SCIENCESPRINGDAY

FCT FACULDADE DE CIÊNCIAS E TECNOLOGIA UNIVERSIDADE NOVA DE LISBOA

Chemistry Department

Bacterial stress I Metalloproteins

BioProt/Bioin-Bacterial Mechanisms of Environmental Adaptation Group.

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- Nathália Castro (PhD student)
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Marta S.P. Carepo (PI)

- 2008-Researcher (Ciencia 2007 and invited researcher)
- Post-doc in Genetics /Mol. Biology UFPA- Brazil
- PhD Biochem./Biotech.
- Supervisor: 1 Post-doc, 2 PhD, 1 MSc
- Total publications:18 papers (708 citations)

Objectives

Bacterial Stress

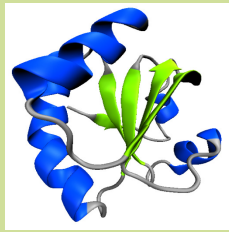
- Study of bacterial resistance systems responding to **toxic** environmental stresses: heavy metals (As, Mo), cyanide.
- Elucidation of metabolic pathways involved in **cold** microbial adaptation in *E. antarcticum*- Prospection for new proteins with biotechnological potential.

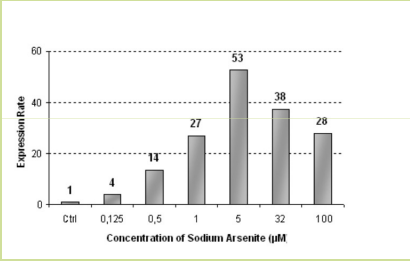
Biochemical characterization of Metalloproteins

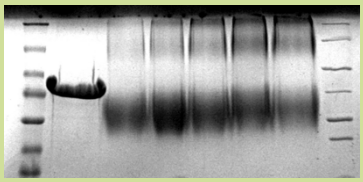
- Biochemical and spectroscopic characterization of proteins containing heterometallic clusters
- Transcriptomic studies addressing the function of proteins containing novel heterometallic clusters isolated from sulfate reducing bacteria (SRB).

Methodology

- Directed mutagenesis, cloning, overexpression and protein purification
- Enzymatic kinetic assays
- Protein/DNA interactions EMSA (Electron Mobility shift assays)
- Complementation arsenic resistance assays in *E. coli* and SRB
- Transcriptomic studies by Real time RT-PCR
- Spectroscopic characterization of metalloproteins by Uv-visible and EPR (electron paramagnetic resonance)
- Refolding kinetics







Expected Results

- Understand the regulation mechanisms involved in bacterial metal stress
- Characterization of new proteins involved in resistance to heavy metal (As, Mo)
- Characterization of metaloproteins involved in cell division in SRB
- Characterization of proteins, from the psychrotrophic bacterium *Exiguobacterium antarcticum* B7, important in cold adaptation and/or with biotechnological potential.

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