Universidad de Navarra

Facultad de Ciencias

MÁSTER EN INVESTIGACIÓN BIOMÉDICA
Research Project Proposal
Academic year 2025-2026

Project Nº 12
Title: *Culture of lung cancer patient-derived tumor fragments, as platforms to predict response to immunotherapy-based drugs*
Department/ Laboratory *Laboratory of LUNGSEARCH, Program in Solid Tumors, CIMA*
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Summary

The short-term 3D *ex vivo* culture of patient-derived tumor fragments (PDTFs) is a highly convenient preclinical platform recently developed to test anticancer therapies, including immunotherapies. This approach may help guide clinical trials. It is an attractive method that uses tumor fragments cultured *ex vivo*, allowing therapies to be tested in a context where tumor architecture is preserved. PDTFs can be maintained in culture for several days while retaining all immune cell populations. They can also be frozen and later thawed to test different drugs *ex vivo*. Moreover, this platform can be used to identify cellular or cytokine/chemokine factors associated with treatment response.

The goal of this project is to test novel immunotherapy-based strategies in PDTFs derived from lung cancer patients. Methods include culturing PDTFs, drug testing, and characterizing the response by: a) dissociating tumors and analyzing tumor, immune, and other tumor microenvironment cells; b) performing multispectral immunofluorescence (mIF) on histological sections of PDTFs to simultaneously evaluate a panel of immune-related markers; c) conducting multiplexed analysis of cytokine/chemokine panels using Luminex technology.

Drugs to be tested in PDTF cultures will include chemo-immunotherapy combinations and bispecific antibodies designed to enhance the activity of cytotoxic lymphocytes and antigen-presenting cells.

The student selecting this master's project will gain experience with cutting-edge technologies applied to clinical challenges. PDTF cultures from lung cancer patients may serve as *ex vivo* "avatars" to anticipate individual responses to therapy, as demonstrated in several studies. Therefore, this approach could represent a breakthrough in personalized medicine. Experience in this field can be highly valuable for careers in biomedical laboratories.

yes	X
no	

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