Universidad de Navarra
Facultad de Ciencias

MÁSTER EN INVESTIGACIÓN BIOMÉDICA
Research Project Proposal
Academic year 2026-2027

Project Nº 40

Title: Study of the functionality and sex-dependent variations of the lymphatic vasculature in the **resolution of post-myocardial infarction inflammation**

Department/ Laboratory.
Departamento de Bioquímica y Genética (Grupo de cardiopatía isquémica).
Facultad de Ciencias. UNAV

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Summary

Cardiovascular disease (CVD) remains the leading cause of death worldwide, accounting for approximately 17 million deaths per year. In Spain, CVD was responsible for 26.13% of total mortality. Women suffer from 5.75% more CVD than men (INE 2022and is associated with a poorer prognosis.

Cardiac disease is now considered an inflammatory condition in which modulation of immune cell activity and their trafficking through blood and lymphatic vessels is crucial. Until very recently, the **lymphatic vasculature** had been largely overlooked in the context of heart disease. Interestingly, lymphatic vessels appear to respond differently in male versus female animal models. This finding, together with the sex differences already mentioned, has prompted us to **ask how these vessels respond in models of acute myocardial infarction**.

The Department of Biochemistry, in collaboration with CIMA and the Hospital of Navarra, is developing the FIBROS-X project lead by Dr B. Pelacho, which addresses the molecular study of cardiac regeneration as a function of biological sex. This Master's project represents a component of project and focuses on the **differential study of lymphatic vasculature functionality following myocardial infarction**, with particular emphasis on differences between male and female mice.

We will use **histological techniques**, **flow cytometry**, and **gene expression analysis** to characterize lymphatic vessel structure and permeability in infarcted hearts during the remodeling process. In addition, we will study *in vitro* **transmigration** of immune cells across lymphatic monolayers, as well as the capacity of myeloid and fibroblastic cells to **transdifferentiate** into vascular precursors. Special emphasis will be placed on the analysis of sex-dependent differences throughout this work.

yes	X
no	

Does the project include the possibility of supervised animal manipulation to complete the training for animal manipulator?