1 Introduction
2 Executive summary
3 Research areas and groups
4 Associated clinicians

3.2.4 Vascular Pharmacology and Metabolism (FARMAVSM) Group



Publications: 10 | Q1: 7

COMPOSITION

Carlos Félix Sánchez Ferrer.
Catedrático de Farmacología. Universidad Autónoma de Madrid
Concepción Peiró Vallejo.
Catedrática de Farmacología. Universidad Autónoma de Madrid

- **Diego Berlanas Vicente.** *Ayudante de Investigación. Universidad Autónoma de Madrid*
- **Ana Cuadrado Gómez.** *Investigadora Predoctoral. Universidad Autónoma de Madrid*
- **Fernando de la Cuesta Marina.** *Investigador Postdoctoral. Universidad Autónoma de Madrid*
- **Jorge Francisco Gómez Cerezo.** *Jefe de Servicio de Medicina Interna. Hospital Universitario Infanta Sofía*
- **Fátima Ainara González Moro.** *Investigadora Predoctoral. Universidad Autónoma de Madrid*
- **Ángel Moreno Luque.** *Ayudante de Investigación. Universidad Autónoma de Madrid*
- **Carmen María Parra Moreno.** *Investigadora Predoctoral. Universidad Autónoma de Madrid*
- **Alan Andrés Rivera Tenorio.** *Investigador Predoctoral . Universidad Autónoma de Madrid*
- **Ibone Rubio Sánchez-Pajares.** *Ayudante de Investigación. Universidad Autónoma de Madrid*
- **Alicia Villacampa Calvo.** *Investigadora postdoctoral. Universidad Autónoma de Madrid*

STRATEGIC OBJETIVES

- Our research addresses challenge 1 of the Spanish Strategy for Science, Technology and Innovation: "Health, demographic change and well-being." The main objective is to improve our understanding of vascular aging, both in healthy and pathological conditions, such as obesity and type 2 diabetes mellitus. Vascular aging is associated with complex structural and functional changes in blood vessels. This process is crucial for the health status of older adults and represents the main risk factor in the development of cardiovascular diseases.
- Obesity and type 2 diabetes mellitus are highly prevalent and closely related diseases, to the point that the term "diabesity" has been coined. Diabesity constitutes one of the greatest health and socioeconomic challenges in Western countries, especially due to its cardiovascular complications. Epidemiological studies indicate that patients with diabesity have a reduced life expectancy, closely linked to the development of diseases such as hypertension and atherosclerosis. Diabesity is also considered an age-related disease and a progeroid entity, sharing similar cellular and molecular mechanisms with age-induced vascular dysfunction. Understanding the pathways involved in vascular damage and premature aging associated with diabesity could help delay vascular complications.
- Furthermore, preserving vascular function during aging should not only reduce deaths and disabilities secondary to cardiovascular events, but should also mitigate other negative aspects of aging that lead to loss of function and/or disability, such as motor impairment and cognitive frailty. In fact, it is now clear that robustness in old age cannot be achieved without preserving vascular function.

RESEARCH LINES

- 1. Mechanisms of human vascular aging
- 2. Mechanisms of vascular damage in diabetes mellitus
- 3. Obesity, adipokines, insulin resistance, and vascular dysfunction
- 4. Role of the angiotensin-(1-7)/Mas receptor axis in vascular function and inflammation.
- 5. Development of new therapies based on extracellular vesicles for cardiovascular diseases

RESEARCH ACTIVITY

Doctoral Theses

- **Shamoon L.** SARS-CoV-2 S protein impact on endothelial cell senescence, cytoprotection exhaustion and vascular damage: a protective role of klotho and angiotensin-(1-7)[dissertation]. Madrid: UAM: 2025(28/02/2025). Director: Peiró Vallejo C, Sánchez Ferrer CF
- **González Moro FA.** Avances en estrategias terapéuticas para alteraciones vasculares asociadas al envejecimiento acelerado: diferencias entre sexos en el modelo samp8 y optimización de la encapsulación de senoterapéuticos en vesículas extracelulares de células madre[dissertation]. Madrid: UAM: 2025(18/09/2025). Director: de la Cuesta Marina F.

IdiPAZ Instituto de Investigación Hospital Universitario La Paz

1 Introduction
2 Executive summary
3 Research areas and groups
4 Associated clinicians



- **Morales Rodríguez de Lope M.** Estandarización de vesículas de origen vegetal: potencial de las nanovesículas como agentes terapéuticos y caracterización de marcadores de identidad en vesículas extracelulares[dissertation]. Madrid: UAM: 2025(04/12/2025). Director: de la Cuesta Marina F

Master Theses

- **Díaz Huertas S.** Antidiabetic drugs as regulators of the NLRP3 inflammasome and protectors of the vascular system[dissertation]. Madrid: UAM: 2025(04/09/2025). Director: Peiró Vallejo C, Sánchez Ferrer CF. PID2023-147378OB-I00
- **Vivar García I.** Mechanisms of vascular smooth muscle protection by anakinra and the anti-diabetic drug canagliflozin[dissertation]. Madrid: UAM: 2025(15/09/2025). Director: Peiró Vallejo C, Villacampa Calvo A.

Final Degree Theses

- **Latorre Soler J.** Abordaje fármaco-nutricional de la obesidad y diabetes tipo II y empleo de semaglutida[dissertation]. Madrid: UAM: 2025(25/05/2028). Director: de la Cuesta Marina F.

Publications

- **Campuzano R, Mostaza JM, Barrios V, Egocheaga-Cabello I, Gómez-Cerezo JF, Pallarés-Carratalá V, Martínez-López I, Castellanos M, Hernández-Subirá I, Morant-Talamante N, Parrondo J, Arigita-Lastra L, Gámez JM.** Assessing LDL-C levels and lipid-modifying therapies in a real-world cohort of patients with atherosclerotic cardiovascular disease: The REALITY Study. J Clin Med. 2025; 14(7): 2340. Article. IF: 3.3; Q1
- **de Lope MMR, Sánchez-Pajares IR, Herranz E, López-Vázquez CM, González-Moro A, Rivera-Tenorio A, González-Sanz C, Sacristán S, Chicano-Gálvez E, de la Cuesta F.** Acompendium of bona fide reference markers for genuine plant extracellular vesicles and their degree of phylogenetic conservation. J Extracell Vesicles. 2025; 14(9): e70147. Article. IF: 21.7; D1
- **Gómez-Cerezo JF, Fernández-Martín J, Barba-Romero MA, Sánchez-Martínez R, Hermida-Ameijeiras A, Camprodon-Gómez M, Ortolano S, López-Rodríguez MA.** Current status of the immunogenicity of enzyme replacement therapy in fabry disease. Orphanet J Rare Dis. 2025; 20(1): 253. Review. IF: 3.6; Q2
- **González-Moro A, Herranz E, de Lope MMR, Sánchez-Pajares IR, Sánchez-Ramírez J, Rivera-Tenorio A, Shamoon L, Sánchez-Ferrer CF, Peiró C, de la Cuesta F.** Sex-specific molecular hallmarks point to increased atherogenesis susceptibility in male senescence-accelerated mice. Life Sci. 2025; 369: 123529. Article. IF: 6.4; Q1
- **Kardassis D, Stancu CS, Toma L, Gafencu AV, Georgescu A, Alexandru-Moise N, Molica F, Kwak BR, Burlacu A, Hall IF, Butoi E, Magni P, Wu JX, Novella S, Gamon LF, Davies MJ, Caporali A, de la Cuesta F, Mitic T, Vindis C.** Unravelling molecular mechanisms in atherosclerosis using cellular models and omics technologies. Vasc Pharmacol. 2025; 158: 107452. Article. IF: 3.7; Q2
- **Magalhaes GS, Villacampa A, Rodrigues-Machado MG, Campagnole-Santos MJ, Santos RAS, Sánchez-Ferrer CF, Peiró C.** Oral Angiotensin-(1-7) formulation after established elastase-induced emphysema suppresses inflammation and restores lung architecture. Front Pharmacol. 2025; 16: 1540475. Article. IF: 5.4; Q1
- **Magni P, Mitic T, Devaux Y, Pierre P, Sopic M, de la Cuesta F, Vitorino R.** Deciphering immune dynamics in atherosclerosis: Inflammatory mediators as biomarkers and therapeutic target. Eur J Clin Invest. 2025; 55(6): e70043. Review. IF: 4.1; Q1
- **Mitic T, Georgescu A, Alexandru-Moise N, Davies MJ, Vindis C, Novella S, Gerdts E, Kararigas G, Wettinger SB, Formosa MM, Kwak BR, Molica F, Amigo N, Caporali A, de la Cuesta F, Hall IF, Chroni A, Martelli F, Schmid JA, Magni P, Kardassis D.** Current status and challenges of multi-omics research using animal models of atherosclerosis. J Mol Cell Cardiol Plus. 2025; 13: 100476. Article. IF: 2.2; Q3
- **Tejedor-Santamaría L, Márquez-Expósito L, Villacampa A, Marchant V, Battaglia-Vieni A, Rayego-Mateos S, Rodrigues-Diez RR, Santos FM, Valentijn FA, Knoppert SN, Broekhuizen R, Ruiz-Torres MP, Goldschmeding R, Ortiz A, Peiró C, Nguyen TQ, Ramos AM, Ruiz-Ortega M.** CCN2 Activates cellular senescence leading to kidney fibrosis in folic acid-induced experimental nephropathy. Int J Mol Sci. 2025; 26(9): 4401. Article. IF: 5.6; Q1
- **Villacampa A, Shamoon L, Valencia I, Morales C, Figueiras S, de la Cuesta F, Sánchez-Niño D, Díaz-Araya G, Sánchez-Pérez I, Lorenzo O, Sánchez-Ferrer CF, Peiró C.** SARS-CoV-2 S Protein reduces cytoprotective defenses and promotes human endothelial cell senescence. Aging Dis. 2025; 16(3): 1626-38. Article. IF: 9.6; D1

Research projects

- **de la Cuesta Marina F.** Developing novel nanotherapies for atherosclerosis by delivering senolytics to the plaque using mesenchymal stem cell-derived extracellular vesicles (2019-T1/IND-13794 y 2023-5A/IND-28938). CM. 2020-2025. Managment centre: UAM
- **de la Cuesta Marina F.** Nueva terapia senolítica para enfermedad vascular asociada al envejecimiento mediante bioingeniería de vesículas extracelulares de células madre para administración dirigida (PID2021-126274OB-I00). AEI. 2022-2025. Managment centre: UAM
- **de la Cuesta Marina F.** Terapias senoliticas avanzadas basadas en nanoparticulas biologicas para tratar el envejecimiento vascular (CNS2022-135368). AEI. 2023-2025. Managment centre: UAM
- **de la Cuesta Marina F.** Escalado y fabricación GMP de vesículas extracelulares de células madre mesenquimales para terapias avanzadas (IND2023/BMD-27323). CM. 2024-2027. Managment centre: UAM
- **Peiro Vallejo C, Sánchez Ferrer CF.** NLRP3 inflamasome at the crossroad of vascular inflammageing: a novel target for senomorphic drugs (PID2023-147378OB-I00). Plan Nacional de I+D+i. 2024-2027. Managment centre: UAM