UNIVERSITÀ DEGLI STUDI DELL'AQUILA

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[DB0130] - ANIMAL MODELS AND ANIMAL CARE

Module of [DB0127] - EXPERIMENTAL MODELS IN BIOTECHNOLOGY

General information

Course	MEDICAL AND PHARMACEUTICAL BIOTECHNOLOGY
Course type	Master or equivalent second cycle
Academic year	2026/2027
Year	1
Training activity type	Compulsory subjects, characteristic of the class
Scope	Morphology, Functions and Pathology of Cells and Complex Organisms
Language	Italian
CFU	6 CFU
Didactic Activity Type	Lecture
Evaluation	FINAL GRADE
Teaching period	First Semester (from 01/10/2026 to 11/01/2027)
Holders	RUCCI NADIA - Main teacher
Teachers	MAURIZI ANTONIO
Length	64 hours (64 hours Lecture)
Subject area	BIOS-13/A
Location	L'Aquila - Università degli Studi
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Module's Language

Italian

Module's Goals

The main objectives of this course are: To describe in detail the national and international laws and policies regulating the animal experimentation and the application of the Animal Research: Reporting of in Vivo Experiments (ARRIVE) guidelines;To provide a background for the most relevant animal models employed to investigate the molecular mechanisms promoting a specific disease; To have knowledge of all the strategies employable to develop a transgenic animal model; To identify and describe all the techniques employed to assess the pathologic phenotype of the animal model; To set up pre-clinical experiments for testing alternative therapies for the treatment of a specific disease. The course is in line with the training objectives envisaged by the course of study, which aims to train professional profiles with a solid scientific background and with high levels of ability and application skills, capable of carrying out different roles, with functions of responsibility in research, scientific innovation and technical-productive development of biotechnologies, applied both in medical and pharmaceutical fields.

Module's Learning outcomes

At the end of this teaching course, the student should have acquired: A deep knowledge of all the ethical rules applied to the animal experimentation, with particular regards to the 3R rule “Replacement, Reduction and Refinement”; A general state of the art of each disease approached during the course and of all suitable animal models available to recapitulate the disease; The ability to set up an in vivo experiment and to identify the most suitable animal model to be used according to the disease approached and to the specific topic to be investigated within the disease.

Module's Required skills

This course requires basic knowledge in the field of human histology and embryology, physiology, pathology and genetics, acquired during the bachelor in Biotechnology.

Module's Subjects

The main topics of this course are: Ethics of the employ of animal models: when the use of an animal model is irreplaceable and all the rules that must be adopted for animal maintenance and handling in order to guarantee animal wellness (**0.5 CFU**); -Detailed description of the pathology and of the main in vivo models employed to study the following diseases: diabetes, cardiovascular diseases, chronic inflammatory diseases, osteoporosis, Duchenne muscle dystrophy, oncologic diseases (breast cancer, colon cancer, osteosarcoma, bone metastases), neurodegenerative diseases (Alzheimer, Parkinson, Huntington diseases) (**3.5 CFU**).The course includes student training related to the following topics: Learning, through educational video, the good practices of maintenance and manipulation of murine animal models; Learning, through educational video or visiting dedicated laboratories, the instrumentation and the main tests used for the analysis of a specific pathological phenotype; Transgenic animal models: basic knowledge and most recent strategies advancements.

Module's Teaching methods

Frontal lessons with slides; Interactive discussion during the lessons in order to evaluate in itinere learning; Webinars; Free available international scientific publications (articles and reviews) that can be downloaded from “PubMed” https://www.ncbi.nlm.nih.gov/pubmed/; - Ref. textbook: Robbins and Cotran: “Pathological basis of disease”; The course includes student training which will also held by educational video watching; Learning methods can be adapted on the basis of any indication from the University Disability Committee.

Module's Verification of learning

Oral exam: 3 questions will be asked, aimed to understand: 1) the preparation of the candidate in terms of understanding the covered topics; 2) the ability of the candidate to identify the best model to be employed for a specific disease; 3) the ability of the candidate to describe all the methods and experimental approaches needed to characterize the pathological phenotype of a specific animal model and to follow up its onset and development during the timeframe of the experiment and at the end. The exam grade will reflect the following levels of preparation: - Not sufficient (<18/30): Fragmentary and superficial knowledge of the contents, inadequate exposition skills. - Sufficient (18/30 – 20/30): Sufficient but general knowledge of the contents, simple exposition, limited autonomy of critical analysis. - Adequate (21/30 – 24/30): Appropriate but not in-depth knowledge of the contents, acceptable terminology, partial autonomy of critical analysis. - Good (25/30-27/30): Appropriate and broad knowledge of contents, good ability to apply knowledge, appropriate language skills and good autonomy of critical analysis. -Great (28/30-30/30): Wide, complete and in-depth knowledge of the contents, excellent ability of analysis and synthesis, confident and correct presentation. - Excellent (30/30 cum laude): Very broad, complete and in-depth knowledge of the contents, well-established ability to apply the contents, excellent capacity for synthesis and interdisciplinary connections, mastery of exposition. For the ERASMUS students there is the possibility to perform the examination in English. The learning assessment can be adjusted on the basis of any indication from the University Disability Committee. Since this module is part of an integrated course, it would be possible to perform a partial evaluation, however the final evaluation will be the result of the weighted average among the grades of the modules by considering their weight (a.k.a. CFU).

Module's Books

Free available international scientific publications (articles and reviews) that can be downloaded from “PubMed”. https://www.ncbi.nlm.nih.gov/pubmed/; Ref. textbook: Robbins and Cotran: “Pathological basis of disease”.

2030 Agenda Goals for Sustainable Development Module's

This teaching activity contributes to the achievement of the Sustainable Development Goals of the UN 2030 Agenda



Module's Extra info

Reception: by appointment via mail at the following address: nadia.rucci@univaq.it, building Angelo Camillo De Meis (Coppito 2), 1st floor, room B-2-36; virtual meetings are also possible, via teams platform.