SCIENCESPRINGDAY

FCT FACULDADE DE CIÊNCIAS E TECNOLOGIA UNIVERSIDADE NOVA DE LISBOA

Departamento de Ciências da Vida

Microbial Genetics Lab at FCT

Isabel de Sá-Nogueira

Associate Professor of Microbiology

Agregação (Habilitation) in Microbiology, Molecular Genetics and Molecular Biology
PhD in Biology-Molecular Biology

http://sites.fct.unl.pt/microbial-genetics/

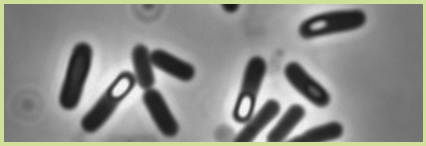
Research Team: Isabel Sá-Nogueira (PI), M. Isabel Correia, Mário Ferreira, Lia Godinho, Viviana Correia, Aristides Mendes, Tiago Pinheiro, José Pereira

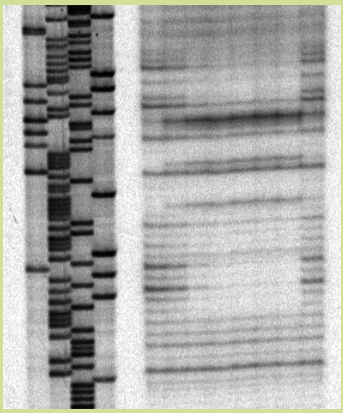
CREM
CENTRO DE RECURSOS MICROBIOLÓGICOS

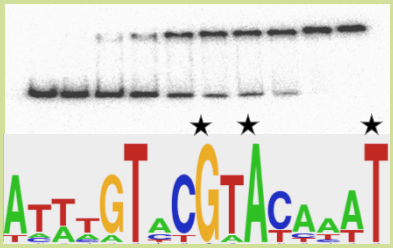
Objectives

The research in our laboratory is primarily focused on the mechanisms that control **gene expression** of **carbohydrate metabolism** in bacteria. Our favorite bug is *Bacillus subtilis* the Gram-positive model organism and an industrial bacterial workhorse in microbial fermentations. Several lines of research are being followed. Currently we are carrying out two major research projects:

- Characterization of the AraR regulon comprising genes required for the extracellular degradation of polysaccharides, transport of oligomers and simple sugars, intracellular degradation and further catabolism.
- Elucidation of the regulatory mechanisms of hemicelullases by genetic and biochemical characterization of enzymatic consortia involved in the degradation of plant cell wall polysaccharides.







Methodology

Microbiology and Bacterial Genetics. Molecular Biology techniques.

DNA and RNA analysis; gene cloning and gene knockout; mutagenesis: site-directed and random;

Gene expression analysis; gene reporter fusions; northern blot analysis, qRT-PCR; in vitro transcription;

Protein-DNA interactions and protein-protein interactions;

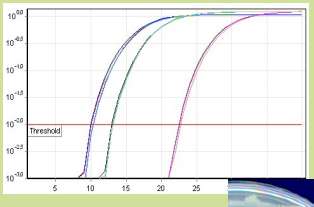
Protein expression and purification; protein detection – western blot analysis; enzyme biochemical characterization.

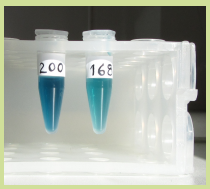
Expected Results

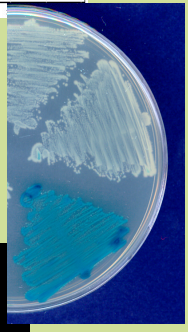
Understand how the transcriptional and translational regulatory networks interact with other cellular components such as the metabolic system.

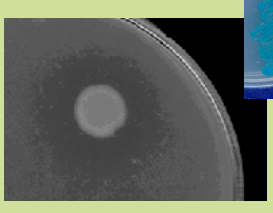
Contribute to studies of carbohydrate metabolism in *B. subtilis,* which are of special interest due to the extensive utilization of this organism for the production of industrial enzymes. It is estimated that *Bacillus* spp enzymes represent 50% of the total industrial enzyme market.

Design of efficient enzymatic systems for economic degradation of the plant cell wall and plant biomass valorization.









Funding:

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