

BOLSA DE INVESTIGAÇÃO (M/F)

Referência: *BioModularH₂ (FP6-NEST-2005-Path-SYN-043340)*

Título do Projecto: Engineered Modular Bacterial Photoproduction of Hydrogen

Código interno: PR011703

Está aberto concurso para recrutamento de um(a) bolseiro(a) de Investigação para colaborar no projecto acima referido, financiado pela União europeia.

A bolsa, em regime de exclusividade, terá a duração de 5 meses, com início previsto em 15 de Fevereiro de 2010.

O valor mensal da bolsa será de € 745,00, pago por transferência bancária (preferencialmente).

Local de trabalho: Unidade de Investigação de Microbiologia Celular Aplicada, IBMC, Porto.

Programa de trabalho: Caracterização de partes e módulos sintéticos (ver sumário em anexo).

Perfil pretendido:

Os candidatos devem possuir licenciatura na área das Ciências Biológicas, Bioquímica ou afins. Dá-se preferência a candidatos com experiência em biologia molecular de cianobactérias.

O prazo para recepção de candidaturas decorre de 19 de Janeiro a 2 de Fevereiro de 2010.

As propostas deverão incluir CV e uma carta de referência e ser enviadas para o e-mail candidaturas@ibmc.up.pt com indicação do código interno (PR011703).

Após avaliação do CV, os candidatos pré-seleccionados poderão ser chamados para entrevista.

A contratação será regida pelo estipulado na legislação em vigor relativamente ao Estatuto de Bolseiro de Investigação Científica, nomeadamente a Lei 40/2004, de 18 Agosto, e o Regulamento de Bolsas de Investigação Científica do IBMC (www.ibmc.up.pt/fellowships.php).

Engineered Modular Bacterial Photoproduction of Hydrogen BioModularH₂

Supervisor/co-supervisor:

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Project Summary:

Our project aims at designing reusable, standardised molecular building blocks that will produce a photosynthetic bacterium containing engineered chemical pathways for competitive, clean and sustainable hydrogen production. Our engineering approach will provide the next generation of synthetic biology engineers with the toolbox to design complex circuits of high potential industrial applications such as the photo-production or photo-degradation of chemical compounds with a very high level of integration. For this purpose we have targeted on a cyanobacterium, a very chemically rich and versatile organism highly suitable for modelling, to be used as future platform for hydrogen production and biosolar applications. In particular, our synthetic biological approach aims at creating an anaerobic environment within the cell for an optimized, highly active iron-only hydrogenase by using an oxygen consuming device, which is connected to an oxygen sensing device and regulated by artificial circuits.

This project will also help to establish a systematic hierarchical engineering methodology (parts, devices and systems) to design artificial bacterial systems using a truly interdisciplinary approach that decouples design from fabrication. We aim to construct biological molecular parts by engineering proteins with new enzymatic activities and molecular recognition patterns, by combining computational and *in vitro* evolution methodologies. Subsequently, we will design novel devices (e.g. input/output, regulatory and metabolic) by combining these parts and by using the emerging knowledge from systems biology. Furthermore, we shall design custom circuits of devices applying control engineering and optimisation. In parallel, we will develop a cyanobacterial “chassis” able to integrate our synthetic circuits using a model-driven biotechnology.