

THERAPEUTIC TARGETS IN CARDIOVASCULAR PHARMACOLOGY (5 ECTS)

COORDINATORS: Óscar Lorenzo, Dpt. of Medicine (oscar.lorenzo@uam.es)
Concha Peiró, Dpt. of Pharmacology (concha.peiro@uam.es)

OBJECTIVES: To address the main molecular, cellular, and pathophysiological aspects related to major cardiovascular diseases, together with a critical analysis of the new therapeutic and pharmacological approaches for these pathologies.

LOCATION: Sala Multiusos. First floor, Pharmacology Department, School of Medicine

LEARNING METHODOLOGY: the course will be composed of research-based lectures and journal clubs with paper-based group discussion and presentations by the students.

OVERVIEW OF CONTENTS:

WEEK 1

Welcome and Introduction

(M 17 February, 10:30-11:00, 0,5 h)

by Profs. Óscar Lorenzo & Concha Peiró (coordinators)

TOPIC 1: Introduction to Cardiovascular Diseases

Topic coordinator: Prof. C.F. Sánchez Ferrer

“Epidemiology of cardiovascular diseases” (M 17 February, 11:00-12:00, 1h)

by Prof. F. Rodríguez-Artalejo

- Magnitude and distribution of cardiovascular diseases
- Risk factors – Types of risk factors
- Magnitude and distribution
- Challenges in cardiovascular diseases prevention and control
- Future perspectives

“Definition of cardiovascular diseases” (M 17 February, 12:00-13:00, 1h)

by Prof. J.L. López-Sendón

- Definition and groups of cardiovascular diseases
- Complications of cardiovascular diseases
- Diagnostic methods
- Treatments
- Future perspectives

“The concept of endothelial dysfunction” (T 18 February, 10:00-11:30, 1,5 h)

by Prof. CF. Sánchez-Ferrer

- Basic aspects of vascular biopathology
- Vascular reactivity
- Endothelial cells
- Nitric oxide, prostanoids, other endothelium-derived compounds
- Endothelial dysfunction

“Oxidative stress and vascular function in health and disease” (T 18 February, 11:30-12:30, 1 h)

by Prof. Ana Briones

- Main sources of vascular reactive oxygen species (ROS)
- ROS and vascular disease

TOPIC 2: Trends in Hypertension and Renal Failure (6 h)

Topic coordinator: Prof. A. Briones

How do we define hypertension? (W 19 February, 10:00-11:00, 1 h)

by Prof. A. Briones

- Guidelines on Hypertension
- Definition of Hypertension
- Types of Hypertension

“Role of inflammation in vascular damage associated to hypertension” (W 19 February, 11:00-12:00, 1 h)

by Prof. A. Briones

- General aspects of inflammation in vascular damage in hypertension
- Inflammation versus resolution of inflammation
- Role of resolution of inflammation in vascular damage in hypertension

“Fetal and perinatal programming of hypertension” (W 19 February, 12:00-13:00, 1 h)

by Prof. S. Arribas

- Developmental origins of health and disease: evidence from epidemiological studies
- Determinant factors
- Mechanisms implicated in hypertension of developmental origin.

“Hypertension and chronic kidney disease” (Th 20 February, 10:00-11:00, 1 h)

by Prof. B. Fernández

- Concept of hypertension and hypertension-induced kidney injury
- Concept of chronic kidney disease
- Hypertensive nephropathy
- The conundrum of hypertensive guidelines

“Journal Club 1” (Th 20 February, 11:00-12:30, 1,5 h)

Guidelines for management of hypertensive patients. Profs. C. Peiró & O. Lorenzo

WEEK 2

TOPIC 3: Trends in atherothrombosis (5h)

Topic coordinator: Prof. A. Briones

In search of anti-inflammatory mechanisms in atherosclerosis” (M 24 February, 10:00-11:00, 1 h)

by Prof. C. Gómez

- The concept of atherosclerosis and the atheroma plaque
- General aspects of inflammation in atherosclerosis
- Clinical trials testing anti-inflammatory agents.
- New therapeutic targets

“Journal Club 2” (M 24 February, 11:00-12:30, 1,5 h)

The CANTOS Trial. Prof. C. Peiró

Abdominal aortic aneurysm (AAA): pathological mechanisms, biomarkers and therapeutic targets” (T 24 February, 10:00-11:00, 1 h)

by Prof. J.L. Martín

- Mechanisms involved in AAA development.
- Diagnostic and prognostic biomarkers of AAA
- Novel therapeutic targets

“SARS-CoV-2, COVID-19 and atherothrombosis” (T 25 February, 10:00-11:00, 1 h)

by Prof. C. Peiró

- COVID-19 and vascular complications
- Isolated SARS-CoV-2 elements as pathophysiological agents
- SARS-CoV-2 and endothelial cell damage

“Journal Club 3” (T 25 February, 11:00-12:30, 1,5 h)

Role of matricellular proteins in the vascular wall: homeostasis versus pathology.

Prof. M. Ruiz Ortega

TOPIC 4: Diabetes mellitus, obesity and cardiometabolic complications (5h)

Topic coordinator: Prof. O. Lorenzo

Diabetes and vascular cell damage. Is glucose the only player? (W 26 February, 10:00-11:00, 1,5 h)

by Prof. C-F. Sánchez Ferrer

- Vascular complications associated to diabetes mellitus
- Hyperglycemia and inflammation as hallmarks of diabetes vasculopathy
- Drugs to target the high glucose-inflammation synergy

“Simulation session” (W 26 February, 11:00-12:30, 1,5 h)

Measuring metabolic fluxes in cardiovascular cells

by Profs. A. Villacampa & J. Lumpuy

“Adipokines as effectors of vascular disease” (Th 27 February, 10:00-11:00, 1 h)

Master's Degree in Pharmacological Research (2024-2025) 2º semester

by Prof. I. Valencia

- The concept of adipokines
- Pathophysiology of adipokines in the vasculature

“Journal Club 4” (Th 27 February, 11:00-12:30, 1,5 h)

Biomarkers discovery on cardiovascular failure?

by Prof. O. Lorenzo

WEEK 3

TOPIC 5: Trends in Cardiovascular Ageing (5h)

Topic coordinator: Prof. C. Peiró

“Endothelial cell senescence and vascular inflammaging” (M 3 March, 10:00-11:30, 1,5 h)

by Prof. C. Peiró

- The hallmarks of vascular ageing. Cell senescence and vascular disease
- The endothelial cell senescent phenotype: the SASP and vascular inflammation
- Is endothelial cell senescence a new pharmacological target?

“Klotho: the kidney-derived anti-ageing protein” (M 3 March, 11:30-12:30, 1h)

by Prof. MD Sánchez-Niño

- Kidney disease, a leading cause of death: a link with accelerated ageing and vascular calcification
- Klotho, an anti-ageing protein produced by tubular cells
- Understanding klotho deficiency in the context of premature ageing
- Klotho as a therapeutic target to preserve cardiovascular health and to delay ageing

“Metformin as a new anti-ageing strategy for CV diseases” (T 4 March, 10:30-11:00, 1h)

by Prof. O. Lorenzo

“Journal Club 5” (T 4 March, 11:00-12:30, 1,5h)

sDPP4 and endothelial cell senescence.

by Prof. I. Valencia

WEEK 4

ASSESSMENT & EVALUATION (M 11 March, 3,5h)

10:00-10:30: Quick Test for general comprehension assessment

11:00-11:30 Oral presentation of a paper based on Topic 1

11:30-12:00 Oral presentation of a paper based on Topic 2

12:00-12:30 Oral presentation of a paper based on Topic 3

12:30-13:00 Oral presentation of a paper based on Topic 4

13:00-13:30 Oral presentation of a paper based on Topic 5