Home Office

NON-TECHNICAL SUMMARY

Establishment of early pregnancy

Project duration

5 years 0 months

Project purpose

- (a) Basic research
- (b) Translational or applied research with one of the following aims:
  - (ii) Assessment, detection, regulation or modification of physiological conditions in man, animals or plants.

Key words

Pregnancy, Embryo, Superovulation, Oestrus

Retrospective assessment

> The Secretary of State has determined that a retrospective assessment of this licence is not required.

Objectives and benefits

Description of the project's objectives, for example the scientific unknowns or clinical or scientific needs it's addressing.

What's the aim of this project?

This project aims to understand the physiological mechanisms associated with superovulation and the establishment of pregnancy. Given that these are conserved across species, the results of this project will be of both clinical and veterinary value. Since the establishment of pregnancy is a rate limiting step

associated with many experimental procedures (e.g. the breeding of specific experimental models of human disease), this project will also allow us to improve the methods used to achieve pregnancy and reduce both the numbers of animals used overall but also the severity of the procedures that they are subjected to.

Potential benefits likely to derive from the project, for example how science might be advanced or how humans, animals or the environment might benefit - these could be short-term benefits within the duration of the project or long-term benefits that accrue after the project has finished.

What are the potential benefits that will derive from this project?

There are several potential benefits to this research:
(i) For humans: this will highlight the mechanisms associated with superovulation and the establishment of early pregnancy and highlight novel potential interventions for the management of infertility, recurrent miscarriage and preterm labour.
(ii) For animals: the methods developed and optimised as part of this project aim to streamline many laboratory protocols with a view to replacing the use of vasectomised males and reducing the number of females overall in research programmes which use rodents as models (mice and rats).
Moreover, it is expected that those that are still used will have refined, milder and less-invasive measures used for establishing pregnancy. This could benefit hundreds of thousands of animals worldwide per year as well as potentially having translational benefits for the farming industry in the longer term.

Species and numbers of animals expected to be used

What types and approximate numbers of animals will you use over the course of this project?

Mice: 5,300 animals.
Rats: 900 animals.
Over 5 years.

Predicted harms

Typical procedures done to animals, for example injections or surgical procedures, including duration of the experiment and number of procedures.

In the context of what you propose to do to the animals, what are the expected adverse effects and the likely/expected level of severity? What will happen to the animals at the end?

The adverse effects to these well-established procedures are minimal and the novel ones being developed will present a reduction in severity. The animals will be humanely euthanized at the end of each experiment. Pups generated from experimental females will be used in further experiments wherever possible in order to minimise the numbers of animals used overall.

Replacement

State why you need to use animals and why you cannot use non-animal alternatives.

The mechanisms associated with the establishment of pregnancy are highly complex and systemic such that they cannot be studied in alternatives (e.g. cells/organs).

Reduction

Explain how you will assure the use of minimum numbers of animals.

The number of animals will be reduced in two ways: (i) by careful experimental planning with support from a statistician in order to minimise wastage and (ii) by improving existing experimental protocols used for achieving a pregnancy after embryo transfer.

Refinement

Explain the choice of species and why the animal model(s) you will use are the most refined, having regard to the objectives. Explain the general measures you will take to minimise welfare costs (harms) to the animals.

The mouse is used as a model for other rodents as it is the least sentient species, yet remains a representative and useful model. Welfare costs will be reduced by using less invasive procedures (e.g. pessaries instead on injections) as well as ensuring that any animal used in an experimental procedure (none of which are more than moderate severity) is regularly monitored and receives pain control if appropriate. Animals will also be housed in social groups where they can exhibit normal behaviour.