

Research Project Proposal
Academic year 2020-2021

Máster en Investigación Biomédica

Project Nº 57 ASIGNADO

Title: *Genetically engineered mouse models by Crispr/cas9 genome editing for the screening of cutting-edge immunotherapies*

Department/ Laboratory
Division of Oncology. Solid Tumors. Lab 1.02. (CIMA)

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Summary

Lung cancer still represents a devastating disease. Yet, current efforts to dissect critical determinants and molecular mechanisms of tumor development together with their response to novel immunotherapies have been hampered by the paucity of experimental available models. We have recently developed novel GEMMs (genetically engineered mouse models) of autochthonous lung tumors with complex genocopies of humans tumors (The Cancer Genome Atlas) by using genome editing CRISPR/Cas9 technology. This project aims: (1) To dissect the contribution of changes in the phenotypic and genomic mutational landscape to early and late steps of tumor progression. (2) To dissect the immune infiltrate associated with different GEMM concurrent mutants. (3) To use this information for the screening of novel cutting-edge immunotherapies and assess their mechanistic efficacy in organoids and in vivo models.

The approach will heavily rely on cutting-edge technologies of genome editing, GEMMs, organoids, the use of adeno, retro and lentiviral transduction systems, cell and molecular biology techniques (RT-qPCR, Western, cloning by homologous recombination, and functional assays (CHIP, kinase assays, NGS), image analysis (microCT scans, X-rays, microPET, bioluminescence in vivo), bioinformatic and computational tools. This approach will preserve immunosurveillance and tumor-stromal interactions ideal to unveil critical targets for the development and evaluation of novel immunotherapies. We look for an open-minded, highly motivated young scientist with strong organizational and excellent communications skills.

yes	X
no	

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