Universidad de Navarra

Máster en Investigación Biomédica
Research Project Proposal
Academic year 2022-2023

Project Nº 43

Title: Emerging Infectious Diseases: Therapeutics development and assay

Department/ Laboratory *Laboratory where the project will be carried out indicating Department, Area, Faculty, CUN, CIMA etc.*
ISTUN Instituto de Salud Tropical Universidad de Navarra; Departamento de Microbiología y Parasitología

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Summary:

Emerging and reemerging infectious diseases (EIDs) are increasing globally. Among them, vector-borne zoonotic diseases are major sources of mortality and morbidity worldwide. Leishmaniasis is a group of diseases caused by protozoan parasites from the genus *Leishmania* transmitted by female sand flies. According to the World Health Organization (WHO) data, these infections are endemic in 98 countries worldwide, with more than 350 million people at risk [1]. The clinical manifestations range from localized skin lesions to fatal visceral parasitemia. Currently, effective vaccine does not exist and treatments are largely unsuccessful, it's therefore extremely important to look for new therapeutic targets and drug therapies.

Therapeutic targets and new treatments: Our research team has recently identified potential therapeutic targets for the development of new drugs against leishmaniasis[2–5]. At the same time, newly synthetized chemical compounds with leishmanicidal activity have been identified in collaboration with the Department of Pharmaceutical Technology and Chemistry [6,7]. The aims of the project are to deep into the mechanism of action of such compounds, look for potential therapeutic targets and analyze the role of the newly discovered ones in drug resistance

Methodology: parasite culture handling; cell viability assay MTT; *In vitro* infection of macrophages; in vivo infection of mice; cell stain; Molecular techniques: nucleic acids extraction from biological samples, conventional PCR, Real-time PCR

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REFERENCES

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3. Vacas, A., Fernández-Rubio, C., Larrea, E., Peña-Guerrero, J. & Nguewa, P. A. LmjF.22.0810 from Leishmania major Modulates the Th2-Type Immune Response and Is Involved in Leishmaniasis Outcome. *Biomedicines* **8**, (2020).

4. Algarabel-Olona, M. *et al.* In Leishmania major, the Homolog of the Oncogene PES1 May Play a Critical Role in Parasite Infectivity. *Int. J. Mol. Sci.* **22**, (2021).

5. Peña-Guerrero, J. *et al.* Discovery and Validation of Lmj_04_BRCT Domain, a Novel Therapeutic Target: Identification of Candidate Drugs for Leishmaniasis. *Int. J. Mol. Sci.* **22**, (2021).

6. Fernández-Rubio, C. *et al.* Leishmanicidal activities of novel methylseleno-imidocarbamates. *Antimicrob. Agents Chemother.* **59**, 5705–5713 (2015).

7. Fernández-Rubio, C. *et al.* Leishmanicidal Activity of Isoselenocyanate Derivatives. *Antimicrob. Agents Chemother.* **63**, (2019).

yes	X
no	

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