



Research Project Proposal
Academic year 2021-2022
MÁSTER EN INVESTIGACIÓN BIOMÉDICA

Project Nº 03 ASIGNADO

Title: Unraveling the link between epigenetics, RNA transcription and splicing in cancer

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

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Summary:

Transcription is a precisely controlled process that allows the expression of genes in a tissue and temporal manner. Epigenetic mechanisms, including DNA methylation and histone modifications, play a key role in transcription activation or silencing, modifying chromatin structure and DNA accessibility. After transcription, alternative splicing regulates gene expression generating distinct mRNA species from one primary transcript. Both events are altered in cancer. Our research is focussed on understanding how epigenetics and splicing could interact and collaborate to regulate the tumorigenic process and translate our findings into clinical applications. We have described that the splicing regulator SLU7 is essential for the survival of cancer cells of different tissue origin (Urtasun et al, Oncogene 2016; Jimenez et al, NAR 2019) and that it is required to preserve the expression of the DNA methyltransferase 1 (DNMT1) and therefore the correct DNA methylation maintenance (Recalde et al. submitted).

The aim of our research is now to better characterize this new link between epigenetics and splicing and develop new strategies to target SLU7 in vivo to treat cancer.

To this aim, the methodology to be used will be:

- different human cancer cell lines,*
- transfections with specific siRNAs,*
- assays to measure cell proliferation, apoptosis, DNA methylation, splicing, NMD, among others,*
- techniques such as Western blot, co-immunoprecipitation, immunofluorescence, real time PCR, methylation specific PCR (MSP), cloning.*

yes		Does the project include the possibility of supervised animal manipulation to complete the training for animal manipulator?
no	X	