Master in Laboratory Animal Science and Welfare

Introduction

The UAB Master in Laboratory Animal Science & Welfare has been running since 2000 to provide specialized training for professionals who work with animals for research purposes.

The program is accredited by the

Federation of European Laboratory Animal Science Associations

as "Category D – Specialist in laboratory animal science" and forms part of the UAB Laboratory Animal Residential Program recognised by

European College for Laboratory Animal Medicine

For Veterinarians, completion of the 6 master modules allows to obtain the Veterinarian Certificate in Laboratory Animal Science and Medicine, approved by VetCEE Veterinary Continuous Education in Europe (VetCEE)

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Course Structure

The course comprises 6 modules, a practical placement and a project. It is designed to be completed in three years and to be fully compatible with a full time job. The modules are intensive and two are run each year lasting between 1-2 weeks. In this way the course can accommodate students who live outside Barcelona. Students are individually evaluated for each module.

Course Objectives

The program aims to provide expertise and professional excellence in all areas of laboratory animal science relevant to animal experimentation.

Specifically, the program is designed for veterinarians and other specialist personnel designated with responsibility for the welfare and care of laboratory animals.

Each module can be completed independently with some modules leading to accreditation for some of the functions described in EU Directive EU63/2010 and DR 53/2013 such as performing procedures, project design and project evaluation. See individual modules for details.

Completion of the whole course enables students to carry out functions described in EU Directive EU63/2010. For details, see:
European Commission, Directorate-General for Environment, *Caring for animals aiming for better science – Directive 2010/63/EU on protection of animals used for scientific purposes : education and training framework*, Publications Office, 2019, https://data.europa.eu/doi/10.2779/311480

Registration

Students may register for individual modules or for the whole Master course.
Special reduced fees are applicable for members of SECAL, ESLAV or ECLAM Residents.
In some cases, students may be eligible for a grant from Laboratory Animals or ICLAS.
Alternatively, students may register for individual modules each of which may lead to an official UAB certificate which can be used to demonstrate competence in the areas covered by the module.

Course Directors:
Professor PatriVergara (DipECLAM); Department of Cellular Biology, Physiology and Immunology. Faculty of Veterinary Science, Universitat Autònoma de Barcelona (tel: +34 680118778; e-mail: patri.vergara@uab.cat)

Estefania Contreras, DVM, PhD, Animal Facility UAB, e-mail: estefania.contreras@uab.cat)

Organising Faculty/Department:

Department of Cellular Biology, Physiology and Immunology. Faculty of Veterinary Science, Universitat Autònoma de Barcelona.
More information: pg.animals.laboratori@uab.cat

Modules detail

Each module consists of webinars and face to face lectures and practical sessions.

Following are the details of each module and estimated dates for the next edition of each module. Some topics and teachers may change as each module is updated for each edition. Details syllabus and specific dates are fixed at least 6 months in advance to the start of the module.

Module 1

Animal Experimentation: Welfare, Legislation, Ethical Committees and Evaluation of Projects

The course focuses on the topics of Welfare, Ethical Committees and Legislation in respect of laboratory animals.
This module provides the knowledge and skills required by designated veterinarians and other onsite personnel responsible for the welfare and care of animals to perform the functions of project evaluation.
The content of this module also complies with the training requirements set out in European Directive EU63/2010, developed by the Expert Working Group, supported by European Commission, in respect of the following modules: 1) National Legislation; 2) Ethics, welfare and the 3Rs (level 1); 5) Recognition of pain, suffering and distress; 9) Ethics, welfare and the 3Rs (level 2); 11) Design of procedures and projects (level 2), (i) Legal issues; 24) Designated Veterinarian, (i) Legislation, (ii) Ethics, welfare and the 3Rs, (v) The principles of veterinary communications; (25) Project evaluator and (50) Local environment as well as Inspectors module.

Syllabus:

Topic 1: Introduction to LAS: Associations/organizations, professional networks
Topic 2: Legislation, including responsibilities of the LA veterinarian
Topic 3: Bioethics
- Society perception of animal experimentation
- Introduction to bioethics
- Ethical frameworks
- Bioethics applied to lab animals, including the 3 Rs

Topic 4: Concepts in laboratory animal welfare
- Welfare and stress
- Concept of animal welfare
- Sentience
- How can animal welfare be studied?
- Overview of main welfare problems in lab animals
- Physiology of stress
- Main stressors in lab animals, including stress caused by transport
- Positive re-enforcement, habituation/conditioning, preference tests and socialization of animals

Assessment of severity and humane end points
Pain and analgesia
Environmental enrichment and behavioural indicators of welfare
Re-use and the legal, practical and ethical issues on re-homing after use of animals in research
Retrospective evaluation

Topic 5: Assessment of protocols – general principles

Ethical committees
Cost-benefit analysis

Topic 6: Assessment of procedures – case studies

Rodents and rabbits
Carnivore
Pigs, ruminants and birds
Fish
NHP
Wild Animals

Topic 7: Inspection

Module coordinador:
Prof. Xavier Manteca Vilanova
Departament of Food and animal Science. Veterinary School (UAB, Barcelona)

Teaching Staff (as per the last edition, March 2025):
David Anderson, Home Office, UK/ European Commission
Ignacio Álvarez Gómez de Segura, Veterinary School, University Complutense, Madrid, Spain
Marta Amat, Veterinary School of Barcelona, Spain
Aurora Bronstad, University of Bergen, Norway
Estefania Contreras, CReSA/ IRTA and Universitat Autònoma de Barcelona, Spain
Anne-Dominique Degryse, ECLAM, France
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Jan Langermans, Biomedical Primate Research Center (BPRC). The Netherlands
Xavier Manteca, Veterinary School of Barcelona, Spain
Kathy McCall, Home Office, UK/ European Commission
Juan Ramos, Universitat Autònoma de Barcelona, Spain
Peter Sandoe, University of Copenhagen, Denmark
Hugh Simmons, Animal and Plant Health Agency (APHA), UK
Violeta Solis, GSK, Madrid, Spain.
Oriol Tallo Parra, Veterinary School of Barcelona, Spain
Patri Vergara, Veterinary School of Barcelona, Spain

Duration of Course: 9 ECTS (44 attendance hours)

Course dates: 15 February - 30 April, 2028

Attendance dates at UAB: 1 week to be determined.

Module 2

Management of Animal Facilities. Breeding and Animal Care Programs.

This module provides the knowledge and skills required for the effective management of animal facilities for experimental animals by designated veterinarians and other onsite personnel responsible for the welfare and care of laboratory animals.

The content of this module also complies with the training requirements set out in European Directive EU63/2010, developed by the Expert Working Group, supported by European Commission, in respect of the following modules: 3.1) Basic and appropriate biology (theory); 4) Animal care, health and management.; 11) Design of procedures and projects (level 2) (iv) responsibilities; 23) Advanced animal husbandry, care and enrichment practices; 24) Designated veterinarian, (iii) Animal health, care and management.

Syllabus:

Topic 1. Strategic planning, impact of institutional policy and guidelines internal relations, relations with other animal centres and with society.

Topic 2. Animal facility design, construction and equipment: basic concepts; conforming to legislation and "good practices"; specialized functions of animals, projects, personnel and equipment.

Topic 3. Management of materials in animal facilities: hygiene and disinfection programmes; storage of material and equipment; sterilization, waste disposal.

Topic 4. Rodent facility: Equipment; management programmes, acclimatisation; environmental enrichment; security (access); automatic processes; analysis of specific needs and resolution of problems; equipment currently available; maintenance of technical installations; water and bedding; daily routines; animal identification.

Topic 5. Rodent specialised facilities.

5.1 Digital cages.
5.2 Gnotobiotic models

Topic 6. Facility for rabbits: Equipment; management programmes; environmental enrichment; analysis of specific needs and resolution of problems (feeding, bedding, waste disposal); equipment currently available; daily routines; animal identification.

Topic 7. Non-Human Primates facility: Equipment; management programmes; environmental enrichment; analysis of specific needs and resolution of problems (feeding, bedding, waste disposal); equipment currently available; daily routines; animal identification.

Topic 8. Carnivore facility: Equipment; management programmes; environmental enrichment; analysis of specific needs and resolution of problems (feeding, bedding, waste disposal); equipment currently available; daily routines; animal identification.

Topic 9. Facility for swine: Equipment; management programmes; environmental enrichment; analysis of specific needs and resolution of problems (feeding, bedding, waste disposal); equipment currently available; daily routines; animal identification.

Topic 10. Ruminant facility: Equipment; management programmes; environmental enrichment; analysis of specific needs and resolution of problems (feeding, bedding, waste disposal); equipment currently available; daily routines; animal identification.

Topic 11. Facility for avian species: Equipment; management programmes; environmental enrichment; analysis of specific needs and resolution of problems (feeding, bedding, waste disposal); equipment currently available; daily routines; animal identification.

Topic 12. Facility for aquatic species: Equipment; management programmes; breeding programmes; environmental enrichment; analysis of specific needs and resolution of problems (feeding, water quality); equipment currently available; daily routines; animal identification.

Topic 13. Health and Safety in animal facilities; legislation; health and safety procedures; evaluation and prevention of risks; protection of personnel; hygiene of the facility, control and disposal of waste.

Topic 14. Special considerations in the design and functioning of biocontainment facilities (BSL-2 and BSL-3).

Topic 15. Disaster planning.

Topic 16. Human Resources.

16.1 Management of personnel. Categories of personnel and career programs; recruitment of personnel; incentives and evaluation of personnel.
16.2 Education and training in a research institution. Maintenance of personnel E&T portfolio.

Topic 17. Lean management: budgeting; purchasing policy; animal costing; obtaining animals-breeding or obtaining animals externally; effective financial management.

Topic 18. Breeding and animal stock management. Software available. Daily routines.

Topic 19. Handling, storing, traceability of data and samples.

19.1. Sample and tissue banks
19.2 Animal Samples (Noraybanks).

Topic 20. Quality in animal care and use programmes.

Topic 21. Animal Transport.

PRACTICALS

Practical 1. Practical operations in IVCs

Practical 2. Digital cases. Data collection and analysis

Practical 3. Practical with equipment for individual protection

Practical 4. Visit to Animal Facility at Center of Comparative Medicine and Bioimage (CMCiB), Research Institute Germans Trias i Pujol, Badalona, Spain.

Module coordinator:

Sandra Barbosa, UAB Animal Facility.

Teaching Staff (as per last edition in October 2025)**:**

Xavier Abad, Animal Health Research Center (IRTA-CReSA), Barcelona.
Marta Acilu, NorayBio, Bilbao, Spain.
Isabel Blanco, Spanish National Cancer Research Center (CNIO), Madrid, Spain
Joana Bom, GIMM – Gulbenkian Institute for Molecular medicine, Oeiras, Portugal.
Sara Capdevila, Center of Comparative Medicine and Bioimage (CCMiB), Research Institut Germans Trias i Pujol, Badalona, Spain.
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Jose Manuel Sanchez-Morgado, University of Edinburgh, United Kingdom
Josep Santigosa, Biosis SL, Barcelona, Spain.
Fabrizio Scorrano, Novartis. Basel, Switzerland.
David Solanes Foz, Zoetis. Olot, Spain.
Christian Urdiales Garcia, Techniplast S.p.A, Italy.
Joana Visa, Visa Coaching Institute, Spain.

Duration of course: 12 ECTS (80 attendance hours)

Course dates: 15 September -15 December, 2028

Attendance dates at UAB: 9 days to be determined.

Module 3

Genetics of Laboratory Animals and Experimental Models

This module provides the practical and theoretical knowledge and skills regarding genetics and experimental models required by designated veterinarians and other onsite personnel responsible for the welfare and care of laboratory animals in the conduct of experimental procedures.

The module consists of two parts. The experimental models' component provides extensive knowledge of different experimental animal models in different research areas. The genetic component explores models of genetically modified animals, their production, maintenance and the implications for their use.

The content of this module also complies with the training requirements set out in European Directive EU63/2010, developed by the Expert Working Group, supported by the European Commission, in respect of the following modules: 3.2) Basic and appropriate biology (practical); 7) Minimally invasive procedures without anaesthesia (theory), 8) Minimally invasive techniques without anaesthesia (skills).

Syllabus:

Topic 1. Genetics, genetic control and genetically modified rodents.

1.1. Basic Concepts of the genetics of mammals.
1.2. Genetically defined lines of mice.
1.3. Genetic modification: transgenesis, targeted mutagenesis and genome editing. Tools and applications.
1.4. Genetically defined lines of rats and other rodents used in animal experiments. Spontaneous mutations. International standardized nomenclature of lines and mutations in rodents
1.5. Genetic control and genetic contamination. Molecular Biology tools used in genetics of rodents. Practical cases.
1.6. Discussing PCR and genetic control results
1.7. Standard nomenclature inbred, outbred congenic and mutant mice and rats
1.8. Managing conditionals and inducible models
1.9. Rodent embryo manipulation. Collection, culture and transfer. Comparing mice and rats.
1.10. Genetic altered models in fish
1.11. Management of colonies. Breeding strategies to keep consanguinity and avoid consanguinity. Breeding schemes in genetically altered animals.
1.12. Influence of genetic background on phenotype, examples in neurobiology
1.13. Epigenetics, concept and impact on genotype and phenotype
1.14. Microbioma and Phenotype
1.15. Rederivation
1.16. The 3Rs in GA models. How to use international resources
1.17. Production and Management of GA colonies for Phenotyping Platforms
1.18. Rodent basic phenotyping
1.19. Phenotypes by image
1.20. Models in Neurobiology

1.21. Reproductive biotechnology. Cryopreservation. FIV
1.22. Legal management of genetically altered animals
1.23. Establishing a new genetically altered line according to Directive 2010/63/EU. Practical issues.
1.24. Large animals genetic modification in pigs
1.25. Practical sessions:
1.25.1. Genotyping procedures
1.25.2. Obtaining sperm, FIV and scrotal vasectomy
1.25.3. Cryopreservation 2 cells and morulae
1.25.4. Collection and Transfer of mouse-1-cell embryos

Topic 2. Selection of animal model according to biological characteristics
2.1. Biology, management and care guidelines in cephalopods
2.2. Nutrition and its influence on research
2.3. **Practical sessions** on management, sexing, marking, administration and taking samples in the main species of experimental animals:
2.3.1. Mice and rat
2.3.2. Rabbits
2.3.3. Pigs
2.3.4. Ruminants
2.3.5. Birds
2.3.6. Fish
2.3.7. Amphibians
2.3.8. Cephalopods
2.3.9. Dogs (demonstration)
2.3.10. Nonhuman primates (demonstration)

Topic 3 Selection of experimental model according to type of research.
3.1. Introduction to animal models.
3.2. Experimental models in neurodegenerative and rare diseases.
3.3. Experimental models in cardiovascular diseases.
3.4. Experimental models in oncology.
3.5. Experimental models in diabetes and metabolic diseases.
3.6. Experimental models in Reproduction.
3.7. Experimental models in foetal medicine.
3.8. Experimental models in immunology.
3.9. Experimental models in infectious diseases.

Module Coordinators:

Belen Pintado, Centre Nacional of Biotechnology, Madrid, Spain
Sergio Berdún Marín, Research Parc of Barcelona (PCB) and Veterinary School, Barcelona, Spain

Teaching Staff (as per last edition March 2026)**:**

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Joaquim Alves da Silva. Champalimaud Research, Lisbon, Portugal
Carles Bandini, Anapath Research, Spain

Carlos Baldellou, Universitat Autònoma de Barcelona, Spain
Fernando Benavides, Dpt. of Epigenetics and Molecular Carcinogenesis. MD Anderson Cancer Center, Houston, Texas, USA.
Laurentiu Benga. Central Animal Research Facility, Heinrich Heine University. Dusseldorf, Germany
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Cory Brayton, Johns Hopkins Medicine, Baltimore, USA
James Bussell, Biomedical Services Department. University of Oxford, United Kingdom
Agustí Casadesús. Toxicologist, Barcelona, Spain.
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Ángel Naranjo, Centro Nacional de Biotecnología, CNB-CSIC, Madrid, Spain
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Juan Ramos, Universitat Autònoma de Barcelona, Spain
Jacobo Reinosa, Anapath Research, Spain
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Mercè Roca, HIPRA, Amer, Spain
Mireia Rovira i Berger, Laboratori de Luminescència i Espectroscòpia de Biomolècules,UAB, Spain
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Sandra Turon. Centre de Biotecnologia Animal Teràpia Gènica (CBATEG). UAB. Barcelona, Spain
Julia Valldeoriola, Anapath Research, Spain
Toni Ventura, Idibell, Barcelona, Spain

Roger Villanueva, Institut de Ciències del Mar, Barcelona, Spain
David P Wolfer, Neuroscience Center, Zurich, Switzerland
Sebastian Zagmutt, Universitat Internacional de Catalunya, Barcelona, Spain.

Duration of course: 15 ECTS, 88 attendance hours

Course dates: 15 February -15 May 2029

Attendance dates at UAB: two weeks to be determined

Module 4

Microbiology, Diseases and Health Monitoring

This module provides the practical and theoretical knowledge and skills regarding microbiology, diseases and health monitoring required by designated veterinarians and other onsite personnel responsible for the welfare and care of laboratory animals in the conduct of experimental procedures.

The module looks at the importance of health monitoring and the range of diseases that can affect laboratory animals and how diseases may affect experiment results.

This module also provides practical training in relation to animal biology, euthanasia and minimally invasive methods.

Syllabus:

Topic 1. Introduction to the pathology and infectious diseases of laboratory animals

Topic 2. Definition, importance and microbiological characteristics of laboratory animals. Microbiota and its influence in animal models.

Topic 3. Diseases in rodents and rabbits.
- Basic concepts.
- Diseases in mice.
- Diseases in rats.
- Diseases in guinea pigs.
- Diseases in rabbits.

Topic 4. Health monitoring in rodents and rabbits
- Importance of infectious diseases in animal experimentation
- Health monitoring following FELASA recommendations
- Evaluation of the risk of spread of infectious agents in animal housing facility
- Maintenance and control of a high quality sanitary status
- Practical case study

Topic 5. Clinical biochemistry and hematology studies
- Basic concepts and interpretation of results

Topic 6. Clinical sings in experimental animals

Topic 7. Microbiology and diseases in carnivores
- Diseases in dogs, cats and ferrets
- Health monitoring: FELASA recommendations.
- Prevention of diseases, clinical examination and taking samples.

Topic 8. Microbiology and diseases in fish
- Introduction
- Microbiology and diseases in fish

Health monitoring and biosecurity in laboratory fish: FELASA recommendations

Topic 9. Microbiology and diseases in ruminants and pigs
Microbiology and diseases
Health monitoring: FELASA recommendations

Topic 10. Microbiology and diseases in primates
Health monitoring: FELASA recommendations.
Disease Prevention, clinical exploration, sampling.
Primate diseases

Topic 11. Microbiology and diseases of poultries
Health monitoring
Disease Prevention, clinical exploration, sampling.
Primate diseases

Topic 12. Experimental pathology

Practical sessions: Necropsy and tissue sampling in rodents and pig.

Module coordinator: M Neus Prats Costa. IRB Barcelona – Institute for Research in Biomedicine, Barcelona, Spain

Teaching Staff:

Mariona Aulí, Almirall, Spain
Marion Berard, Institute Pasteur, France
Laurence Bonnet, Marshall BioResources, France
Alys Bradley, Charles River Laboratories, Edinburgh Ltd
Stephanie Buchheister , Hannover Medical School, Germany
Alex Cobos, Departament of Animal Health. Universitat Autònoma de Barcelona, Spain
Estefania Contreras, Laboratory Animal Integrated Services (SIAL), Universitat Autònoma de Barcelona, Spain
Mariano Domingo, Departament of Animal Health. Universitat Autònoma de Barcelona, Spain
Begoña García, Charles River Laboratoires, Evreux , France
Patrick Hardy, FELASA Working Group on Farm Animals, France
Jan Langermans, Biomedical Primate Research Center (BPRC), The Netherlands.
Ricard March, Laboratorios Hipra S.A., Spain
Miquel Nofraries, Departament of Animal Health. Universitat Autònoma de Barcelona, Spain
Jean-Philippe Mocho, Joint Production System Ltd., UK
Francesc Padrós, Departament of Animal and Vegetal Biology and Ecology. UAB, Spain
Neus Prats, Alexion/Astra Zeneca Rare Diseases, Spain
Yolanda Saavedra, University of Surrey, UKMariona Aulí, Almirall, Spain

Duration of course: 6 ECTS (44 attendance hours)

Course dates: 1 October - 15 December 2026

Attendance dates at UAB: 9-13 November 2026

Module 5

Anaesthesia, Analgesia and Euthanasia of Laboratory Animals

This module covers anaesthesia, analgesia and euthanasia of the main species of laboratory animals and their impact on animal welfare and experimental results. The course also focuses on the knowledge required by designated veterinarians and other onsite personnel responsible for the welfare and care of laboratory animals in the conduct of experimental procedures.

The content of this module complies with the training requirements set out in the European Directive EU63/2010 developed by the European Commission in respect of the following modules: 6.1 Humane methods of killing (theory); 6.2 Humane methods of killing (skills); 20 Anaesthesia for minor procedures; 21 Advanced anaesthesia for surgical or prolonged procedures; 24 Designated Veterinarian, (iv) Anaesthesia, analgesia, surgery.

Syllabus:

Topic 1. Basic principles in anaesthesia (review)*

1.1 Basic principles of anaesthesia
1.2 Anaesthetic and analgesic agents
1.3 Managing and monitoring anaesthesia
1.4 Specialized techniques

Topic 2. Basic principles in analgesia

2.1 Recognising and Alleviating Animal Pain
2.2 How to assess pain in animals
2.3. Pain Management of laboratory animals

Topic 3. Update on euthanasia of laboratory animals

Topic 4. Anaesthesia, analgesia and euthanasia in most common species

4.1 Rodents
4.2. Rabbits
4.3. Pigs
4.4. Ruminants
4.5 Fish, birds and reptiles
4.6. Primates
4.7. Carnivores (review)*

Topic 5. Mechanical ventilation

5.1 Basic mechanical ventilation
5.2 Advanced mechanical ventilation

Topic 6. Local and regional anaesthesia

6.1 Local and regional anaesthesia
6.2 Electro & ultrasound guided regional anaesthesia

Topic 7. Monitoring

7.1 Monitoring in rodents
7.2 Advanced Monitoring

Topic 8. Impact of anaesthesia in research results

Topic 9. Drug and animal data management

Practical Sessions

Anaesthesia, analgesia and euthanasia in rodents and rabbits, including monitoring and ventilation

Anaesthesia (with recovery) and analgesia in sheep, including advanced ventilation

Anaesthesia, analgesia and euthanasia in pig, including electrical-stimulation and ultrasound guided techniques

Simulation of anaesthesia and anaesthetic complications

Module Coordinator:

Ignacio Álvarez Gómez de Segura. Facultad de Veterinaria, Universidad Complutense, Madrid.

Teaching Staff (as per the last edition, March 2024)**:**

Klas Abelson. Department of Experimental Medicine, University of Copenhagen, Denmark
Adrià Aguilar. Faculty of Veterinary Medicine, Universitat Autonoma de Barcelona, Spain
Ignacio Álvarez. Faculty of Veterinary Medicine, Universidad Complutense de Madrid, Spain
Mario Arenillas. Getafe Hospital, Madrid, Spain
Javier Benito. Faculty of Veterinary Medicine, University of Montreal, Canada
Ariel Cañón. Vall d'Hebron Research Institute (VHIR), Barcelona, Spain
Cristina Costa. Faculty of Veterinary Medicine, Universitat Autonoma de Barcelona, Spain
Paul Flecknell. Comparative Biology Centre. University of Newcastle, UK
Patricia Hedenqvist. University of Agricultural Sciences. Sweden
Francisco Laredo. Faculty of Veterinary Medicine, Universidad de Murcia, Spain
Carlota Largo. Hospital la Paz. Madrid, Spain
Xavier Moll. Faculty of Veterinary Medicine, Universitat Autonoma de Barcelona, Spain
Francesco Staffieri, Department of Precision and Regenerative Medicine and Ionian Area, Faculty of Veterinary Medicine, University of Bari "Aldo Moro", Bari, Italy

Duration of course: 6 ECTS (44 attendance hours).

Course dates: 1 March - 15 May, 2027

Attendance dates at UAB: 8-12 March, 2027

Module 6

Reduction and Refinement in Experimental Design and Methodology. Research and Development of Drugs

This module provides the practical and theoretical knowledge and skills regarding experimental design and methodology required by designated veterinarians and other onsite personnel responsible for the welfare and care of laboratory animals in the conduct of experimental procedures.

This course covers the most important aspects in relation to the reduction in the number of animals used in research, experimental design, literature searches and presentation of results. It also deals with refinement through the study of the main non-invasive and minimally invasive techniques and refinement in surgical techniques. The module also provides an overview of the strategy and processes required in research and drug development.

The content of this course also complies with the training requirements set out in European Directive EU63/2010 developed by the European Commission in respect of the following modules: 10. Design of procedures and projects (level 1), 11. Design of procedures and projects (level 2), 22. Principles of surgery and 51. Information provision and retrieval.

Block I: Reduction
Topic 1. Evidence-Based Transition to Animal-free Innovations
Topic 2. Experimental design
Topic 3. Systematic Reviews and preclinical trials registration
Topic 4. Internal validity and bias analysis

Block II: Refinement
Topic 5. Asepsis and preparation for surgery. Aseptic surgery in rodents
Topic 6. Pre-operative assessment, perioperatory and postoperatory care.
Fluidotherapy and antibiotherapy
Topic 7. Microsurgery techniques: vascular surgery
Topic 8. Recording of physiological parameters by non-invasive and minimally invasive techniques
Topic 9. Imaging techniques
- 9.1. Bioluminiscence and fluorescence
- 9.2. Magnetic Resonance Imagining (MRI)
- 9.3. Positron Emission Tomography (PET)
- 9.4 Echography
- 9.5 Micro Computed Tomography

Block III: Experiments under legal requirements
Topic 10. Drug development and Drug Efficacy
Topic 11.Development of veterinary drugs
Topic 12. Drug development: Safety and toxicology
Topic 13. Biologicals: immunogenicity and immunotoxicity
Topic 14: Quality standards: Good Laboratory Practice and consistency in conducting scientific procedures and correct handling, storing, recording, and ensuring traceability of samples
Topic 15: Translatability of digital biomarkers in drug development
Topic 16: Translational research

P R A C T I C A L S E S S I O N S

Practical session 1.1: Imaging techniques in rodents: Positron Emission Tomography, Ecography. MicroCT, Bioluminiscence and Biofluorescence (IVIS).
Practical session 1.2: Imaging techniques: Magnetic Resonance Imaging (MRI).
Practical session 2.1: Principles of surgery in refinement. Asepsis. Sutures and knots. Aseptic surgery in rats. Minimally invasive devices
Practical session 2.2: Introduction to microsurgery.
Practical session 2.3: Cannulation, catheters.
Practical session 2.4: Laparoscopy and Ultrasound guided vascular cannulation
Practical session 3.1: Telemetry

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Duration of course: 12 ECTS (80 attendance hours)

Course dates: 1 October -15 December, 2027.

Attendance dates at UAB: 10 days to be determined

Practicum

This training, accounting for 15 ECTs, takes place in the student's own workplace and is supervised by Master course teachers. The training is supplemented with placements in other animal centres which satisfy the requirements for practical training for the Master course.

Each student must prepare a detailed written description of their workplace and their tasks performed. The student's Master tutor will establish a plan for monitoring and evaluating the student's work. Depending on the amount of time that the student is able to dedicate to specific tasks, the variety of species housed in their centre and the diversity of tasks, the Master coordinator may assign additional tasks to supplement the training.

To ensure that students have experience in all areas of the Master syllabus, students are required to complete a practical placement of approximately one month duration, in a different animal centre to the one they work in focusing on areas in which they need experience. This placement may be divided into two to facilitate compatibility with student’s job obligations.

Project

The Masters course project comprises two components:

1. A report detailing the student's practical experience to date in relation to laboratory animal science including the experience obtained at work, from the Master's practicum as described above and from the practical sessions on the Masters course.

2. The second requirement of the project is to demonstrate accredited experience in laboratory animal research by presenting an original research paper as first author which must be published in a journal listed in the Science Citation Index (SCI)

The research project may be conducted before, during or after completion of the modular training and work experience placements and the research may be done in any European or non-European research centre.

Once completed, the research paper and practical experience report are submitted for assessment by a committee of the master's teaching staff.

Current fees for 2026-2029

Ordinary fee master complete to be paid in 3 academic years: 19,660 €

Price per module:

Module 1: 1,890 €

Module 2: 2,648 €

Module 3: 4,237 €

Module 4: 2,145 €

Module 5: 2,900 €

Module 6: 3,890 €

Practicum: 990 €

Project: 990 €

Reduced fee for awardees of scholarship for the master (ICLAS, LAL, Novartis), ECLAM Residents and ESLAV and SECAL members: 17,040€

Price per module for the above:

Module 1: 1,610 €

Module 2: 2,250 €

Module 3: 3,600 €

Module 4: 1,825 €

Module 5: 2,465 €

Module 6: 3,310 €

Practicum: 990 €

Project: 990 €

Sponsors

The course thanks **Serveis Integrats de l'Animal de Laboratori (SIAL)**

International Council for Laboratory Animal Science (ICLAS)

Laboratory Animals Limited

Novartis

And

for their support with individual scholarships.

Institutions and Companies that contribute with materials or facilities to the program

Anapath Research

Animal Health Research Center (IRTA-CReSA)

BBRAUN

Center of Comparative Medicine and Bioimage (CCMiB)

Centro de Cirugía de Mínima Invasión Jesús Usón

Centro Nacional de biotecnología (CNB-CSIC)

EMER/MINDRAY

Harvard Bioscience /Panlab

Institut de Ciencies del Mar (ICM-CSIC)

Institut de Recerca Vall d'Hebron (VHIR)

Institute of Oncology (VHIO)

NorayBio-AniBio

Okinawa Institute of Science and Technology (OIST)

Parc de Recerca Biomedica de Barcelona (PRBB)

SODISPAN BIOLAB SL/Kent Scientific

Storz, Data Sciences International (DSI)

Tecniplast- BIOSIS SL