

IBMC - Instituto de Biologia Molecular e Celular

Postdoctoral fellowship (f/m)

Internal Code: Norte2020HOST03

Project: NORTE-01-0145-FEDER-000012, Structured Programme on Bioengineering Therapies for Infectious Diseases and Tissue Regeneration

Title: AIP56 as an antigen-delivery platform

IBMC/i3S is opening **1 (one) Postdoctoral Fellowship** to join its Research Program in New therapies for infectious.

We are looking for a Fellow holding a PhD in Biochemistry, Microbiology, Biology, or related fields with experience and full autonomy in working in Molecular and Cellular Biology, Microbiology, namely in the field of bacterial toxins, and preferably with experience in protein expression and purification as well as structural biology. English language, both spoken and written, and good inter-personal relationships in the context of a multidisciplinary research team are essential attributes.

Group: Fish Immunology and Vaccinology

PI: Nuno M. S. dos Santos

Work Plan:

Toxins are remarkably specific, extremely potent and extraordinarily efficient, and the modular domain-based structure of AB toxins, with a “catalytic domain” that target molecules playing crucial functions in cellular processes, a “translocation domain” able to translocate the enzymatic domain or other moieties into the cell cytosol, and a “receptor-binding domain” providing targeting specificity, confers them unique features for being used as biotechnological tools (1-3). Recently, we have identified in the bacterial toxin AIP56 specificities that makes it a privileged platform for being engineered and used as biotechnological tool. Given the specificity of AIP56 for targeting macrophages and DCs, two main antigen-presenting cells (APCs) ((4, 5)), and the knowledge we have regarding its functional domains, it is now possible to engineer AIP56 for using it as antigen-delivering platform, directing AIP56-fused antigens to APCs. Thus, known and traceable peptide and/or protein antigens will be fused to AIP56 lacking its catalytic domain and containing or not its translocation domain, so the antigen can be delivered to the cell cytosol or to stay in the endosomal compartment. The immunological response to the selected antigens will be studied. For better understanding and developing/improving the delivery platform, the translocation process and identification of AIP56's receptor in the target cells will be also attempted.

1. Chaddock JA & Acharya KR (2011) Engineering toxins for 21st century therapies. *FEBS Journal* 278(6):899-904.
2. Antignani A & FitzGerald D (2013) Immunotoxins: The Role of the Toxin. *Toxins* 5(8):1486-1502.
3. Madhumathi J & Vema RS (2012) Therapeutic targets and recent advances in protein immunotoxins. *Curr Opin Microbiol* 15(3):300-309.
4. Trombetta ES & Mellman I (2005) Cell biology of antigen processing in vitro and in vivo. *Annu Rev Immunol* 23:975-1028.
5. Lewis KL, Del Gid N, & Traver D (2014) Perspectives on antigen presenting cells in zebrafish. *Developmental & Comparative Immunology* 46(1):63-73.

The work will be developed at Instituto de Investigação e Inovação em Saúde - i3S, Porto, Portugal.

The Postdoctoral Fellowship will be for 24 months, not renewable, and it is expected to start in May 1st 2016.

The fellowship amount is 1495 euros, paid by bank transfer, preferentially.
(<http://alfa.fct.mctes.pt/apoios/bolsas/valores>)

Fellowships are regulated by current laws relating to the Statute of Science Research Fellows, namely Law 40/2004 of August 18, amended and republished by Decree-Law No. 202/2012 of 27 August and the Regulation of Scientific Research Studentships of IBMC approved by Fundação para a Ciência e Tecnologia
(<http://www.fct.pt/apoios/bolsas/docs/RegulamentoBolsasFCT2015.pdf>)

Selection Committee:
Nuno M. S. dos Santos, PhD
Ana do Vale, PhD
Pedro J. B. Pereira, PhD

Applications are open from March 15th to March 31st, 2016.

To apply for the Postdoctoral Fellowship interested candidates must hold a PhD degree and submit the following documents a) Complete CV; b) Letter of Motivation; and c) Referee Letter, *via* the online application system:

<http://www.ibmc.up.pt/gestaocandidaturas/index.php?codigo=Norte2020HOST03>

The ranking list of candidates will be published at IBMC website, and the selected candidate will be notified by email.