

## 68403 - Medical research models

### Syllabus Information

**Academic year:** 2024/25

**Subject:** 68403 - Medical research models

**Faculty / School:** 104 - Facultad de Medicina

**Degree:** 530 - Master's in Introduction to Medical Research

**ECTS:** 6.0

**Year:** 1

**Semester:** First semester

**Subject type:** Compulsory

**Module:**

### 1. General information

Every researcher must follow the scientific method. For this, it is essential to have a broad knowledge of the available research models, and to understand their usefulness and difficulty in order to make the right choice when planning the materials and methods in the research project. This course provides an overview of the models used, both in basic science (laboratory) and applied (clinical trials), focusing on the aspects that enable the transition between the two. It is oriented so that at the end of the course the student will be able to outline a research project or clinical trial, including the definition of the hypothesis and objectives, the most appropriate methodology, and the expected benefits.

### 2. Learning results

The student, in order to pass this course, must demonstrate the following results....

- List, classify and describe the research models used in the research laboratory for biomedical research, as well as their applications.
- List, describe and categorize research models used in clinical research, as well as their applications.
- Design biomedical research projects or clinical trials, at the initiate level.
- Know the basic ethical rules regarding human and animal experimentation.

Note: One of the main conditions for the success of a research work is to know how to identify the most appropriate methodology for the problem posed and the particular context in which a research is developed. In the same way, the researcher must be able to analyze the methodology used in scientific works, in order to evaluate its validity.

### 3. Syllabus

Definitions and types of models. Experimental designs for laboratory research. In vitro models. Research with cellular organelles. Cell cultures, advantages and disadvantages. Flow cytometry. Animal experimental models. Ex-vivo research: isolated organs and tissues. Models in enzymatic deficiencies. Application in rare diseases. Oncological research. Bone regeneration, biomarkers and anti-inflammatory nutrition. Research models in aging. Models in exercise physiology. Omic sciences in medicine and pharmacometabolomics. Clinical trials and their application to medical research. Translational research. Legal and ethical considerations. UNIZAR's Research Support Services.

### 4. Academic activities

1A Master Class: 56hours (2.24 ECTS).

4 Special practices: 2 hours (0.08 ECTS).

All students will be informed about the risks that may be involved in the practices of this subject, as well as if dangerous products are handled and what to do in case of accident, and must sign a commitment to comply with work and safety standards to be able to perform them. For more information, please consult the Occupational Risk Prevention Unit: <http://uprl.unizar.es/estudiantes.html>.

6B Work: 2 hours (0.08 ECTS).

7 Study: 86.6 hours (3.464 ECTS).

8 Evaluation: 3.4 hours (0.136 ECTS).

## **5. Assessment system**

In accordance with the provisions of article 5 of RD 1125/2003 (BOE September 18), the results obtained by the student will be graded according to the following numerical scale from 0 to 10, with one decimal place, to which the corresponding qualitative grade may be added:

0-4.9: Fail (SS).

5.0-6.9: Pass (AP)

7,0-8,9: Notable (NT)

9,0-10: Outstanding (SB)

Three tools will be used to evaluate the learning outcomes:

1) Teacher's report, assessing the student's attendance, attitude and participation: 30% of the final grade.

2) Test exam or short questions: 40% of the final grade.

3) Individual work (Moodle homework): 30% of the final grade.

## **6. Sustainable Development Goals**

3 - Good Health & Well-Being

4 - Quality Education