



Research Project Proposal

Academic year 2020-2021

Máster en Investigación Biomédica

Project Nº 29

Title:

Riboswitches for therapeutic expression

Department/ Laboratory *Laboratory where the project will be carried out indicating Department, Area, Faculty, CUN, CIMA etc.*

Gene therapy and regulation of gene expression. Lab 406. CIMA

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Summary

Gene therapy is expected to transform the health system in the coming years. Before, it is compulsory to have a technology that sustains the level of the therapeutic gene within the therapeutic threshold. A stringent example is the cytokine IL12, an excellent immune activator with proven efficacy as antitumor agent whose use is precluded by the toxicity of high doses. Ideally, therapeutic levels could be controlled by clinicians with a simple drug and drug dose should be adjusted in each patient to reach efficacy. This describes an inducible system. Several inducible systems have been developed with little translation to the gene therapy arena. To fill this gap, in the lab we have developed a potent system, small in size, invisible for the immune system, safe and cell-type independent. This project aims to develop an upgraded version that responds to FDA-approved drugs with no toxicity and excellent bioavailability, an essential next step in the way to the market. This will require (i) riboswitch selection using a variant of SELEX and high throughput sequencing, (ii) evaluation of the functionality of enriched riboswitches in culture cells and animal models, and (iii) proof of concept of the best-in-class candidate to regulate IL12 and achieve toxicity-free antitumor activity. We have an excellent technology than needs a final impulse to show its robustness, before it can be moved forward to the gene therapy field.

yes

x

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

no