Universidad de Navarra
Facultad de Ciencias

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

Project Nº 43

Title: *Targeting tumor metastasis with aptamers*

Department/ Laboratory
Aptamer lab, Therapeutic Innovation Program, CIMA

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Summary

Metastasis remains the leading cause of cancer-related death, and effective treatments for metastatic and therapy-resistant tumors are still very limited. Despite advances in cancer immunotherapy, many patients with advanced disease fail to respond or eventually relapse, highlighting a critical unmet clinical need for innovative strategies that can target and eliminate disseminated tumor cells.

In our lab, we are building an innovative RNA aptamer platform to precisely modulate the immune system and improve cancer treatment. Aptamers are small RNA molecules that can bind specific cell types with high affinity and deliver therapeutic cargos directly into target cells, offering a powerful and versatile approach for next-generation immunotherapies.

In this Master's project, the student will focus on targeting metastatic and therapy-resistant tumor cells; one of the main obstacles in oncology. Using in vivo SELEX technology, we will identify RNA aptamers that selectively home to metastatic tumors in mouse models. The project will combine experimental and computational approaches, including high-throughput sequencing and bioinformatic analysis, to track aptamer selection and identify top candidates.

Selected aptamers will be validated through molecular and cellular assays to evaluate their specificity and function. Finally, they will be engineered to deliver immunomodulatory RNA molecules aimed at enhancing antigen presentation and improving the efficacy of immune checkpoint therapies.

This project offers hands-on training in cancer immunology, RNA biology, and advanced technologies such as in vivo selection and sequencing analysis, within a dynamic and collaborative research environment.

yes	x
no	

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