

Report

This report is aimed at highlighting the results achieved during the practice period, which is an essential part of Master in Laboratory Animal Science and Welfare Program. The practice was conducted in the Transgenic Unit of National Center for Biotechnology in Madrid from 14th to 25th November 2022.

The transgenic unit provides with a number of services, such as: developing the transgenic mice with pathological onset based on request, maintaining the mice colonies, scientific support of related topics for in-house researchers and other institutions.

During the practice the tremendous amount of information was accepted by my side, particularly it gave me a clear understanding of the gradual steps for the following working process development of my new in house GM mouse facility.

The list of discussed questions included:

- ✓ Gradual steps for establishing a new animal facility with GM animals.
- ✓ Assessment of my GM facility unit.
- ✓ The type of equipment which, has to be established facility in each zone: conventional and the pathogen free (with examples of common mistakes).
- ✓ The way of calculating resources for establishing a GM facility.
- ✓ Questions which must be addressed to researchers for successful work performance.
- ✓ The informational resources which should be used for performing GM animals.
- ✓ The nomenclature of GM animals.
- ✓ The way of effective paperwork operation in order to avoid possible mistakes.
- ✓ The types of identification which are better to use for animal cages for avoiding mistakes.
- ✓ The way Mendelian inheritance works when the breeding plan is developed.
- ✓ Outbred and inbreed mouse breeding system, common mistakes, time periods for renewing colony, backing up the founders.
- ✓ Congenic mouse breeding system.
- ✓ Types of GM technics which are commonly used (advantages and disadvantages).
- ✓ In vitro fertilization.
- ✓ The way of receiving the pseudopregnant mice
- ✓ The common problems with barrier colony management.
- ✓ Rederivation protocols by cesarean section or embryo transfer.
- ✓ Case discussion about nude mice breeding protocol.
- ✓ The problem of embryonic mortality in homozygous mice.
- ✓ The ways of dealing with two or more genetic modifications.
- ✓ Technics of cryopreservation (mouse spermatozoa, oocytes and embryos).

The following technics, which were trained and refreshed:

- ✓ Preparation of media solution for the following manipulations with embryos.
- ✓ Performing mice hormone injections for superovulation base on the protocol.
- ✓ Clinical observation of the plugs.

- ✓ Organizing groups of donor females.
- ✓ Embryos quality assessment.
- ✓ The ovaries extraction for receiving two stage embryos.
- ✓ Two stage embryos cleaning, collecting and transferring to new media for the following incubating.
- ✓ Intra nuclear injection of DNA.
- ✓ Embryo transfer to infundibulum.

All obtained information and skills assist me with getting deeply structural knowledge how to deal with GM colonies, which will be transferred to my working process.

I'm intended to continue my professional development in the field of genetically modified mice breeding with emphasis on animal housing and novel breeding strategies. I truly believe that this practice in combination with the Master trainings and lectures provided me with invaluable knowledge and experience needed for my further work and personal goals.

I am grateful to the ICLAS for providing me with a support for profession development of laboratory animal specialists, which undoubtedly improves the quality of animal welfare and their using in scientific research.

Additionally, I would like to highlight the high level of Master program (Universitat Autònoma de Barcelona) organization and chosen studying approaches with the great combination of lectures and practical classes conducted by Dr. Patrocinio Vergara Esteras and the teaching staff.

Finally, with my deepest regards to Dr. Belen Pintado and her team (Centro Nacional de Biotecnología, Madrid), who kindly allowed me to carry out my practice and gave me endless number of explanations, scientific and practical support, which I will definitely apply in my work.

Yours sincerely,

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