



Research Project Proposal
Academic year 2015-2016

Project Nº 56 ASIGNADO
Title: <i>STUDY AND CHARACTERIZATION OF A NEWLY DISCOVERED ONCOGENIC DOMAIN IN LEISHMANIA SPP.</i>
Department/ Laboratory <i>Department of Microbiology and Parasitology. Instituto de Salud Tropical (ISTUN) University of Navarra.</i>
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<p>Leishmaniasis is one of the 17 neglected tropical diseases recognized by the WHO, caused by the protozoan parasites of the genus <i>Leishmania</i>. Due to the lack of an effective vaccine, current approaches of disease control are limited to the management of vector and reservoir hosts in order to reduce transmission, and treatment by chemotherapeutic agents. However, efficiency of current treatment strategies is reduced by growing incidences of drug resistance. The availability of the complete genome sequence of <i>Leishmania spp.</i> and the better understanding of the biology of these parasites offer new directions for research in the identification of therapeutic targets and biomarkers, and for the design of novel treatment strategies. Recent studies have identified, in both tumor cells and parasites, similar molecular targets. Various drugs, initially designed as antitumor agents, have been shown to also exhibit leishmanicidal activity, with some of them already in use in the clinic (e.g., miltefosine and edelfosine). It has also been observed that certain characteristics of the proliferation of <i>Leishmanias</i> inside macrophages resemble those of the proliferation of cancer cells. Furthermore, many infectious diseases, including parasitic infections like schistosomiasis, have also been demonstrated to be oncogenic. Future studies in the field are likely to be directed towards the identification of molecules commonly involved in both infectious diseases and cancer. We have recently identified the presence of the homolog of an oncogene in the</p>



genome of *Leishmania spp* and we called it *YinP*. *YinP* harbours an oncogenic domain. We would like to study and characterize this newly discovered oncogenic domain from *Leishmania spp*.

Methods currently used in our Lab:

Cell culture; RNA extraction; RNA Retrotranscription; Primers Design; gene amplification by PCR; Agarose gel and electrophoresis; PCR product purification; ligation of insert in a vector of expression; Transformation of *E. coli* bacteria; Sequencing; Growth of transformed bacteria; Extraction of plasmids; Gene transfection; Selection of mutants; Assays of malignancy and responses to treatments (proliferation, invasion and clonogenic Assays); Real-time PCR; molecular and cellular strategies based on fluorescent fusion proteins; Western Blot; Microscopy; Cytometry.

References *References could be added (no more than three)*

1. A. C. Ivens et al., *Science* 309, 436-442 (2005).
2. W. Xie et al., *PLoS.One.* 7, e42253 (2012).
3. L. Cheng et al., *J.Clin.Invest* 122, 2857-2870 (2012).

POSSIBILITY OF PhD

[Redacted area]

YES*

* (PhD grant required) To be discussed.