MASTER THESIS OPPORTUNITIES

The SysBioLab group (CCMAR-CBMR) is offering the opportunity to ambitious students with a will to learn and start a career in science to join our group.

Project CyanoEXpress:

CyanoEXpress is a gene expression exploratory tool widely used by cyanobacteriologist around the globe. It contains all available gene expression data for the cyanobacterium Synechocystis 6803. The goal of our group is to extent this database to all other cyanobacteria for which abundant gene expression is available. Such compendium of data will also permit the prediction of gene functions by comparing co-expression profiles between different species.

The ideal student for this project will have a background in biology and an interest to learn bioinformatic tools. The student will have also the opportunity to work in the lab to confirm some of its findings. In this part of the project the student will learn to grow cyanobacteria, monitor their growth, extract nucleic acids, generate mutants and quantify expression by q-PCR.

At the end of the project the student is expected to write a master thesis as well as contribute to the publications of the results in relevant journals.

For more information contact the project coordinators: PhD. Matthias Futschik (mfutschik@aulg.pt), or PhD. Miguel Hernández (mprieto@ualg.pt).

Requirements:

Licenciatura Biologia, Bioquímica, Biologia Marinha ou na área das Ciências do Meio Aquático

Remuneration:

The position is not remunerated

Deadline: The position will be open from 20 of March until filled

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Project PerR regulon:

In Synechocystis 6803 exist three proteins homologs to the ferric uptake regulator (Fur) of Escherichia coli. This protein has been shown to be crucial in the maintenance of iron homeostasis in several prokaryotes including cyanobacteria. In Synechocystis 6803 only one of the homologous genes, furA, seem to regulate genes involved in iron homeostasis, while the other two denoted Zur and PerR, are involved in Zinc homeostasis and oxidative stress respectively.

Besides these hints on their role little is known on the functional scope of PerR. To increase this knowledge it is important to characterize its regulon, understanding for regulon a collection of genes or operons under regulation by the same regulatory protein. For this the student will perform a phylogenetic analysis of PerR homologous and known targets to predict the putative binding site promoting repression or induction of the downstream genes. Such binding site will be then confirmed by chromatin immunoprecipitation (ChIP) and high-throughput sequencing of the purified targets. The obtained information will be integrated together with previously obtained data in a regulatory network which will be linked to our existing database CyanoEXpress.

The ideal student for this project will have a background in biology and an interest to learn bioinformatic tools. The student will learn to grow cyanobacteria, monitor their growth, extract nucleic acids, generate mutants, quantify expression by q-PCR, protein electrophoresis techniques, and assist in the preparation of the ChIP-seq samples.

At the end of the project the student is expected to write a master thesis as well as contribute to the publications of the results in relevant journals.

For more information contact the project coordinators: PhD. Matthias Futschik (mfutschik@aulg.pt), or PhD. Miguel Hernández (mprieto@ualg.pt).

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