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JOB VACANCY IN
COMPUTATIONAL SYSTEMS BIOLOGY

The Molecular Systems Biology Group at the Center for Neuroscience and Cell Biology (CNC) – University of Coimbra, is seeking candidates for an **M.Sc.-level fellowship** under project FCOMP-01-0124-FEDER-020978 (ref. FCT: PTDC/QUI-BIQ/119657/2010)– "Finding the naturally evolved design principles of prevalent metabolic circuits", financed by national funds through FCT/MCTES and co-financed by the European Fund for Regional Development (FEDER) through "COMPETE – Programa Operacional Factores de Competitividade (POFC)".

Biochemical networks are mostly composed of a few prevalent elementary circuits whose design is constrained by natural selection for robust performance. As consequence we may expect, and are finding, some general principles associating design of biochemical circuits to their function. The discovery and understanding of these principles will have important implications. Thus, in circuit instances whose interaction structure is known, knowledge of the design principles helps clarifying function, functional consequences of perturbation and directions for reengineering. In circuit instances whose function is known, it helps identifying missing interactions and indicates semi-quantitative relationships among kinetic parameters and state variables. *This project addresses design principles of prevalent motifs in metabolic networks. We seek to: (a) identify the most frequent motifs, (b) identify the regulatory patterns that are most frequently associated to them, and (c) elucidate the design principles of the most prevalent hitherto uncharacterized motifs both at the level of regulatory "diagram" and at a semi-quantitative level. The work plan of this fellowship is focused on part (c). It will entail the mathematical modeling of metabolic circuits and the analysis of the relationship between circuit design and performance [1-3].*

The work will be carried out at CNC under supervision of Dr. Armindo Salvador. The fellowship will have the duration of 12 months, eventually renewable. Salary will be €980/month.

The successful applicant must hold an M. Sc. degree awarded by an University in the areas of Biochemistry, Bioinformatics, Biological Engineering, Biomedical Engineering or related areas, and demonstrate good mathematical and computational skills. Previous experience in kinetic modelling of chemical or biochemical processes is a preferential condition.

Applications must be sent by email to armindo.salvador@gmail.com no later than September 5, 2013 and include a motivation letter, CV, habilitations certificate, and two references (with indication of name, institution, email address and phone number) who may provide an objective assessment of the candidate. Selected candidates will be called for interview.

References

1. Coelho, P.M.B.M., A. Salvador, and M.A. Savageau (2009). *PLoS Comput. Biol.* **5**: e1000319.
2. Savageau, M.A. *et al.* (2009), Proc. Natl. Acad. Sci. USA **106**: 6435–6440.
3. Coelho, P.M.B.M., A. Salvador, and M.A. Savageau (2010) *PLoS ONE* **5**:e13031.

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