68403 - Medical research models

Información del Plan Docente

Academic Year	2018/19
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	Indeterminate
Subject Type	Compulsory
Module	---

1.General information

1.1.Aims of the course

1.2.Context and importance of this course in the degree

1.3.Recommendations to take this course

2.Learning goals

2.1.Competences

2.2.Learning goals

2.3.Importance of learning goals

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

The methodology followed in this course is oriented towards achievement of the learning objectives. It is based on the description and categorization of clinical and basic research models. A wide range of teaching and learning tasks are implemented, such as:

- Lectures where these models are explained and students learn the different characteristics of each model.
- Seminars by experts, which work as the practical application of the theoretical contents.
- Small research project: students will choose a scientific hypothesis and the most suitable methodology for each topic.

4.2.Learning tasks

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The course includes the following learning tasks:

- Lectures.
- Seminars by experts.
- Scientific research project. The student must design a research project containing the following points:
  - Background: historical review of the literature and studies on the issue. Description of the methods used in the past to identify the causes and pathophysiological mechanisms of that disease.
  - Current status of the topic: description of the problem. Unresolved issues. Description of the methods that are being used in the most recent work investigating the causes or pathophysiological mechanisms of that disease.
  - Hypothesis and research objectives.
  - Proposed Method or experiment that could solve outstanding issues on the chosen disease. Writing the Materials and Methods sections of the research project.
  - List the cited sources according to the standard rules for scientific publication.
  - Informatic tools will be provided from the University of Zaragoza library.

4.3.Syllabus

The course will address the following topics:

Lectures

Section 1. From Basic research to clinical research in medicine

- Types of study in medical research in Medicine. Which is the most appropriated method to every research?
- Experimental animal models. legal and ethical considerations.
- Ex-vivo models of research: isolated organs and tissues.
- Cell cultures. Methodology. Primary cultures. Continuous cell lines. Advantages and disadvantages of experimentation based on cell cultures.
- Genetic analysis: direct and indirect techniques. Addressing complex pathologies.
- The molecular revolution recombinant DNA technology.
- High performance techniques: genomics, transcriptomics, proteomics, metabolomics and phosphoproteomics.
- Expression systems of Heterologous protein.
- Genetically modified organisms for biomedical research.
- Antibodies; production and applications in biomedical research.
- Integration models. Bioinformatics. Systems biology.

Section 2. Clinical Research Models

- The clinical trial as a model of medical research.
- Ethics in clinical trial.
- Research models of evidence-based therapeutic.
- Models of post-authorization studies.

Section 3. Design of a research project

- I have a question / idea I would like to investigate.
- What means do I have to develop this project?
- How do I managed to adquire help for my project.
- How do I budget my project?
- How do I design / submit my project?

Seminars

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Section 1. From Basic research to clinical research in medicine

- Animal models in oncology research.
- Models on aging research.
- Lange Syndrome Research as a model for rare diseases.
- Utilities of flow cytometry in Medical Research.
- Molecular basis of hypertension.

4.4.Course planning and calendar

Timetable

- Hours: Monday to Thursday / From 16 to 20 H .
- Days: 15th, 19th, 20th,21th, 22th, 26th, 27th, 28th, 29th, November.

Assessment

- Presentation of the project draft before November 29th
- Short answer exam on November 29-30th.

Resources

- Online course on the virtual platform Moodle of the University of Zaragoza. This website will include detailed information about the course (objectives, program and evaluation system), a communication system between students and teachers, and and an easy way to submit the summative activities of the course.

4.5.Bibliography and recommended resources

Conn, P. Michael.. Totowa, N.J Sourcebook of Models for Biomedical Research

Springer Science & Business Media, 2008

ISBN: 1597452858, 9781597452854

Argimón JM, Jimenez J. Métodos para la investigación clinica y epidemiologica. 3ª ed. Elsevier España; 2004.

Crawford, R.L.; Allen, T.. In: Sourcebook of models for biomedical research / edited by P. Michael Conn; Totowa, N.J. : London : Humana Press ; Springer [distributor], 2008.,