



MASTER'S DEGREE IN BIOMEDICAL RESEARCH

Research Project Proposal

Academic year 2023-2024

Project Nº 31

Title: Exploring microproteins to unveil novel anticancer therapies

Department/ Laboratory DNA and RNA therapy. Lab 406. CIMA /UNAV.

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Summary

Recent years have served to demonstrate the immense relevance of microRNAs and long non-coding RNAs for cell homeostasis, and their fundamental role as disease biomarkers and molecular targets. Now, we are in the era of microproteins. Unnoticed until very recently, microproteins are rising as essential factors in the edge of evolution. Experiments performed so far reveal that microproteins are very numerous and poorly conserved, but that many are essential for cell viability. We believe that some of them could be excellent targets in anticancer therapies.

Ribosome profiling coupled with mass spectrometry experiments performed in the lab with samples from patients with hepatocellular carcinoma (HCC), have identified around 19000 canonical proteins and around 6000 non-annotated novel microproteins. We are searching within this community to identify those essential for tumor cell proliferation. Top candidates will be interrogated in a CRISPR-Cas screen and those with relevance in cell growth will be identified by high-throughput sequencing. After validation of the best candidates with independent techniques, we will select those whose inhibition plays a major impact in the growth of HCC cells in culture and in animal models. Association studies will be performed to identified those whose expression is related to patient survival. Looking for functional hints, microprotein tagging will help to identify location and interaction partners. The final aim is to walk towards novel therapies for the treatment of HCC.

yes	x
no	

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