

**Mouse Anatomy and Pathobiology**

Code: 45023  
ECTS Credits: 10

Degree	Type	Year	Semester
3500042 Erasmus Mundus Master in Human Disease Models Morphological Phenotyping	OB	0	1

## Contact

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## Teaching groups languages

You can check it through this [link](#). To consult the language you will need to enter the CODE of the subject. Please note that this information is provisional until 30 November 2023.

## Teachers

Ana Maria Carretero Romay

Marc Navarro Beltran

Jesus Ruberte Paris

Victor Nacher Garcia

Judit Pampalona Sala

## External teachers

Anastasia Tsingotjidou

Livia d'Angelo

Luísa Mendes-Jorge

Monica Chocová

Paolo de Girolamo

## Prerequisites

There are no prerequisites. Consistency in daily work and the ability to observe are important.

## Objectives and Contextualisation

- Understand the basic mouse genetics and the mechanisms that control embryonic processes.

- To know the etiology and meaning of developmental abnormalities.
- Recognize and understand the shape, structure, disposition and relationships of mouse organs and systems.
- Identify microscopically mouse tissues and organs.
- Use embryological, anatomical, and histological terminology correctly and appropriately.
- Integrate mouse morphology through the organic, cellular, and subcellular levels
- Understand the fundamental principles of general pathology
- To identify structural organ alterations through histology and immunohistochemistry to correlate them with specific pathological processes.

## **Learning Outcomes**

- CM01 (Competence) Incorporate the morphology of mice at organic, cell and subcell levels.
- CM02 (Competence) Correlate structural alterations in the mouse's organs with specific pathological processes.
- KM01 (Knowledge) Know about the mechanisms that control embryonic processes in mice.
- KM02 (Knowledge) Recognise the etiology and meaning behind developmental anomalies.
- KM03 (Knowledge) Identify and understand the form, structure, and arrangement of organs in mice, and the relationship between them.
- KM04 (Knowledge) Identify the tissue and organs of mice using a microscope.
- KM05 (Knowledge) Understand the fundamental principles of mouse pathology.
- KM06 (Knowledge) Identify structural alterations in organs using histology and immunohistochemistry.
- SM01 (Skill) Use anatomical, embryonic, histological and pathological terminology correctly.
- SM02 (Skill) Perform a dissection and autopsy of a mouse correctly.

## **Content**

- Mouse status in biomedicine
- Standardized nomenclature for mice
- Anatomical and histological methods
- Mouse embryology and placenta
- Gross anatomy and topography in mouse
- Histology of mouse organs
- Ultrastructure of mouse tissues
- Ontological approach to mouse morphology
- Introduction to general mouse pathology
- Mouse necropsy
- Pathology of the major organ systems
- Optional: language courses (Spanish, Catalan)

## Methodology

The methodology used during the teaching and learning process is based on the student efficiency analyzing the information that our team made available through different means. The main role of the teacher is to help the student, not only giving information, but also directing and supervising the learning process. The course is based on the following activities:

- **Classroom lectures:** The student acquires the scientific knowledge of the discipline. The student must complete this knowledge with the personal and autonomous study of the topics explained.
- **Laboratory sessions:** Practical sessions approach the theoretical models to reality and reinforce, complete and allow to apply the knowledge acquired in lectures. In laboratory sessions, the students grouped in small groups will study bones, dissect mice and analyze histological preparations. Throughout the observation of these specimens, the student will acquire a three-dimensional concept of the structural disposition, required to understand, for example, the movement of joints, the muscular biomechanics, the distribution of vessels and nerves, or the juxtaposition of adjacent structures. In dissection sessions, the student will also develop hand dexterity and other skills, such as curiosity and observation. The attendance to the practical sessions will be controlled.

The student's learning will be monitored through different evaluative tests in dissection and microscopy rooms. These tests will evaluate the understanding of practical sessions and the integration of theoretical contents acquired in the lectures.

The materials used in the subject will be available on the Moodle platform.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

## Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Classroom lectures	75	3	CM01, CM02, KM01, KM02, KM03, KM04, KM05, KM06, SM01, SM02, CM01
Laboratory sessions	25	1	KM03, KM04, KM06, SM01, SM02, KM03
Type: Autonomous			
Autonomous learning	145	5.8	KM01, KM02, KM03, KM04, KM05, SM01, KM01

## Assessment

The evaluation will be performed continuously along the course, for the better monitoring of the teaching and learning processes, encouraging the continuous effort during the semester and verifying the compliance of competences assigned.

There will be 2 continuous evaluation controls during the module with an overall weight of 10% from the final grade. There will be an oral practical examination on the specimens (bones, dissections, histological digital preparations, etc.) used during the practical sessions. The weight of the qualifications obtained in the practical examination will be 40% of the final grade. A minimum grade of 4.5 points out of 10 will be required in the practical examination.

There will be a multiple-choice questions theoretical examination, worth the 50% of the final grade. The student's final grade will be calculated from the average of all the partial grades. The course will be passed with a final grade of 5 or higher.

## Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Individual continuous controls of practical work	10	2	0.08	CM01, KM03, KM04, SM01
Multiple choice written examination	50	2	0.08	CM01, CM02, KM01, KM02, KM03, KM04, KM05, KM06, SM01, SM02
Practical oral examination	40	1	0.04	CM01, KM03, SM01, SM02

## Bibliography

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- Iwaki T, Yamashita H, Hayakawa T (2001). A color Atlas of Sectional Anatomy of the Mouse. Braintree Scientific Inc
- Paxinos G and Franklin KBJ (2008). The Mouse Brain in Stereotaxic Coordinates. Compact Third Edition. Academic Press
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- Ruberte J, Carretero A, Navarro M (2017). Morphological Mouse Phenotyping. Anatomy, Histology and Imaging. Academic Press
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- Treuting PM, Dintzis SM, Montine KS (2018). Comparative Anatomy and Histology. A Mouse, Rat, and Human Atlas. Academic Press
- Watson C, Paxinos G, Puelles L (2011). The Mouse Nervous System. Academic Press

## Software

Not applicable