Universidad de Navarra
Facultad de Ciencias

MÁSTER EN INVESTIGACIÓN BIOMÉDICA
Research Project Proposal
Academic year 2025-2026

Project Nº 18

Title: *New Therapeutic Strategies based on Epigenetic Mechanisms to combat the Hepatocellular Carcinoma.*

Department/ Laboratory *Hepatology: Molecular Mechanisms and Targets in Liver Carcinogenesis group. Solid Tumors Program. CIMA – University of Navarra.*

Director 1 *Amaya López Pascual*
Contact: *alopezpas@external.unav.es*
Codirector: *Maite G Fernandez-Barrena*
Contact: *magarfer@unav.es*

Summary

Hepatocellular carcinoma (HCC) is a complex cancer with a poor prognosis, a cure rate of just 25%, and a 5-year survival below 30%. These outcomes underscore the urgent need for improved therapeutic strategies. While immune checkpoint inhibitors (ICIs) have shown promise in treating unresectable solid tumors, their efficacy in HCC remains limited, demanding further research to overcome resistance mechanisms. A critical area of focus is understanding immune evasion in HCC and identifying effective combination therapies. Epigenetic mechanisms, positioned at the intersection of the microenvironment and the genome, have emerged as key modulators of metabolism and cell fate. Specific epigenetic alterations hold potential as biomarkers for identifying immunotherapy responders and as targets to overcome resistance to ICIs. Their attractiveness lies in their reversibility, flexibility, and diverse interactions, making them amenable to pharmacological interventions.

Our group has identified the histone methyltransferase CARM1 as a contributor to hepatocarcinogenesis, with a role in metabolic reprogramming and potential as a combinatorial target with ICIs. This proposal aims to: (i) investigate the role of CARM1 in HCC using liver-specific knockout models, and (ii) evaluate the antitumoral effects of CARM1 inhibition in HCC, alone and in combination with ICIs. Using advanced experimental techniques and clinically relevant in vitro and in vivo models, we will employ innovative molecular tools to validate CARM1 as a pharmacological target in HCC. The project takes an interdisciplinary, translational approach to generate preclinical evidence that may guide future clinical trials and ultimately improve outcomes for patients with this aggressive cancer.

yes	X
no	

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