

## ***PCISBIO day @ ITQB, 5<sup>th</sup> of July 2018***

**Title:** Structural Characterization of Engineered Zika Virus Antigens with Human Antibodies

(Instruct R&D Project APPID: 502; Research team: M. Archer (PI) and D. Athayde, ITQB NOVA; I. Viana and R. Neto, Fiocruz- Recife and CSIC Madrid (J. M. Carazo))

**Speaker:** Margarida Archer (ITQB NOVA)

### ***Abstract:***

The current Zika virus (ZIKV) pandemic has been associated with unparalleled reports of neurological sequelae ranging from Guillain Barré syndrome to microcephaly, urging the development of diagnostic tools and vaccines to stop the infection spread. However, the lack of knowledge about several aspects of the immunopathology of the ZIKV hampers the development of traditional immunization strategies and adds new momentum to the quest for effective prophylactic and therapeutic approaches against ZIKV.

In this project we propose to characterize the structure of ZIKV epitope motifs that are unique to and conserved among ZIKV strains, and the interaction interface with the respective human antibodies. A multidisciplinary approach using *de novo* design of proteins, molecular simulations and biophysical characterization will be combined with 3D structure determination by X-ray crystallography and single particle cryo-electron microscopy (SP-EM). The identified structures will further be used as templates for the design of vaccine immunogens bearing the required biological properties to generate potent antibodies.

Funding will open novel lines of research at ITQB (Margarida Archer Lab) in collaboration with Aggeu Magalhães Institute of Fiocruz – Recife, Brazil (Isabelle Viana and Roberto Neto). Fiocruz is located in the epicenter of the recent ZIKV outbreak and has a long-term and well-documented experience with clinical and translational research in the infectious diseases field. Furthermore, Diogo Athayde, a student from M. Archer Laboratory was granted an Instruct internship fellowship to spend 6 months in the Biocomputing Unit of Consejo Superior de Investigaciones Científicas (CSIC) Madrid, under the supervision of Jose Maria Carazo, a renowned expert in SP-EM methodology and software developer, to gain know-how in SP-EM and characterize the structure of the ZIKV proteins in complex with the respective human monoclonal antibodies. This knowledge will be critical for the ITQB team to keep in the forefront of structural biology.