



UNIVERSIDADE
NOVA
DE LISBOA

MARIE SKŁODOWSKA-CURIE INDIVIDUAL FELLOWSHIPS 2018
EXPRESSION OF INTEREST FOR HOSTING MARIE CURIE FELLOWS

HOST INSTITUTION

School of Sciences and Technology | UCIBIO Research Unit

RESEARCH GROUP AND URL

Bionanolab – <http://www.requimte.pt/ucibio/research-groups/lab/bionano>

Catalysis & Functional and Smart Materials - <http://www.requimte.pt/laqv/functional-molecules-and-materials-sustainability>

SUPERVISOR (NAME AND E-MAIL)

Ricardo Franco - ricardo.franco@fct.unl.pt | Eulália Pereira - eulalia.pereira@fc.up.pt

SHORT CV OF THE SUPERVISOR

RICARDO FRANCO

2016 – Agregação/Habilitation – FCT/UNL, Portugal – Biochemistry/Physical Biochemistry;

1995 – Ph D – FCT/UNL, Portugal – Bioinorganic Chemistry;

1989 – FCT/UNL, Portugal – Five-year degree in Applied Chemistry – Biotechnology;

Previous and current scientific and/or professional activities

4/2000 to present – Assistant Professor with Habilitation, Chemistry Department; Leader of the BioNanoLab research Group, UCIBIO, REQUIMTE, FCT/UNL, Caparica, Portugal.

Researcher ID (Thomson Reuters): <http://www.researcherid.com/rid/C-5247-2008>

ORCID: <http://orcid.org/0000-0002-5139-2871>

Scopus Author ID: 7202551051; 1928 citations; H index = 25

EULÁLIA PEREIRA

1996 – PhD – FCUP, Portugal – Inorganic Chemistry;

1987 – FCUP, Portugal – Four-year degree in Chemistry;

Previous and current scientific and/or professional activities

10/1996 to present – Assistant Professor, Chemistry Department; Leader of the BioNanoLab research Group, LAQV, REQUIMTE, FCUP, Porto, Portugal.

Researcher ID (Thomson Reuters): <http://www.researcherid.com/rid/C-6282-2013>

ORCID: <https://orcid.org/0000-0003-2086-5696>

Scopus Author ID: 7202834210; 1844 citations; H index = 23



5 SELECTED PUBLICATIONS

RICARDO FRANCO

- “Gold nanoparticles for the development of Clinical Diagnosis methods” Pedro Baptista, Eulália Pereira, Peter Eaton, Gonçalo Doria, Adelaide Miranda, Inês Gomes, Pedro Quaresma and Ricardo Franco; *Anal. Bioanal. Chem.* (2008) 391, 943–950; DOI: 10.1007/s00216-007-1768-z;
- “Gold nanoparticles as (bio)chemical sensors” Miguel Peixoto de Almeida, Eulália Pereira, Pedro Baptista, Inês Gomes, Sara Figueiredo, Leonor Soares and Ricardo Franco, In *Comprehensive Analytical Chemistry. Gold Nanoparticles in Analytical Chemistry* (2014) Valcárcel M, López-Lorente A.I. (eds.), 1st ed., Vol. 66, pp. 529–567, Elsevier, Amsterdam, Netherlands, ISBN: 978-0-444-63285-2;
- “Star-shaped magnetite@gold nanoparticles for protein magnetic separation and SERS detection”; Pedro Quaresma, Inês Osório, Gonçalo Doria, Patrícia A. Carvalho, André Pereira, Judith Langer, João Pedro Araújo, Isabel Pastoriza-Santos, Luis M. Liz-Marzán, Ricardo Franco, Pedro Baptista and Eulália Pereira; *RSC Adv.* (2014), 4 (8), 3659 – 3667, DOI: 10.1039/c3ra46762g;
- “Unravelling Malaria antigen binding to antibody-gold nanoparticle conjugates” Miguel A. S. Cavadas, Marco P. Monopoli, Cláudia Sá e Cunha, Miguel Prudêncio, Eulália Pereira, Iseult Lynch, Kenneth A. Dawson and Ricardo Franco; *Part. Part. Syst. Charact.* (2016) 33 (12), 906–915, DOI: 10.1002/ppsc.20160018;
- “Office paper decorated with silver nanostars - an alternative cost effective platform for trace analyte detection by SERS” Maria João Oliveira, Pedro Quaresma, Miguel Peixoto de Almeida, Andreia Araújo, Eulália Pereira, Elvira Fortunato, Rodrigo Martins, Ricardo Franco and Hugo Águas; *Sci. Rep.* (2017) 7, 2480 DOI:10.1038/s41598-017-02484-8.

EULÁLIA PEREIRA

- “One-pot synthesis of triangular gold nanoplates allowing broad and fine tuning of edge length” Adelaide Miranda, Eliana Malheiro, Elzbieta Skiba, Pedro Quaresma, Patrícia A. Carvalho, Peter Eaton, Baltazar de Castro, John A. Shelnett, Eulália Pereira *Nanoscale* 2010, 2, 2209-2216; DOI: 10.1039/CONR00337A;
- "Europium-polyoxometalates encapsulated into silica nanoparticles: characterization and photoluminescence studies" Cristina S. Neves, Carlos M. Granadeiro, Luís Cunha-Silva, Duarte Ananias, Sandra Gago, Gabriel Feio, Patricia A. Carvalho, Peter Eaton, Salette S. Balula, Eulália Pereira *Eur. J. Inorg. Chem.* 2013, 2877-2886; DOI: 10.1002/ejic.201201482;
- “Star-shaped magnetite@gold nanoparticles for protein magnetic separation and SERS detection”; Pedro Quaresma, Inês Osório, Gonçalo Doria, Patrícia A. Carvalho, André Pereira, Judith Langer, João Pedro Araújo, Isabel Pastoriza-Santos, Luis M. Liz-Marzán, Ricardo Franco, Pedro Baptista and Eulália Pereira; *RSC Adv.* (2014), 4 (8), 3659 – 3667, DOI: 10.1039/c3ra46762g;
- "Localized Surface Plasmon Resonance (LSPR) biosensing using gold nanotriangles: Detection of DNA hybridization events at room-temperature" Leonor Soares, Andrea Csáki, Jacqueline Jatschka, Wolfgang Fritzsche, Orfeu Flores, Ricardo Franco, Eulália Pereira *Analyst* 2014, 139, 4964-73; DOI: 10.1039/c4an00810c;
- “A Direct Comparison of Experimental Methods to Measure Dimensions of Synthetic Nanoparticles” Peter Eaton, Pedro Quaresma, Cristina Soares, Cristina Neves, Miguel Peixoto de Almeida, Eulália Pereira, Paul West *Ultramicroscopy* 2017, 182, 179-190; DOI: 10.1016/j.ultramic.2017.07.001.



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PROJECT TITLE AND DESCRIPTION

Nanoimmunoconjugates of anisotropic metal nanoparticles for Surface Enhanced Raman Spectroscopy (SERS) detection of clinically relevant antigens/biomolecules

This Project proposes to create devices based on bionanoconjugates of NPs with antibodies, for the inexpensive, easy, specific and sensitive detection of clinically-relevant antigens. Examples of the latter are food toxins or antigens related to infectious diseases such as malaria and HIV. These devices will be applied, e.g., to a lateral flow immunochromatography, towards a prototype of a point-of-care system. Surface Enhanced Raman Spectroscopy (SERS) is a highly sensitive analytical technique, based on light dispersion by Raman-active molecules in the vicinity of plasmonic nanostructures. The Raman signal can be amplified by several orders of magnitude, when molecules are adsorbed at the surface of metal nanoparticles (NPs), with coinage metals (gold or silver) providing the highest enhancements. The main objective of this work is thus to explore the feasibility of SERS as a sensitive, robust and fast technique for analytical applications in portable sensors. Sensors will be prepared and tested in the Bionanoblab (UCIBIO, Caparica) with SERS-active NPs synthesized in LAQV, Porto.

SCIENTIFIC REQUIREMENTS

The sought profile is for a motivated and driven individual, eager to learn new techniques, and with excellent capacity for independent work, both in the laboratory and in paper-writing settings. General laboratory skills in chemistry and biochemistry are required. Candidates with previous work on the (bio)nanotechnology area are especially encouraged to apply, although application of candidates with no previous experience in the area will also be carefully considered.

SCIENTIFIC AREA WHERE THE PROJECT FITS BEST

Chemistry (CHE) • Life Sciences (LIF)

OTHER RELEVANT INFORMATION

Collaborations are set in place with Dr. Miguel Prudêncio (Instituto de Medicina Molecular (IMM), Lisbon), expert in malaria biology and Dr. Fátima Nogueira (Instituto de Higiene e Medicina Tropical (IHMT), Lisbon), supplying real samples from malaria patients.