



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

Project Nº 60

Title: Validation of the clinical significance and mechanistic characterization of proteins with prognostic value found in liquid biopsies of lung cancer.

Department/ Laboratory Lungsearch Laboratory. Solid Tumors Program. Cancer Division. Center for Applied Medical Research (CIMA). Department of Pathology, Anatomy and Physiology. School of Medicine.

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Summary

Lung cancer is the leading cause of death globally. Estimations for 2026 from the Global Cancer Observatory indicate that it causes one out of five deaths. Although diagnosis and treatment has improved, five-year survival is below 20% mostly due to its diagnosis at advanced stages. Furthermore, a proportion of tumors in early stages relapse after surgery. Therefore, identification and validation of prognostic biomarkers is urgently needed to improve survival and identify high-risk relapsing patients who require complementary treatments. In the last years, the LUNGSEARCH Laboratory from CIMA has identified prognostic biomarkers in blood liquid biopsies enabling the detection of proteins with prognostic value in overall survival (OS) and disease-free survival (DFS). The aims of this Master Project will be to validate these proteins and to characterize by in vitro and in vivo experiments the responsible biological mechanisms and their importance in lung carcinogenesis.

In vitro assays will be performed to evaluate the biological effect (e.g. cellular proliferation or migration) of these proteins in terms of their expression and their expression manipulation (e.g. CRISPR, shRNAs) in lung cancer cell lines. Furthermore, to assess the relationship of the expression of these proteins with OS and DFS, immunohistochemistry will be done in lung cancer tissue arranged in TMAs (tissue multiplex assays) from patients of Clínica Universidad de Navarra (2000–2024). The protein showing the most promising results will be selected for in vivo studies in mice to determine the effect of manipulating its expression and study its influence in the tumor microenvironment.

Table with 2 columns and 2 rows: yes, X; no,

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