



MÁSTER EN INVESTIGACIÓN BIOMÉDICA

Research Project Proposal

Academic year 2022-2023

Project Nº 49 ASIGNADO

Title: PRODUCTION AND BIOLOGICAL EVALUATION OF MULTIFUNCTIONAL POLYMERIC FIBRES BY SOLUTION BLOW SPINNING FOR THE TREATMENT OF CUTANEOUS INFECTIONS INCLUDING LEISHMANIASIS

Department/ Laboratory

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Summary

More than half of the twenty neglected tropical diseases (NTDs) listed by the World Health Organization (WHO), are cutaneous diseases (pathologies with skin manifestations), often associated with long-term disability, stigma and mental health problems. Cutaneous leishmaniasis (CL), caused by the intracellular protozoan *Leishmania major*, is one of these skin NTDs, and its manifestations are slow-healing chronic ulcerations, which develop into scars causing disfigurement and social stigma.

This TFM project aims to establish the conditions under which miltefosine (MF) and other antiprotozoal drugs currently administered for the treatment of CL can be incorporated into biocompatible polymeric fibres obtained by solution blow spinning (SBS) in the form of sprayable wound dressings, for the controlled release of the drug through the skin.

The research project will involve an exhaustive investigation at a physicochemical level about the affinity of the drugs for the fibres and their release capacity. Subsequently, the microbicidal activity of the drug-loaded fibres produced by SBS will be investigated in vitro, as well as the evaluation of the biological activity in *Leishmania* cultures and in mouse macrophages. Finally, tests will be carried out on the lesions produced in infected experimental models. These assays will provide information on the genes involved in the drug's activity and its ability to modulate host immunity, a key aspect of parasite elimination. The results obtained will help to correlate the morphological properties of the drug (such as MF) functionalized fibres with the biological activity and thus better understand the mechanism of action, with the aim of developing alternatives to existing current formulations for the treatment of CL.

yes	X
no	

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