

Research Project Proposal
Academic year 2017-2018

Project Nº 13
Title: Study of biodistribution of NP in Leishmania spp infected mice by Near-IR and bioluminescence imaging.
Department/ Laboratory: Tropical Health Institute, University of Navarra
Director: Dra. Socorro Espuelas Contact: sespuelas@unav.es Codirector: Dra. Esther Moreno Contact: emoreno@unav.es
Summary <p>The aim of the project is the analysis of the effect of visceral leishmaniasis (VL) infection in the biodistribution of biodegradable and polymeric albumin nanoparticles (NP). It is generally accepted that liver, spleen and bone marrow is the ultimate fate of both NP and VL parasites after parenteral administration [1]. However, the effect of infection in NP biodistribution and interaction with infected macrophages has been poorly analyzed. Only one paper described the lower uptake of polystyrene NP by infected macrophages in comparison with non infected cells [1]. At body level, VL infection produced granuloma formation in the liver and great destruction of spleen architecture that could affect the kinetic and amount of NP accumulation in these organs [2]. Moreover, NP could have immunomodulatory properties that can collaborate with the loaded drugs as a short of chemoimmunotherapy and faster resolve leishmania infection. Leishmaniasis is currently associated with the immune status of the patient and immunosuppression considered as risk factor for developing the illness.</p> <p>For that purpose, we will prepare and optimize the loading of indocyanine green (a dye with excitation and emission bands within the near-infrared optical window) into albumin nanoparticles (nanotechnology-pharmaceutical technology). Thus, we will analyze the co-localization of transgenic <i>Leishmania infantum</i> that express luciferase and nanoparticles by simultaneous in vivo bioluminescence and Near-IR in vivo imaging of <i>L. infantum</i> BALB/c mice.</p>
References <p>[1] Moghimi, Parhamifar et al., 2012, <i>J Innate Immun</i>, 4, (5-6), 509-528</p> <p>[2] Firdessa, Oelschlaeger et., 2014, <i>Eur J Cell Biol</i>, 93, (8-9), 323-337</p>



[3] Engwerda, Ato et al., 2004, Trends Parasitol, 20 (11), 524-530