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2010-2012: Msc in Structural and Functional Biochemistry FCT/UNL

Publications:

- Dantas JM *et al* (2011) *J Biol Inorg Chem* 17
- Dantas JM *et al* (2011) *Dalton Trans* 40
- Dantas JM *et al* (2013) *BBA* 1827



Characterization and improvement of extracellular electron transfer networks in *G. sulfurreducens*

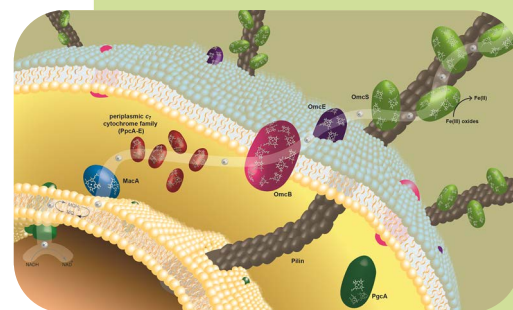
Biochemistry and Bioenergetics of Heme Proteins Lab



Objectives

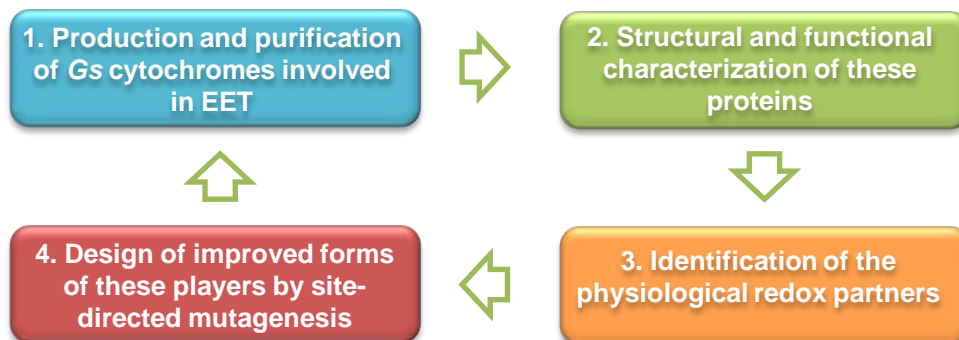
Supervisor: Prof. Carlos A. Salgueiro

Extracellular electron transfer (EET) in *Geobacter* species is one of the physiological hallmarks of these bacteria. This capability has several practical applications in the bioremediation of radioactive and toxic metals and in bioenergy generation, converting organic compounds to electricity in microbial fuel cells. The Gram-negative bacterium *Geobacter sulfurreducens* (Gs) is a well-studied member of the *Geobacter* genus, currently used as a model, because it is easily cultured, its whole genome is sequenced and can be genetically manipulated for physiological studies. The mechanism(s) by which Gs cells transfer electrons out of the cells is still poorly understood. This work aims to elucidate and improve the EET networks in the respiratory chain of *Geobacter sulfurreducens*.



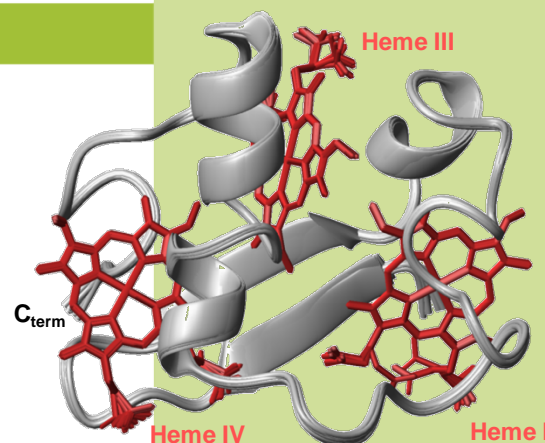
Proposed model for EET pathway to Fe(III) oxides in *Geobacter sulfurreducens*

Methodology



Expected Results

In this work it is expected to elucidate the EET mechanisms of Gs. In order to fulfill these goals, the solution structure of proteins that have been identified as key components for EET in this bacterium will be determined. The main targets include Gs inner membrane associated, periplasmic and outer membrane proteins. The study of the structural and functional properties of these proteins will be crucial in establishing the extracellular electron transfer networks in Gs.



Solution structure of a Gs cytochrome involved in EET (PDB code: 2LDO)

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