IBMC - Instituto de Biologia Molecular e Celular

BI-Mestre fellowship (f/m)

Internal Code: Norte2020HOST29

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) BI-Mestre Fellowship** to join its Research Program in New therapies for infectious.

We are looking for a Fellow holding a Master degree in Biology, Biochemistry, Microbiology, or related fields with experience and full autonomy in working in Molecular and Cellular Biology, preferably with experience in working with cell lines (in vitro and ex vivo) and flow cytometry. Experience with CRISPR/CAS9 will be valued. 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. Despite the tropism to the APCs, other cell types which may eventually also be preferred targets of the toxin are not characterized, and we therefore intend to characterize in detail the populations and subpopulations that are targeted by the toxin. Moreover, identifying the receptor to which the toxin binds is also a primary goal. For this purpose, screenings will be performed using a susceptible cell line in which genes will be knocked out by CRISPR/CAS9.

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 & Verma 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 Cid 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.

CCDRn Comissão de Coordenação e Desenvolvimento Regional do Norte
NORTE2020 Programa Operacional Regional do Norte
PORTUGAL 2020
UNIÃO EUROPEIA Fundo Europeu de Desenvolvimento Regional

The BI-Mestre Fellowship will be for 7 months, not renewable, and it is expected to start in October 1st 2018.

The fellowship amount is 980 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
Johnny Lisboa, PhD

Applications are open from August 15th to September 10th, 2018.

To apply for the Postdoctoral Fellowship interested candidates must hold a Master degree and submit *via* the online application system:
http://www.ibmc.up.pt/gestaocandidaturas/index.php?codigo=Norte2020HOST29
the following documents:

a) Complete CV;
b) Letter of Motivation;
c) Contact Person(s) who may be asked to provide references about the candidate;

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