Universitat de Lleida

DEGREE CURRICULUM

ANIMAL EXPERIMENTATION

Coordination: MORA GIRAL, CONCEPCION

Academic year 2021-22

ANIMAL EXPERIMENTATION 2021-22

Subject's general information

Subject name	ANIMAL EXPERIMENTATION
Code	14704
Semester	1st Q(SEMESTER) CONTINUED EVALUATION
Typology	

Degree	Course	Character	Modality
Master's Degree in Biomedical Research	1	COMPULSORY	Attendance-based

Course number of credits (ECTS)	8
Type of activity, credits, and groups	

Activity type	PRALAB	PRAULA	TEORIA
Number of credits	1.8	0.6	5.6
Number of groups	1	1	1

Coordination	MORA GIRAL, CONCEPCION
Department	MEDICINE
Teaching load distribution between lectures and independent student work	Theory: ..... 40 hours (attendance required, unless sanitary situation recommends virtual classes) Laboratory Practices: ....24 hours(attendance required) Mentored activities :..... Computer Practices:..... Autonomous tasks: .....120 hours (not attendance required, unless sanitary situation recommends virtual classes) TOTAL HOURS: 80 h attendance required +120 h attendance not required PRESENCIAL ATTENDANCE REQUIREMENT WILL BE DETERMINED BASED ON THE HEALTH SITUATION, AND, COMBINATION OF PHYSICAL ATTENDANCE WITH VIRTUAL ATTENDANCE MAY BE IMPLEMENTED WHENEVER THE HEALTH SCENARIO RECOMMENDS IT.
Important information on data processing	Consult this link for more information.
Language	Catalan Spanish English
Distribution of credits	Theory: 5,6 ECTs Laboratory practical classes: 1,8 ECTs Computer practices: 0,6 ECTs

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
EGEA NAVARRO, JOAQUÍN	joaquim.egea@udl.cat	,4	
GOMEZ ARBONES, XAVIER	xavier.gomez@udl.cat	,6	
MORA GIRAL, CONCEPCION	conchi.mora@udl.cat	2	
MORENO MARTINEZ, JOSE ANTONIO	joseantonio.moreno@udl.cat	1,8	
NADAL GARCIA, JESUS	jesus.nadal@udl.cat	,2	
PENA SUBIRÀ, RAMONA NATACHA	romi.pena@udl.cat	,2	
PIÑOL FELIS, MARIA CARMEN	carme.pinyol@udl.cat	2,8	

Subject's extra information

COMPETENCES

CB2 Being able to apply the acquired knowledge and have the ability to solve problems in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their field of study

CB3 Being able to integrate knowledge and handle complexity, and formulate judgments based on information that was incomplete or limited, include reflecting on social and ethical responsibilities linked to the application of their knowledge and judgments

CG1 Knowing how to select and apply different analytical methods at the molecular, biochemical, cellular, genetic and phenotypic level for the diagnosis and study of the diseases.

CG2 Knowing how to plan and execute a research project by following the scientific method and appropriate technology with high degree of initiative and commitment.

CG7 Being able to present scientific papers and scientific articles that may be considered for publication in international journals

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CE5 Being able to describe the national and European legislation about animal experimentation and being able to develop an animal experimental procedure that can be favourably evaluated by the Animal Experimentation Ethics Committee

CE8 Being able to design and execute experiments on animals with the criterion of reducing the number of animals, minimizing the suffering and application of alternative techniques

CT1 Having a correct oral and written expression

CT3 Mastering ICT

CT4 Respect the fundamental rights of equality between men and women, to the promotion of human rights and the values ??of a culture of peace and democratic values

OBJECTIVES

1. Being able to design experiments involving experimentation animals, according to the minimal number criteria and reducing the pain inflicted to the animal to the minimum. Application of alternative techniques.
2. Knowing the Spanish and the European legislation
3. To elaborate an animal experimentation procedure eligible for positive evaluation by an Ethical Committee.
4. Getting to know new in vivo, non invasive, imaging systems and their applications.
5. Behavioral phenotyping of experimentation animals.
6. Genotyping and phenotyping of experimentation animal models by flow cytometry.
7. Designing experimental approaches using experimentation animals to study pathologies or physiological processes in Biomedicine.

PROFESSORATE

Coordinators:

Dr. Conchi Mora (e-mail: conchi.mora@mex.udl.cat)

Professorate:

Name	Office	e-mail	Phone
Carme Piñol		pinyol@medicina.udl.cat	973702211
Concepción Mora		conchi.mora@mex.udl.cat	973702958
José Antonio Moreno	PRODAN-UdL	jamoreno@prodan.udl.cat	973702556
Concepció Soler	UB	concepciosoler@ub.edu	
Eugènia Mato	UAB	emato@santpau.cat	
Xavier Gómez		xga@medicina.udl.cat	973702208
Aletta Kraneveld	Univ. Utrecht	A.D.Kraneveld@uu.nl	
Jesús Nadal	PRODAN-UdL	jnadal@prodan.udl.cat	973702889
Romi Pena i Subirà	PRODAN-UdL	romi.pena@prodan.udl.cat	973702568

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Eduardo Angulo	PRODAN-UdL	eangulo@prodan.udl.cat	973702562
Francisco Ciruela	UB	fciruela@ub.edu	
Dr. Thomas Stratmann		Thomas.stratmann@ub.edu	
Rosa Gasa	IDIBAPS	rgasa@clinic.ub.es	
Joaquim Egea	UdL	joaquim.egea@udl.cat	
Maria Rufàs	HUAV		
Jordi Escoll	HUAV		
Lena Alexopoulou	CIML	alexopoulou@ciml.univ-mrs.fr	
Mª José Mansilla	HUGTiP	mjosemansilla@yahoo.es	

SUBJECT CONTENTS

1. Animal Experimentation. Spanish and European Legislation. Protocol design and endpoint protocols. Monitoring pain during the course of the experiment. Alternative techniques. **(Theory, Seminars, Exercise: elaboration of a written protocol)**
2. Sanitary levels in animal experimentation husbandry. Fighting infections. Manipulation of Experimentation Animals to administer substances or to retrieve samples from them. Surgical procedures. Euthanasia **(Theory. Practical class)**
3. Genetic manipulation of experimentation animals. **(Theory. Practical class)**
4. In vivo, non invasive, imaging systems of experimentation animals. **(Theory)**
5. Behavioral phenotyping of animal models. **(Theory)**
6. Animal models for diverse human pathologies: immunopathologies, physiopathologies, methabolic pathologies. **(Theory)**
7. Genotyping and phenotyping experimentation animal models by flow cytometry. **(Theory. Practical class)**
8. Designing experimental approaches using experimentation animals to study pathologies or physiological processes in Biomedicine.**(Theory)**

PRACTICAL AND SEMINAR PROGRAM

Depending on the public health situation, the evaluation may be either presential or virtual.

1. Protocol design and endpoint protocols (**elaboration of a written protocol)**
2. Manipulation of Experimentation Animals to administer substances or to retrieve samples from them. Surgical procedures. Euthanasia.
3. Genetic manipulation of experimentation animals
4. Genotyping and phenotyping experimentation animal models by flow cytometry.
5. Seminars on animal experimentation applications and techniques.

EVALUATION

Students will be evaluated according with their attendance to the theory and practical sessions, elaboration of written tests, exercises and quizzes, and, finally, a written final multi-choice- question examination .

Depending on the public health situation, the evaluation may be either presential or virtual.

Evaluation criteria	Overall pounding (%)
Attendance to classes	20
Tests, exercises, problems	30
Final tests (work, examination)	50

BIBLIOGRAPHIC AND INTERNET RESOURCES

Current Protocols in Cytometry. J. Paul Robinson, Managing Editor (Purdue University Cytometry Laboratories); Zbigniew Darzynkiewicz (New York Medical College); Robert Hoffman (BD Biosciences); John Nolan (La Jolla Bioengineering Institute); Alberto Orfao (Universidad de Salamanca); Peter Rabinovitch (University of Washington); Simon Watkins (University of Pittsburgh); Past Editors: Phillip N. Dean, Jurek Dobrucki, Lynn G. Dressler, Carleton C. Stewart, Hans J. Tanke, Leon L. Wheeless . Wiley InterScience. 2010.

Current protocols in Immunology. John E. Coligan (Rockville, MD); Barbara Bierer (Brigham and Women's Hospital and Harvard Medical School); David H.Margulies (Bethesda, MD); Ethan M. Shevach (Bethesda, MD); Warren Strober (Bethesda, MD); Richard Coico (Temple University); Guest Editors: Patricia Brown (Frederick, Maryland); John C. Donovan (Wyeth Research); Past Editor: Ada Kruisbeek (Netherlands Research Institute) . Wiley InterScience. 2010.

Manipulating the Mouse Embryo: A Laboratory Manual . Third edition. Andras Nagy, *Samuel Lunenfeld Research Institute;* **Marina Gertsenstein,** *Samuel Lunenfeld Research Institute;* **Kristina Vintersten,** *European Molecular Biology Laboratory;* **Richard Behringer,** *University of Texas M.D. Anderson Cancer Center. 2003. CLHS Press.*

FELASA Guidelines for the Accreditation of Health Monitoring Programmes and for Testing Laboratories involved in Health Monitoring.W Nicklas . The Royal Society of Medicine Press Limited. 2009.

In vivo imaging of light-emitting probes. B.W.Rice, M.D. Cable. , M.B. Nelson, Xenogen Corporation.J. Biomed. Opt., Vol. 6, 432 (2001).

Behavioral phenotyping of transgenic and knockout mice: experimental design and evaluation of general health, sensory functions, motor abilities, and specific behavioral tests. Jacqueline N. Crawley* . Brain research 835: 18-26. 1999.

Behavioral phenotyping strategies for mutant mice. J.N. Crawley. Neuron 57: 809-818 . 2008.

P. Flecknell. **Anestesia de animales de laboratorio**. Academic Press Ltd: London. 2009.

JM. Zúñiga, J.A. Tur, S.N. Milocco, R. Piñeiro. **Ciencia y Tecnología en protección y experimentación animal.** McGraw-Hill Interamericana: Madrid. 2001.

The Federation of European Laboratory Animal Science Associations http://www.felasa.eu/

European Centre for the Validation of Alternative Methods

http://ecvam.jrc.ec.europa.eu/

Laboratory Animals. The International Journal of Laboratory Animal Science and Welfare.

National Centre for the Replacement, Refinement and Reduction of Animals in Research
http://www.nc3rs.org.uk/

Guidelines for the use of animals in cancer research

http://www.norecopa.no/norecopa/vedlegg/9Tumour-guidelines.pdf

Competences

CB2 Know how to apply the knowledge acquired and have the ability to solve problems in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their area of study (*)

CB3 Being able to integrate knowledge and face the complexity of formulating judgments based on information that, being incomplete or limited, includes reflections on the social and ethical responsibilities linked to the application of their knowledge and judgments (*)

CG1 Know how to choose and apply the different methodologies of molecular, biochemical, cellular, genetic and phenotypic analysis for the diagnosis and study of diseases.

CG2 Know how to plan and execute a research project following the scientific method and appropriate technology with a high degree of initiative and commitment.

CG7 Be able to present scientific reports and scientific articles that can be considered for publication in international journals

CE5 Know how to describe national and European legislation on animal experimentation and be able to develop an animal experimentation procedure that can be favorably evaluated by an Ethical Committee for Animal Experimentation

CE8 Be able to design and carry out experiments with animals according to the criteria of reducing the number of animals, minimizing suffering and applying alternative techniques

CT1 Have a correct oral and written expression

CT3 Mastering ICT

CT4 Respect the fundamental rights of equality between men and women, the promotion of Human Rights and the values of a culture of peace and democratic values