

# ACADEMIC YEAR 2023-2024



Code **33198**: Interaction Drug-Organism  
 Code **33199**: Physiological Basis of Therapeutics  
 Code **33200**: Pharmacology of Organs and Systems  
 Code **33201**: Methodology in Clinical Trials  
 Code **33202**: Communication and scientific documentation /Data analysis

## OCTOBER (week 1)

	MONDAY-2	TUESDAY-3	WEDNESDAY 4	THURSDAY-5	FRIDAY-6
9-10h	Presentation  <i>Prof. Fernando de la Cuesta</i> <i>Prof. Lus Gandía</i>	<b>33199</b> Homeostasis. Transport through membrane.  <i>Prof. Javier Blanco</i>	<b>33199</b> Resting membrane potential  <i>Prof. Javier Blanco</i>	<b>33199</b> Synaptic transmission  <i>Prof. Javier Blanco</i>	<b>33199</b> General organization of the nervous system  <i>Prof. Ignacio Monedero</i>
10-11h	<b>33201</b> Drug development: from preclinical to human studies  <i>Prof. Francisco Abad</i>	<b>33199</b> Intercellular communication  <i>Prof. Javier Blanco</i>	<b>33199</b> Action potential  <i>Prof. Javier Blanco</i>	<b>33199</b> Skeletal and smooth muscle contraction  <i>Prof. Javier Blanco</i>	<b>33199</b> Motor nervous system: reflexes and voluntary movement  <i>Prof. Ignacio Monedero</i>
11-12h	<b>33198</b> Pharmacokinetics I  <i>Prof. Almudena Albillos</i>	<b>33198</b> Targets I: Classification of pharmacological receptors: Ion channels  <i>Prof. Concha Peiró</i>	<b>33198</b> Targets III: ionotropic and metabotropic receptors  <i>Prof. Concha Peiró.</i>	<b>33200</b> Neurotransmitters in the autonomous nervous system  <i>Prof. Ana Briones</i>	<b>33200</b> Neurotransmitters in the central nervous system  <i>Prof. Ana Briones</i>
12-13h	<b>33198</b> Pharmacokinetics II  <i>Prof. Almudena Albillos</i>	<b>33198</b> Targets II: Enzymes and transporters  <i>Prof. Concha Peiró</i>	<b>33201</b> Clinical drug development: phases and types of studies  <i>Prof. Alberto Borobia</i>	<b>33201</b> Clinical trials: definitions, methodological basis, the development of a clinical trial  <i>Prof. Alberto Borobia</i>	<b>33202</b> <b>SEMINAR I</b> Research resources <b>(BRING COMPUTER)</b>
13-14 h					<i>Prof. Elena Tortosa</i>

# ACADEMIC YEAR 2023-2024



Master in Pharmacological  
Research

Code **33198**: Interaction Drug-Organism  
 Code **33199**: Physiological Basis of Therapeutics  
 Code **33200**: Pharmacology of Organs and Systems  
 Code **33201**: Methodology in Clinical Trials  
 Code **33202**: Communication and scientific documentation /Data analysis

## OCTOBER (week 2)

	MONDAY-9	TUESDAY-10	WEDNESDAY -11	THURSDAY-12	FRIDAY-13
9-10h	<b>33198</b> <b>SEMINAR- I</b>  <b>9:30 to 11 h</b> Pharmacokinetics	<b>33199</b> Special senses-cont  <i>Prof. Ignacio Monedero</i>	<b>33198</b> <b>SEMINAR- II</b> Quantifying drug-receptor interaction		
10-11h	<i>Prof. Almudena Albillos</i>	<b>33199</b> Languaje, learning and memory  <i>Prof. Ignacio Monedero</i>	<i>Prof. Jesús Hernández-Guijo</i>		
11-12h	<b>33199</b> Somatosensory system  <i>Prof. Ignacio Monedero</i>	<b>33198</b> Drug side effects and pharmacological interactions  <i>Prof. Antonio Carcas</i>	<b>33198</b> Drugs for special populations  <i>Prof. Irene García</i>		
12-13h	<b>33199</b> Special senses  <i>Prof. Ignacio Monedero</i>	<b>33201</b> Objectives definition. Selection of endpoints. Defining the study population <i>Prof. Alberto Borobia</i>	<b>33202</b> Single-cell and spatial -omics  <i>Prof. Fernando de la Cuesta</i>		
13-14h	<b>33198</b> Targets IV: Receptors with enzymatic activity and nuclear receptors  <i>Prof. Concha Peiró</i>	<b>33200</b> Cholinergic drugs  <i>Prof. Manuela García</i>	<b>33199</b> <b>SEMINAR</b> Sleep  <i>Prof. Ignacio Monedero</i>		

# ACADEMIC YEAR 2023-2024



Code **33198**: Interaction Drug-Organism  
 Code **33199**: Physiological Basis of Therapeutics  
 Code **33200**: Pharmacology of Organs and Systems  
 Code **33201**: Methodology in Clinical Trials  
 Code **33202**: Communication and scientific documentation /Data analysis

## OCTOBER (week 3)

	MONDAY-16	TUESDAY-17	WEDNESDAY -18	THURSDAY-19	FRIDAY-20
9-10h			<b>33199</b> Innate immunity  <i>Prof. Ignacio Monedero</i>	<b>33201</b> Bias in clinical trials. Randomisation and blinding  <i>Prof. Alberto Borobia</i>	
10-11h	<b>33200</b> Hypnotic and sedative drugs  <i>Prof. María Cano-Abad</i>	<b>33199</b> Erythrocytes  <i>Prof. Ignacio Monedero</i>	<b>33199</b> Acquired immunity  <i>Prof. Ignacio Monedero</i>	<b>33199</b> <b>SEMINAR I :</b> Temperature Control (1h).  <i>Prof. Ignacio Monedero</i>	
11-12h	<b>33198</b> Polymorphisms of receptors, enzymes, metabolizers and transporters <i>Prof. Irene García</i>	<b>33199</b> Haemostasis  <i>Prof. Ignacio Monedero</i>	<b>33200</b> Antipsychotic and antiparkinson drugs  <i>Prof. Ana Briones</i>	<b>33200</b> Antiepileptic drugs  <i>Prof. María Cano</i>	
12-13h	<b>33201</b> Types of design: parallel, crossover, sequential, therapeutic equivalence <i>Prof. Elena Ramírez</i>	<b>33200</b> Antidepressants  <i>Prof. María Cano</i>	<b>33202</b> <b>SEMINAR</b> Designing a pharmacological research project II (2 hours)  <i>Prof. Elena Tortosa</i> <i>Prof. M<sup>a</sup> Dolores Sánchez</i> <i>Prof. Fernando de la Cuesta</i>	<b>33200:</b> <b>SEMINAR -I</b> Pharmacology of the ANS.  <i>Prof. Ana Briones</i>	
13-14h	<b>33199</b> Blood Haematopoiesis  <i>Prof. Ignacio Monedero</i>				

# ACADEMIC YEAR 2023-2024



Code **33198**: Interaction Drug-Organism  
 Code **33199**: Physiological Basis of Therapeutics  
 Code **33200**: Pharmacology of Organs and Systems  
 Code **33201**: Methodology in Clinical Trials  
 Code **33202**: Communication and scientific documentation /Data analysis

## OCTOBER (week 4)

	MONDAY-23	TUESDAY-24	WEDNESDAY -25	THURSDAY-26	FRIDAY-27
9-10h	<b>33201</b> Safety evaluation in clinical trials.  <i>Prof. Elena Ramírez</i>	<b>33198</b> <b>SEMINAR- III</b> Pharmacogenetics  <i>Prof. Irene García</i>			<b>33201</b> Principles of pharmacoeconomic analysis in the clinical trials  <i>Prof. Lucía Díaz</i>
10-11h	<b>33199</b> Introduction to cardiovascular system. Cardiac muscle  <i>Prof. Javier Blanco</i>	<b>33199</b> Cardiac Electric Activity. Cardiac mechanics  <i>Prof. Javier Blanco</i>	<b>33201</b> Analysis and interpretation of the results of a clinical trial  <i>Prof. Alberto Borobia</i>	<b>33200</b> Steroidal anti-inflammatory drugs (corticosteroids)  <i>Prof. Concha Peiró</i>	<b>33199</b> Cardiac output. Venous return  <i>Prof. Javier Blanco</i>
11-12h	<b>33200</b> Drugs for the treatment of migraine  <i>Prof. Manuela G<sup>a</sup> López</i>	<b>199</b> <b>SEMINAR</b> Blood and Immune System  <i>Prof. Ignacio Monedero</i>	<b>33200</b> Non-steroidal and anti-inflammatory drugs  <i>Prof. Concha Peiró</i>	<b>33199</b> Systemic circulation  <i>Prof. Javier Blanco</i>	<b>33200</b> Biological anti-inflammatory drugs  <i>Prof. Concha Peiró</i>
12-13h		<b>33199</b> Cardiac Function  <i>Prof. Javier Blanco</i>	<b>33201</b> Methods of synthesis of scientific evidence: the meta-analysis  <i>Prof. Lucía Díaz</i>	<b>33199</b> Hemodynamics. Microcirculation  <i>Prof. Javier Blanco</i>	<b>3199</b> Blood pressure regulation. Special circulations  <i>Prof. Javier Blanco</i>
13-14h					

# ACADEMIC YEAR 2023-2024



## Master in Pharmacological Research

Code **33198**: Interaction Drug-Organism  
 Code **33199**: Physiological Basis of Therapeutics  
 Code **33200**: Pharmacology of Organs and Systems  
 Code **33201**: Methodology in Clinical Trials  
 Code **33202**: Communication and scientific documentation /Data analysis

### OCTOBER-NOVEMBER (week 5)

	MONDAY-30	TUESDAY-31	WEDNESDAY -1	THURSDAY-2	FRIDAY-3
9-10h	<b>33199</b> Structure and functions of the respiratory system  <i>Prof. Álvaro Llorente</i>	<b>33199</b> Mechanics of ventilation. Spirometry  <i>Prof. Álvaro Llorente</i>		<b>33201</b> The ethics of clinical research: the role of investigators, regulators and ethics committees. The patient informed consent. <i>Prof. Irene García</i>	<b>33199</b> <b>SEMINAR II</b> Cardiovascular regulation <b>(Bring computer)</b>  <i>Prof. Javier Blanco</i>
10-11h	<b>33200</b> Opiods  <i>Prof. Concha Peiró</i>	<b>33202</b> <b>SEMINAR</b> Designing a pharmacological research project I  <i>Prof. Elena Tortosa</i> <i>Prof. M<sup>a</sup> Dolores Sánchez</i> <i>Prof. Fernando de la Cuesta</i>		<b>33199</b> Pulmonary ventilation and perfusion  <i>Prof. Álvaro Llorente</i>	<b>33200</b> Mechanism of action of antibiotics  <i>Prof. Alberto Borobia</i>
11-12h	<b>33200</b> Immunomodulatory drugs  <i>Prof. Concha Peiró</i>	<i>Prof. Elena Tortosa</i> <i>Prof. M<sup>a</sup> Dolores Sánchez</i> <i>Prof. Fernando de la Cuesta</i>		<b>33199</b> Exchange and transport of gases  <i>Prof. Álvaro Llorente</i>	<b>33200</b> Clasification of antibiotics  <i>Prof. Alberto Borobia</i>
12-13h	<b>33200</b> Drugs for the treatment of anaemia and colony stimulating drugs <i>Prof. Luis Gandía</i>	<b>33201</b> The regulation of clinical trial drug development. National and International clinical trials <i>Prof. Irene García</i>		<b>33200</b> Drugs that affect blood coagulation  <i>Prof. Luis Gandía</i>	

# ACADEMIC YEAR 2023-2024



## Master in Pharmacological Research

Code **33198**: Interaction Drug-Organism  
 Code **33199**: Physiological Basis of Therapeutics  
 Code **33200**: Pharmacology of Organs and Systems  
 Code **33201**: Methodology in Clinical Trials  
 Code **33202**: Communication and scientific documentation /Data analysis



13-14h					
--------	--	--	--	--	--

### NOVEMBER (week 6)

	MONDAY-6	TUESDAY-7	WEDNESDAY -8	THURSDAY-9	FRIDAY-10
9-10 h	<b>33199</b> Renal function. Glomerular filtration and renal blood flow. <i>Prof. M<sup>a</sup> Carmen Iglesias</i>	<b>33199</b> Countercurrent mechanism. Bidirectional transport. Plasma clearance. <i>Prof. M<sup>a</sup> Carmen Iglesias</i>			
10-11 h	<b>33201</b> <b>SEMINAR</b> Internal validity. Assessment of bias. Examples <i>Prof. Antonio Carca</i>	<b>33200</b> Antiviral drugs <i>Prof. Alberto Borobia</i>	<b>33199</b> Renal control of extracellular volume and osmolarity. <i>Prof. M<sup>a</sup> Carmen Iglesias</i>		
11-12 h		<b>33200</b> Antifungal and antiparasitic drugs <i>Prof. Alberto Borobia</i>	<b>33199</b> <b>SEMINAR III</b> Respiratory regulation <i>Prof. Álvaro Llorente</i>		
12-13 h	<b>33200:</b> <b>SEMINAR- II</b> Pharmacology of the CNS <i>Prof. María Cano</i>	<b>33200</b> Pharmacology of the respiratory system <i>Prof. Manuela G<sup>a</sup> López</i>	<b>33201</b> <b>SEMINAR</b> End-points in clinical trials and its clinical relevance (composite, surrogate) <i>Prof. Antonio Carcas</i>		
13-14 h					

# ACADEMIC YEAR 2023-2024



## Master in Pharmacological Research

Code **33198**: Interaction Drug-Organism  
 Code **33199**: Physiological Basis of Therapeutics  
 Code **33200**: Pharmacology of Organs and Systems  
 Code **33201**: Methodology in Clinical Trials  
 Code **33202**: Communication and scientific documentation /Data analysis

### NOVEMBER (week 7)

	MONDAY-13	TUESDAY-14	WEDNESDAY -15	THURSDAY-16	FRIDAY-17
9-10 h	<b>33202</b> Statistics and probability: from sample to population  <i>Prof. Carlos Sánchez Sorzano</i>	<b>33199</b> Renal control of plasma pH.  <i>Prof. M<sup>a</sup> Carmen Iglesias</i>	<b>33200</b> : <b>SEMINAR III</b> - Antiinflammatory- Immunomodulatory drugs  <i>Prof. Concha Peiró</i>	<b>*Exam</b> : Interaction Drug-Receptor	<b>33199</b> Introduction to digestive function. Mastication, salivation and deglutition <i>Prof. Javier Blanco</i>
10-11 h	<b>33202</b> Confidence intervals  <i>Prof. Carlos Sánchez Sorzano</i>	<b>333202</b> Continuous variables (1)  <i>Prof. Carlos Sánchez Sorzano</i>			<b>33199</b> Stomach motility and secretion.  <i>Prof. Javier Blanco</i>
11-12 h	<b>33201</b> <b>SEMINAR</b> External validity and generalization of results  <i>Prof. Antonio Carcas</i>	<b>33202</b> Continuous variables (2)  <i>Prof. Carlos Sánchez Sorzano</i>	<b>33202</b> P-values and statistical significance (1)  <i>Prof. Carlos Sánchez Sorzano</i>	<b>33200</b> Ionotropic and beta-blockers  <i>Prof. Ana Briones</i>	<b>33202</b> Statistical assumptions  <i>Prof. Carlos Sánchez Sorzano</i>
12-13 h		<b>33200</b> : Pharmacology of the gastrointestinal system  <i>Prof. Manuela G<sup>a</sup> López</i>	<b>33202</b> P-values and statistical significance (2)  <i>Prof. Carlos Sánchez Sorzano</i>	<b>33200</b> Vasodilators and calcium antagonists  <i>Prof. Ana Briones</i>	<b>33202</b> Statistical tests (1)  <i>Prof. Carlos Sánchez Sorzano</i>
13-14 h	<b>33199</b> Tubular processes: reabsorption and secretion.  <i>Prof. M<sup>a</sup> Carmen Iglesias</i>	<b>33199</b> <b>SEMINAR IV</b> Renal function  <i>Prof. M<sup>a</sup> Carmen Iglesias</i>		<b>33200</b> : <b>SEMINAR- IV</b> Pharmacology of blood coagulation  <i>Prof. Luis Gandía</i>	<b>33200</b> Pharmacology of the renin- angiotensin system  <i>Prof. Ana Briones</i>



# ACADEMIC YEAR 2023-2024



Code **33198**: Interaction Drug-Organism  
 Code **33199**: Physiological Basis of Therapeutics  
 Code **33200**: Pharmacology of Organs and Systems  
 Code **33201**: Methodology in Clinical Trials  
 Code **33202**: Communication and scientific documentation /Data analysis

## NOVEMBER (week 8)

	MONDAY-20	TUESDAY-21	WEDNESDAY -22	THURSDAY-23	FRIDAY-24
9-10 h	<b>33201</b> <b>SEMINAR</b> Interpretation of positive results	<b>33201</b> <b>SEMINAR</b> Interpretation of negative results	<b>33199</b> Digestion and absorption of carbohydrates and proteins  <i>Prof. Javier Blanco</i>		<b>3199</b> Hypothalamus-pituitary axis.  <i>Prof. M<sup>a</sup> Carmen Iglesias</i>
10-11 h	<i>Prof. Francisco Abad</i>	<i>Prof. Francisco Abad</i>	<b>33199</b> Small and large intestine motility and secretion.  <i>Prof. Javier Blanco</i>	<b>33199</b> Digestion and absorption of lipids. Liver function  <i>Prof. Javier Blanco</i>	<b>33199</b> Thyroid hormones  <i>Prof. M<sup>a</sup> Carmen Iglesias</i>
11-12 h	<b>33201</b> <b>SEMINAR</b> Publication bias and communication. Conflict of interest in the implementation and communication of results of clinical trials	<b>33200</b> Diuretics  <i>Prof. Ana Briones</i>	<b>33200</b> Lipid lowering medication  <i>Prof. Ana Briones</i>	<b>33200</b> : Antineoplastic Drugs: cytostatics  <i>Prof. Carlos F. Sánchez</i>	<b>33200</b> :  <b>SEMINAR -IV</b> Pharmacology of respiratory and gastrointestinal system
12-13 h	<i>Prof. Antonio Carcas</i>	<b>33200</b> Drugs that regulate bone metabolism  <i>Prof. Manuela G. Lopez</i>	<b>33200</b> Antidiabetic drugs  <i>Prof. M<sup>a</sup> Dolores Sánchez Niño</i>	<b>33200</b> : Biological Therapy in cancer  <i>Prof. Concha Peiro</i>	<i>Prof. Manuela G<sup>a</sup> López</i>
13-14 h					



# ACADEMIC YEAR 2023-2024



Code **33198**: Interaction Drug-Organism  
 Code **33199**: Physiological Basis of Therapeutics  
 Code **33200**: Pharmacology of Organs and Systems  
 Code **33201**: Methodology in Clinical Trials  
 Code **33202**: Communication and scientific documentation /Data analysis

## NOVEMBER-DECEMBER (week 9)

	MONDAY-27	TUESDAY-28	WEDNESDAY -29	THURSDAY-30	FRIDAY-1
9-10 h	<b>33202</b> Statistical tests (2)  <i>Prof. Carlos Sánchez Sorzano</i>	<b>33202</b> Fitting models (1)  <i>Prof. Carlos Sánchez Sorzano</i>	<b>33202</b> Fitting models (3)  <i>Prof. Carlos Sánchez Sorzano</i>	<b>33200</b> : <b>SEMINAR V-</b> Pharmacology of the cardiovascular system  <i>Prof. Ana Briones</i>	<b>33200-</b> Cellular therapy for Chron's Disease  <i>Prof. Damian Gª Olmo</i>
10-11 h	<b>33202</b> Statistical tests (3)  <i>Prof. Carlos Sánchez Sorzano</i>	<b>33202</b> Fitting models (2)  <i>Prof. Carlos Sánchez Sorzano</i>	<b>33199</b> Suprarenal glands  <i>Prof. Mª Carmen Iglesias</i>		<b>33200-</b> Extracellular vesicle-based biological therapies  <i>Prof. Fernando de la Cuesta</i>
11-12 h	<b>33199</b> Sex hormones  <i>Prof. Mª Carmen Iglesias</i>	<b>33200</b> Pharmacology of sex hormones  <i>Prof. M. Cano-Abad</i>	<b>33199</b> <b>SEMINAR V</b> Intake and weight regulation  <i>Prof. Mª Carmen Iglesias</i>	<b>33200</b> : Gene therapy: general concepts  <i>Prof. Silvia Gómez Sebastián</i>	<b>33200</b> : <b>SEMINAR VI-</b> Pharmacology of metabolism  <i>Prof. Mª Dolores Sánchez</i>
12-13 h	<b>33199</b> Regulation of calcium metabolism  <i>Prof. Mª Carmen Iglesias</i>	<b>33199</b> Endocrine pancreas  <i>Prof. Mª Carmen Iglesias</i>		<b>33200-</b> Application of herpes virus in gene therapy  <i>Prof. Silvia Gomez</i>	
13-14 h					

# ACADEMIC YEAR 2023-2024



Code 33198: Interaction Drug-Organism  
 Code 33199: Physiological Basis of Therapeutics  
 Code 33200: Pharmacology of Organs and Systems  
 Code 33201: Methodology in Clinical Trials  
 Code 33202: Communication and scientific documentation /Data analysis

## DECEMBER (week 10)

	Dec- MONDAY-4	TUESDAY-5	WEDNESDAY -6	THURSDAY-7	FRIDAY-8
		*EXAM Scientific communication and documentation /Data analysis			

ı

## DECEMBER (week 11)

	MONDAY-11	TUESDAY-12	WEDNESDAY -13	THURSDAY-14	FRIDAY-15
	*Exam: Physiological basis of therapeutics			*Exam: Methodology in ClinicalTrials	

## DECEMBER (week 12)

	MONDAY-18	TUESDAY-19	WEDNESDAY -20	THURSDAY-21	FRIDAY-22
		*Exam: Pharmacology of Organs and Systems			

Code **33198**: Interaction Drug-Organism  
Code **33199**: Physiological Basis of Therapeutics  
Code **33200**: Pharmacology of Organs and Systems  
Code **33201**: Methodology in Clinical Trials  
Code **33202**: Communication and scientific documentation /Data analysis

## Professors

### Department of Pharmacology

- Almudena Albillos
- Francisco Abad Santos
- Alberto Borobia
- Ana Briones
- María F Cano-Abad
- Antonio Carcas
- Fernando de la Cuesta
- Jesús Hernández-Guijo
- Luis Gandía Juan
- Manuela García López
- Concha Peiró Vallejo
- Carlos Sánchez Ferrer
- M<sup>a</sup> Dolores Sánchez Niño
- Elena Ramírez
- Elena Tortosa

### Department of Physiology

- Javier Blanco Rivero
- M<sup>a</sup> Carmen Iglesias de la Cruz
- Álvaro Llorente Berzal
- Ignacio Monedero Cobeta

### Invited Professors

- Damián García Olmo (Hospital Fundación Jiménez Díaz)
- Silvia Gómez Sebastián (Departamento de medicina Preventiva y salud pública y microbiología)
- Carlos Oscar Sánchez Sorzano (Centro nacional de biotecnología-CNB)

### Coordinators:

Prof. Luis Gandía Juan  
Dpto. Farmacología-Lab 7  
[luis.gandia@uam.es](mailto:luis.gandia@uam.es)

Prof. Fernando de la Cuesta Marina  
Dpto. Farmacología-Lab 5  
[fernando.delacuesta@uam.es](mailto:fernando.delacuesta@uam.es)

### Subject coordinators

**33198**: Interaction Drug-Receptor  
Prof. María F. Cano Abad  
[maria.cano@uam.es](mailto:maria.cano@uam.es)

**33199**: Physiological basis of therapeutics  
Prof. Javier Blanco Rivero  
[javier.blanco@uam.es](mailto:javier.blanco@uam.es)

**33200** Pharmacology of Organs and Systems  
Prof. María F. Cano Abad  
[maria.cano@uam.es](mailto:maria.cano@uam.es)

**33202**:  
Communication and scientific documentation  
Prof. Elena Tortosa Binacua  
[elena.tortosa@uam.es](mailto:elena.tortosa@uam.es)

Data analysis  
Prof. Carlos Oscar Sorzano  
[coss@cnb.csic.es](mailto:coss@cnb.csic.es)

**33201**: Methodology in Clinical Trials  
Prof. Antonio Carcas  
[antonio.carcas@uam.es](mailto:antonio.carcas@uam.es)