Universidad de Navarra
Facultad de Ciencias

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

Project Nº 32

Title: *Neoantigen vaccines against Fibrolamellar carcinoma*

Department/ Laboratory
Program of Immunology and Immunotherapy, CIMA, Labs 3.01-3.02

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Summary

Fibrolamellar carcinoma (FLC) is a liver tumor with no effective systemic treatment. More than 90% of FLC patients share the DNAJB1-PRKACA gene fusion, which generates new sequences (neoantigens; neoAgs) that could be recognized by tumor-specific T cells, making them an attractive target for immunotherapy approaches. Our group is focused on the identification of neoAgs in liver tumors for vaccine design, with translation to clinical trials. Thus, the **goal** of this project is the identification and immunogenic characterization of neoAgs derived from the DNAJB1-PRKACA fusion region for vaccine design and preclinical testing. **Methodology**: The project initially includes (a) in silico selection of neoAgs, (b) in vitro binding studies of neoAgs to MHC molecules and (c) in vivo vaccination experiments in wild-type and humanized murine models. Vaccine immunogenicity will be demonstrated by ELISPOT, ELISA and flow cytometry experiments determining T cell activation. In parallel, the project involves plasmid construction and cell transduction to generate stable murine and human tumor cell lines expressing the DNAJB1-PRKACA fusion region. Neoantigens showing successful immunogenicity will be further tested using these tumor cell lines, analyzing in vitro tumor recognition by neoAg-specific T cells and in vivo antitumor therapeutic efficacy of DNAJB1-PRKACA fusion-based vaccines. Moreover, in order to improve vaccine efficacy at the level of antigen processing and presentation, sequence-optimizing changes will be introduced, in combination with drugs that modulate the antigen processing machinery.

yes	x
no	

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