



**Title: The role of underexplored post-translational modifications on STAT3 interactions in living cells**

Place of work/: Cell Structure and Dynamics Laboratory, Dep. Quimica e Bioquimica, Faculdade de Ciências, Universidade de Lisboa.

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Abstract / MSc thesis project proposal

Signal transducer and activator of transcription 3 (STAT3) is a transcription factor essential for normal development, immunity, tissue regeneration, cancer and response to stress and insults. In order to carry out its multiple functions, it forms homodimers and complexes with other proteins such as HIF1alpha, RelA/p65, GRIM-19, p300/CBP, RARalpha or Smads. These interactions could be regulated by some of the 80 post-translational modifications (PTMs) identified in STAT3, most of which remain barely explored. We have recently developed molecular tools to study the role of underexplored PTMs on STAT3 interactions in living cells. The student will continue to develop new cell lines and molecular tools, and characterize them by means of fluorescence microscopy, flow cytometry and molecular biology methods. Additionally, the student will be integrated in a workflow to analyse the proteome and interactome of different STAT3 proteoforms by mass spectrometry and proteomics methods. The student will carry out analysis of the response of STAT3 to inflammatory/developmental cytokines such as LIF, TNF-alpha or IL-6, among other extracellular factors. The student will also learn soft skills related to the preparation of scientific reports, and is expected to assist to regular scientific seminars at the FCUL Campus and the surroundings (Instituto de Medicina Molecular, Faculdade de Farmacia, Instituto de Saúde Ricardo Jorge,...). The responsibilities of the student will include: keeping organized, detailed and rigorous records of their work; regular reporting to bench tutors and supervisors; active participation in lab meetings; contributing actively to the organization of the laboratory and the maintenance of reagent stocks; and helping labmates with their own projects. We are looking for highly motivated, pro-active, hard-working and independent individuals to join our team and enjoy an exciting working environment. Students selected for this project, after thesis registration, are eligible to apply to the BioISI Junior Programme (supporting 8 students with a 6-month Scholarship(BII), being the selection criterium the academic merit of the candidates.