



**COURSE DATA**

**DATA SUBJECT**

**Code:** 43034  
**Name:** Pharmacology of psychoactive substance dependence: therapeutic perspectives  
**Cycle:** Master's Degree / Doctorate  
**ECTS Credits:** 4  
**Academic year:** 2026-27

**STUDY (S)**

Degree	Center	Acad. year	Period
2138 - Master's Degree in Research in and Rational Use of Medicines	Facultat de Farmàcia i Ciències de l'alimentació	1	Annual
3170 - PhD in Biomedicine and Pharmacy	Escola de Doctorat		Annual
3170 - PhD in Biomedicine and Pharmacy	Escola de Doctorat		Annual

**SUBJECT-MATTER**

Degree	Subject-matter	Character
2138 - Master's Degree in Research in and Rational Use of Medicines	Pharmacology of drug abuse addiction: therapeutic perspectives	ELECTIVES
3170 - PhD in Biomedicine and Pharmacy		
3170 - PhD in Biomedicine and Pharmacy		

**COORDINATION**

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**SUMMARY**

Subject belonging to the researcher module \"Master in Research and Rational Use of Medicines\" that seeks to study the neuropharmacological basis of treatment for drug addiction. Addiction is a chronic and relapsing disease with very difficult therapeutic approach. This is mainly due to ignorance still existing about the molecular and cellular basis of this phenomenon. Detailed knowledge of the effects that different drugs have on the brain is crucial for understanding, refining and designing new useful therapeutic strategies for the treatment of this disease. The contents of this subject are designed to illustrate the advances in this scientific field mainly in relation to the molecular and cellular basis of both



acute and chronic effects of abuse drugs as well as the phenomenon of relapse in abstinent patients, which is the main obstacle found by the therapist who treats these patients.

In addition, the new therapeutic agents and the mechanism of action of these new anti-relapse drugs will be presented.

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## PREVIOUS KNOWLEDGE

### RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

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

### OTHER REQUIREMENTS

There is no registration restriction

## COMPETENCES / LEARNING OUTCOMES

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

Be able to access the information required (databases, scientific articles, etc.) and to interpret and use it sensibly.

Be able to access to information tools in other areas of knowledge and use them properly.

Dominar el método científico, el planteamiento de protocolos experimentales y la interpretación de resultados en la búsqueda, desarrollo y evaluación de nuevos fármacos.

Dominar la comunicación científica. Poseer habilidades sociales y comunicativas en la práctica asistencial.

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

Select and manage available resources (instrumental and human) to optimise research outcomes.

Students should apply acquired knowledge to solve problems in unfamiliar contexts within their field of study, including multidisciplinary scenarios.

Students should be able to integrate knowledge and address the complexity of making informed judgments based on incomplete or limited information, including reflections on the social and ethical responsibilities associated with the application of their knowledge and judgments.

Students should communicate conclusions and underlying knowledge clearly and unambiguously to both



specialized and non-specialized audiences.

To acquire basic skills to develop laboratory work in biomedical research.

## DESCRIPTION OF CONTENTS

### 1. What is addiction?

In this first introductory topic, we will begin with the definition of the phenomenon of addiction to drugs of abuse, with special emphasis on the definitions and diagnostic criteria established in the DSMV and ICD-10. The unit will be structured according to the following scheme:

- o Definitions of addiction to drugs of abuse
- o Visions of the problem
- o Vulnerability to addiction

### 2. Neurobiological vision of addiction: hypotheses and theories.

The different visions that from different angles are proposed for the understanding of the addictive disorder will be exposed.

### 3. Animal models in the pharmacology of addiction

The different animal models currently used in the study of addiction will be analyzed according to the following scheme:

- o Self-administration animal models
- o Preference conditioning or aversion of place
- o Models of discrimination
- o Resistance to extinction
- o Models of withdrawal and conditional withdrawal syndrome
- o Relapse models: ADE and resumption

### 4. Psychostimulants

This thematic unit is dedicated to the study of psychostimulants from various perspectives, including:

- o Definitions
- o History of abuse, use and addiction
- o Pharmacokinetics
- o Abuse and potential for addiction
- o Neurobiological mechanisms at the molecular, cellular and system levels of psychostimulant addiction



## 5. Alcohol

This thematic unit is dedicated to the study of alcohol as a drug of abuse. The unit is organized according to the following scheme:

- o Definitions
- o History of abuse, use and addiction
- o Pharmacokinetics
- o Abuse and potential for addiction
- o Neurobiological mechanisms at the molecular, cellular and system level of alcoholism

## 6. Opioids

This thematic unit is dedicated to the study of opioids as drugs of abuse. The unit is organized according to the following scheme:

- o Definitions
- o History of abuse, use and addiction
- o Pharmacokinetics
- o Abuse and potential for addiction
- o Neurobiological mechanisms at the molecular, cellular and system levels of opioid addiction

## 7. Nicotine

This thematic unit is dedicated to the study of nicotine and the phenomenon of smoking. The unit is organized according to the following scheme:

- o Definitions
- o History of abuse, use and addiction
- o Pharmacokinetics
- o Abuse and potential for addiction
- o Neurobiological mechanisms at the molecular, cellular and system level of smoking

## 8. Neurobiologia de la recaiguda

En aquesta unitat didàctica s'abordarà l'estudi del Sistema Dopaminèrgic mesocorticolímbic i dels canvis en el produïts pel consum crònic de drogues que expliquen el fenomen de les recaigudes.

## 9. Neurobiology of relapse

In this didactic unit the study of the mesocorticolimbic dopaminergic system and the changes in the produced by chronic drug use that explain the phenomenon of relapses will be addressed.

In this practice, the student will be shown the methodology of stereotaxis, as well as its application in



## 10. Introduction to stereotaxy

neuropharmacological studies that use both localized drug administrations, discrete lesions, or for the application of in vivo sampling techniques. Subsequently, the students will know the materials and elements necessary to carry out the sampling using the microdialysis technique.

## 11. In vivo microdialysis: determination of DA in NAc

Once the elements necessary to perform an in vivo sampling by the microdialysis technique (P1), a neurochemical tool used in numerous Europharmacological studies in the field of addiction, are known, students will apply this knowledge by carrying out a practical session where they will quantitatively and qualitatively determine the DA in several samples of dialysate obtained in one of the areas involved in the reward system: the Accumbens Nucleus.

## 12. Analysis of motor activation induced by intracerebral drug administration: studies with a mu opioid receptor agonist in rats

During the development of this practice, students will be shown one of the methodologies used in studies on behavioral activation derived from intrategmental drug administration. Students will learn how different opioid receptor agonists affect the motor response.

## WORKLOAD

### PRESENCIAL ACTIVITIES

Activity	Hours
Theory	24,00
Laboratory	4,00
<b>Total hours</b>	<b>28,00</b>

### NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	44,00
Independent study and work	8,00
Preparation of lessons	8,00
Preparation for assessment activities	0,00
Resolution of case studies	0,00
<b>Total hours</b>	<b>60,00</b>

## TEACHING METHODOLOGY



## 43034 Pharmacology of psychoactive substance dependence: therapeutic perspectives

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 subject the basic methodology in the first sessions is the master class. To complete the classroom hours, the materials provided for face-to-face teaching will be adapted, so that the student can access them at any time. Use of the virtual classroom forum to answer questions.

To be able to follow the development of the topics well, the student must have prior knowledge of physiology, pathophysiology and biochemistry, mainly. To complement the master classes, several practical approaches will be made (blocks 10, 11 and 12) using virtual methods and / or attending the laboratory of the Department of Pharmacy and Pharmaceutical Technology.

The virtual media used are based on the use of video tutorials and videoconferences. In these sessions, various experimental models commonly used in neuropharmacology studies of addiction will be put into practice. In addition, seminars will also be held to debate and clarify doubts with students on the different topics studied throughout the program. During the development of the seminars, the students will have to prepare an expository and individual work that they will have to present in Secondary Education Centers with the background of spreading the knowledge acquired to a subgroup of population that due to their age is considered especially vulnerable and attracted to the consumption of drugs. All this informative work is integrated within the State Network of Teaching Innovation in Childhood, Adolescence, Youth and Society (REIDIAJS 3.0). In summary, the following table sets out the methodology of the subject, as well as the hours of dedication for each type of activity proposed (student contact hours).

Hours	Method
Master lesson	20
Seminars	4
Laboratory practices	4

Laboratory practices 4

### EVALUATION

It will be an essential requirement to pass the subject to attend face-to-face classes, both master classes, seminars and practical sessions in the laboratory or through virtual means. Participation in the debates and discussions on the course content, as well as the individual work carried out, will be especially valued. The exhibition of

an informative work in a School of Secondary Education directed to students of 3<sup>o</sup> or 4<sup>o</sup> of E.S.O.

In any case, the following criteria will be applied in the final evaluation:

Formative evaluation:	Analysis and discussion of topics	20%
Final evaluation:	Expository seminar (REIDIACS Project)	80%

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### REFERENCES

- Artículos de revisión - Artículos de investigación específica



- - Neurobiology of Addiction. GF Koob y M LeMoal (2006). Amsterdam, Academic Press - Molecular Biology of Drug Addiction. R Maldonado (2003). New Jersey. Humana Press - Cerebro y Adicción. D Redolat Ripollés. Ed UOC (2008)