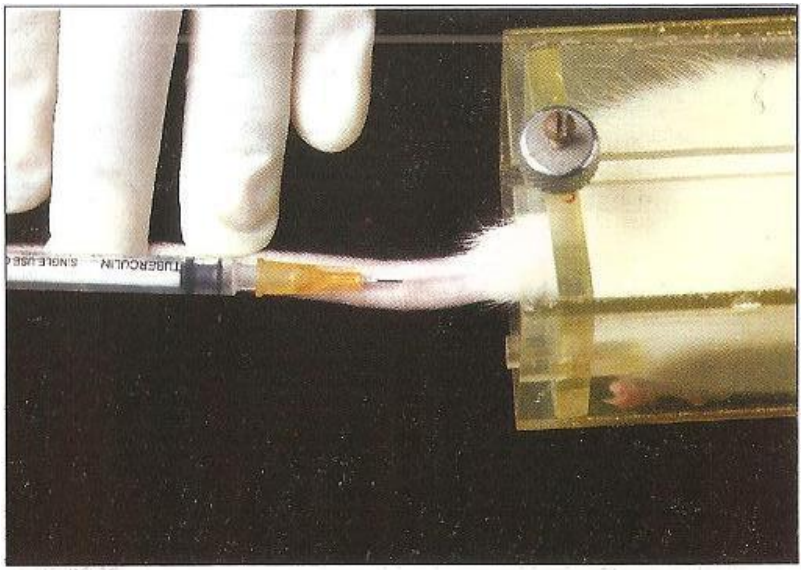
Restraining rat by crossing over the forelimbs



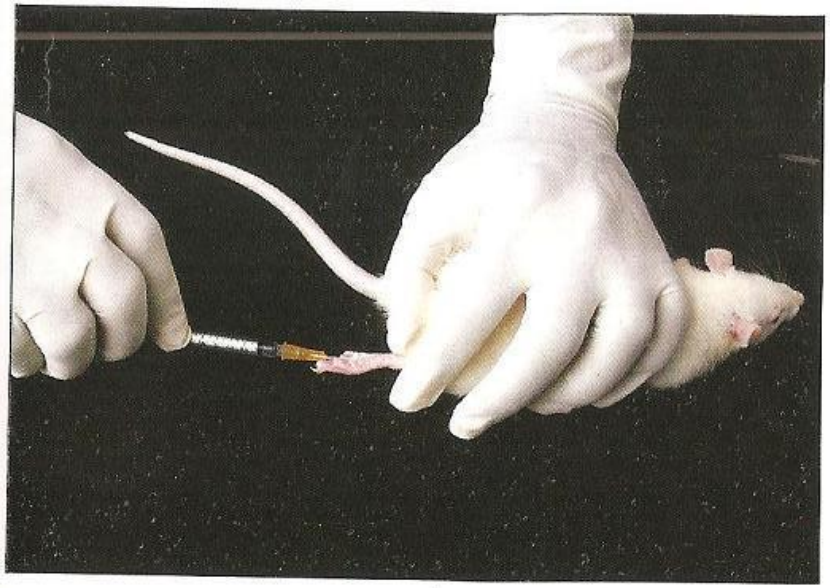
Oral administration of drug

Intraperitoneal injection

Sub-cutaneous injection



Intravenous injection

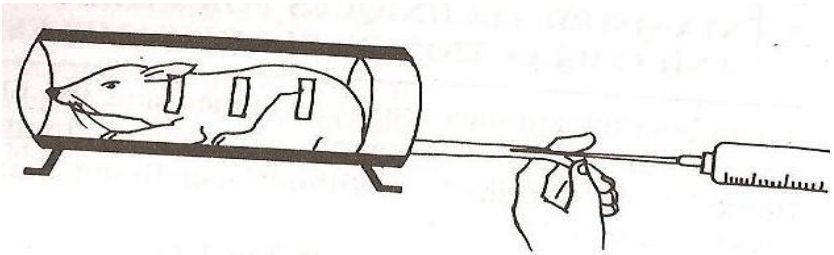


Sub-Plantar injection

Intramuscular injection

Technique used

- Blood collection
  - Retro-orbital
  - Tail vein
  - Marginal Ear Vein



- Scarification Technique
  - Head Blown
  - Cervical Dislocation
  - Anesthesia

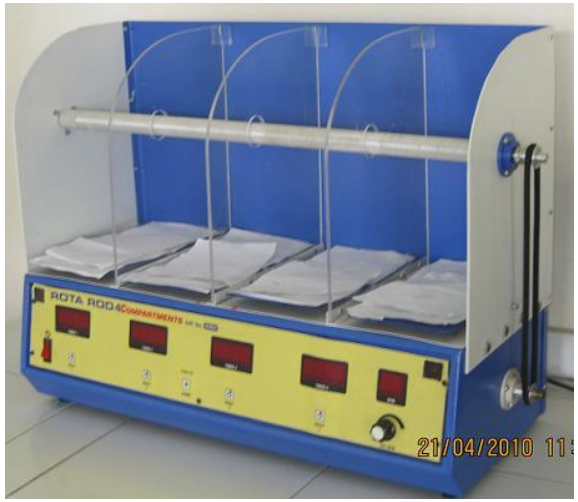
Experimentation

- Experimentation on isolated preparation (*in vitro*)
- *In vivo* experimentation

- ***In vivo* experimentation**
  - **CNS Experimental Pharmacology**
    - Locomotor Activity
    - Anticonvulsant Activity
    - Hypnotic Activity
    - Antidepressant activity
    - Anxiolytic activity
    - Antidepressant activity
    - Antiparkinsonian activity
    - Learning and Memory
  - **Analgesic and anti-inflammatory activity**

Instruments:

Actophotometer

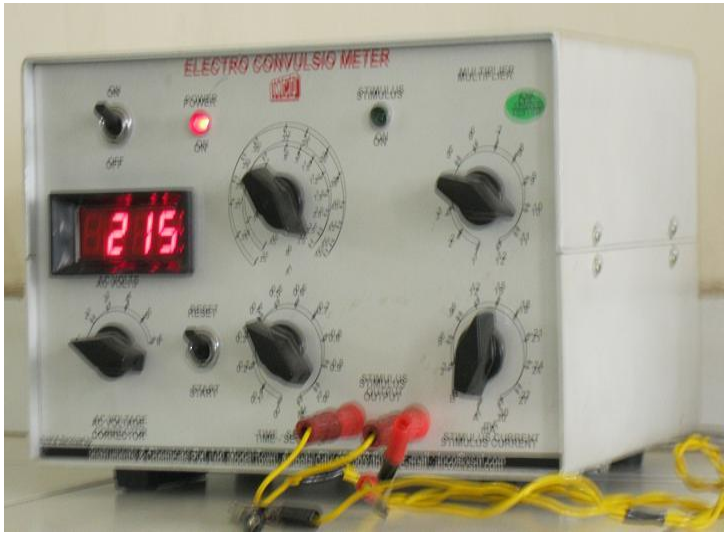


Rota-rod Apparatus

Analgesiometer

Forced Swim Apparatus

Plethysmometer



Electroconvulsometer

Cooks Pole Apparatus

Morris Water maze Apparatus

Elevated Plus Maze Apparatus

References

- **S. K. Kulkarni.** Handbook of experimental pharmacology, Vallabh Prakashan, 3rd edition, 2009.
- **R. K. Goyal.** Practical's in pharmacology, B. S. Shah Prakashan, 9th edition, 2009.
- **S. B. Kasture.** A handbook of experiments in preclinical pharmacology, Career Publication, 1st edition, 2009.
- **M. N. Ghosh.** Fundamentals of experimental pharmacology, Hilton and company, 3rd edition, 2005.

EXPERINENT OUTLINE

Exp 1: General introduction to experimental pharmacology.

Reference:

S.K.Kulkarni, R.K. Goyal, S. B. Kasture

Definitions: Pharmacology, Clinical pharmacology, preclinical pharmacology, Experimental pharmacology

Basic equipments used in Exp. Pharmacology

organ bath.....

Different laboratory animals

(Strain, wt range, exp use)

Rat, mice, frog, rabbit, Guinea pig, Dog, Monkey etc.

Legal regulation for the use of exp animals.

(description of CPCSEA and IAEC)

Exp 2: Handling of experimental animals and route of drug administration.

Ref. S. B. Kasture

Exp 3: