



**MÁSTER EN INVESTIGACIÓN BIOMÉDICA**

**Research Project Proposal**

Academic year 2022-2023

**Project Nº 09**

**Title:** *Microproteins as a new source of anticancer vaccines*

**Department/ Laboratory** *Laboratory where the project will be carried out indicating Department, Area, Faculty, CUN, CIMA etc.*

CIMA 406

**Director 1** *Puri Fortes*

**Contact:** *pfortes@unav.es*

**Summary**

Molecular biology has traditionally overlooked the relevance of small cellular factors. Some years ago, the scientific community was surprised to find that thousands of small RNAs or microRNAs exist in the cell that regulate gene expression. Now is the time for microproteins. The existence of microproteins has been ignored until very recently. The reason for this is that their small size complicates the traditional protocols for protein studies and the identification of microprotein genes in the genome. This can be changed with ribosome profiling studies, CRISPR-Cas and the new split GFP technology. In our laboratory, we have performed multiomic analyses of cancer-relevant RNAs and ribosome profiling studies. Their combination has allowed us to identify a collection of microproteins that are overexpressed in cancer and absent from healthy tissue. We now want to study this collection by tagging their carboxi-terminal ends with CRISPR technology to demonstrate their existence, functionality and, in collaboration with Dr. Pablo Sarobe, their potential to develop anticancer vaccines. This will require cloning; cell transfection; CRISPR-Cas genome editing and evaluation; gene expression analyses by RT-qPCR, Western-blot and FACS; functional studies with immunoprecipitation coupled to mass-spectrometry and gene silencing by RNA interference and; evaluation of the immunogenicity of the final vaccine. We believe that these studies may represent a breakthrough for anticancer therapy.

yes	x
no	

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