VNIVERSITAT DE VALÈNCIA

Course Guide
43031 In vivo/in vitro methods for evaluation of anti-inflammatory, antiallergic and immunosuppressive drugs

COURSE DATA

Data Subject	
Code	43031
Name	In vivo/in vitro methods for evaluation of anti-inflammatory, antiallergic and immunosuppressive drugs
Cycle	Master's degree
ECTS Credits	3.0
Academic year	2021 - 2022

Study (s)

Degree	Center	Acad. year	Period
2138 - Master's Degree in Research in and Rational Use of Medicines	Faculty of Pharmacy and Food Sciences	1	First term
3103 - null		0	Annual

Subject-matter

Degree	Subject-matter	Character
2138 - Master's Degree in Research in and Rational Use of Medicines	8 - Pharmacology of inflammation and immunity	Optional

Coordination

Name	Department
FERRANDIZ MANGLANO, MARIA LUISA	135 - Pharmacology
GINER PONS, ROSA MARIA	135 - Pharmacology
TERENCIO SILVESTRE, MARIA CARMEN	135 - Pharmacology

SUMMARY

Subject belonging to the research itinerary of the “Master in Research and Rational Use of Medicines" that aims to address the most important aspects of the methodology of laboratory work in the area of experimental inflammation. Inflammatory processes are the basis of numerous pathologies affecting a large number of people, so anti-inflammatory drugs are one of the most widely used therapeutic groups. To properly train the Master's student in the research aspect, it is important to know in depth the experimental models used to evaluate the possible anti-inflammatory activity of new molecules as well as the different mechanisms of action.

The pathophysiologic basis of various experimental models of acute and chronic inflammation will be studied, analyzing their suitability for the objectives sought in each case.

PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

Other requirements

In order to properly follow the development of the topics, the student must have prior knowledge of Pharmacology, Physiology, Pathophysiology and Biochemistry, mainly. It would be very convenient for the student to have taken previously the subject of the Master "Basis of Pharmacology of Inflammation", which gives the most current theoretical knowledge on inflammatory diseases and its pharmacological treatment.

COMPETENCES (RD 1393/2007) // LEARNING OUTCOMES (RD 822/2021)

2138 - Master's Degree in Research in and Rational Use of Medicines

- Manejar adecuadamente las fuentes de información biomédica y poseer la habilidad de hacer una valoración crítica de las mismas integrando la información para aportar conocimientos a grupos asistenciales multidisciplinares
- Utilizar adecuadamente las herramientas informáticas, métodos estadísticos y de simulación de datos, aplicando los programas informáticos y la estadística a los problemas biomédicos
- Students should apply acquired knowledge to solve problems in unfamiliar contexts within their field of study, including multidisciplinary scenarios.
- Students should demonstrate self-directed learning skills for continued academic growth.
- To acquire basic skills to develop laboratory work in biomedical research.
- Students should possess and understand foundational knowledge that enables original thinking and research in the field.
- Be able to integrate new technologies in their professional and/or research work.
- Know how to write and prepare presentations to present and defend them later.
- Ser capaces de analizar de forma crítica tanto su trabajo como el de su compañeros.
- Be able to access to information tools in other areas of knowledge and use them properly.
- Be able to apply the research experience acquired to professional practice both in private companies and in public organisations.

- Resolver de dilemas éticos derivados del empleo de medicamentos.
- Dominar la comunicación científica. Poseer habilidades sociales y comunicativas en la práctica asistencial.
- Capacidad de seleccionar y gestionar los recursos disponibles (instrumentales y humanos) para optimizar resultados en investigación.
- Dominar el método científico, el planteamiento de protocolos experimentales y la interpretación de resultados en la búsqueda, desarrollo y evaluación de nuevos fármacos.

LEARNING OUTCOMES (RD 1393/2007) // NO CONTENT (RD 822/2021)

- To work properly with cell cultures, both primary cells and transformed cell lines.
- To know how to choose and apply analytical techniques more suitable for the determination of the mediators and parameters of interest in each experimental model.
- To know and always respect the rules of use of animals for experimentation at all times
- To analyze *in vivo* experimental models, knowing their advantages and limitations.
- To assess the effect and mechanism of action of anti-inflammatory and immunosuppressive drugs
- To plan the appropriate organization to perform work as a team and carry it out efficiently.
- To use scientific databases, abstracts, full articles, etc., needed to complete their training on the use of advanced techniques.

DESCRIPTION OF CONTENTS

1. Introduction to the methodology for the evaluation of anti-inflammatory and anti-allergic drugs

- Know the fundamental concepts of experimentation both in vitro and in vivo, especiaespecially in the field of inflammation

2. In vitro assays

- Isolation of human neutrophils and determination of pro-inflammatory mediators: oxygenated radicals, degranulation enzymes, etc.
- Mouse macrophage cell cultures: toxicity studies, nitric oxide determination.
- Study and critical analysis of different protocols for determining other pro-inflammatory mediators

3. In vivo assays

Study of the fundamentals of various in vivo models and their usefulness in the study of new active principles:
- Air pouch stimulated by zymosan
- Carrageenan-induced plantar edema
- Freund's adjuvant-induced arthritis
- Collagen-induced arthritis
- Oxazolone-induced allergic contact dermatitis

WORKLOAD

ACTIVITY	Hours	% To be attended
Laboratory practices	30,00	100
Development of group work	10,00	0
Study and independent work	6,00	0
Readings supplementary material	9,00	0
Preparation of practical classes and problem	20,00	0
TOTAL	**75,00**	

TEACHING METHODOLOGY

During the activities, both theoretical and practical, the applications of the subject contents in relation to the Sustainable Development Goals (SDG) will be indicated. This is intended to provide knowledge, skills and motivation to understand and address these SDGs, while promoting reflection and criticism.

In this course, the basic methodology is laboratory practice.

In order to understand the protocols to be used, each session will start with a theoretical introduction of the assay to be carried out in the laboratory, which will include the pathophysiological and pharmacological basis of the experimental model. To complete and to carry out this theoretical introduction, the appropriate material will be made available to students in the Virtual Classroom in ppt presentations or a videoconference will be held, if deemed necessary.

In addition, the Virtual Classroom will be used to discuss and answer questions with students about the different topics covered throughout the program and to provide supplementary material.

During the development of the course, students must prepare an individual or in pairs report on any of the topics studied, which will be based on the analysis of recent publications on any or some of the experimental models used in the research of new anti-inflammatory drugs. At the last sessions, students should present their work, providing their own conclusions with a critical view.

EVALUATION

It is an essential requirement in order to pass the subject the student's attendance at classes, both the theoretical introductions and practical sessions, where the acquisition of skills in the laboratory will be assessed. Participation in the debates and discussions on the contents of the course, as well as the work carried out individually or in pairs, will be especially appreciated.

REFERENCES

Basic

- Se trabajará con artículos de investigación y revisiones publicados en los últimos 5 años