Instituto de Medicina Molecular João Lobo Antunes

Master Project Proposal

Title: Antimicrobial and Anticancer Properties of Peptides from Argentinian Amphibians

Synopsis:

In this project, we will study the biological potential of peptides isolated from the Argentinian amphibian *Pleurodema bufoninum* (1). P. bufonium, also known as the large four-eyed frog, is native to South America, and the peptides excreted in its skin have been characterized by our Argentinian and Brazilian colleagues. One peptide in particular, sequence DDGEEEAESEVANPEENTEGEKKKKCRRRKGSKLLKRCRGVKI-COOH, also known as PBF8, has potential as an anticancer peptide. Such peptide s are beleived to act on tumoral cells by destabilisin the membrane, while other mechanisms are also known, (2).

In this project we will aseess the anticancer potential of PBF8, and related peptides by testing it against common tumour cell lines, such as HeLa, 4T1, D122, representing cervical cancer, breast cancer, lung carcinoma cell models.

Furthermore, the mode of action of the peptide on the cell will be probed by assessing the requirements for membrane interaction with membrane models, the solution and membrane structure, and high-resolution microscopy using atomic force microscopy (AFM) (3).

Finally antimicrobial action will be probed assaying the efficiency of the peptide in inhibiting important microbial targets.

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Webpage of the group: https://imm.medicina.ulisboa.pt/en/investigacao/labs/santos-nuno-c-lab/

Bibliography:

(1) See http://www.iucnredlist.org/details/summary/57284/0 a description of the species.
(2) Gaspar, D. et al. *Front. Microbiol.* **2013**, *4*, 294.
(3) Eaton, P., & West, P. (2010). *Atomic Force Microscopy*. Oxford: OUP.

Remunerated or volunteer training:
Volunteer