

Cell Therapy and Angiogenesis in Ischemic Diseases

Group leader

Arderiu Marqués, Gemma (IR)

Researchers

Civit Urgell, Anna (IR)

Serrano López, Alejandro (IR)

Research technicians

Beteta Jiménez, Marina (IR)

García García, Olaya (IR)



DESCRIPTION

The research group “Cell Therapy and Angiogenesis in Ischemic Diseases”, an emerging team within Area: Cardiovascular Diseases, is dedicated to investigating the vascular effects of ischemia and angiogenesis. Their work focuses on exploring the therapeutic potential of adipose-derived stem cells (ASCs) to promote blood vessel formation and repair damaged tissues in ischemic conditions. By combining cutting-edge techniques in cell therapy and molecular biology, the group aims to develop novel treatments that improve outcomes for patients with cardiovascular diseases. Their research not only seeks to understand the underlying mechanisms of angiogenesis but also to translate these findings into clinical applications, offering hope for more effective and personalised therapies. Ultimately, their goal is to advance the diagnosis, treatment, and prevention of ischemic diseases through innovative approaches.

MAIN LINES OF RESEARCH

- Cell therapy and angiogenesis: Application of adipose-derived stem cells (ASCs) to promote blood vessel formation (angiogenesis) in ischemic conditions. (Arderiu Marqués, Gemma).
- Endothelial dysfunction and cardiovascular disease: Impaired blood vessel function as a key factor in the development of atherosclerosis, hypertension, and other

cardiovascular disorders. (Arderiu Marqués, Gemma).

- Tissue factor and angiogenesis: The role of thrombogenic tissue factor (TF) in vascular remodeling and pathological angiogenesis. (Arderiu Marqués, Gemma).

SCIENTIFIC CHALLENGES

- Characterize ASCs (adipose stem cells) obtained from different tissues of individuals with various pathologies and determine their angiogenic capacity for use in cell therapy.
- Enhance the angiogenic capacity of ASCs through differentiation, genetic manipulation, and/or the use of their derivatives, such as microvesicles.

ACTIVE & AWARDED GRANTS

- Arderiu Marqués, Gemma. Reprogramación directa de las ASCs a células endoteliales mediante factores de transcripción para inducir la regeneración vascular en la enfermedad arterial periférica. PI20/01517. Instituto de Salud Carlos III (ISCIII). Duration: 2021-2024. 147.620,00 €
- Arderiu Marqués, Gemma. Nueva estrategia terapéutica mediante vesículas extracelulares derivadas de células madre derivadas de tejido adiposo como medicina regenerativa en enfermedades vasculares periféricas. PI23/01136. Instituto de Salud Carlos III. Duration: 2024-2026. 152.500,00 €
- Arderiu Marqués, Gemma. Repairing early endothelial cell damage to promote cardiovascular health: interplay between endothelial cells and monocytes as a primary strategy in ischemic diseases. MARATO 202303-30. Fundacio La Marato de TV3. Duration: 2024-2027. 149.785,00 €
- Arderiu Marqués, Gemma. Obesidad e insuficiencia cardíaca con fracción de eyección preservada: papel de las ASCs derivadas del tejido adiposo. SEC 2024-2. Sociedad Española de Cardiología (SEC) Duration: 2024-2028. 15.000,00 €

SCIENTIFIC PRODUCTION

- Arderiu G, Bejar MT, Civit A, Peña E, Badimon L. Crosstalk of human coronary perivascular adipose-derived stem cells with vascular cells: role of tissue factor. BASIC RESEARCH IN CARDIOLOGY. 2024; 119(2). DOI:10.1007/s00395-024-01037-1. PMID:38430261. IF:7,500 (Q1/1D). Document type: Article.
- Arderiu G, Civit A, Díez A, Moscatiello F, Ballesta C, Badimon L. Differentiation of Adipose Tissue Mesenchymal Stem Cells into Endothelial Cells Depends on Fat Depot Conditions: Regulation by miRNA. Cells. 2024; 13(6):513. DOI:10.3390/cells13060513. PMID:38534357. IF:5,100 (Q2/4D). Document type: Article.