

Chemistry Department

Enzyme Biosensors | Proteomics



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M. Gabriela Almeida (PI)

- Associate Professor (CESEM);
- Researcher (REQUIMTE);
- Supervisor:
1 PostDoc, 2 PhD, 6 MSc;
- Total publications: 23;
- Projects:
PI (5) ; team member (6)
consultant (1).

- M. Gabriela Almeida (PhD)
- Célia M. Silveira (PhD)
- Isa Imperial (MSc, ongoing)
- Humberto Pedrosa (MSc, ongoing)
- Patrícia Rodrigues (MSc ongoing)
- Carla Ferreira (graduate)
- Joana Frazão (undergraduate)



Objectives

BIOSENSORS

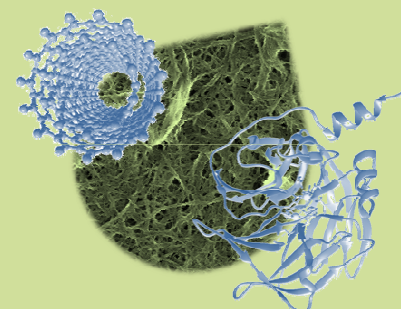
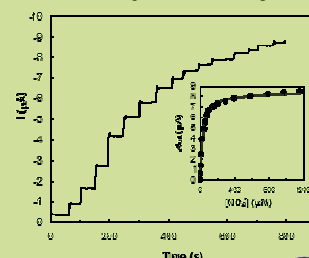
- Construction of biosensing devices using electron transfer enzymes and electrochemical platforms for signal transducing.
- Rapid, selective and sensitive multianalyte detection.
- Construction of green analytical methods.



PROTEOMICS

- Proteomic characterization of microbial organisms (e.g. sulfate reducers; yeast); identification of response biomarkers to stress conditions.
- Identification of protein biomarkers for human diseases.

amperometry



Methodology

- Modification of electrode surfaces with enzymes and nanostructured materials.
- Analytical performance optimization (detection limit, linear range, sensitivity, selectivity, life-time).
- Method validation and analysis of real samples (blood/plasma, waters and food).

- Biological systems are subjected to different stimuli.
- Protein extraction and solubilization.
- High-resolution 2D electrophoresis.
- Protein identification (MS and/or MS/MS).

Expected Results

- Open new avenues of investigation in the nitric oxide (NO) field using novel and improved analytical tools.
- New patient-friendly tools for:
 - early detection of cardiovascular disease markers (homocystein).
 - therapeutic monitoring of anti-HIV drugs (Efavirenz).

- Identification of the global changes on protein expression in microbial organisms, induced by stress conditions.
- New insights on the cardiotoxicity of anticancer agents (mitoxantrone).
- Identification of new osteoarthritis biomarkers.



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