

EXPERIMENT NO.: 2

DATE:

AIM: STUDY OF LABORATORY ANIMALS USED FOR EXPERIMENTAL PHARMACOLOGY

1. FROG: (Adult Weight 50-100gm)

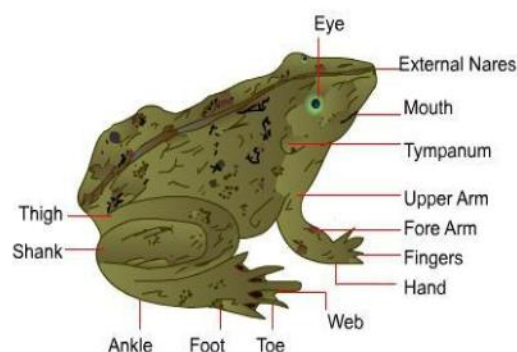
Biological Source: Rana Tigrina

Common Strain Used: Rana esculenta, Rana pipiens and Rana temporaria.

Specific Characteristics: Frog is a cold-blooded amphibian. It has three chambers in its heart, two auricles and one ventricle.

Used in Experimental Pharmacology:

- Study of isolated tissue like rectus, abdominis muscle, heart, sciatic nerve preparation etc.
- To study the effect of drug acting on central nervous system, neuromuscular junction and heart.
- Whole frog is also used in screening of certain drugs like anesthetics.

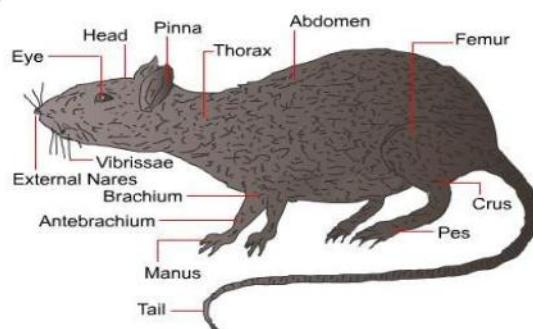


2. RAT: (Adult Weight 200-250gm)

Biological Name: Rattus Norvegicus.

Common Strain Used: Albino rats of wistar strain, Sprague-Dawley, Wistar Kyoto, Lewis, and Porton.

Specific Characteristics: Rat is a warm-blooded rodent. It can't vomit and does not possess the vomiting center. It has no tonsil and gallbladder in its body. Hence it can't be used in screening of the drugs having activities on vomiting center, or gall bladder. Rat is omnivorous animal. It shows resistance to the effects of cardiac glycosides.



Uses in experimental pharmacology:

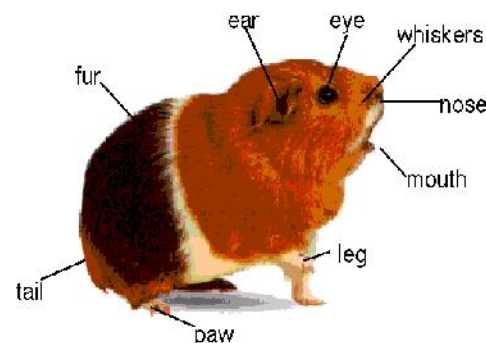
- Psychopharmacological Studies.
- Study of analgesics and anticonvulsants
- Bioassay of various hormones such as insulin, oxytocin, vasopressin etc.
- Study of estrus cycle, mating behaviour and lactation.
- Studies on isolated tissue preparations like uterus, stomach, vasdeferens, anococcygeus muscle, fundus strip, aortic strip, heart rate etc.
- Chronic study on blood pressure.
- Gastric acid secretion studies.
- Study of hepatotoxic and antihepatotoxic compound.

- Acute and chronic toxicity studies.
- Study on mast cells using peritoneal fluid and mesenteric attachments.

3. GUINEA PIG: (Adult Weight 400-600gm)

Biological name: *Cavia Procellus*.

Specific Characteristics: It is a docile animal. It is susceptible to tuberculosis and anaphylaxis. It is highly sensitive to histamine and penicillin. It required exogenous ascorbic acid in diet. Guinea pig is a warm blooded rodent. Its name itself has become synonymous to an experimental animal.



Use in Experimental pharmacology:

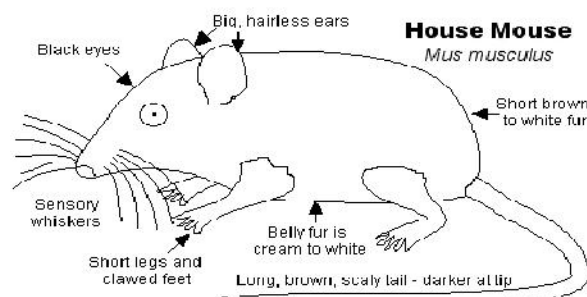
- Evaluation of bronchodilators.
- Anaphylactic and immunological studies.
- Study of histamine and anti histamines.
- Bioassay of digitalis.
- Evaluation of local anesthetics.
- Hearing experiments because of sensitive cochlea.
- Study in isolated tissue specially, ileum, tracheal chain, vas deferens, teania coli, hearts etc.
- Study of tuberculosis and ascorbic acid metabolism.

4. MOUSE: (Adult Weight 20-25gm)

Biological name: *Mus Musculus*.

Common Strain Used: Laca, balb-c and Swiss albino.

Specific characteristics: Mouse is most wide used animal in different toxicity studies. It is a warm blooded rodent. Mice are very sensitive to the sedative effects of hexobarbitone. They are smallest, cheap and easy to handle.



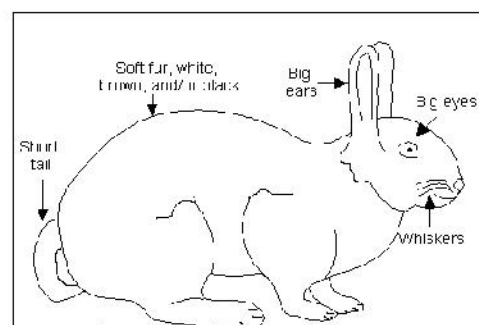
Used in Experimental Pharmacology:

- Bioassay of Insulin.
- Toxicological and teratogenic study.
- Screening of analgesic and anticonvulsants.
- Screening of chemotherapeutics agents.
- Study related to genetic and cancer research.
- Study of Drugs acting on central nervous system.

5. RABBIT: (Adult Weight 1.5-3kg)

Biological Name: *Oryctolagus Cuniculus*.

Strains Used: New Zealand White, Himalayan Black.



Specific Characteristics: it is docile animal with large ears. Usually New Zealand white rabbits are used. Rabbit is a warm blooded mammalian animal. Some strains of rabbit are resistance to effective of atropine because they have higher concentration of atropinase enzyme in their blood. In this species coitus it induces secretion of leutenising hormone (LH) in females, which leads to ovulation. Hormone progesterone is known to block such ovulation.

Use in Experimental Pharmacology:

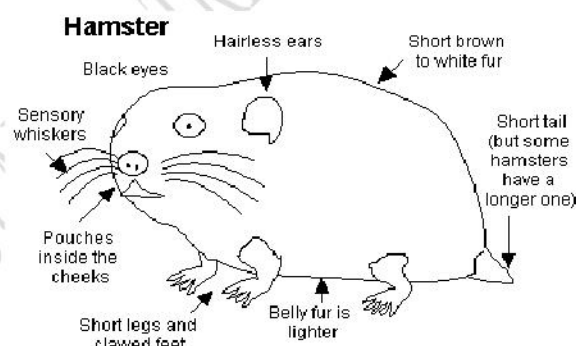
- Pyrogen testing.
- Bioassay of anti-diabetics and sex hormones.
- Irritancy tests.
- Study of drug used in glaucoma.
- Screening of agents affecting capillary permeability.
- Pharmacokinetics studies.

6. HAMSTER:

Biological Name: Mesocricetus Auratus and Cricetulus Griseus

Specific Characteristics: they have short body with short legs and tail. The skin is loose and covered with dense short soft fur.

The cheeks pouches are prominent and extend upto the shoulder region.



Use in Experimental Pharmacology:

- Chines hamsters have low chromosome number making it useful for cytological investigations, genetics, tissue culture and radiation research.
- Research on diabetes mellitus.
- Research related to virology, immunology and implantation studies.
- Bioassay of prostaglandins.

Note:

- Rodents are defined by having a single pair of continuously growing incisors in both upper and lower jaws, which they must wear down by gnawing. Non-rodents do not have this characteristic set of teeth.
- **Rodents:** Mice, rats, squirrels, beavers, hamsters, porcupines.
- **Non-rodent:** Frog, Rabbits, hares, shrews, bats, cats, dogs, and humans.

TEACHER'S SIGNATURE