

TP 1. Design of an experimental study

Main steps of an in vivo study

1. Determine the purpose of the study.

2. Plan the study according to the determined goal;

-Choose the species (species available at Jijel University; Albino Wistar Rats; NMRI Mice)

-Choose the animal model: the animal models achievable at the University of Jijel are generally chemically induced models: (Ex, diabetes by alloxan; hepatic inflammation induced by Ccl4 or paracetamol, etc.).

-If the study consists of testing the biological effect of an active substance, it is necessary to carefully choose the doses to be tested and the period of exposure/treatment (acute, sub-acute, chronic) as well as the age of exposure /treatment (prenatal, postnatal, juvenile, adult, aging, etc.)

Depending on the nature of the molecule administered (either the substance tested or the substance to create the animal model), the vehicle and the route of administration must be determined according the physicochemical and pharmacokinetic characteristics of the administered molecule.

Use a hydrophilic excipient for the administration of hydrophilic molecules a lipophilic excipient for the administration of lipophilic molecules.

-Divide the animals into groups, each group receives a treatment determined according to the aim of the work + the negative control group, (the use of a negative control group is essential). It is recommended to minimize the number of the groups in a study provided this does not affect the representative quality of the study.

-Sacrifice of animals at the end of the study: note that certain sacrifice methods can affect the measured parameters e.g. (biochemical parameters, neurotransmitters, etc.), in addition anesthetic agents can interact with the biological activity of the substance tested or the measured parameters.

The anesthetic agents used at Jijel University are particularly ether and chloroform (use chloroform with caution due to its carcinogenic effect)

-Organ removal (dissection) must be carried out immediately and on ice. Label your samples and store them properly at (-20 C°).

Questions

1/ Indicate the purpose of choosing a hydrophilic vehicle to administer a hydrophilic substance and a lipophilic vehicle to administer a lipophilic substance.

2/ Give an example of a hydrophilic vehicle and a lipophilic vehicle.

3/ State the purpose of using the negative control group.

4/ Mention the advantages of reducing the number groups in experimental studies.

5/ In your opinion, what is the best method for animal sacrifice? Justify your answer.

