SCIENCESPRINGDAY

FACULDADE DE CIÊNCIAS E TECNOLOGIA
UNIVERSIDADE NOVA DE LISBOA

Department of Chemistry

Bioelectrochemistry

REQUIMTE • Biochemistry and Biophysics

Biofísica Molecular
Molecular Biophysics

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(Senior Researcher, Ciência 2008)

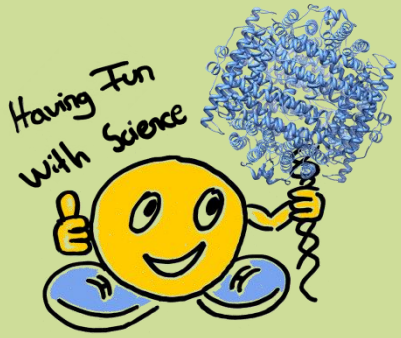
PhD in Biochemistry
(UNL, 2007)
14 papers in international peer reviewed journals
3 conference proceedings

ISI Web of Knowledge 15 (h-index=6)

Objectives

Main current research interests

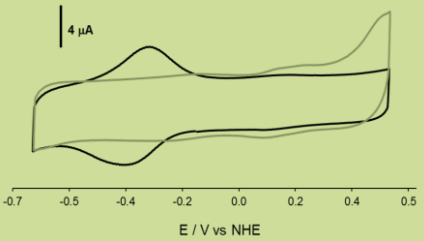
1) Protein and enzymes catalytic activity and immobilization on novel biocompatible conducting matrices based on ionic liquids hydrogels aiming biosensor and energy production devices;
2) Ferritins (Ft) and DNA-binding proteins from starved cells (Dps) aiming the comprehension of the uptake/storage/release iron mechanisms and repair mechanisms elucidation; also, different DNA damage (adducts formation and statistically relevant mismatches) and repair mechanisms are under study;
3) Pharmacological compounds detection and development of micro-sensors for physiological and environmental matrices.

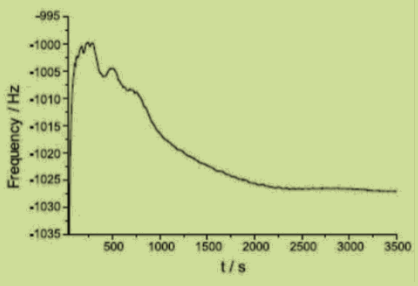


Methodology

Main methodologies and techniques

- Electrochemistry applied to biological systems, namely classic bulk and fast pulse techniques; proteins and enzymes chemical and physical adsorption on different surfaces, biological molecules immobilization in conducting polymers and ionic liquids based hydrogel materials; application of disposable screen-printed electrodes in order to achieve suitable low cost biosensors;
- Spectroelectrochemistry and piezoelectric techniques (EQCM-Electrochemical Quartz Crystal Microbalance);
- Application of Electroanalytical techniques including microelectrodes (suitable for resistive media) and hydrodynamic regimes.

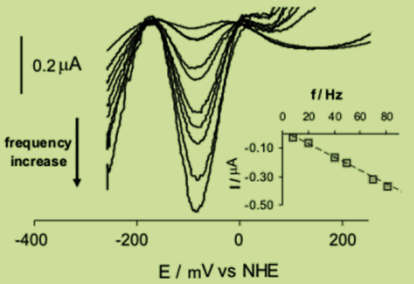




Expected Results

Main achievements in the above described research topics

- Novel matrices: successful enzyme and multienzymatic systems immobilization and evaluation of the catalytic response
- Ferritin and related proteins: assessment of electrochemical response as function of metal content in presence/absence of substrates
- Pharmacological compounds detection: multiple pharmacological compounds detection on different media and comparison with standard methodologies.



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