SCIENCESPRINGDAY

FCT FACULDADE DE CIÊNCIAS E TECNOLOGIA UNIVERSIDADE NOVA DE LISBOA

Chemistry Department

Biomimetics for Phosphoproteomics

Íris L. Batalha, O. Iranzo, C. Lowe, A. Cecília Roque

REQUIMTE, Biomolecular Engineering Laboratory

http://sites.fct.unl.pt/biomolecular_eng/

Íris L. Batalha

PhD Student

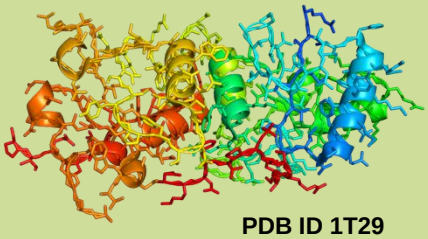
icb17770@campus.fct.unl.pt

2007 – BSc Applied Chem., FCT
2009 – MSc Biotechnology, FCT
2009 – Research Fellow, IBET
2010 – Visiting scientist at Wayne State University, USA
2010 – Best poster ESBES conf.
2011 – Honorable Mention SHIC´11
Current Pos. – MIT Portugal PhD Student in Bioeng. Systems, FCT

Objectives

Protein phosphorylation has been vastly associated with highly incident human diseases, such as cancer and Alzheimer's. However, it is difficult to identify and quantify phosphorylated proteins and peptides by Mass Spectrometry due to their low stoichiometry and abundance in plasma and serum samples. Current methodologies used to overcome these issues are either unspecific or costly.

The aim of this project is to develop **novel synthetic affinity ligands** using an high-throughput platform, which are both target-oriented and inexpensive.

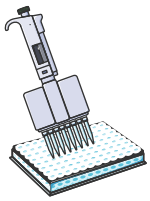


PDB ID 1T29

Methodology

Structural Studies

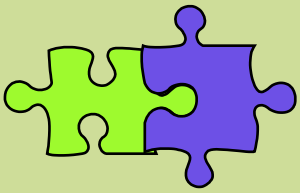
Solid-Phase Synthesis of Biomimetic Ligands



Screening against target proteins and peptides

Design of mimetic structure

Target Specificity



Expected Results

Three different combinatorial libraries of ligands were synthesized using solid-phase synthesis, yielding a total of 232 small molecules. These ligands were screened in parallel against phosphorylated and non-phosphorylated targets.

Binding conditions were optimized for the four lead ligands, by changing pH and salt concentrations, presenting high binding capacities and enrichment values between 65 and 92%.

Funding:

FCT Fundação para a Ciência e a Tecnologia
MINISTÉRIO DA EDUCAÇÃO E CIÊNCIA

We thank the financial support from Fundação para a Ciência e a Tecnologia, Portugal, through contracts PTDC/EBB-BIO/102163/2008, PTDC/EBB-BIO/098961/2008, PTDC/EBB-BIO/118317/2010 and SFRH/BD/64427/2009 for I.L.B., the Associate Laboratory REQUIMTE (PEst-C/EQB/LA0006/2011), and Santander Totta Bank – Universidade Nova de Lisboa for the Scientic Award 2009/2010.