

Al-Mustaqbal University College

Department of Pharmacy

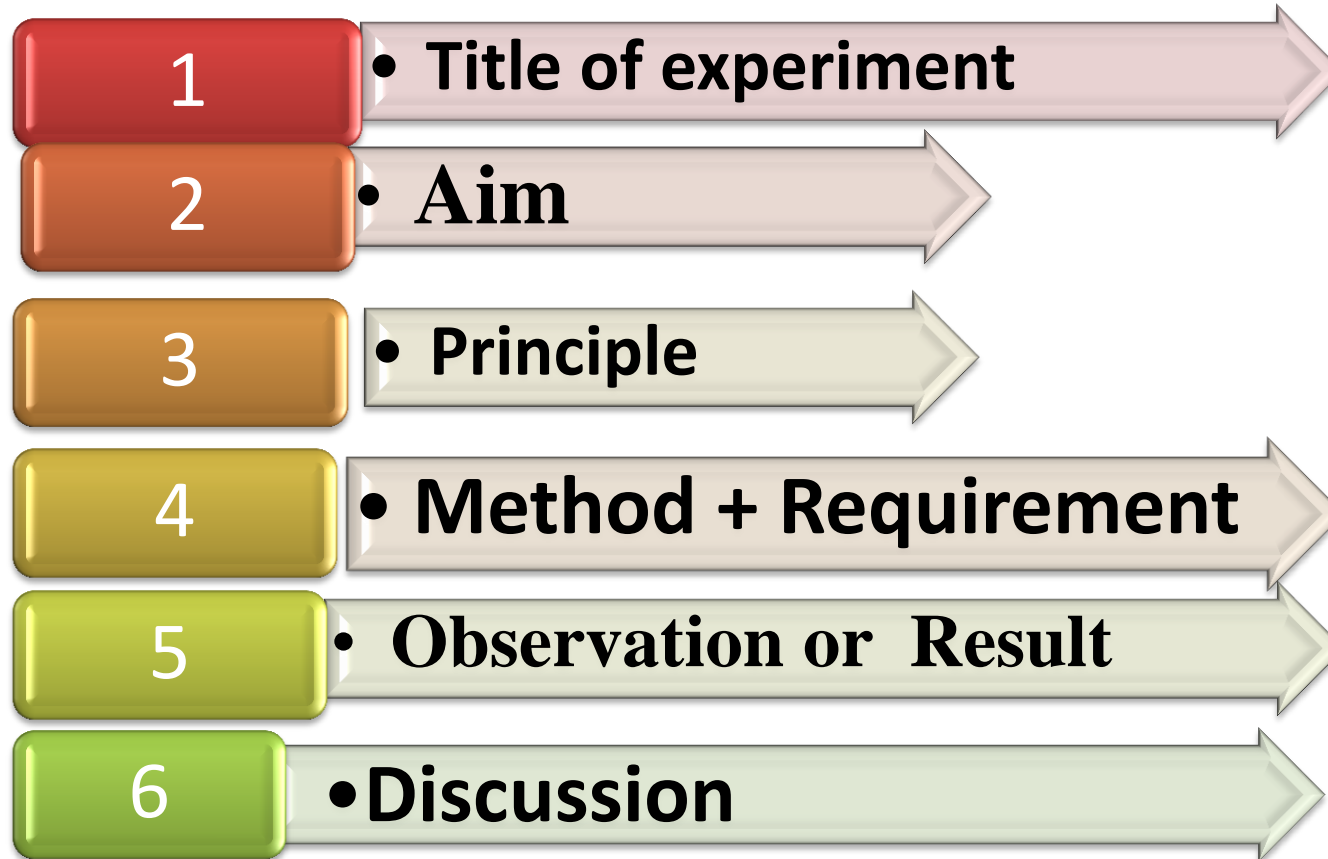
Pharmacology lab 6/ 4th stage

**Evaluation of analgesic effect of the
(centrally acting)**

drug by animal experiments

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Experimental Writing steps



Evaluation of analgesic effect of the (centrally acting) drug by animal experiments

Aim- :

To study the analgesic effect of (centrally acting drug) by tail immersion method.

Requirements:

Animal- Rat (100 –150 g)

Drug (central analgesic)

Apparatus

Principle:

Analgesics are drugs that selectively relieve pain that acts on the central nervous system or on the peripheral nervous system without affecting consciousness.

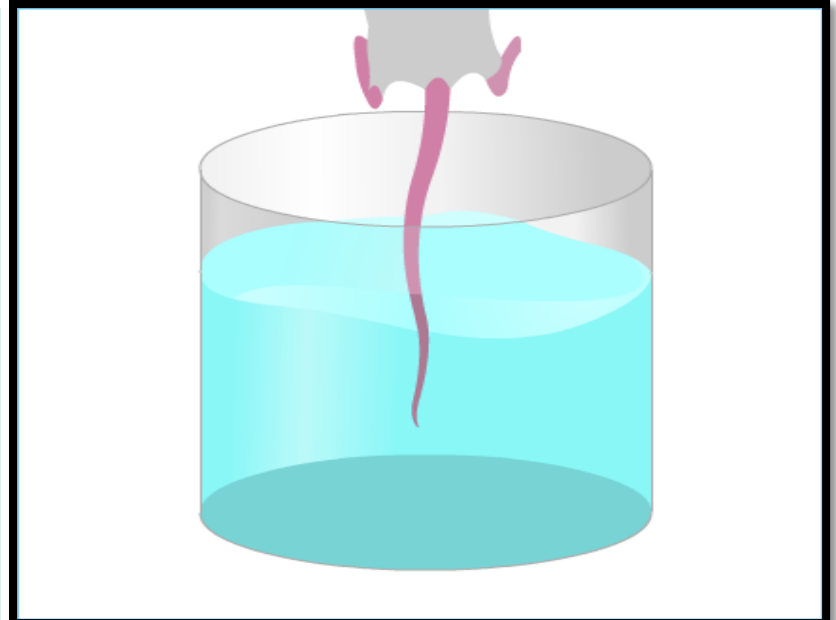
The analgesics can be classified into:

- Opioid analgesics &
- Non-opioid analgesics.

Methods

1-Tail Immersion Test

The tail flick test is a thermal hyperalgesia test in which the tail of the animal is subjected to a **heat source**. Once the animal uncomfortable, he removes feels spontaneously the tail (**tail flick**).



2- Hot-plate test

This test consists in a thermal pain measurement.

In this test, the animal is placed on a heated-plate to measure his thermal pain reflexes which are characterized either by withdrawal of the paw or by licking and jumping..



3-Tail flick meter

Basically, a radiant heat is applied on the tail; when the animal feels discomfort, it reacts by a sudden tail's movement (tail flick) which automatically stops the stimulation and the timer for the measurement of the animal reaction time (period from the beginning of the stimulation until detection of the animal's response.)



4- Formalin Test

The formalin test is an acceptable and reliable model of nociception that generates two separate phases of increased licking activity.

The **initial licking stage lasts** for **the first five minutes** and a **late phase** takes from **15 to 45 minutes** after the injection of formalin.

Formalin (20 μ L of a 2.5% solution) was injected subcutaneously into the dorsal surface of the right **hind paw**.

The pain response time(licking time) was calculated in two periods: 0 to 5 min, the **first phase** (**caused by direct motivation of the nociceptors**), and 15 to 45 min, the **second phase** (**inflammatory pain produced by release of inflammatory mediators**).

5-Writhing test

Writhing test is a chemical method used to induce pain of peripheral origin by injection of irritant principles like phenylquinone, acetic acid in mice.

Analgesic activity of the test compound is inferred from decrease in the frequency of writhing.

(The manifestations of abdominal writhings in mice) as an arching of back, extension of hind limbs and contraction of abdominal musculature..

Procedure:

- ❑ Weigh and number the animal, the basal reaction time is observed

- ❖ Normally animals show such a response in 3 to 4 sec and a cut off time of 10 sec is observed to avoid damage to the tail.

- ❑ Inject drug and note the cut off time of animal for half an hr. Calculate the percentage increase in time.

OBSERVATIONS :

Sr. No.	Body weight (g)	Basal reaction time (sec)			Mean	Reaction time after morphine administration		
		1	2	3		15 min	30 min	60 min
1	22	3	3.5	2.5	Mean	5	8	10*
2	20	3.5	2.5	3.5		6	6	8.5
3	22	3.5	3	3		5	7.5	9
4	23	3	3.5	3.5		5	8	9.5
5	24	2.5	3.5	2.5		6	7	9
6	20	2.5	2.5	3.5		5	8	10*
Mean								

Discussion:

After the administration of the drug there is a percentage increase in the time of tail flick on dipping it in hot water because of analgesic activity of given a drug.

Thank You

