



MASTER RESEARCH PROJECT



Emerging human pathogens from the *Shewanella* genus: understanding the molecular mechanism behind ferric iron-siderophore reduction

Human infections attributed to *Shewanella* sp are increasing, with more than 70% of the known cases being reported since 2000. Nonetheless, virtually nothing is known regarding *Shewanella* pathogenicity.

It is well-established that iron availability is essential for bacterial growth and is involved in the expression of virulence-associated factors in pathogens. Therefore, one of the host's first lines of defense against infection is the withholding of iron. To outwit the host, pathogens commonly use small iron-chelating molecules known as siderophores that are secreted in apo-form and subsequently imported into the cell as ferric iron-siderophore complexes. These ferric complexes are then reduced by siderophore-interacting proteins (SIPs) that allow the release of iron and subsequent reutilization of the siderophores.

The aim of this project is to study in detail SIPs from two major *Shewanella* pathogens, disclosing the mechanism behind ferric iron-siderophore reduction. This will provide insights into the pathogenicity of these emerging human pathogens.

Methodologies:

- Microbiology
- Molecular Biology
- Protein expression
- Protein purification
- Thermodynamic and kinetic studies
- Spectroscopy
- Calorimetry

For more information please visit the WebPages:

<http://www.itqb.unl.pt/~louro/>

<http://www.itqb.unl.pt/research/biological-chemistry/inorganic-biochemistry-and-nmr>

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