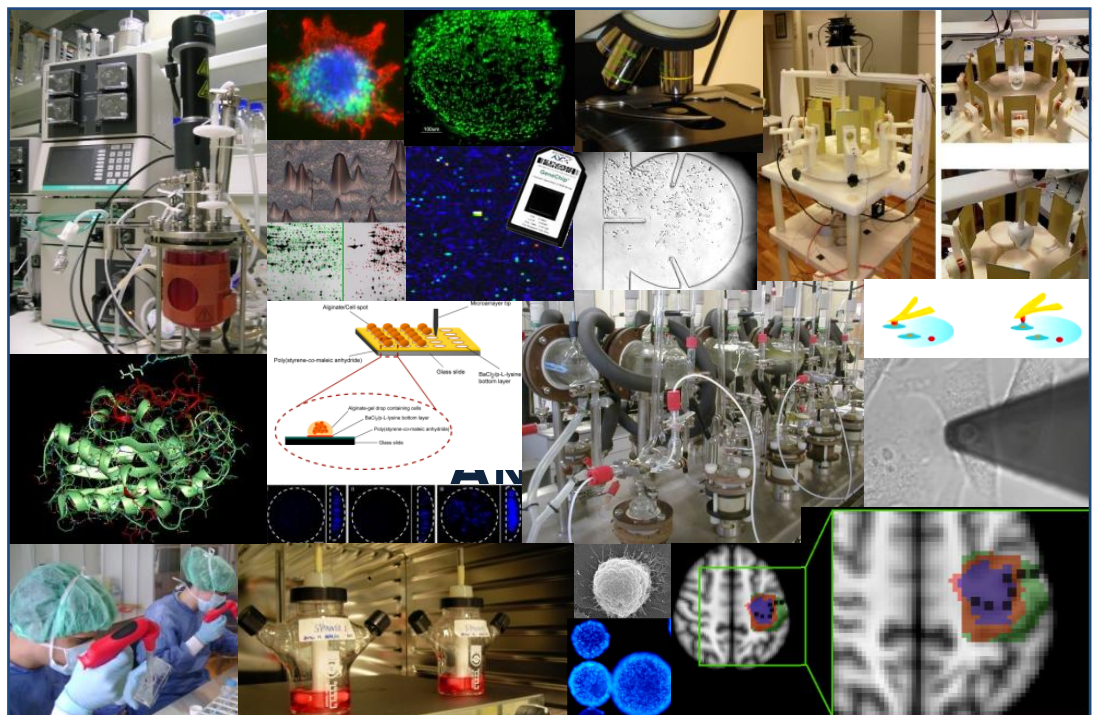




INSTITUTO SUPERIOR TÉCNICO
UNIVERSIDADE TÉCNICA DE LISBOA

DEPARTMENT OF BIOENGINEERING



ANNUAL REPORT 2012

Department of Bioengineering - IST

Annual Report 2011

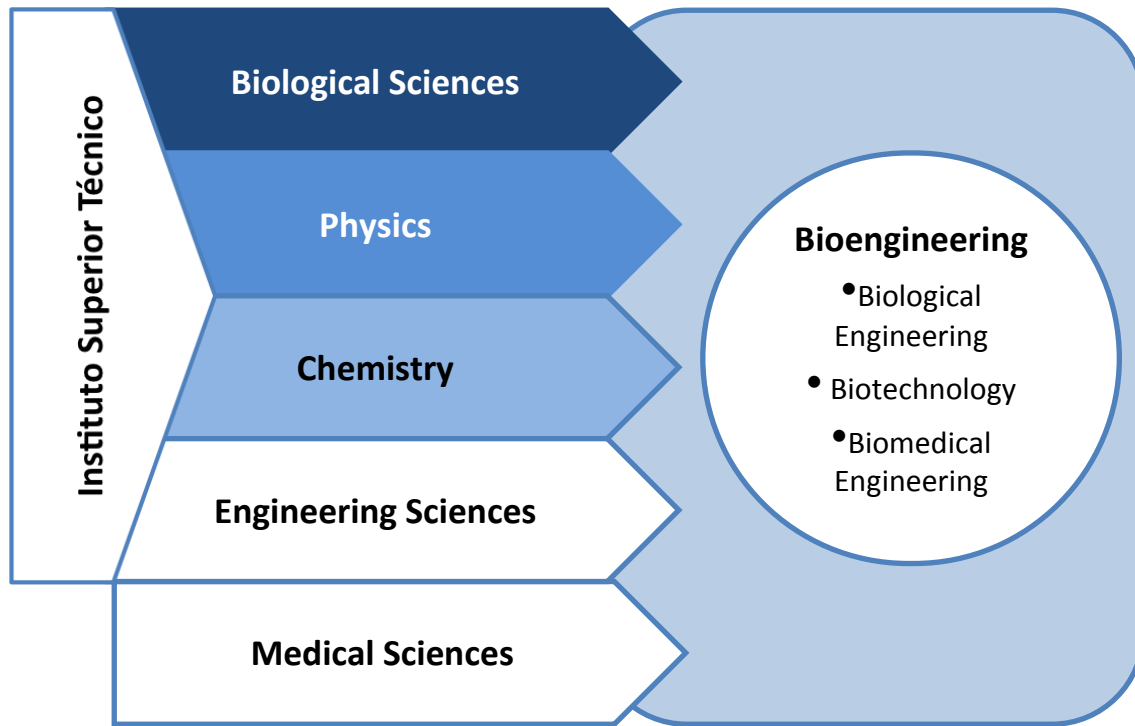


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<https://fenix.ist.utl.pt/departamentos/dbe/>

In memoriam

Júlio Maggiolly Novais (1943 – 2012)



Júlio Novais graduated in 1966 in Industrial Chemical Engineering at Instituto Superior Técnico, Technical University of Lisbon. After his graduation, he joined IST faculty as Assistant in Chemical Technology. In 1968, he started his post-graduate studies at the University of Birmingham, UK, with a M.Sc. thesis in Biological Engineering and a PhD in 1971, with a pioneer thesis on enzyme immobilization under the supervision of Nick Emery. After obtaining his doctoral degree, Júlio did the compulsory military service in the Portuguese Navy. In 1974, he returned to IST as Assistant Professor and created the first course in Biochemical Engineering in Portugal. His scientific activities were focused on Enzyme Technology and in Environmental Biotechnology, two areas which he developed to create a school not only at IST but also in other universities and research laboratories.

He was one of the founders of the “Centro de Engenharia Biológica das Universidades de Lisboa” and was the Principal Investigator of “Linha 7” - “Laboratório de Engenharia Bioquímica” at IST. I, as well as Isabel Sá Correia and Manuela Fonseca, had the privilege and the opportunity to join his laboratory, located in early days in the top floor of Pavilhão de Minas.

I started my PhD thesis under his supervision in September 1978, on enzyme immobilization and enzyme reactors. This was a time when we shared the same office and developed a friendship and camaraderie that would lead to the several initiatives in the future. In 1983, Júlio got his “Agregação” and myself my PhD degree. After that, we started working together in two initiatives that led to creation of the Biotechnology branch of the Chemical Engineering degree at IST, and of the M.Sc. degree on Biotechnology. Both pioneered the Biotechnology education in Portugal.

The Portuguese Society of Biotechnology (“SPBT”) was also another creation of Júlio. In April 1981, we participated (the only Portuguese communication was ours!) in the 2nd European Congress on Biotechnology held in Eastbourne, South England. One evening in the hotel lobby we had a meeting with 5 other Portuguese participants and Júlio proposed the creation of “SPBT”, which was officially launched in May 1981 in a meeting in “Sala de Reuniões” of IST, with the presence of 20 participants! Júlio was its 1st President. He was the driving force of the society, systematically writing its “Boletim de Biotecnologia” and joining the European Federation of Biotechnology (EFB). He was able to raise funding to support the participation of young researchers and professors in the EFB Working Parties, to increase the influence of SPBT in the EFB structure. Several of us from IST and other universities can recognize how important his support was to the development of the Portuguese biotechnology and of our own careers.

Júlio also played a very important role in the development of Science and Technology in Portugal. He held several crucial positions at JNICT, as President of the Coordination Committee of Biotechnology, and, later, as Vice-President of FCT.

One of his main characteristics was his calmness and tranquility, and above all the freedom that he always gave to his collaborators to develop their activities. I can testify the support that he always gave to my career, to my initiatives, the last one being the creation of the Department of Bioengineering! I only decided to go ahead with the proposal, when one morning in his office, he gave me his full support!

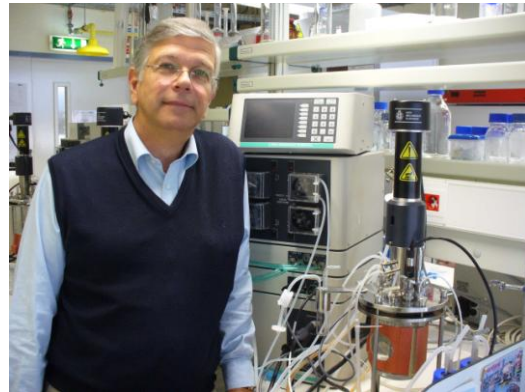
Thank you Júlio, without your support, guidance and friendship, I and most of the biotechnology community at IST and in Portugal would not have been able to realize all the achievements that have been attained.

Your legacy will be always respected and remembered!

A handwritten signature in black ink, reading "Joaquim M.S. Cabral". The signature is written in a cursive, flowing style.

Joaquim M.S. Cabral (the first PhD student of Júlio Novais, September 1978- January 1983)

1. Welcome letter



The Department of Bioengineering (DBE), which initiated its activities in January 2011, is a very unique Department in Portuguese universities that brings together faculty members with expertise in different areas of Life Sciences, Biological Engineering and Biomedical Engineering. The DBE mission is to provide an advanced and high-level education in bioengineering and to promote science and technological development in the fields of biological and biomedical sciences and engineering.

The highest priorities of DBE are to contribute to the new paradigm of the convergence of Life Sciences and Engineering and to reinforce the pioneer role and leadership of IST in bioengineering and biotechnology education and research in Portugal, focusing on the translation of knowledge to the industrial and clinical applications, the creation of intellectual property, and formation of spin-offs.

The DBE main achievements in its 2nd year consisted of the consolidation of the integration of the faculty, teaching, and research, the coordination of the different cycles of study on Biological Engineering, Biomedical Engineering and Biotechnology and of a new M.Sc. degree on Biomedical Sciences and Technologies, in collaboration with the Faculty of Medicine of the University of Lisbon, that started in September 2012. More recently, a M.Sc. degree on Microbiology, in collaboration with the Faculty of Veterinary Medicine of the Technical University of Lisbon and Faculties of Medicine and of Sciences of the University of Lisbon was approved by the course accreditation agency A3ES.

The DBE is also coordinating the proposal to establish a new institutional platform with the Faculty of Medicine of the University of Lisbon, on Biomedical Sciences and Engineering.

We welcome the scientific community interested in knowing our department to attend the Bioengineering Seminars, which started in 2012! These seminars give an overview of the teaching and research activities of our faculty and introduce invited speakers. Prospective students and potential faculty are also very welcome to join an ambitious and active Department of the XXI century!

A handwritten signature in black ink, reading "Joaquim M.S. Cabral". The signature is written in a cursive, flowing style.

Joaquim M.S. Cabral
President of DBE

2. The Department of Bioengineering – DBE - at IST

Bioengineering is a new scientific field in which an engineering approach is applied to life sciences, namely biology and medicine. Bioengineering applies the methods of engineering to biological and medical systems to answer some of the most challenging problems currently facing modern society. Likewise, Bioengineering takes inspiration in biological and medical systems to discover new methodologies for engineering practice. This integration of engineering and life sciences constitutes a new paradigm for engineering and is currently the area of engineering research and education undergoing the most explosive growth both in terms of student enrolment, course offerings, and research development worldwide.

The formation of the Department of Bioengineering of Instituto Superior Técnico (IST) was approved by the School Council of IST on December 13, 2010. The objective of DBE is to achieve an integrated coordination of the scientific research, teaching activities, and extension services of IST in the fields of Biological Engineering, Biomedical Engineering, Biotechnology and Biological Sciences. DBE aims at giving higher visibility and at reinforcing the pioneering and the leadership role that IST has had in these subjects, as well as leading the expansion to novel and strategic areas of Bioengineering, such as neuroengineering. The creation of the DBE is the keystone of the strategic development of IST in the area of Life Sciences and Technologies. The Department is currently supported by a faculty of 28, with additional 6 doctorate Research Scientists and 12 post-doc researchers. 4 staff members support the administrative, computational, and laboratorial infrastructures. The planned development includes an important participation of the DBE in the formation of a new institutional platform between IST and Faculties of Medicine and related institutions so that the participation of IST in training related to medical sciences is reinforced and that the formation currently offered in Biomedical Engineering is consolidated and expanded. Enlarging the faculty to cover the different expanding areas of bioengineering and consolidating and improving the buildings of the DBE to potentiate the on-going research and the synergies between researchers are in addition current objectives of the DBE.

The mission of DBE is the advanced formation of human resources within the principles and methods of Engineering Sciences and Biological and Biomedical Sciences and Technologies and to support its translation into new products, processes and services that may contribute to the sustainable development and to the improve quality of life of our society. It is the DBE objective to achieve international recognition as one of the top departments of bioengineering at European level in 10 years, based on its indexes of scientific productivity, industrial translation, and ability to attract top 2nd and 3rd cycle international students.

Further information can be found in the DBE website: <https://fenix.ist.utl.pt/departamentos/dbe/>

3. The activities of the DBE

Developed in 2012

- Coordination of 1st and 2nd cycle on Biological Engineering
- Coordination of 2nd cycles on Biotechnology; Bioengineering and Nanosystems; and Biomedical Sciences Medical Technologies (in collaboration with the Faculty of Medicine of the University of Lisbon)
- Coordination at IST of the Erasmus Mundus Master's Programme in Systems Biology - euSYSBIO
- Coordination of 3rd cycle on Biotechnology
- Coordination of 1st, 2nd and 3rd cycles on Biomedical Engineering
- Participation in the Coordination of 2nd cycle on Pharmaceutical Engineering
- Participation in the Coordination of 3rd cycle on Bioengineering (MIT-Portugal Program)
- Starting of the Bioengineering Seminar Series

Planned for 2013

- Formation and organization of the first meeting of the International Advisory Board of the DBE.
- Launching of a 2nd cycle in Microbiology (in collaboration with other schools of the University of Lisbon)
- Participation in the Interdisciplinary Platforms launched by IST: *Nanotechnology and Materials Engineering, Energy, and Environment*.
- Proposal of a new institutional platform (foreseen at doctoral level) with the Faculty of Medicine of the University of Lisbon: *Life and BioMedical Sciences and Engineering*
- Continuing of the Bioengineering Seminar Series.
- Continuation of the integration of faculty, teaching, and research, organization of new teaching laboratories (Biomaterials, Bioinstrumentation, Biomedical Imaging).
- Review teaching offers of the DBE (1st, 2nd, and 3rd cycle).
Development of an integrated a human resources/faculty recruiting plan/departmental buildings and laboratories plan for the next 5-10 years.

Long-term planned activities

- Initiative in Neuroengineering.
- Creation of the Advanced Institute for Life and Biomedical Sciences and Technologies (and Biomedicine) which may take the form of an Associated Laboratory

4. Education

The Department of Bioengineering is currently coordinating the following degree courses:

- Integrated Masters in Biological Engineering (fenix.ist.utl.pt/cursos/mebiol) (1st and 2nd cycle, 300 ECTS, 65 places for candidates to the 1st year)
- Masters in Biotechnology (fenix.ist.utl.pt/cursos/mbiotec) (2nd cycle, 120 ECTS, 25 places for candidates to the 1st year))
- Integrated Masters in Biomedical Engineering (fenix.ist.utl.pt/cursos/mebiom) (1st and 2nd cycle, 300 ECTS, 50 places for candidates to the 1st year)
- Masters in Bioengineering and Nanosystems (fenix.ist.utl.pt/cursos/mbionano) (2nd cycle, with collaboration of the Physics and the Electrical Engineering Departments of IST, 120 ECTS, 20 places for candidates to the 1st year)
- Doctorate in Biotechnology (<https://fenix.ist.utl.pt/cursos/dbiotec>) (3rd cycle, includes the Advanced Specialization Diploma in Biotechnology, 30 ECTS)
- Doctorate in Biomedical Engineering (fenix.ist.utl.pt/cursos/debiom) (3rd cycle,)

The Department of Bioengineering participates in the coordination of the following degree courses:

- Masters in Pharmaceutical Engineering (fenix.ist.utl.pt/cursos/MEFarm) (2nd cycle, in collaboration with the Faculty of Pharmacy of the University of Lisbon)
- Erasmus Mundus Master's Programme in Systems Biology - euSYSBIO (in collaboration with KTH, Stockholm, Sweden and Finland's Aalto University)
- Doctorate in Bioengineering (fenix.ist.utl.pt/cursos/dbioeng) (3rd cycle, offered in association with the New University of Lisbon and the University of Minho, and in collaboration with the MIT (MIT-Portugal Program))

In addition, the Department of Bioengineering participates in the following degree programs:

- Joint Doctoral Program IST-EPFL in the area of Biomedical Imaging.

The Department of Bioengineering exchanges students and staff in the framework of the Erasmus and other programmes with European and Latin American Universities, in the fields of Biological Engineering, Biomedical Engineering, Biotechnology and Bio/Nanotechnology.

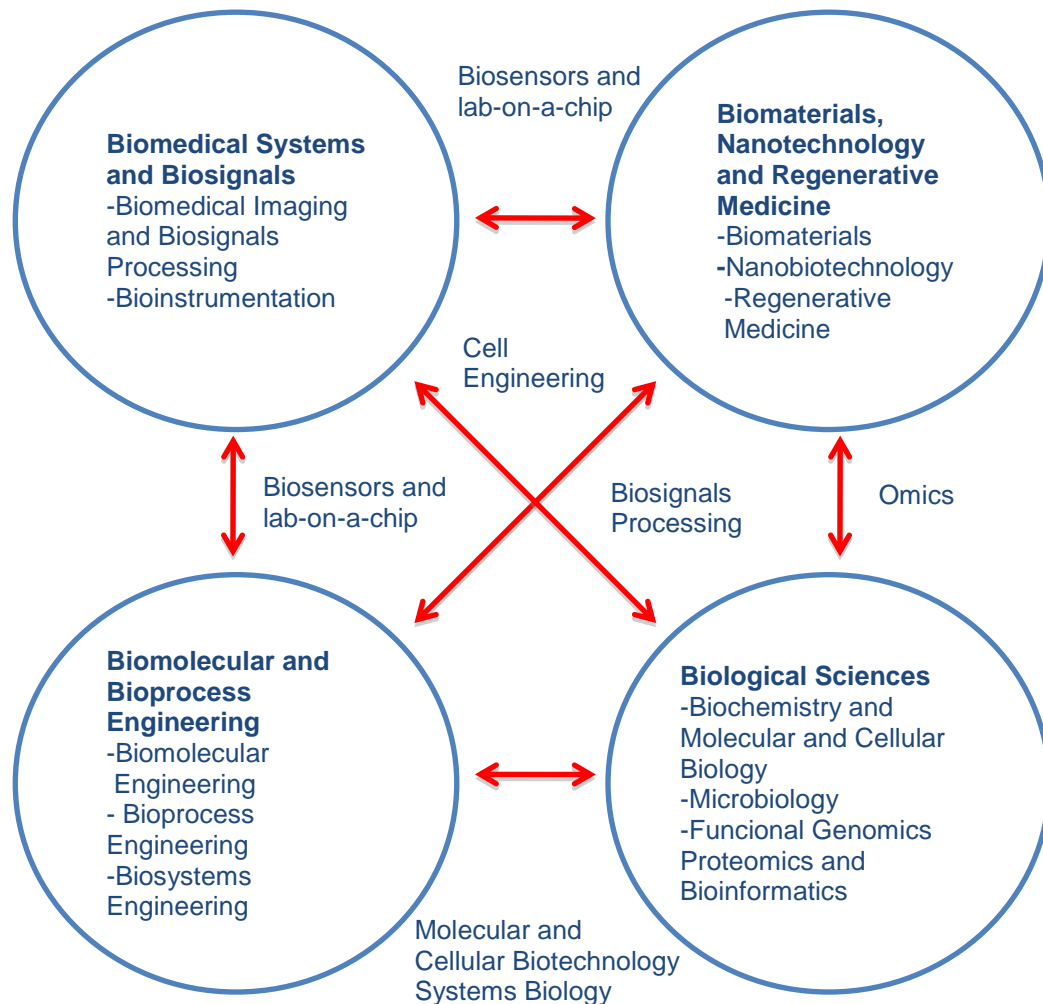
5. Research Activities

Scientific Areas

Bioengineering covers a wide domain. It is positioned in the overlap of three fundamental sciences: biology, engineering and medicine. This property provides the substrate for Health Science. The Department of Bioengineering **has four scientific areas** that cover the valences required for a solid development and human resource formation in Health Sciences. These are desired to interoperate fostering new approaches. These areas are:

- Biological Sciences
- Biomaterials, Nanotechnology and Regenerative Medicine
- Biomedical Systems and Biosignals
- Biomolecular and Bioprocess Engineering

The following graphical representation depicts some of the already existing synergies between the different scientific areas.



• **Biological Sciences**

In the Department of Bioengineering, research and teaching interests of the Biological Sciences scientific area range from Molecular and Cellular Biology, Biochemistry and Microbiology to the contemporary genome-based view of Biology. Ongoing interdisciplinary research programs involve molecular biosciences across disciplines, from molecules to systems, and synthetic and molecular systems biology strategies to understand how biological systems orchestrate their multiple functions envisaging the exploitation/control of their biological activities.

The scientific area of Biological Sciences offers a multidisciplinary education that involves the fundamentals of Molecular and Cellular Biology, Biochemistry and Microbiology, the molecular tools and the strategies of Genetic Engineering, the understanding of Microbial Biochemistry and Physiology, the Functional and Comparative Genomics and Bioinformatics, the Integrative Microbiology and the Molecular Systems and Synthetic Biology perspective. There is a focus on the study of microorganisms which is critical for the understanding of the fundamental mechanisms of life and for new developments and applications in industrial biotechnology, environmental restoration and energy production and in human and animal health and food sectors.

The Biological Sciences scientific area is involved in all the undergraduate and graduate training programs with a biological component offered at IST, as well as in advanced postdoctoral training in the field. Students, at all levels, do have the opportunity to actively participate in research training in the laboratories of the Biological Sciences Research Group of the Institute of Biotechnology and Bioengineering (IBB), Centre for Biological and Chemical Engineering at IST.

• **Biomaterials, Nanotechnology and Regenerative Medicine**

This scientific area integrates a set of technologies which have as a common point the controlled interaction, at the micro and nanoscale, of complex artificial constructs with biomolecules, cells and tissues. High impact applications in biotechnology and medicine are the goal, in particular in the development of novel strategies for bionanotechnology and regenerative medicine. Research at the DBE encompasses the interdisciplinary areas of biomaterials, nanotechnology and nanobiotechnology, and stem cell engineering and regenerative medicine.

Biomaterials: although biomaterials are primarily used for medical applications, they are also used to grow cells in culture, to assay for blood proteins in the clinical laboratory, in processing biomolecules in biotechnology, for fertility regulation implants in cattle, in diagnostic gene arrays, in the aquaculture of oysters and for investigational cell-silicon "biochips." The commonality of these applications is the interaction between biological systems and synthetic or modified natural materials.

Nanotechnology: the engineering of functional systems at the molecular scale. Nanotechnology is the understanding and control of matter at dimensions between approximately 1 and 100 nanometers, where unique phenomena enable novel applications. Nanobiotechnology consists on the application of nanotechnology concepts to bioengineering and biological sciences, in lab-on-a-chip systems, novel biosensors, nanoparticles for drug delivery, surface functionalization, etc. Bionanotechnology consists in the translation of biological concepts for engineering applications, namely taken from neural sciences, systems biology, biomaterials and biomimetics.

Regenerative Medicine: regenerative medicine is an interdisciplinary field of research and clinical applications focused on the repair, replacement or regeneration of cells, tissues or organs to restore impaired function resulting from any cause, including congenital defects, disease, trauma and ageing. It uses a combination of several converging technological approaches, both existing and newly emerging, that moves it beyond traditional transplantation and replacement therapies. The approaches often stimulate and support the body's own self-healing capacity. These approaches may include, but are not limited to, the use of soluble molecules, gene therapy, stem and progenitor cell therapy, tissue engineering and the reprogramming of cell and tissue types.

The Biomaterials, Nanotechnology and Regenerative Medicine scientific area is involved in the undergraduate formation in Biotechnology and Bioengineering, including in the degrees in Biological Engineering and Biomedical Engineering, as well as in advanced doctoral and postdoctoral training in the field. Students, at all levels, do have the opportunity to actively participate in research training in the laboratories of the BioEngineering Research Group of the Institute of Biotechnology and Bioengineering (IBB), Centre for Biological and Chemical Engineering at IST, in the INESC-MN micro and nanofabrication cleanroom facilities, and in the NanoLab.

- **Biomedical Systems and Biosignals**

This area has a broad scope, covering a very long list of topics. While the subarea of Biomedical Systems encompasses all hardware implementations and physical interaction with biological entities, the subarea of Biosignals relates to the signal processing associated with interpretation, representation and modelling of biological functional systems, both with a medical and engineering emphasis. The Biomedical Systems and Biosignals scientific area at DBE is particularly involved in the subareas of bioinstrumentation, bioelectromagnetism, medical imaging, modeling of biological systems and biosignal processing, and focuses its teaching activities in the undergraduate and graduate formation in Biomedical Engineering, although it also offers courses to the other degrees in Bioengineering and Biotechnology. An initiative in neural engineering is being considered by the DBE. Students, at all levels, do have the opportunity to actively participate in research training in the groups of Biomedical Imaging and Biosignals Processing and the Bioinstrumentation group, at the Associated Laboratories Institute of Systems and Robotics (ISR) and Institute of Telecommunications (IT), respectively.

- **Biomolecular and Bioprocess Engineering**

This scientific area aims at the development of biological processes to obtain value-added products with potential applications in key areas such as the pharmaceutical, food, cosmetics and fine chemicals as well as in biofuels production and processing effluent and pollution control. This area covers the Biological Technologies, including Biocatalysis, Fermentation, Biological Reactors, Process Separation and Purification of Biomolecules, Monitoring and Control of Bioprocess and Biosystems Engineering. One of the areas of greatest impact and a main point of focus at IST is the production, purification and stabilization of proteins / enzymes and the "design" of improved bioconversion processes of substrates and waste to obtain compounds with high added value.

The Bioprocess and Biomolecular Engineering is divided in the subareas of:

Biomolecular Engineering: engineering of proteins, nucleic acids engineering, enzyme engineering, biocatalysis and biotransformations, biomolecular recognition.

Bioprocess Engineering: bioreactor, bioseparation and purification processes, project engineering, biosystems engineering, pharmaceutical engineering, food engineering, bioenergy, environmental biotechnology.

The Biomolecular and Bioprocess Engineering scientific area is deeply involved in the undergraduate formation in Biotechnology and Biological Engineering, as well as in advanced doctoral and postdoctoral training in the field. Students, at all levels, do have the opportunity to actively participate in research training in the laboratories of the BioEngineering Research Group of the Institute of Biotechnology and Bioengineering (IBB), Centre for Biological and Chemical Engineering at IST.

Research

Most of the research performed by the DBE faculty is in laboratories/institutions supported by the FCT (Fundação para a Ciência e a Tecnologia).

Research

- *Laboratories of Biological Sciences and Bioengineering at Centre for Biological and Chemical Engineering/Associated Laboratory Institute for Biotechnology and Bioengineering (www.ibb.pt)*
- *Laboratories of INESC-MN (www.inesc-mn.pt)*
- *NanoLab (nanolab.ist.utl.pt)*
- *Laboratories of Biomedical Imaging and Biosignals Processing at Associated Laboratory Institute for Systems and Robotics (www.isr.ist.utl.pt)*

Illustrative examples of the research carried on at the DBE can be found in the faculty pages that follow in Section 9.

6. Bioengineering Seminar Series

The following is the list of the DBE Bioengineering Seminar Series of 2012. We thank all the speakers for the generosity of their time and for their challenging and exciting presentations.

March 19

Cláudia Lobato da Silva

Department of Bioengineering, IST

"Stem Cell Bioengineering for Cellular Therapies"

April 2

Raúl Martins

Department of Bioengineering, IST

"Electromagnetic Imaging in Biological Tissues"

April 16

Miguel Teixeira

Department of Bioengineering, IST

"Antifungal drug resistance in yeasts: elucidation of the biomolecular mechanisms"

April 30

Pedro Fernandes

Department of Bioengineering, IST

"Miniaturization: a key tool for the fast development of bioconversion processes"

May 14

Carla de Carvalho

Department of Bioengineering, IST

"Improving bacterial performance using adaptive mechanisms"

May 28

Jorge Leitão

Department of Bioengineering, IST

"Small non-coding regulatory RNAs from Burkholderia cepacia complex bacteria: potential targets for therapeutic intervention?"

October 1

Jorge Morgado

Instituto de Telecomunicações, Organic Electronics Group

Department of Bioengineering, Instituto Superior Técnico

"Materials for organic electronics and bioelectronics"

October 15

Pedro Serranho

Portuguese Open University (Universidade Aberta)

Institute for Biomedical Research in Light and Image (IBILI), University of Coimbra

"Inverse Problems and Medical Imaging"

October 29

Paula Duque

Instituto Gulbenkian de Ciência

"Roles of MFS membrane transporters in plant development and stress responses"

November 12

Rui Oliveira

Systems Biology and Engineering Group (SBE), Chemistry Department
Faculty of Sciences and Technology, Universidade NOVA de Lisboa

“Cell functional enviromics: unravelling the function of environmental factors”

November 26

João Lacerda

Instituto de Medicina Molecular (IMM), Faculdade de Medicina da Universidade de Lisboa (FMUL)

“Cell therapy in oncology”

December 10

João Sanches

Institute for Systems and Robotics

Department of Bioengineering, Instituto Superior Técnico

“Biological modeling and quantification from fluorescence microscopy imaging”

7. Master Thesis

The following are the Master dissertations successfully defended in 2012 in the courses coordinated by the DBE. We extend our congratulations to all the students, and wish them the best in the future. Many of these theses were oriented or co-oriented by the DBE. Their names are in bold. We also extend our sincerest thanks to all the colleagues from outside the DBE who participated in the orientation of many of these theses.

Integrated Master Degree (MSc) in Biological Engineering

Student Name: Ana Carolina Oliveira Fernandes
Thesis Title: Dynamical detection of CD4+ cells on an integrated magnetic device
Supervisors: Paulo Freitas and João Braz Gonçalves

Student Name: Ana Filipa Lopes dos Santos
Thesis Title: Kinetic and spectroscopic characterization of a DyP-Type peroxidase from *Bacillus subtilis*
Supervisors: **Maria Raquel Aires Barros** and Lúcia Oliveira Martins

Student Name: Ana Sofia Mendes da Silva Santos Félix
Thesis Title: Non-invasive measurement of steroid hormones in zebrafish holding water
Supervisors: **Gabriel A. Monteiro** and Rui F. Oliveira

Student Names: André Vieira das Neves
Thesis Title: Aplicação de Nanotecnologias na Indústria de Bebidas: Estudo da Complexação de Antioxidantes com Ciclodextrinas, sua Caracterização e Viabilidade
Supervisors: **Marília Mateus** and Catarina M. M. Duarte

Student Name: Carole Pinheiro Neves
Thesis Title: Pilha de Combustível Microbiana: Sinergia entre microalga *Chlorella vulgaris* e consórcio bacteriano para produção de bioelectricidade e valorização de pigmentos
Supervisors: **Frederico Ferreira** and Cristina Torres Matos

Student Name: Catarina Filipa Borges Duarte
Thesis Title: Produção de Ácido Clavulânico - Optimização do processo fermentativo à escala laboratorial e à escala piloto
Supervisors: **Cristina Viegas** and Anabela Frazão

Student Name: Catarina de Jesus Garcia Pinto
Thesis Title: Construção do clone molecular infeccioso do isolado P1OLV do vírus Maedi-Visna
Supervisors: **Gabriel A. Monteiro** and Sílvia C. Barros

Student Name: Cláudia Filipa Pinto da Costa
Thesis Title: Lab-on-chip microsystem for separation and counting of magnetic particles
Supervisors: Paulo Freitas and Susana Cardoso de Freitas

Student Name: Cristina Ribeiro Vicente
Thesis Title: Influência da microfiltração tangencial na qualidade do vinho filtrado
Supervisors: **Helena Pinheiro** and Filipe Crispim

Student Name: Daniela Filipa Martins Silva
Thesis Title: Mechanisms underlying the high production of IL-12 and IFN- γ by *Lactobacillus acidophilus* in dendritic cells
Supervisors: **Maria Ângela Taipa** and Hanne Frøkiær

Student Name: Diogo Eduardo Parruca da Cruz
Thesis Title: The GABAergic septohippocampal pathway in a transgenic mouse model of Alzheimer's disease. The development of GABAergic septohippocampal axons *in vitro*
Supervisors: **Arsénio Fialho** and Marta Pascual

Student Name: Diogo Filipe Mateus Rodrigues
Thesis Title: Production of recombinant human aldehyde oxidase in *E. coli* and optimization of its application for preparative synthesis of oxidized drug metabolites
Supervisors: **Ana Azevedo** and Matthias Kittelmann

Student Name: Filipe Bravo da Silva
Thesis Title: Improvement of alcoholic fermentation performance based on highly acetic acid tolerant wine isolates of *Saccharomyces cerevisiae* and genetically engineered strains
Supervisors: **Isabel Sá Correia** and Margarida Palma

Student Name: Guida Filipa Bartolomeu de Campos Camacho
Thesis Title: Contribution to the functional analysis of the paralogous gene-pairs CgTpo1_1 and CgTpo1_2 and CgFlr1_1 and CgFlr1_2 from the human pathogen *Candida glabrata*
Supervisor: **Miguel Teixeira**

Student Name: Gonçalo Luís Melo Santa
Thesis Title: Drying of soy proteins
Supervisors: **Marília Mateus** and Arno Alting

Student Name: Inês Rosa Paias Silva Carmona
Thesis Title: Análise organizacional do processo de produção de bolachas com vista à sua optimização qualitativa e quantitativa
Supervisors: **Marília Mateus** and Hugo Cavacas

Student Name: Ivo Frederico Pedroso Crespo
Título da Tese: Development and optimization of the polyhydroxybutyrate (PHB) production from organic side streams by continuous, semi-continuous and batch modes
Supervisors: **Helena Pinheiro** and Mariane van Wambeke

Student Name: Joana Isabel Aires Coutinho Guedes
Título da Dissertação: Assessment of TiO₂-doped microcarriers for the production of tissue engineered microunits for bone regeneration
Supervisors: **Cláudia Lobato da Silva** and Ivan Wall

Student Name: Joana Melo Félix
Thesis Title: Immunoregulation of soluble MICA / anti-MICA antibodies system in the context of anti-CTLA-4 melanoma therapy
Supervisors: **Isabel Sá Correia** and Hélène Moins-Teisserenc

Student Name: João Alberto Pacheco Marques de Vasconcelos e Sá
Thesis Title: Production and Purification of the p16INK4a: A Naked Mole-Rat's Resistance Protein to Cancer
Supervisors: **Maria Ângela Taipa** and Alexander Dikiy

Student Name: João Carlos Santos Cruz
Thesis Title: The phosphoenol-pyruvate-oxaloacetate node in *Streptomyces*: a study on pyruvate carboxylase
Supervisors: **Nuno Mira** and Paul A Hoskisson

Student Name: José Carlos Alves Fernandes
Thesis Title: Exploring New Applications For Microcheese
Supervisors: **Marília Mateus** and Eva Düsterhöft

Student Name: Margarida de Meneses Santos Ribeiro de Oliveira
Thesis Title: Characterization of the biological role of the RNA-binding protein FUS
Supervisors: **Arsénio Fialho** and Silvia Barabino

Student Name: Maria João Cardoso Jacinto
Thesis Title: Enhanced organics recovery from wastewater via a membrane assisted A-stage
Supervisors: **Helena Pinheiro** and Korneel Rabaey

Student Name: Maria João Dâmaso Rodrigues Brinquete Proença
Thesis Title: Uncovering the link between DOR and autophagy in AMPK activation by fasting using C2C12 cell model
Supervisors: **Arsénio Fialho** and Antonio Zorzano

Student Name: Maria João da Silva Gabriela Paris
Thesis Title: Effects of protein-emulsifier interactions on milk protein functionality
Supervisors: **Marília Mateus** and Thom Huppertz

Student Name: Maria João de Carvalho Maurício da Fonseca
Thesis Title: Expression of *Thermobifida fusca* cellulases in *E.coli*
Supervisors: **Leonilde Moreira** and Tom Desmet

Student Name: Marta Costa Santos
Thesis Title: Formulação de meio de cultura para microalgas de água salgada a partir de água doce em culturas com recirculação do meio
Supervisors: **Frederico Ferreira** and Luís Costa

Student Name: Pedro Boto Pereira Franco Pinheiro
Thesis Title: Ex-vivo evaluation of the metabolic fate of Nevirapine
Supervisors: Alexandra Antunes and Joana Miranda

Student Name: Raquel Medina dos Santos Cunha
Thesis Title: Differentiation of Adipose-derived Stem Cells into Endothelial Cells
Supervisors: **Cláudia Lobato da Silva** and André Poot

Student Name: Ricardo Miguel Morais de Sousa
Thesis Title: Investigation of dual layer hollow fiber mixed matrix membranes characteristics for toxin removal from blood
Supervisors: **Marília Mateus** and Dimitrios Stamatialis

Student Name: Rita Maria Sousa Pires da Costa Basto
Thesis Title: Expanded Bed Chromatography to capture enzymes from cell homogenates
Supervisors: **Luís Fonseca** and Jeroen den-Hollander

Student Name: Rita Alexandra Leal Cruz
Thesis Title: Förster Resonance Energy Transfer to study periplasmic protein interaction *in vivo*, PBP5 a first candidate
Supervisors: **Arsénio Fialho** and René van der Ploeg

Student Name: Rita de Albano da Silva Lares
Thesis Title: Characterization of the coelomic fluid of the starfish *Marthasterias glacialis* in a wound-healing phase
Supervisors: **Gabriel A. Monteiro** and Ana Coelho

Student Name: Rita Dias Guardão Moreira da Franca
Thesis Title: Characterization of *Saccharomyces cerevisiae* unable to accumulate trehalose upon nutrient starvation
Supervisors: **Isabel Sá Correia** and Marta Rubio-Texeira

Student Name: Sandra Paula Ramalho Ferreira
Thesis Title: Estudo para optimização dos custos de produção do antibiótico Demeclociclina por via fermentativa
Supervisors: **Cristina Viegas** and Anabela Frazão

Student Name: Sara Margarida Silvestre Gonçalves Coelho
Thesis Title: Implementation and optimization of the reverse-flow diafiltration for *in situ* product recovery
Supervisors: **Marília Mateus** and Kristina Meier

Student Name: Sílvia Carina Carvalho Ribeiro
Thesis Title: Evaluation and Optimization of an API production process using PAT and Lean-Six Sigma tools
Supervisors: **José Cardoso de Menezes** and Pedro Duarte

Student Name: Sílvia Januário Antunes
Thesis Title: Métodos de análise do perfil organoléptico da cerveja
Supervisors: **José Cardoso de Menezes** and Teresa Sampaio

Student Name: Simão Pedro da Franca Telhada de Azevedo e Castro
Thesis Title: Role of Unfolded Protein Response in the activation of an apoptotic process upon glucose deprivation in cancer cells
Supervisors: **Leonilde Moreira** and Ferdinando Chiaradonna

Student Name: Susana Rafael Gomes Clérigo
Thesis Title: Análise dos Sistemas de Gestão da Qualidade e da Segurança Alimentar da empresa e elaboração de requisitos a verificar em empresas subcontratadas
Supervisors: Miguel Casquilho and Fátima Rosa

Student Name: Vanda Isabel Machado Branco
Thesis Title: Optimization of high-solids biomass reactors for biogas production by chemical and microbial additives
Supervisors: **Helena Pinheiro** and Mariane van Wambeke

Integrated Master Degree (MSc) in Biomedical Engineering

Student Name: Ana Catarina Camejo Barreto
Thesis Title: Proteção Radiológica nos Procedimentos de Pesquisa Radioguiada do Gânglio Sentinela
Supervisors: Lúcia Ferreira and Gabriela Cardoso

Student Name: Ana Cláudia de Castro Ferreira Carriço
Thesis Title: Eficiência dos Agrupamentos de Centros de Saúde de Lisboa e Vale do Tejo: Uma abordagem por Data Envelopment Analysis
Supervisors: Rui Marques and Paulo Nicola

Student Name: Ana Filipa Brissos Afonso
Thesis Title: Classification of Pigmented Skin Lesions based on Color Features
Supervisors: Margarida Silveira and Teresa Mendonça

Student Name: Ana Filipa Gouveia Bento Ricardo Ferreira
Thesis Title: Evaluation of whiplash injuries in victims from road accidents in Portugal
Supervisors: João Dias and Jorge Santos

Student Name: Ana Margarida Caetano Ruela
Thesis Title: What is the role of color in dermoscopy analysis?
Supervisors: Jorge Salvador Marques and Teresa Mendonça

Student Name: André Marques Sales Henriques
Thesis Title: Role of the multidrug efflux pumps CgAqr1 and CgTpo2/3 in *C. glabrata* resistance to flucytosine and azole drugs
Supervisor: **Miguel Teixeira**

Student Name: Artur Jorge Antunes Oliveira
Thesis Title: Medical Equipment Replacement: Economic analysis under deterministic and uncertain environments
Supervisors: João Oliveira and João Carvalho

Student Name: Braúlio Jose Pedro Vieira
Thesis Title: Analysis and Design of an Active Joint Motion Limiter with Remote Haptic Interface for Locomotion Support
Supervisors: Miguel Tavares da Silva and Jorge Manuel Martins

Student Name: Bruno Manuel Dias dos Santos
Thesis Title: A study on gene-disease relations in the context of neurodegenerative diseases
Supervisors: Sara Madeira and Alexandre Francisco

Student Name: Catarina Guerreiro Palma
Thesis Title: Fadiga de Osso Trabecular: Desenvolvimento de uma Metodologia Experimental
Supervisors: Maria de Fátima Vaz and João Eurico Fonseca

Student Name: Cecília Maria Costa Bento de Sousa Nunes
Thesis Title: Learning from Imbalanced Neuropsychological Data
Supervisors: Alexandra Carvalho and Sara Madeira

Student Name: David Manuel Galaz Tavares
Thesis Title: MRI/TRUS data fusion Prostate cancer diagnostic and focal treatment
Supervisor: Jorge Manuel Martins

Student Name: Eduardo Vicente Fonseca
Thesis Title: Proliferative Potential and Immunomodulatory Secretory Profile of Human Mesenchymal Stem Cells from Healthy Donors and Acute Myocardial Infarction Patients: A Comparative Study
Supervisors: **Cláudia Lobato da Silva** and **Joaquim Sampaio Cabral**

Student Name: Gonçalo Morais e Castro Rodrigues
Thesis Title: Purification of Human Induced Pluripotent Stem Cell-Derived Cells for Regenerative Medicine Applications
Supervisors: **Joaquim Sampaio Cabral** and **Maria Margarida Diogo**

Student Name: Joana Carolina Sequeira Pinto
Thesis Title: Spatiotemporal dynamics of CBF and BOLD fMRI responses to breath-hold challenges
Supervisors: **Patrícia Figueiredo** and Pedro Vilela

Student Name: Joana Catarina Alves Rodrigues
Thesis Title: Ischemia in the acute hippocampal slice preparation: consequences for membrane properties
Supervisors: Paulo «Freitas and Raquel Dias

Student Name: João António Sobral Leite Veiga
Thesis Title: Matching of a Hierarchical Muscle Fatigue Model with Subject-specific Endurance Times
Supervisors: Miguel Tavares da Silva and Mamede de Carvalho

Student Name: João Miguel Dias Marques Semedo
Thesis Title: Model-Based Clustering Applied to Sleep Macrostructure Analysis
Supervisor: **Agostinho Rosa**

Student Name: João Paulo Neves Leal
Thesis Title: Adaptive ROC analysis in Carotid Atherosclerosis Diagnosis for Endarterectomy
Supervisors: **João Sanches** and Mónica Oliveira

Student Name: José Alexandre de Nóbrega Chicharo
Thesis Title: Spintronic Lateral Flow Biochip Platform
Supervisors: Paulo Freitas and Filipe Cardoso

Student Name: Luis Carlos Gomes Pereira
Thesis Title: Modelling the eukaryotic cell cycle
Supervisors: Rui Dilão and Andreas Bohn

Student Name: Luís Carlos Lameiras Costa
Thesis Title: The volume-outcome relationship for colorectal cancer surgery in the Portuguese National Health System
Supervisor: José Figueiredo

Student Name: Mafalda de Oliveira Ruas Gonçalves
Thesis Title: Unravelling regulatory modules in Amyotrophic Lateral Sclerosis
Supervisors: Sara Madeira and Alexandre Francisco

Student Name: Mafalda Pereira de Oliveira de Sottomayor Negrão
Thesis Title: Towards a new calcium phosphate bone cement containing an antibiotic
Supervisors: Ana Paula Serro and Miguel Rodrigues

Student Name: Miguel Amador Rosa
Thesis Title: Process improvement in health care units: Scenarios Planning with Discrete Event Simulation Model applied to a Nuclear Medicine Unit
Supervisor: Mónica Oliveira

Student Name: Miguel Monteiro Maia Machado
Thesis Title: Computational Analysis of The Dependence Of Ward's Area Position With Physical Activity.
Supervisors: Paulo Fernandes and Fátima Baptista

Student Name: Mariana Rita Alves Francisco
Thesis Title: Sobre o Papel da Textura na Detecção Automática de Melanomas
Supervisors: Jorge Salvador Marques and Teresa Mendonça

Student Name: Marta Maria Cannas Henriques da Silva e Sousa
Thesis Title: Classification in dementia based on structural and perfusion MRI
Supervisors: Margarida Silveira and **Patrícia Figueiredo**

Student Name: Marta Cristina Goncalves Farracho
Thesis Title: Determination of Individual Muscle Forces using Multibody Dynamics Analysis and Experimental EMG Data
Supervisors: Miguel Tavares da Silva and João Costa

Student Name: Marta Monteiro Silva Carvalho
Thesis Title: Isolation and *ex-vivo* expansion of endothelial progenitor cells from the umbilical cord blood
Supervisors: **Cláudia Lobato da Silva** and **Joaquim Sampaio Cabral**

Student Name: Marta Susana Nunes Martins dos Santos
Thesis Title: Biometrical and Psychophysiological Assessment through Biosensors
Supervisors: Ana Fred and Sílvia Ouakinin

Student Name: Pedro Guilherme Santos Albuquerque e Castro
Thesis Title: Performance measurement in Portuguese Public hospitals: Combining Data Envelopment Analysis, Dynamic Clustering and Multiple Criteria Decision Analysis methods to analyze hospital efficiency and quality
Supervisors: Mónica Oliveira and João Soares de Mello

Student Name: Pedro Luís Henriques Teixeira
Thesis Title: Risk factors for pedestrian injuries in Portugal
Supervisors: João Dias and Jorge Costa Santos

Student Name: Pedro Moraes Castel-Branco
Thesis Title: Afecção do Tempo de Médicos de Família: Modelo de Apoio ao Planeamento de Consultas
Supervisors: Susana Relvas and Mónica Oliveira

Student Name: Raquel Sofia Cardoso Galante
Thesis Title: Influência da ação tribológica na libertação de levofloxacina a partir de materiais de lentes de contato
Supervisors: Ana Paula Serro and Benilde Saramago

Master Degree (MSc) in Biotechnology

Student Name: Ana Carolina Ferreira Vencá
Thesis Title: Identification and characterisation of efflux pumps in *Rhodococcus erythropolis*
Supervisors: **Carla Carvalho** and Miguel Viveiros Bettencourt

Student Name: Ana Cristina Taborda Gomes de Almeida
Thesis Title: Functional analysis of the MDR transporters Tpo1 and Pdr18 under stress induced by the agricultural fungicide mancozeb in yeast
Supervisors: **Isabel Sá-Correia** and **Tânia Rodrigues Cabrito**

Student Name: Ana Margarida de Mendonça Rosa
Thesis Title: Paper-Based Microfluidics for Molecular Diagnostics: Immobilization of biomolecules in wax-printed microfluidic channels via CBM3-ZZ chimeric protein
Supervisors: **Duarte Miguel Prazeres** and João Inácio da Silva

Student Name: Andreia Filipa Ramos Fernandes
Thesis Title: Detection of protein cancer biomarkers in Magnetoresistive Biochip: case study of interleukin 6.
Supervisors: **Luís Fonseca** and **Sofia Martins**

Student Name: Andreia Filipa Silva de Matos
Thesis Name: Integrated Platform for the Expansion and Neural Differentiation of Human Induced Pluripotent Stem Cells
Supervisors: **Maria Margarida Diogo** and **Tiago Fernandes**

Student Name: António Maria Santa Marta de Soure
Thesis Title: *Ex-vivo* expansion of human hematopoietic stem/progenitor cells from the umbilical cord blood for Cellular Therapy
Supervisors: **Cláudia Lobato da Silva** and **Joaquim Sampaio Cabral**

Student Name: Beatriz de Jesus da Cruz Monteiro
Thesis Name: Study of the effects of electrospun poly(ϵ -caprolactone)/Gelatin matrices on human mesenchymal stem cell culture
Supervisors: **Frederico Ferreira** and **Cláudia Lobato da Silva**

Student Name: Bruno Miguel Martins Alves
Thesis Title: Purification of IgG from animal cell cultures using gum arabic coated magnetic particles
Supervisors: **Raquel Aires Barros** and Ana Cecília Roque

Student Name: Carla Alexandra Nunes Mateus
Thesis Name: Study of bioremediation strategies for soils contaminated with s-triazine herbicides: The bioaugmentation bacteria *Pseudomonas* sp. ADP and *Arthrobacter aureescens* TC1 compared
Supervisor: **Cristina Viegas**

Student Name: Elisabete de Figueiredo Quintas Borges de Freitas
Thesis Title: DNA vaccines against avian influenza virus: Enhancing immune response by protein targeting
Supervisors: **Gabriel A. Monteiro** and Miguel Fevereiro

Student Name: Filipa Gomes de Almeida Dias
Thesis Title: Functional analysis of the *Burkholderia cepacia* complex bceOSU genes encoding putative polysaccharide O-acyltransferases
Supervisors: **Leonilde Moreira** and Ana Sofia Ferreira

Student Name: Francisco António Guilherme Moreira
Thesis Title: Biodiesel production by enzymatic transesterification of triglycerides
Supervisors: **Joaquim Sampaio Cabral** and **Sara Badenes**

Student Name: Joana Catarina Onofre Pinto Ferreira Serra
Thesis Title: Cultivation of human mesenchymal stem cells as 3-D aggregates to enhance their therapeutic potential
Supervisors: **Cláudia Lobato da Silva** and **Joaquim Sampaio Cabral**

Student Name: Joana Vital Cabral Batista
Thesis Title: Novel process for human hematopoietic stem cell selection
Supervisors: **Cláudia Lobato da Silva** and **Ana Azevedo**

Student Name: João Pedro da Fonseca Anes
Thesis Title: Development of an immobilized enzyme system aiming at inulin hydrolysis under continuous flow
Supervisor: **Pedro Fernandes**

Student Name: Marta Filipa Ferreira da Silva
Thesis Title: Integrated purification of monoclonal antibodies directly from cell culture medium with aqueous two-phase systems
Supervisors: **Ana Azevedo** and **Raquel Aires Barros**

Student Name: Maria Ana Laorden Rocha de Matos Cortes
Thesis Title: Production of energy with bacterial cells
Supervisors: **Carla Carvalho**

Student Name: Nadiya Kubasova
Thesis Title: Purification of Plasmid Minicircles Biopharmaceuticals by Combined Enzymatic and Chromatographic Techniques
Supervisors: **Gabriel A. Monteiro** and **Duarte Miguel Prazeres**

Student Name: Raquel Espírito Santo Monteiro Correia
Thesis Title: Brain Derived Neurotrophic Factor (BDNF) delivery to neural stem cells by minicircles
Supervisors: **Catarina Madeira** and **Maria Margarida Diogo**

Student Name: Rita Isabel Alturas Dias Varela Martins
Thesis Title: Expansion of Human Neural Stem Cells derived from Pluripotent Stem Cells under Xeno-free conditions
Supervisors: **Maria Margarida Diogo** and **Joaquim Sampaio Cabral**

Student Name: Rita Margarida de Sousa Costa
Thesis Title: Scalable production of human mesenchymal stem cells under xeno-free conditions for Cellular Therapy
Supervisors: **Cláudia Lobato da Silva** and **Joaquim Sampaio Cabral**

Student Name: Sara Alexandra da Silva Lourenço Rosa
Thesis Title: Development of a CHO cell factory for the production of monoclonal antibodies
Supervisors: **Ana Azevedo** and **Cláudia Lobato da Silva**

Erasmus Mundus em Systems Biology

Student Name: Bimal Babu Upadhyaya
Thesis Title: Integration of Genomics and Transcriptomics: Analysis of *Streptococcus pneumoniae* Wild-type and Δ ccpA Strains
Supervisors: Sara Madeira and Susana Vinga

Student Name: Kaur Alasoo
Thesis Title: Elucidating the transcriptional regulatory network controlling the TPO1 response to benzoic acid in yeast
Supervisor: **Isabel Sá-Correia**

Student Name: Mohamed Salaheldin Ahmed Khairat El Hadidi
Thesis Title: The Use of RNA-Seq Data for Re-annotation of Transcriptomes
Supervisors: **Isabel Sá-Correia** and José M Jiménez-Gómez

Student Name: Yue Sun
Thesis Title: Identification of REST regulated genes in prostate cancer via high-throughput technologies
Supervisors: **Isabel Sá-Correia** and Colin Collins

Master Degree (MSc) in Bioengineering and Nanosystems

Student Name: Marta Helena Guerreiro Costa

Thesis Title: Effect of electrospun nanofibrous matrices on co-culture of hematopoietic stem cells and mesenchymal stem cells

Supervisors: **Frederico Ferreira** and **Cláudia Lobato da Silva**

Student Name: Stefano Virgilio

Thesis Title: Solution processed p-i-n solar cells based on P3HT:PCBM bulk heterojunctions

Supervisors: **Jorge Morgado** and Hendrik Bolink

8. Doctoral Thesis

The following are the Doctoral dissertations successfully defended in 2012 in the 3rd cycle courses coordinated by the DBE. We extend our congratulations to all the students, and wish them the best in their future careers. Many of these theses were oriented or co-oriented by the DBE. Their names are in bold. We also extend our sincerest thanks to all the colleagues from outside the DBE who participated in the orientation of many of these theses.

PhD in Biotechnology

Student Name: Dalila Madeira Nascimento Mil Homens

Title: *Burkholderia cenocepacia* pathogenesis: unraveling the virulence functions of trimeric autotransporter adhesins and development of alternative therapies to target this pathogen

Supervisors: **Arsénio Fialho**

Student Name: Andreia Sofia Matos Madeira

Title: Genome-wide expression approaches applied to biomedical research: Long-term adaptation of *Burkholderia cenocepacia* to cystic fibrosis patient's airways and extended ex-vivo cultivation of human mesenchymal stem cells

Supervisors: **Isabel Sá Correia** and **Joaquim Sampaio Cabral**

Student Name: Susana Santos Moita de Oliveira Marques

Title: L(+)-Lactic Acid Production from Recycled Paper Sludge

Supervisors: **José Santos** and José Carlos Pereira Roseiro

Student Name: Luis de Matos Borlido

Title: Magnetic Adsorbents for the Purification of Monoclonal Antibodies

Supervisors: **Raquel Aires Barros**, **Ana Azevedo** and Ana Cecília Roque

Student Name: Inês Nunes da Silva

Title: Comparative genomics and transcriptomics to study mucoid morphotype variation in *Burkholderia cepacia* complex clinical isolates

Supervisors: **Leonilde Moreira** and Jorg Becker

Student Name: Catarina Roma Rodrigues

Title: Global responses to phenol and myrcene in *Pseudomonas* at the level of cell membrane proteome unveiled by quantitative proteomics

Supervisors: **Isabel Sá Correia** and Pedro Santos

PhD in Bioengineering

Student Name: David Fernandes Braga Malta

Title: Ex vivo engineered combinatorial microenvironments for stem cell fate studies. The balance between stem cell self-renewal and differentiation

Supervisors: **Cláudia Lobato da Silva**, **Joaquim Sampaio Cabral** and Sangeeta Narain Bhatia

Student Name: Agnieszka Jóskowiak

Title: Integration of light sensor arrays with microfluidic networks to scale down 2D fluorescence spectroscopy for high throughput organism/cell condition analysis

Supervisors: **João Pedro Conde** and **Duarte Miguel Prazeres**

Student Name: Maria Sofia Reis de Orey

Title: Passive Dynamic Walkers and Sensory Systems for Gait Analysis

Supervisors: Miguel Tavares da Silva, Dava J. Newman and Jorge Manuel Martins

Student Name: Ana Carina Bila da Silva
Title: Acoustic Sensors for Biomedical and Biotechnology Applications – The Quartz Crystal Microbalance as a Platform for Mammalian Cell Sensing
Supervisors: Guilherme Matos Ferreira and **Cláudia Lobato da Silva**

Student Name: Cláudia Alexandra da Rocha Vistas
Title: Optical Biosensors for Biomedical Applications: Detection of Semiconductor Nanocrystals Labeled HIV-1 Proteins with Hydrogenated Amorphous Silicon Photodetectors
Supervisors: Guilherme Matos Ferreira and **João Pedro Conde**

Student Name: Swarna Deepa Pandian
Title: Flailar - a myosin Va neurological mutant displays autistic-like behavior and synaptic defects
Supervisors: Ramiro Daniel Carvalho de Almeida, Martha Constantine-Paton and **Joaquim Sampaio Cabral**

Student Name: Federico Cismondi
Title: Preprocessing and Misclassifying Issues in Clinical Data Sets for Prediction and Intervention
Supervisors: João Sousa, Stan N. Finkelstein and Shane Raymond Reti

Student Name: André Soromenho da Silva Fialho
Title: Knowledge Discovery in Intensive Care Unit Shock Patients
Supervisors: João Sousa, Stan N. Finkelstein and Shane Raymond Reti

Student Name: Cristiana da Silva Oliveira Paulo
Title: Permanent Antifungal Materials and Coatings: Bioactivity and Cytotoxicity Characterization
Supervisors: Lino da Silva Ferreira and **Joaquim Sampaio Cabral**

Student Name: Filipe de Sousa e Menezes Miguel Grácio
Title: Variability in Biological Systems: Modeling Consequences and Applications
Supervisors: Bruce Tidor and Arlindo Oliveira

9. Staff

The DBE staff includes 28 faculty members, 7 researchers, 2 secretaries, and 3 laboratory technicians.

Secretariats

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Venâncio, Maria da Conceição
1st and 2nd cycle coordination office secretary
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Research Areas and Interests

Responsible for the Bioseparation Engineering Laboratory (BEL) of the Bioengineering Research Group (BERG) of Centre for Biological and Chemical Engineering, leader research unit of the Associate Laboratory Institute for Biotechnology and Bioengineering (IBB). Current research interests include bioseparation of antibodies and cells through aqueous two-phase systems, magnetic nano-particles and chromatography, and application of lab-on-a-chip microfluidic devices to biopharmaceuticals separation and process integration

Selected Publications

Borlido, L., Azevedo, A.M., Sousa, A.G., Oliveira, P.H., Roque, A.C.A., Aires-Barros, M.R., "Fishing human monoclonal antibodies from a CHO cell supernatant with boronic acid magnetic particles", J. Chromatogr. B, 903, 163-170 (2012)

Gomes, A.G., Azevedo, A.M., Aires-Barros, M.R., Prazeres, D.M.F., "Validation and scale-up of plasmid DNA purification by phenyl-boronic acid chromatography", J. Sep. Sci., 35, 3190–3196 (2012)

Nascimento, K.S., Cunha, A.I., Nascimento, K.S., Cavada, B.S., Azevedo, A.M., Aires-Barros, M.R., "An overview of lectins purification strategies", J. Mol. Recognit., 25, 527-41 (2012)

Rosa, P.A.J., Azevedo, A.M., Sommerfeld, S., Bäcker, W., Aires-Barros, M. R., "Continuous aqueous two-phase extraction of human antibodies using a packed column", J. Chromatogr. B, 880, 148-156 (2012)

da Silva, D.F.C., Azevedo, A.M., Fernandes, P., Chu, V., Conde, J.P., Aires-Barros, M.R., "Design of a microfluidic platform for monoclonal antibody extraction using an aqueous two-phase system", J. Chromatogr. A, 1249, 1-7 (2012)

Academic Info

President of the Pedagogical Council of IST
President of the Centre for Biological and Chemical Engineering (CEBQ)
Classes in 2011/12: Separation and Purification of Biological Products (1st semester); Biotechnology (2nd semester)

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Research Areas and Interests

Research Scientist of the Bioseparation Engineering Laboratory of the Bioengineering Research Group (member of the Associated Laboratory IBB – Institute for Biotechnology and Bioengineering). Current research interests include production of monoclonal antibodies by animal cell culture and design of novel downstream processes for the purification of biological products.

Selected Publications

L. Borlido, A.M. Azevedo, A.G. Sousa, P.H. Oliveira, A.C.A. Roque, M.R. Aires-Barros, “Fishing human monoclonal antibodies from a CHO cell supernatant with boronic acid magnetic particles”, J. Chromatogr. B **903**, 163-170 (2012)

A.G. Gomes, A.M. Azevedo, M.R. Aires-Barros, D.M.F. Prazeres, “Validation and scale-up of plasmid DNA purification by phenyl-boronic acid chromatography”, J. Sep. Sci. **35**, 3190–3196 (2012)

K.S. Nascimento, A.I. Cunha, K.S. Nascimento, B.S. Cavada, A.M. Azevedo, M.R. Aires-Barros, “An overview of lectins purification strategies”, J. Mol. Recognit. **25**, 527-41 (2012)

P.A.J. Rosa, A.M. Azevedo, S. Sommerfeld, W. Bäcker, M.R. Aires-Barros, "Continuous aqueous two-phase extraction of human antibodies using a packed column", J. Chromatogr. B **880**, 148-156 (2012)

D.F.C. da Silva, A.M. Azevedo, P. Fernandes, V. Chu., J.P. Conde, M.R. Aires-Barros, “Design of a microfluidic platform for monoclonal antibody extraction using an aqueous two-phase system”, J. Chromatogr. A **1249**, 1-7 (2012)

D.P.C. de Barros, A.M. Azevedo, J.M.S. Cabral, L.P. Fonseca, “Optimisation of flavour esters synthesis by *Fusarium solani pisi* cutinase”, J. Food Biochem. **36**, 275-284 (2012)

Academic Info

Classes in 2010/11: Separation and Purification of Biological Products, Bioengineering Laboratories, Biological Engineering Laboratory I, Biotechnology Laboratories II

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Research Areas and Interests

Director of the Associated Laboratory Institute for Biotechnology and Bioengineering; Head of the BioEngineering Research Group; Principal Investigator of the Stem Cell Bioengineering and Regenerative Medicine Laboratory. Current research interests include Stem Cells Research for Tissue Engineering and Regenerative Medicine; Stem Cell Bioprocessing and Manufacturing; development of novel stem cell bioreactors and advanced bioseparation and purification processes.

Selected Publications

Barbosa, H.S.C, Fernandes, T.G., Dias, T.P., Diogo, M.M., Cabral, J.M.S., New Insights into the Mechanisms of Embryonic Stem Cell Self-Renewal under Hypoxia: a Multifactorial Analysis Approach, PLoS One 7(6), e38963 (2012) doi: 10.1371/journal.pone.0038963

Coelho, M.B., Cabral, J.M.S., Jeffrey M. Karp, J.M., Intraoperative Stem Cell Therapy, Ann. Rev. Biomed. Eng.14, 325-349 (2012) doi: 10.1146/annurev-bioeng-071811-150041

Diogo, M.M., da Silva C.L., Cabral J.M.S., Separation Technologies for Stem Cell Bioprocessing, Biotechnology and Bioengineering 109, 2699-709 (2012) doi: 10.1002/bit.24706

Oliveira P.H., Boura J., Abecasis M.A., Gimble J.M., da Silva C.L. Cabral J.M.S, Impact of hypoxia and long-term cultivation on the genomic stability and mitochondrial performance of ex vivo expanded human stem/stromal cells, Stem Cell Research 9, 225-236 (2012) doi.org/10.1016/j.scr.2012.07.001

Rodrigues, C.A.V., Fernandes, T.G., Diogo, M.M., da Silva, C.L., Cabral, J.M.S., "Stem Cell Cultivation in Bioreactors", Biotechnol. Adv., 29(6), 815-829 (2011) doi: 10.1016/j.biotechadv.2011.06.009

dos Santos, F.; Andrade, P.Z.; Abecasis, M.M.; Gimble, J.M.; Chase, L.G.; Campbell, A.M.; Boucher, S.; Vemuri, M.C.; da Silva, C.L., Cabral, J.M.S. "Toward a Clinical-Grade Expansion of Mesenchymal Stem Cells from Human Sources: A Microcarrier-Based Culture System Under Xeno-Free Conditions" Tissue Eng., Part C, 17 (12) 1201-1210 (2011) doi: 10.1089/ten.tec.2011.0255.

Academic Info

Head of Department of Bioengineering
Coordinator of the Ph.D. program on Bioengineering (MIT-Portugal Program)
Classes in 2012/13: Introduction to Biological Engineering, Bioprocess Engineering Principles

Carla C.C.R. de Carvalho

PhD - IST, UTL, 2003
MSc – IST, UTL, 1999
Degree in Chem Eng. – IST, UTL, 1998
Research Scientist

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Research Areas and Interests

Effect of toxic compounds and stressful conditions on cellular membranes and cell surface properties of bacteria and mechanisms of bacterial adaptation. Lipidomics. Prevention and identification of biofilms. Fluorescence microscopy and image analysis to assess cell physiology and morphology. Production of compounds with marine bacteria. Biotransformation and design of bioreactors for the production of high-value compounds from low-value substrates in organic/aqueous systems using whole cells.

Selected Publications

C.C.C.R. de Carvalho, "Adaptation of *Rhodococcus erythropolis* cells for growth and bioremediation under extreme conditions", *Research in Microbiology* **163**, 125-136 (2012).
(Doi: 10.1016/j.resmic.2011.11.003)

C.C.C.R. de Carvalho, M.J. Caramujo, "Lipids of prokaryotic origin at the base of marine food webs", *Marine Drugs* **10**, 2698-2714 (2012) (DOI:10.3390/md10122698).

M.J. Caramujo, C.C.C.R. de Carvalho, S. Silva, K.R. Carman, "Dietary carotenoids regulate astaxanthin content of copepods and their susceptibility to UV light and copper toxicity", *Marine Drugs* **10**, 998-1018 (2012) (DOI:10.3390/md10050998).

C.C.C.R. de Carvalho, "Biofilms: new ideas for an old problem", *Recent Patents on Biotechnology* **6**, 13-22 (2012) (DOI: 10.2174/187220812799789163).

C.C.C.R. de Carvalho, M.J. Caramujo, "Tumour metastasis as an adaptation of tumour cells to fulfil their phosphorus requirements", *Medical Hypotheses* **78**, 664-667 (2012)
(DOI:10.1016/j.mehy.2012.02.006).

M.P.C. Marques, K. Walshe, S. Doyle, P. Fernandes, C.C.C.R. de Carvalho, "Anchoring high-throughput screening methods to scale-up bioproduction of siderophores", *Process Biochemistry* **47**, 416-421 (2012) (DOI:10.1016/j.procbio.2011.11.020).

C.C.C.R. de Carvalho "Enzymatic and whole cell catalysis: finding new strategies for old processes", *Biotechnology Advances* **29**, 75-83 (2011) (DOI: 10.1016/j.biotechadv.2010.09.001)

Academic Info

Classes in 2011/2012: Biological Engineering Laboratory II (LEB-II), Biofuels (Bioc)

Patrícia Almeida Carvalho

Ph.D. University of Groningen, 2001
Assistant Professor

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Research Areas and Interests

The areas of scientific interest are currently centred on the production of nanostructured composite materials and advanced characterization of materials at micro/nano/pico scales.

Selected Publications

D. Nunes, M. Vilarigues, J.B. Correia, P.A. Carvalho, “Nickel-carbon nanocomposites: Synthesis, structural changes and strengthening mechanisms”, *Acta Materialia* **60** (2012) 737–747. (DOI: 10.1016/j.actamat.2011.10.012).

D. Nunes, V. Livramento, U. Mardolcar, J.B. Correia, P.A. Carvalho, “Tungsten-nanodiamond composite powders produced by ball milling”, *Journal of Nuclear Materials* **426** 115–119 (2012). (DOI: 10.1016/j.jnucmat.2012.03.028).

M. Correia, V. Michel, A.P. Matos, P. Carvalho, M.J. Oliveira, R.M. Ferreira, M. Huerre, R. Seruca, C. Figueiredo, J.C. Machado, E. Touati, “Docosahexaenoic acid inhibits *Helicobacter pylori* growth in culture and mice gastric mucosa colonization”, *PlosOne* **7** e35072 (2012) (DOI:10.1371/journal.pone.0035072).

D. Nunes, V. Livramento, R. Mateus, J.B. Correia, L.C. Alves, M. Vilarigues, P.A. Carvalho, “Mechanical synthesis of copper-carbon nanocomposites: Structural changes, strengthening and thermal stabilization”, *Materials Science and Engineering A*, **528** 8610-8620 (2011). (DOI: 10.1016/j.msea.2011.08.048).

D. Nunes, V. Livramento, N. Shohoji, H. Fernandes, C. Silva, J.B. Correia, P.A. Carvalho, “Copper-micrometer-sized-diamond nanostructured composites”, *Scripta Physica*, **T145** 014069 (2011). (DOI: 10.1088/0031-8949/2011/T145/014069).

D. Nunes, J.B. Correia, P.A. Carvalho, R., N. Shohoji, H. Fernandes, C. Silva, L.C. Alves, K. Hanada, E. Osawa, “Production of Cu/Diamond composites for first-wall heat sinks”, *Fusion Engineering and Design* **86** 2589–2592 (2011). (DOI: 10.1016/j.fusengdes.2011.01.085)

S. Graça, P.A. Carvalho, R. Colaço, “Dislocation structures in nanoindented ductile metals - a TEM direct observation”, *Journal of Physics D: Applied Physics* **44** 335402 (2011). DOI: 10.1088/0022-3727/44/33/335402)

Academic Info

Responsible for the Administration of the DBE

Classes in 2011/12: Introduction to Materials Science, Biomaterials II, Biomedical Materials and Nanotechnology, Characterization of Materials, Advanced Microscopy

Rogério Colaço

Ph.D. Technical University of Lisbon, 2002
Habilitation, Technical University of Lisbon, 2012
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Research Areas and Interests

Researcher of CQE - Centro de Química Estrutural (CQE) and, currently, the co-responsible of the NanoLab - The Nanostructured Materials and Nanotechnologies Laboratory of DBE. Current scientific interest are centred on the synthesis and advanced characterization of engineering materials and systems, namely for biomedical applications, by using Atomic Force Microscopy based techniques.

Selected Publications

R. Colaço and P.A. Carvalho, Atomic Force Microscopy in Bioengineering Applications, in Scanning Probe Microscopy in Nanoscience and Nanotechnology 3, NanoScience and Technology, pp 397-430, B. Bhushan (ed.), DOI 10.1007/978-3-642-25414-7 15, Springer-Verlag Berlin Heidelberg, 2012

A. P. Serro, R. Colaço and B. Saramago Effect of albumin adsorption on biotribological properties of artificial joints, in Proteins at Interfaces III – State of the Art, Chapter 23, pp 497-527, Thomas Horbett, John L. Brash, Willem Norde Editors, DOI: 10.1021/bk-2012-1120 ACS Symposium Series, American Chemical Society, 2012.

A.P. Serro, A. Carapeto, G. Paiva, J. P. S. Farinha, R. Colaço, B. Saramago, Formation of an intact liposome layer adsorbed on oxidized gold confirmed by three complementary techniques: QCM-D, AFM and Confocal fluorescence microscopy, Surface and Interface Analysis 44 (2012) 426–433.

B. Nunes, A.P. Serro, B. Saramago, E. Alves, V. Oliveira, R. Colaco, Ageing effects on the wettability behavior of laser textured silicon, Applied Surface Science 257 (2011) 2604–2609.

S. Graça, P. A. Carvalho, R. Colaço, Dislocation structures in nanoindented ductile metals – a TEM direct observation, J. of Physics D: Applied Physics 44 (2011) 335402.

Academic Info

Member of the Executive Board of IST - Responsible for the Academic Affairs
(on release from teaching in 2012)

João Pedro Conde

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Professor

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Research Areas and Interests

Co-responsible for the Thin Film MEMS and BioMEMS research group of INESC Microsystems and Nanotechnologies (a laboratory member of the Associated Laboratory IN-Institute of Nanoscience and Nanotechnology). Current research interests include novel thin film devices such as thin film silicon and polymer MEMS and NEMS and Lab-on-Chip microfluidic devices with integrated biosensors using cells, proteins, and nucleic acids.

Selected Publications

P. Novo, D.M.F. Prazeres, V. Chu, J.P. Conde, “Microspot-based ELISA in microfluidics: chemiluminescence and colorimetry detection using integrated thin-film hydrogenated amorphous silicon photodiodes”, *Lab Chip* **11**, 4063-4071 (2011). DOI information: <http://dx.doi.org/10.1039/C1LC20362B>.

D.C. Martins, V. Chu, D.M.F. Prazeres, J.P. Conde, “Electrical detection of DNA immobilization and hybridization by streaming current measurements in microchannels”, *Appl. Phys. Lett.* **99**, 183702 (2011). DOI information: <http://dx.doi.org/10.1063/1.3658457>. (*selected for the Virtual Journal of Nanoscale Science and Technology, AIP, issue of November 14, 2011; selected for the Virtual Journal of Biological Physics Research, AIP, issue of November 15, 2011*).

P. Rosa, S. Tenreiro, V. Chu, T.F. Outeiro, J.P. Conde, “High-throughput study of alpha-synuclein expression in yeast using microfluidics for control of local cellular microenvironment”, *Biomicrofluidics* **6**, 014109 (2012). DOI information: <http://dx.doi.org/10.1063/1.3683161>. (*selected for the Virtual Journal of Biological Physics Research, AIP, issue of February 15, 2012*)

A. Jóskowiak, N. Stasio, V. Chu, D.M.F. Prazeres, J.P. Conde, “Integrated detection of intrinsic fluorophores in live microbial cells using an array of thin film amorphous silicon photodetectors”, *Biosensors and Bioelectronics* **36**, 242 (2012). DOI information: <http://dx.doi.org/10.1016/j.bios.2012.04.029>.

A. Gualdino, V. Chu and J.P. Conde, “Pressure effects on the dynamic properties of hydrogenated amorphous silicon disk resonators”, *J. Micromech. Microeng.* **22**, 085026 (2012). DOI information: <http://dx.doi.org/10.1088/0960-1317/22/8/085026>.

Academic Info

Vice-President of the DBE for Post-Graduation and Research
Coordinator of the Master Degree in Biomedical Engineering and the Doctoral Program in Biomedical Engineering
Classes in 2011/12: Nanotechnology, Nanobiotechnology and Biomaterials

Maria Margarida Diogo

Ph.D. Instituto Superior Técnico, 2004
Research Scientist

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Research Areas and Interests

Current research interests include bioprocessing strategies for expansion and neuronal differentiation of pluripotent and neural stem cells and purification of their derivatives envisaging applications in Regenerative Medicine and drug discovery and their integration with microscale culture systems to explore the effect of microenvironmental factors on stem cell fate.

Selected Publications

M.M. Diogo, C. Lobato da Silva, J.M.S. Cabral, “Separation Technologies for Stem Cell Bioprocessing”, *Biotech. Bioeng.*, **109**(11): 2699-709, (2012). (DOI: 10.1002/bit.24706).

H.S.C. Barbosa, T.G. Fernandes, T.P. Dias, M.M. Diogo, J.M.S. Cabral, “New Insights into the Mechanisms of Embryonic Stem Cell Self-Renewal under Hypoxia: a Multifactorial Analysis Approach”, *Plos One*, 7(6):e38963, (2012). (DOI: 10.1371/journal.pone.0038963).

S. Ribeiro, J. Mairhofer, C. Madeira, M.M. Diogo, C. Lobato da Silva, G. Monteiro, R. Grabherr, J.M.S. Cabral, "Plasmid DNA Size Does Affect Nonviral Gene Delivery Efficiency in Stem Cells", *Cell Reprogram.*, **14**(2):130-137, (2012). (DOI: 10.1089/cell.2011.0093).

C.A.V. Rodrigues, M.M. Diogo, C. Lobato da Silva, J.M.S. Cabral, “Microcarrier Expansion of Mouse Embryonic Stem Cell-Derived Neural Stem Cells in Stirred Bioreactors”, *Biotech. Appl. Biochem.*, **58**(4):231-42, (2011). (DOI: doi: 10.1002/bab.37).

A.M. Fernandes-Platzgummer, M.M. Diogo, R.P. Batista, C. Lobato da Silva, J.M.S. Cabral, “Scale-up of mouse embryonic stem cell expansion in stirred bioreactors”, *Biotech. Prog.*, **27**(5):1421-32, (2011). (DOI: 10.1002/btpr.658).

C.A.V. Rodrigues, T.G. Fernandes, M.M. Diogo, C. Lobato da Silva, J.M.S. Cabral, “Stem Cell Cultivation in Bioreactors”, *Biotech. Adv.*, **29**(6):815-29 (2011). (DOI: doi.org/10.1016/j.biotechadv.2011.06.009)

Academic Info

Classes in 2011/12: Stem Cell Bioengineering (1st semester).

Pedro Fernandes

Ph.D. Instituto Superior Técnico, 1999
Research Scientist

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Research Areas and Interests

Pedro is a member of the Bioprocess Engineering and Biocatalysis Laboratory (a laboratory member of the Associated Laboratory IBB- Institute for Biotechnology and Bioengineering). Current research interests focus on bioprocess intensification through miniaturization. Particular emphasis is given in the development of enzymatic and whole cell based processes within the pharmaceutical and food areas, and in the production of chemicals from renewable resources.

Selected Publications

M.P.C. Marques, K. Walshe, S. Doyle, P. Fernandes, P., C.C.C.R. de Carvalho, “Anchoring high-throughput screening methods to scale-up bioproduction of siderophores”, *Process Biochem.* **47**, 416-421 (2012). (DOI: 10.1016/j.procbio.2011.11.020)

M.P.C. Marques, P. Fernandes, J.M.S. Cabral, P. Znidarsic-Plazl, I. Plaz, “Continuous steroid biotransformations in microchannel reactors”, *New Biotechnol.* **29**, 227-234 (2012). (DOI: 10.1016/j.nbt.2011.10.001).

D.F. Silva, A.M. Azevedo, P. Fernandes, V. Chu, J.P. Conde, M.R. Aires-Barros, “Design of a microfluidic platform for monoclonal antibody extraction using an aqueous two-phase system”. *J. Chromatogr. A*. **1249**, 1-7 (2012). (DOI: 10.1016/j.chroma.2012.05.089)

R. Jovanovic-Malinovska, P. Fernandes, E. Winkelhausen, L. Fonseca, “Galacto-oligosaccharides Synthesis from Lactose and Whey by β -Galactosidase Immobilized in PVA”, *Appl. Biochem. Biotechnol.* **168**, 1197-1211 (2012). (DOI: 10.1007/s12010-012-9850-1)

M.A. Nunes, P.C.B. Fernandes, M.H. Ribeiro, “High-affinity water-soluble system for efficient naringinase immobilization in polyvinyl alcohol–dimethyl sulfoxide lens-shaped particles”. *J. Mol. Recognit.* **25**, 580-594 (2012). (DOI: 10.1002/jmr.2197).

D.S. Nascimento, G. Valasques Junior, P. Fernandes, G.C. Ribeiro, D.M. Lima, A. Góes-Neto, R.Q. Oliveira, R. de C. Figueiredo-Ribeiro, S.A. Assis, “Production, characterization and application of inulinase from fungal endophyte CCMB 328”, *An. Acad. Bras. Cienc.* **84**, 443-454 (2012). (DOI: 10.1590/S0001-37652012005000035).

Frederico Castelo Ferreira

Ph.D. Imperial College London, 2004
Invited Assistant Professor

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Webpage: <http://berg.ist.utl.pt/members/fferreira.html>



Research Areas and Interests

Invited Assistant Professor at the Department of Bioengineering; scientific area of Biomaterials, Nanotechnology and Regenerative Medicine. Member of the BioEngineering Research Group at Institute for Biotechnology and Bioengineering. Current research interests include tailoring materials for stem cells applications, namely mimicking the natural extracellular matrix using nanofiber based polymeric 3D matrices and development of stimulus responsive systems for stem cell ex-vivo cultivation; engineering processes towards production of platelets from human stem cells; study fermentation based routes for jet biofuel production; and development of new efficient and sustainable hybrid systems for purification of pharmaceuticals, namely through membrane separations.

Selected Publications

G. Székely, J. Bandarra, W. Heggie, F.C. Ferreira B. Sellergren "Design, preparation and characterization of novel molecularly imprinted polymers for removal of potentially genotoxic 1,3-diisopropylurea from API solutions", Separation and Purification Technology, 86 (2012) 190–198 (DOI:10.1016/j.seppur.2011.11.004)

G. Székely, J. Bandarra, W. Heggie, B. Sellergren, F.C. Ferreira "A hybrid approach to reach stringent low genotoxic impurity contents in active pharmaceutical ingredients: Combining molecularly imprinted polymers and organic solvent nanofiltration for removal of 1,3-diisopropylurea", Separation and Purification Technology, 86 (15) (2012) 79–87 (doi:10.1016/j.seppur.2011.10.023)

G. Székely, J. Bandarra, W. Heggie, B. Sellergren, F.C. Ferreira "Organic solvent nanofiltration: A platform for removal of genotoxins from active pharmaceutical ingredients", Journal of Membrane Science, Journal of Membrane Science 381 (1-2) 2011 (doi:10.1016/j.memsci.2011.07.007)

M. Sousa, A.R. Bras, , H. I. M. Veiga, F.C. Ferreira, M. N. Pinho, N.T. Correia, M. Dionisio "Dynamical Characterization of a Cellulose Acetate Polysaccharide" J. Phys. Chem. B 114 (2010) 10939-1095 (dx.doi.org/10.1021/jp101665h)

I. Sereewatthanawut, F.C. Ferreira, N. F., Ghazali, A.G. Livingston, "Enantioseparation via EIC-OSN: Process Design and Improvement of Enantiomers Resolvability and Separation Performance" AIChE Journal 56 (4) (2010) 893-904 (DOI: 10.1002/aic.12025)

Academic Info

Contact Point for Industrial Affiliates - MIT Portugal Program (Bioengineering Focus Area).

Classes in 2011/12: Stem Cell Bioengineering; Entrepreneurship in Bioengineering; Chemical Engineering, Biotechnology and Society; Innovation in Bioengineering; Biological Engineering Laboratory II; Bioprocess Engineering Principles; Biotechnology; Cell and Tissue Engineering Green Technologies and Strategic Management; Bioteams- Innovation Teams.

Arsénio M. Fialho

Ph.D. Instituto Superior Técnico, 1996
Associate Professor with Habilitation

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Research Areas and Interests

His current scientific interests, in the field of Molecular and Cellular Microbiology, are centered on the study of bacterial proteins, such as cupredoxins, as novel drug candidates with anticancer activity. Studies aiming to elucidate the cellular and molecular effects of treating breast cancer cell models with azurin, a particular cupredoxin produced by *Pseudomonas aeruginosa*. His research interests are also focused on the study of trimeric autotransporter adhesins as novel and key virulence determinants in members of the Burkholderia cepacia complex, a group of bacteria prevalent in the natural environment that can cause serious infections in patients suffering from Cystic Fibrosis.

Selected Publications

Mil-Homens D., Fialho A.M. “A BCAM0223 Mutant of Burkholderia cenocepacia is Deficient in Hemagglutination, Serum Resistance, Adhesion to Epithelial Cells and Virulence” PLoS One, 7(7):e41747, 2012

Avner B. S., Fialho A.M., Chakrabarty A.M. “Overcoming drug resistance in multi-drug resistant cancers and microorganisms: A conceptual framework” Bioengineered 3:262-270, 2012

Fialho A.M., Salunkhe P., Manna S.K., Mahali S., Chakrabarty A.M. “Glioblastoma Multiforme: Novel Therapeutic Approaches” ISRN Neurology Article ID 642345, doi:10.5402/2012/642345, 2012

Fialho A.M., Bernardes N., Chakrabarty A.M. “Recent patents on live bacteria and their products as potential anticancer agents” Recent Patents on Anti-Cancer Drug Discovery 7: 31-55, 2012

Mil-Homens D., Bernardes N., Fialho A.M. “The antibacterial properties of docosahexaenoic omega-3 fatty acid against the Cystic Fibrosis multi-resistant pathogen Burkholderia cenocepacia” FEMS Microbiology Letters 328:61-69, 2012

Mil-Homens D., Fialho A.M. “Trimeric autotransporter adhesins in members of the Burkholderia cepacia complex: a multifunctional family of proteins implicated in virulence” Frontiers in Cellular and Infection Microbiology doi: 10.3389/fcimb.2011.00013, 2011

Academic Info

Member of the Students Training Committee of the DBE
Classes in 2011/12: Biochemistry and Molecular Biology (1st and 2nd semester); Comparative and Functional Genomics; Molecular and Cellular Microbiology (1st semester)

Patrícia Figueiredo

D. Phil. University of Oxford, 2003
Assistant Professor

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Research Areas and Interests

My research interests are in the field of Neuroimaging, with the goal of developing non-invasive techniques for the study of human brain function. I am particularly interested in the combination of functional magnetic resonance imaging (fMRI) modalities, with an emphasis on methodological developments targeting specific clinical applications. In one line of research, I seek to obtain more quantitative measures of brain activity by evaluating cerebrovascular dynamics through the integration of multiple, complementary MRI techniques. Another line of research involves the simultaneous acquisition of the electroencephalogram (EEG) with fMRI, with the aim of assessing both the spatial and temporal dynamics of brain activity. Overall, I expect that these developments will help elucidate the investigation of pathology in individual patients, as well as identify biomarkers for specific neurological and psychiatric diseases.

Selected Publications

Leite M, Leal A and Figueiredo P (2013) Transfer function between EEG and BOLD signals of epileptic activity. *Front. Neur.* doi: 10.3389/fneur.2013.00001 [Epub ahead of print]

Jorge JP, Figueiredo P, van der Zwaag W, Marques JP (2013) Signal fluctuations in fMRI data acquired with 2D-EPI and 3D-EPI at 7 Tesla. *Magn. Reson. Imag.* [Epub ahead of print]

Pimentel M, Vilela P, Sousa I, Figueiredo P (2013) Localization of the hand motor area by ASL and BOLD fMRI. *Human Brain Mapping* 34(1):96-108.

Murta T, Leal A, Garrido M, Figueiredo P (2012) Dynamic Causal Modelling of epileptic seizure propagation pathways: a combined EEG-fMRI study. *NeuroImage* 62(3): 1634-1642.

Lemos R, Figueiredo P, Santana I, Simões MR, Castelo-Branco M (2012) Temporal integration of 3D coherent motion cues defining simple objects of unknown orientation is impaired in amnesic Mild Cognitive Impairment and Alzheimer's Disease. *Journal of Alzheimer's Disease* 28(4):885-96.

Academic Info

Coordinator of the 1st cycle Masters Degree in Biomedical Engineering at IST.

Mobility coordinator of the Masters Degree in Biomedical Engineering at IST.

Member of DBE's Executive Committee.

Taught courses in 2011/2012: Introduction to Biomedical Engineering (1st semester); and Imaging techniques (2nd semester).

Jorge Humberto Gomes Leitão

Ph.D. Instituto Superior Técnico, 1996
Assistant Professor

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Research Areas and Interests

Current major research interests, in the scientific areas of Molecular Microbiology, Microbial Genetics and Genomics, include the identification and functional characterization of small non-coding regulatory RNAs and virulence related genes from bacteria of the *Burkholderia cepacia* complex, envisaging their exploitation to develop novel strategies to fight infections caused by these bacteria.

Selected Publications

C.G. Ramos, P.J. da Costa, G. Döring, J.H. Leitão, “The novel cis-encoded small RNA h2cR is a negative regulator of *hfq2* in *Burkholderia cenocepacia*”, PLoS One 7(10):e47896 (2012).

C.G. Ramos, A.M. Grilo, P.J. da Costa, J.H. Leitão, “Experimental identification of small non-coding regulatory RNAs in the opportunistic human pathogen *Burkholderia cenocepacia* J2315”. Genomics (in press). doi: 10.1016/j.ygeno.2012.10.006.

S.A. Sousa, J.R. Feliciano, P.F. Pinheiro, J.H. Leitão. Biochemical and functional studies on the *Burkholderia cepacia* complex *bceN* gene, encoding a GDP-D-mannose 4,6-dehydratase. Plos One (in press).

C.G. Ramos, S.A. Sousa, A.M. Grilo, J.R. Feliciano, J.H. Leitão, “The second RNA chaperone Hfq2, is also required for survival to stress and the full virulence of *Burkholderia cenocepacia* J2315”. Journal of Bacteriology 193 (7):1515-152 (2011)

S.A. Sousa, C.G. Ramos, J.H. Leitão. *Burkholderia cepacia* complex: emerging multi-host pathogens equipped with a wide range of virulence factors and determinants. International Journal of Microbiology 2011.pii: 607575.

H. Nadais, M.L. Barbosa, C.G. Ramos, A.M. Grilo, S.A. Sousa, I. Capela, L. Arroja, J.H. Leitão. Enhancing wastewater degradation and biogas production by intermittent operation of UASB reactors. Energy 36: 2164-2168, 2011.

S.A. Sousa, C.G. Ramos, L.M. Moreira, J.H. Leitão. 2010. The *hfq* gene is required for stress resistance and full virulence of *Burkholderia cepacia* to the nematode *Caenorhabditis elegans*. Microbiology 156: 896-908

J.H. Leitão, N. Simões “Identification of novel antimicrobials using a live-animal infection model, In: M. C. Barreto and N. Simões (eds.) Determination of Biological Activities: A Laboratory Manual, Universidade dos Açores, Ponta Delgada (2012), pp. 29-35 (ISBN: 978-972-8612-82-5).

C.G. Ramos, J.H. Leitão, “*Caenorhabditis elegans* as a research tool to unveil bacterial virulence determinants: lessons from the *Burkholderia cepacia* complex”, In: F. Boeri and J.A. Chung (eds.) Nematodes: Morphology, Functions and Management Strategies, Nova Science Publishers, Inc., NY, USA (2012), pp. 135-156, (ISBN: 978-1-61470-784-4).

Academic Info

Coordinator of Tutors of the Department of Bioengineering;
Classes in 2011/12: Microbial Biochemistry and Physiology

Cláudia Lobato da Silva

Ph.D. Instituto Superior Técnico, 2006
Assistant Professor

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Webpage: <http://berg.ist.utl.pt/scbl/CLS.html>

Research Areas and Interests

Current research interests are focused on the *ex-vivo* expansion of human stem cells, Cellular Therapies with human adult stem cells, isolation and purification of stem cells, and bioreactors for stem cell culture. In particular, I have been involved in establishing optimal conditions for the maximization of the expansion of umbilical cord blood-derived hematopoietic stem/progenitor cells, as well as developing bioreactor strategies for the clinical-scale production of mesenchymal stem/stromal cells from different human sources.

Selected Publications

Madeira A, da Silva CL, Dos Santos F, Camafeita E, Cabral JMS, Sá-Correia I. “Human Mesenchymal Stem Cell Expression Program upon Extended Ex-vivo Cultivation, as Revealed by 2-DE-Based Quantitative Proteomics”. PLoS One.7(8):e43523 (2012)

Oliveira PH, Boura J, Abecasis MA, Gimble JM, da Silva CL, Cabral JMS. Impact of hypoxia and long-term cultivation on the genomic stability and mitochondrial performance of ex vivo expanded human stem/stromal cells, Stem Cell Research 9:225-236 (2012)

Diogo MM, da Silva CL, Cabral JMS. Separation Technologies for Stem Cell Bioprocessing, Biotechnology and Bioengineering 109(11):2699-709 (2012)

Ribeiro S, Mairhofer J, Madeira C, Diogo M, da Silva CL, Monteiro G, Grabherr R, Cabral JMS. Plasmid DNA size does affect non-viral gene delivery efficiency in stem cells, Cellular Reprogramming 14(2):130-137 (2012)

Santos F, Andrade PZ, Abecasis MM, Gimble JM, Chase LG, Campbell AM, Boucher S, Vemuri MC, Silva CL, Cabral JMS. Toward a clinical-grade expansion of mesenchymal stem cells from human sources: a microcarrier-based culture system under xeno-free conditions. Tissue Eng Part C Methods. 17(12):1201-10 (2011)

Andrade PZ, da Silva CL, dos Santos F, Almeida-Porada G, Cabral JMS. Initial CD34+ cell-enrichment of cord blood determines hematopoietic stem/progenitor cell yield upon ex vivo expansion. J Cell Biochem. 112(7):1822-31 (2011)

Academic Info

Member of the Coordination of the 2nd cycle Masters Degree in Bioengineering and Nanosystems Classes in 2011/12: Stem Cell Bioengineering, Cellular and Tissue Engineering, Biomolecular and Cellular Engineering (1st semester); Cell and Tissue Engineering (2nd semester)

Catarina Madeira

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Research Scientist

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Research Areas and Interests

Research Scientist at Stem Cell Bioengineering and Regenerative Medicine Laboratory. Current research interest is focused on setting-up gene delivery strategies for stem cells expansion, differentiation or for being used as drug delivery vehicles, specially using non-viral vectors such as plasmids or minicircles associated with cationic liposomes or physical methods.

Selected Publications

C. Madeira, F. dos Santos, P.Z. Andrade, C.L. da Silva, J.M.S. Cabral, “Mesenchymal stem cells for cellular therapies”, Stem cells and cancer stem cells, Springer Edition Vol. 3 Part 3, 179-187 (2012).

S. Ribeiro, J. Mairhofer, C. Madeira, M. Diogo, C.L. da Silva, G. Monteiro, R. Grabherr, J.M.S. Cabral, “Plasmid DNA size does affect non-viral gene delivery efficiency in stem cells”, Cellular Reprogramming **14**(2), 130-137 (2012). (Doi: 10.1089/cell.2011.0093)

A.Santhagunam, C. Madeira, J.M.S. Cabral, “Genetically engineered stem cell-based strategies for articular cartilage regeneration”, Biotechnol. Appl. Biochem., **59**(2), 121-131 (2012). (DOI: 10.1002/bab.1016)

C. Madeira, S. Ribeiro, I.S.M. Pinheiro, S.A.M. Martins, P.Z. Andrade, C.L. da Silva, J.M.S. Cabral, “Gene Delivery to human bone marrow mesenchymal stem cells by microporation”, J. Biotechnol. **151**(1), 130-136 (2011). (doi: 10.1016/j.jbiotec.2010.11.002.)

C. Madeira, R.D. Mendes, S.C. Ribeiro, J.B. Boura, M.R. Aires-Barros, C.L. da Silva, J.M.S. Cabral, “Non-Viral Gene Delivery to Mesenchymal Stem Cells Using Cationic Liposomes for Gene and Cell Therapy”, J.Biomed.Biotechnol. 735349 (2010). (Doi:10.1155/2010/735349)

Academic Info

Classes in 2011-12 (1st semester): Stem Cell Bioengineering

Raul Carneiro Martins

Ph.D. Instituto Superior Técnico, 2004
Assistant Professor

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Research Areas and Interests

Electromagnetic imaging in biological tissues. Biomedical instrumentation. Biopotential electric field caption. Sensors and actuators in biomedical applications. Electromagnetic Sensors. Electromagnetic power transfer in biological mediums.

Selected Publications

J. Caeiros; Martins, RCM; "An Optimized Forward Problem Solver for the Complete Characterization of the Electromagnetic Properties of Biological Tissues in Magnetic Induction Tomography", IEEE Trans. on Magnetics, Vol. 48, No. 12, pp. 4707 - 4712, December, 2012.

Brás, N.B.; Dias, J.; Martins, RCM; Serra, A.C.; "An Alternating Direction Algorithm for Total Variation Reconstruction of Distributed Parameters", IEEE Trans. on Image Processing, Vol. 21, No. 6, pp. 1 - 2, May, 2012.

Caeiros, J.M.S.; Martins, R.C.; , "Electromagnetic tomography: Real-time imaging using linear approaches," *Bioengineering (ENBENG)*, 2011. *ENBENG 2011. 1st Portuguese Meeting in* , vol., no., pp.1-7, 1-4 March 2011 - doi: 10.1109/ENBENG.2011.6026096

Brás, N.B.; Martins, RCM; Serra, A.C.; Ribeiro, A. L.; "A Fast Forward Problem Solver for the Reconstruction of Biological Maps in Magnetic Induction Tomography", IEEE Trans. on Magnetics, Vol. 46, No. 5, pp. 1193 - 1202, May, 2010.

Academic Info

Member of DBE's Executive Committee.

Classes in 2011/2012: Instrumentation and Signal Acquisition in Bioengineering (1st semester).

Marília Mateus

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Research Areas and Interests

Current research interests include the development of membrane adsorbers and membrane chromatography for the purification of protein and plasmid biopharmaceuticals and the characterization of nanoparticles designed for delivery of plasmids and specialty food ingredients.

Selected Publication

L. Raiado-Pereira, A.P. Carapeto, A.M. Botelho-do-Rego, M. Mateus, "Grafting hydrophobic and affinity interaction ligands on membrane adsorbers: A close-up "view" by X-ray photoelectron spectroscopy", Sep. Purif. Technol. **93**, 75-82 (2012). DOI: 10.1016/j.seppur.2012.03.028

International Communications

L. Raiado-Pereira, J. de la Vega, M. Mateus, G.A. Monteiro, D.M.F. Prazeres, "Efficiency of transient transfection in a mammalian cell model influenced by pDNA purification by membrane-HIC", 9th European Symposium on Biochemical Engineering Science - ESBES-9, Istanbul, Turkey, September 23-26, 2012 (held jointly with ISPPP 2012 and ECB15 conferences).

L. Raiado-Pereira, A.M. Gomes, D.M.F. Prazeres, M. Mateus, "Towards a high performing membrane-HIC selective for pDNA - effect of membrane type, pore and pDNA sizes and upscaling", 9th European Symposium on Biochemical Engineering Science - ESBES-9, Istanbul, Turkey, September 23-26, 2012 (held jointly with ISPPP 2012 and ECB15 conferences).

M. Mateus, L. Raiado-Pereira, D.M.F. Prazeres, "Toward therapeutic plasmids purification by hydrophobic interaction membrane chromatography", EUROMEMBRANE 2012 Conference, London, September 23-27, 2012.

M.E. Monteiro, L. Raiado-Pereira, D.M.F. Prazeres, M. Mateus, "Liposome derived membrane adsorber for purification of nucleic acids". EUROMEMBRANE 2012 Conference, London, September 23-27, 2012.

Academic Info

Member of the M.Sc. Dissertation Office of DBE

Member of the School Assembly (elected)

Classes in 2011/12: 'Design Project (Biological Engineering)', 'Design Project (Bioindustry)' and 'Food Technology' (1st semester); 'Biotechnology Laboratories II' (2nd semester)

José Cardoso de Menezes

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Research Areas and Interests

Dr. Menezes is Assistant Professor at IST (Technical University of Lisbon, Habilitation in 2005) and a Senior Researcher at the Institute for Biotechnology and Bioengineering (IBB, TUL). His work deals with the development and use of several systems engineering tools in diverse processing industries with a stronger focus in the bio/pharmaceutical areas, namely Process Analytical Technologies (PAT), Industrial Chemometrics (IC), Multivariate Data Analysis (MVDA), Multivariate Statistics Process Control (MSPC) and Quality by Design (QbD). Main research areas are: Process Analytical Technology; Whole Process/Product Design; Systems Engineering Applied to Manufacturing; and Pharmaceutical Engineering.

Selected Publications

Patent WO 2012/059520 A1 “Spectroscopic finger-printing of raw-materials”, Hoffmann-La Roche AG (Pub. May 10, 2012). Hakemeyer C, Strauss U, Werz S, Jose GE, Folque F, Menezes JC

Alcalà, M., Blanco, M., Menezes, J. C., Felizardo, P. M., Garrido, A., Pérez, D., Zamora, E., Pasquini, C. and Románach, R. J. (2012). Near-Infrared Spectroscopy in Laboratory and Process Analysis. Encyclopedia of Analytical Chemistry. (Review, 46 pgs), Wiley DOI:10.1002/9780470027318.a9361.

Hakemeyer C, Strauss U, Werz S, Jose GE, Folque F, Menezes JC (2012) At-line NIR Spectroscopy as Effective PAT Monitoring Technique in Mab Cultivations During Process Development and Manufacturing. *Talanta* **90**, 12–21.

Lourenco V, Lochmann D, Reich G, Menezes JC, Herdling T, Schewitz J (2012), A Quality by Design study applied to an industrial pharmaceutical fluid bed granulation. *Eur. J. Pharm. Biopharm.* **81**(2), 438–447.

Möltgen CV, Puchert T, Menezes JC, Lochmann D, Reich G (2012), A novel in-line NIR spectroscopy application for the monitoring of tablet film coating in an industrial scale process. *Talanta* **92**, 26-37.

Preisner OE, Menezes JC, Guiomar R, Machado J, Lopes JA (2012), Discrimination of Salmonella enterica serotypes by Fourier transform infrared spectroscopy. *Food Res. Int.* **45**(2), 1058-1064.

Academic Info

Visiting Full Professor at The Technical University of Graz (Austria) for Pharmaceutical Engineering. Invited Associate Professor at Lisbon University's (LU) Faculty of Pharmacy. Coordinator of the Pharmaceutical Engineering joint Masters Program of TUL with LU.

Awards

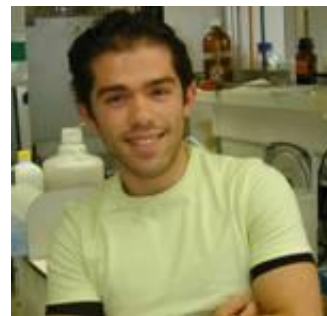
Best Poster Award: Vicente J, Menezes JC, Gaspar F (2012). The role of mechanistic modelling of particle size on the development of pharmaceutical spray drying processes under Quality by Design. 9th Central Eur. Symp. Pharm. Technol. – CESPT2012, Dubrovnik (Croatia), Sept. 20-22.

Nuno P. Mira

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Assistant Professor

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Research Areas and Interests

Current research interests are focused on: *i*) Physiology and molecular biology of *Candida glabrata*, *Saccharomyces cerevisiae* and *Zygosaccharomyces bailii*; *ii*) Regulation of gene and genomic expression in *C. glabrata* and *S. cerevisiae* under stress; *iii*) Exploitation of *Saccharomyces cerevisiae* as a cell factory for the production of add-value chemicals; *iv*) Molecular mechanisms of pathogenesis in *Candida glabrata*; *v*) Epidemiology of invasive fungal infections;

Selected Publications

Nuno P. Mira, Sílvia Henriques, Greg Keller, Miguel C. Teixeira, Rute G. Matos, Cecília M. Arraiano, Dennis R. Winge and Isabel Sá-Correia, “Identification of a DNA binding site for the transcription factor Haa1p, required for *Saccharomyces cerevisiae* response to acetic acid stress”, *Nucleic Acids Research*, 16, 6896-907, (2011)

Mira NP, Teixeira MC and Sá-Correia I, “Adaptation and resistance to weak acids in *Saccharomyces cerevisiae*: a genome-wide view”, *OMICS: a Journal of Integrative Biology*, 14:5, 525-40, (2010)

Mira NP, Palma M, Guerreiro JF and Sá-Correia I, Genome-wide identification of *Saccharomyces cerevisiae* genes required for tolerance to acetic acid, *Microbial Cell Factories*, 9:79, (2010)

Guerreiro JF, Mira NP and Sá-Correia I, Adaptive response to acetic acid in the highly resistant species *Zygosaccharomyces bailii* revealed by quantitative proteomics, *Proteomics*, 12(14): 2303-18, (2012)

Academic info

Classes in 2012/2013: Comparative and Functional Genomics (1st semester); Molecular and Cellular Microbiology (1st semester); Biochemistry and Microbial Physiology (2nd semester); Functional Genomics and Bioinformatics (2nd Semester); Biochemistry and Molecular Biology (1st and 2nd semester)

Gabriel A. Monteiro

Diploma in Biology, Un. Coimbra, 1988
Msc Biotechnology (2 years), IST 1991
Ph.D. Biotechnology, IST 1998
Assistant Professor

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Research Areas and Interests

Development, production and purification of plasmids to DNA vaccination and gene therapy.

Selected Publications

Gonçalves, G. A. L., Bower, D. M., Prazeres, D. M. F., Monteiro, G. A., Prather, K. L. J. (2012) Rational engineering of Escherichia coli strains for plasmid biopharmaceutical manufacturing, Biotechnol. J. 7, 251–261, doi:10.1002/biot.201100062

Lewis, L. A., Umekubo, P. T., Alvi, S., Saby, R., Afrose, J., Astatke, M., Oliveira, P. H., Monteiro, G. A., Prazeres, D. M. F. (2012) Protein-DNA interactions define the mechanistic aspects of circle formation and insertion reactions in IS2 transposition, Mobile DNA, 3:1, 1-24, doi:10.1186/1759-8753-3-1

Toledo, M.A.S., Janissen, R., Favaro, M.T.P., Cotta, M.A., Monteiro, G.A., Prazeres, D.M.F., Souza, A.P., Azzoni, A.R. (2012) Development of a recombinant fusion protein based on the dynein light chain LC8 for non-viral gene delivery, J Control. Release 159, 222-231, doi:10.1016/j.jconrel.2012.01.011

Ribeiro, S., Mairhofer, J., Madeira, C., Diogo, M.M., Silva, C.L., Monteiro, G., Grabherr, R., Cabral, J.M. (2012) Plasmid DNA size does affect non-viral gene delivery efficiency in stem cells, Cell. Reprogram. 14, 130-137, doi:10.1089/cell.2011.0093

Martins, S.A.M., Trabuco, J.R.C., Monteiro, G.A., Prazeres, D.M.F. (2012) GPCR screening and drug discovery: Challenges and latest trends, European Pharm. Rev. 17, 57-62

Gonçalves, G. A. L., Prazeres, D. M. F., Monteiro, G.A., Prather, K. L. J. (2012) De novo creation of MG1655-derived E. coli strains specifically designed for plasmid DNA production, Appl. Microbiol. Biotechnol. xx, xx-xx, doi:10.1007/s00253-012-4308-5

Martins, S.A.M., Trabuco, J.R.C., Monteiro, G.A., Chu, V. Conde, J.P., Prazeres, D.M.F. (2012) Increasing the throughput of GPCR screening assays: Miniaturization and sensor integration, Trends Biotechnol. 30, 566-574, doi:10.1016/j.tibtech.2012.07.004

Academic Info

Classes in 2011/12: Ecology, Biomolecular and Cell Engineering (1st semester); Cell and Tissue Engineering; Biomimicry (2nd semester)

Leonilde Morais Moreira

Ph.D. Instituto Superior Técnico, 1997
Assistant Professor

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e-mail: lmoreira@ist.utl.pt

Webpage: <http://groups.ist.utl.pt/bsrg/Team/lmoreira.html>



Research Areas and Interests

- Exopolysaccharide biosynthesis and regulation in *Burkholderia*
- Role of protein tyrosine phosphorylation in *Burkholderia* virulence
- Genomics and transcriptomics in clinical isolates of *Burkholderia cepacia* complex
- Functional characterization of *Sinorhizobium meliloti* proteins with role in nitrogen fixation symbiosis with legume plants.

Selected Publications

Silva IN, Ferreira AS, Becker JD, Zlosnik JEA, Speert DP, He J, Mil-Homens D, and Moreira LM. (2011). Mucoid morphotype variation of *Burkholderia multivorans* during chronic cystic fibrosis lung infection is correlated with changes in metabolism, motility, biofilm formation and virulence. *Microbiology*. 157:3124-3137. (doi: 10.1099/mic.0.050989-0).

Ferreira AS, Silva IN, Oliveira VH, Cunha R, and Moreira LM. (2011). Insights into the role of extracellular polysaccharides in *Burkholderia* adaptation to different environments. *Frontiers in Cellular and Infection Microbiology*. 1:16, 1-9. (doi: 10.3389/fcimb.2011.00016).

Ferreira AS, Silva IN, and Moreira LM. (2011). Mechanisms controlling the expression of the exopolysaccharide of *Burkholderia* and role in niche adaptation. In "Biotechnology of Biopolymers" (M Elnashar Ed) INTECH, Vienna, Austria (ISBN 978-953-307-179-4).

Santos MR, Cosme AM, Becker JD, Medeiros JMC, Mata MF, and Moreira LM. (2010). Absence of functional TolC protein causes increased stress response gene expression in *Sinorhizobium meliloti*. *BMC Microbiology*. 10:180. (doi: 10.1186/1471-2180-10-180).

Ferreira AS, Leitão JH, Silva IN, Pinheiro PF, Sousa SA, Ramos CG, and Moreira LM. (2010). Distribution of cepacian biosynthesis genes among environmental and clinical *Burkholderia* strains and cepacian exopolysaccharide in resistance to stress conditions. *Applied and Environmental Microbiology*. 76:441-450. (doi: 10.1128/AEM.01828-09).

Cosme AM, Becker A, Santos MR, Sharypova LA, Santos PM, Moreira LM. (2008). The outer membrane protein TolC from *Sinorhizobium meliloti* affects protein secretion, polysaccharide biosynthesis, antimicrobial resistance and symbiosis. *Molecular Plant-Microbe Interactions* 21:947-957. (doi: 10.1094/MPMI-21-7-0947).

Academic Info

Classes in 2011/12: (1st semester)- Molecular Biotechnology, Genetic Engineering, Molecular and Cellular Microbiology; (2nd semester)- Functional Genomics and Bioinformatics, Microbiology.

Jorge Morgado

Ph.D. Instituto Superior Técnico, 1989
Associate Professor with Habilitation

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Research Areas and Interests

The research is carried out within the organic electronics group at Instituto de Telecomunicações-Lisboa, an Associated Laboratory. Current research interests range from conjugated polymers and low molecular weight systems synthesis and their applications in various devices (light-emitting diodes, photovoltaic cells, thin-film transistors and memories). In addition, there is also a research line devoted to the “unimolecular” electronics, encompassing the self-organization of molecular systems on conducting substrates and their electrical characterization using in particular STM.

Selected Publications

A. Charas, A. L. Mendonça, J. Clark, L. Bazzana, A. Nocivelli, G. Lanzani, J. Morgado, “Stimulated emission and ultra-fast optical switching in a ter(9,9'-spirobifluorene)-*co*-methylmethacrylate copolymer”, *J. Polymer Science B: Polymer Physics* **49**, 52-61 (2011) (DOI: 10.1002/polb.22143)

J. Farinhas, Q. Ferreira, R. E. Di Paolo, L. Alcácer, J. Morgado, A. Charas, “Nanostructured donor/acceptor interfaces in photovoltaic cells using columnar-grain films of a cross-linked poly(fluorene-*alt*-bithiophene)”, *J. Mater. Chem.* **21**, 12511 (2011) (DOI: 10.1039/C1JM10195A)

Q. Ferreira, L. Alcácer, J. Morgado, “Stepwise preparation and characterization of molecular wires made of zinc octaethylporphyrin complexes bridged by 4,4'-bipyridine on HOPG”, *Nanotechnology*, **22**, 435604 (2011) (DOI: 10.1088/0957-4484/22/43/435604)

I. S. Lopez, A. L. Mendonça, M. Fernandes, V. de Zea Bermudez, J. Morgado, G. Del Pozo, B. Romero, J. Cabanillas-Gonzalez, “Europium complex-based thermochromic sensor for integration in plastic optical fibres”, *Opt. Mater.* **34**, 1447 (2012) (DOI:10.1016/j.optmat.2012.02.047)

D. Suresh, C. S. B. Gomes, P. T. Gomes, R. E. Di Paolo, A. L. Maçanita, M. J. Calhorda, A. Charas, J. Morgado, M. T. Duarte, “Syntheses and photophysical properties of new iminopyrrolyl boron complexes and their application in efficient single-layer non-doped OLEDs prepared by spin coating”, *Dalton Trans.* **41**, 8502 (2012) (DOI: 10.1039/C2DT30487B)

G. Brotas, J. Farinhas, Q. Ferreira, J. Morgado, A. Charas, “Nanostructured layers of a new cross-linkable poly(3-hexylthiophene) in organic photovoltaics cells”, *Synth. Met.* **162**, 2052 (2012) (DOI: 10.1016/j.synthmet.2012.10.007)

Academic Info

Classes in 2011/12: Chemistry (Electrical and Computing Eng, 1st semester); Materials (2nd semester); Science and Technology of Polymers (2nd semester)

Helena M. Pinheiro

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Research Areas and Interests

Current research interests include the biological wastewaters with emphasis on the biodegradation of recalcitrant pollutants with mixed cultures in sequencing-batch bioreactors. Interests extend to wastewater quality monitoring using spectral data (UV-Vis, NIR and MIR) and chemometrics and its application in supervision and diagnosis of wastewater treatment systems bioreactors.

Selected Publications

N.D. Lourenço, J.A. Lopes, C.F. Almeida, M.C. Sarraguça, H.M. Pinheiro, “Bioreactor monitoring with spectroscopy and chemometrics: a review”, *Anal. Bioanal. Chem.*, **404**(4), 1211-1237 (2012) (DOI:10.1007/s00216-012-6073-9).

N.D. Lourenço, F. Paixão, H.M. Pinheiro, A. Sousa, “Use of spectra in the visible and near-mid-UV range with PCA and PLS processing for suspended solids monitoring in municipal wastewater treatment plants”, *Appl. Spectrosc.*, **64**(9), 1061-1067(2011) (DOI: 10.1366/000370210792434332).

I.C. Gonçalves, L. Lopes, L., H.M. Pinheiro, M.I. Ferra, “Behaviour of different anaerobic populations on the biodegradation of textile chemicals”, *J. Hazard. Mater.*, **172**, 1236-1243 (2009) (DOI:10.1016/j.jhazmat.2009.07.141).

N.D. Lourenço, J.A. Lopes, H.M. Pinheiro, “Real time monitoring of a sequencing batch reactor with in-situ NIR spectroscopy”, in: 6th International Conference on Environmental Science and Technology, Houston, Texas, USA, 25-29 June (2012), Oral Communication, Young Scientist Paper Award (1st Place).

A.M.T. Mata, N.D. Lourenço, H.M. Pinheiro, “Does activated sludge starvation enhance dye bioconversion in the presence of inhibitory compounds?”, in: 8th IWA Leading-Edge Conference on Water and Wastewater Technologies, Amsterdam, The Netherlands, 6-10 June (2011), Best Poster Award.

Academic Info

Member of the Executive Committee of the DBE for External Relations
International Mobility Coordinator in the scientific area of Biotechnology/Biological Engineering
Coordinator for MSc dissertation placements (Biological Engineering)
Elected member of the School Assembly of IST
Classes in 2011/12: Design Project (Biological Engineering); Design Project (Bioindustry); Environmental Biotechnology; Biotechnology & the Environment; Integrated Biological Engineering I.

Duarte Miguel Prazeres

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Research Areas and Interests

Principal investigator of the Nucleic Acids Bioengineering Lab of the Bioengineering Research Group at IBB-Institute for Biotechnology and Bioengineering. Current research interests include nucleic acid engineering (development of plasmid biopharmaceuticals and diagnostics) and nanobiotechnology (lab-on-a-chip microfluidic devices with integrated biosensors using cells, proteins, and nucleic acids).

Selected Publications

Gonçalves, G.A.L., Bower, D.M., Prazeres, D.M.F., Monteiro, G.A., Prather, K.L.J., “Rational Engineering of *Escherichia coli* Strains for Plasmid Biopharmaceutical Manufacturing”, *J. Biotechnol.*, **7**, 251-261(2012) (doi: 10.1002/biot.201100062).

Lewis, L.A., Astatke, M., Umekubo, P.T., Alvi, S., Saby, R., Afrose, J., Oliveira, P.H., Monteiro, G.A., Prazeres, D.M.F., “Protein-DNA Interactions Define the Mechanistic Aspects of Circle Formation and Insertion Reactions in IS2 Transposition”, *Mobile DNA*, **3**, 1-24, (2012). (doi:10.1186/1759-8753-3-1).

Toledo, M.A.S., Janissen, R., Favaro, M.T.P., Cotta, M.A., Monteiro, G.A., Prazeres, D.M.F., Souza, A.P., Azzoni, A.R., “Development of a Recombinant Fusion Protein Based on the Dynein Light Chain LC8 for Non-viral Gene Delivery”, *J. Controlled Release*, **159**, 222-231(2012) (doi: 10.1016/j.jconrel.2012.01.011).

Jóskowiak, A., Stasio, N., Chu, V., Prazeres, D.M.F., Conde, J.P. “Integrated Detection of Intrinsic Fluorophores in Live Microbial Cells Using an Array of Thin Film Amorphous Silicon Photodetectors”, *Biosensors & Bioelectronics*, **36**, 242-249 (2012) (doi: 10.1016/j.bios.2012.04.029).

Gomes, G.A., Azevedo, A.M., Aires-Barros, M.R., Prazeres, D.M.F., “Validation and Scale-up of Plasmid DNA Purification by Phenyl-Boronic Acid Chromatography”, *J. Sep. Sci.*, **35**, 3190-3196 (2012) (doi: 10.1002/jssc.201200225).

Martins, S.A.M., Trabuco, J.R.C., Monteiro, G.A., Chu, V., Conde, J.P., Prazeres, D.M.F. “Towards the Miniaturization of GPCR-based Live-cell Screening Assays”, *Trends Biotechnol.*, **30**, 566-574 (2012) (doi:10.1016/j.tibtech.2012.07.004).

Academic Info

Coordinator of the Integrated Masters Degree in Biological Engineering
Classes in 2011/12: Biological Engineering Laboratories (1st semester); Biomimicry, Bioengineering and Market (2nd semester)

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Research Areas and Interests

Biomedical Signal and Image Processing. Sleep Research. Evolutionary Computation in Search and Optimization. Artificial Life Modelling and Simulation. BioFeedback and Neurofeedback Systems.

Selected Publications

Wenya Nan, Joao Pedro Rodrigues, Jiali Ma, Xiaoting Qu, Feng Wan, Mang I Vai, Agostinho Rosa. Individual alpha neurofeedback training effect on short term memory. *International Journal of Psychophysiology*. <http://dx.doi.org/10.1016/j.ijpsycho.2012.07.182>

Vasco Rui Carvalho Pereira Fernandes Fachada, Nuno Fachada, Tuomas Turpeinen, Paavo Rahkila, Agostinho Rosa and Heikki Kainulainen. TopoCell – An image analysis tool to study intracellular topography. *The Federation of American Society of Experimental Biology Journal (FASEB)*. 2012; 26:578.2

Kurosh Madani, António Dourado Correia, Agostinho Rosa And Joaquim Filipe. Computational Intelligence, Revised And Selected Papers Of The International Joint Conference, IJCCI 2010, Valencia, Spain, October 2010, *Studies In Computational Intelligence*, Volume 399, 2012. DOI: 10.1007/978-3-642-27534-0

DG Migotina, AC Rosa. Segmentation of Sleep EEG Signal by Optimal Threshold. *Proceedings of IASTED Biomed 2012*, pp 114-121. DOI: 10.2316/P.2012.764-063.

DG Migotina, A Calapez, A Rosa. Automatic Artifacts Detection and Classification in Sleep EEG Signals Using Descriptive Statistics and Histogram Analysis: Comparison of Two Detectors. *Proc of 2012 Spring World Congress on Engineering and Technology (SCET2012)* pp 26-31, 2012.

JP Rodrigues, JD Semedo, FM Melicio, JG Pereira, AC Rosa. Peripheral Vision Dynamic test for Athletes. *Proceedings of IASTED Biomed 2012*, pp 933-938. DOI: 10.2316/P.2012.764-063.

Academic Info

Head of Evolutionary Systems and Biomedical Engineering Lab at ISR
Classes in 2011/12: Special Topics in Biomedical Engineering - University of Macau.

Isabel Sá-Correia

Ph.D., IST, 1984 (Microbiology Lab, Gulbenkian Institute of Science)
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Research Areas and Interests

Coordinator of the Biological Sciences Research Group (BSRG), Institute for Biotechnology and Bioengineering, Centre for Biological and Chemical Engineering. Research areas: Molecular and Cellular Microbiology; Functional and Comparative Genomics; Systems and Synthetic Microbiology. Current research interests: Chemical stress response and defence in Yeasts (gene and genomic expression regulation; drug efflux pumps; design and engineering of more robust strains); *Burkholderia cepacia* complex bacteria in cystic fibrosis: epidemiology, adaptive evolution in the lung.

Selected Publications

Cabrito TR, Teixeira MC, Singh A, Prasad R, Sá-Correia I, The yeast ABC transporter Pdr18 (ORF YNR070m) controls plasma membrane sterol composition, playing a role in multidrug resistance, *Biochemical Journal*, 440, 195-202, 2011.

Lourenço, A.B., Roque, F.C., Teixeira, M.C., Ascenso, J.R., Sá-Correia, I., "Quantitative 1H-NMRmetabolomics reveals extensive metabolic reprogramming and the effect of the aquaglyceroporin FPS1 in ethanol-stressed yeast cells", *PLOS One*, 8(2), e55439, 2013

Mira NP, Henriques SF, Keller G, Matos R, Arraiano C, Teixeira MC, Winge DR Sá-Correia I, Identification of a DNA-binding site for the transcription factor Haa1, required for *Saccharomyces cerevisiae* response to acetic acid stress, *Nucleic Acids Research*, 16, 6896-907, 2011.

Teixeira MC, Mira NP, Sá-Correia I, A genome-wide perspective on the response and tolerance to food relevant stresses in *Saccharomyces cerevisiae*. *Current Opinion in Biotechnology*, 22:150-156, 2011.

Guerreiro, J.F., Mira, N.P., Sá-Correia, I., Adaptive response to acetic acid in the highly resistant yeast species *Zygosaccharomyces bailii*, revealed by quantitative proteomics. *PROTEOMICS*, 12: 2303-18, 2012.

Coutinho CP, de Carvalho CCCR, Madeira A, Pinto-de-Oliveira A, Sá-Correia I, *Burkholderia cenocepacia* phenotypic clonal variation during three and a half years of residence in the lungs of a cystic fibrosis patient, *Infection and Immunity*, 79: 2950-60, 2011.

Academic Info

Vice-President of the DBE; Coordinator of the scientific area of Biological Sciences; Coordinator: Master's Programmes in Biotechnology, Microbiology, Erasmus Mundus EuSYSBIO Master's in Systems Biology, PhD Programme in Biotechnology. Classes in 2012/13: Coordination of Molecular and Cellular Microbiology (1st sem.); Functional Genomics and Bioinformatics (2nd sem.).

João Miguel Sanches

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Research Areas and Interests

J. Miguel Sanches is researcher at the Institute for Systems and Robotics (ISR) and in the last years his work has been focused in Biomedical Engineering (BME), namely, in biomedical image processing, physiological based modelling of biological systems in the perspective of systems and control theory and statistical signal processing of physiological data. Biological and medical image processing is his main area of work but he is also involved in the development of signal processing algorithms for polysomnography data and smartphones applications for long term monitoring for sleep disorders diagnosis purposes. In this scope, Heart Rate Variability analysis is today one of his main interests.

Almost all of his research work is in collaboration with medical and biological institutions, namely, Medical School of the University of Lisbon (FMUL), the Institute of Molecular Medicine (IMM) in Lisbon, the Institute of Molecular Pathology and Immunology of the University of Porto (IPATIMUP) and the Electroencephalography and Clinical Neurophysiology Center (Centro de Electroencefalografia Neurofisiologia Clínica - CENC). Several publications and patents were already produced in the scope of this collaborative work.

He is senior member of the IEEE Engineering in Medicine and Biology Society since 2011 and Member of the Bio Imaging and Signal Processing Technical Committee (BISP-TC) of the IEEE Signal Processing Society. He is also president of the Portuguese Association of Pattern Recognition (APRP), an affiliated of the International Association of Pattern Recognition (IAPR).

Selected Publications

U Rajendra Acharya, Oliver Faust, Vinitha Sree S, A P C Alvin, Ganapathy Krishnamurthi, José C R Seabra, João Sanches, Jasjit S Suri, Understanding symptomatology of atherosclerotic plaque by image-based tissue characterization, *Computer methods and programs in biomedicine*. 10/2012; DOI:10.1016/j.cmpb.2012.09.008.

Tânia Oliveira, Lúcia Ferreira, João Sanches and Teresa Paiva, An exploratory study of dissociated states during sleep in patients with fibromyalgia, *Journal of Sleep Research*, vol. 21, pag.165, September 2012 (FM).

Acharya UR, Sree SV, Ribeiro R, Krishnamurthi G, Marinho RT, Sanches J, Suri JS., Data mining framework for fatty liver disease classification in ultrasound: A hybrid feature extraction paradigm, *Med Phys*. 2012 Jul;39(7):4255-4264.

A. Domingues, Teresa Paiva and J. M. Sanches, An actigraphy heterogeneous mixture model for sleep assessment, 34th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, San Diego, USA, August/September 2012.

Carlos Carreiras, Luís Borges de Almeida and J. Miguel Sanches, Phase-Locking Factor in a Motor Imagery Brain-Computer Interface, 34th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, San Diego, USA, August/September 2012 (FM).

David Afonso, José Seabra, Jasjit S. Suri and J. Miguel Sanches, A CAD system for Atherosclerotic Plaque Assessment, 34th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, San Diego, USA, August/September 2012.

José A. Leonardo dos Santos

Ph.D. Instituto Superior Técnico (IST)
Technical University of Lisbon, 1996
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Research Areas and Interests

My current research is focused on plasmid DNA (pDNA) manufacturing processes (production, separation, purification, quality control and monitoring) for application in gene therapy or DNA vaccination. The utilization of membrane processes (ultra and microfiltration) and the development of alternative methods (sonication and microfluidization) to alkaline lysis for plasmid release are under research. For improving the efficiency and the yields of these processes, studies on pDNA compaction and protection against high shear stress processes are being performed. The use alternative microbial GRAS platforms for pDNA production will be other goal of my research.

Selected Publications

J.B. Domingues, M.R. Aires-Barros, J.A.L. Santos, A. M. Azevedo, “Stability Assessment of Antibody Formulations”, 9th International Conference on Protein Stabilisation (ProStab2012), Lisbon, Portugal (2012).

J.D. Martins, E. Tavares, A.M.P. Gomes, D.M.F. Prazeres, J.A.L. Santos, “Mechanical cell lysis technique for plasmid DNA release”, 8th European Congress of Chemical Engineering (ECCE) / 1st European Congress of Applied Biotechnology (ECAB), Berlin, Germany (2011).

A.M.P. Gomes, D.M.F. Prazeres, J.A.L. Santos, “Plasmid DNA recovery and purification by tangential flow filtration”, ICOM2011 – International Congress on Membranes and Membranes Processes, Amsterdam, Netherlands (2011).

W.L. Ming SS. Freitas, G.A. Monteiro, D.M.F. Prazeres, J.A.L. Santos, “Stabilization of naked and condensed plasmid DNA against degradation induced by ultrasounds and high shear vortices”, Biotechnol. Appl. Biochem., **53**, 237-246 (2010) (DOI: 10.1042/BA20080215)

S.S. Freitas, S. Canário, J.A.L. Santos, D.M.F. Prazeres, “Alternative for the Intermediate Recovery of Plasmid DNA: performance, economic viability and Environmental Impact”, Biotechnol. J. **4**, 1-14 (2009) (DOI 10.1002/biot.200800216)

Academic Info

Classes in 2011/12:

- | | |
|---------------------------|--|
| 1 st Semester: | Chemical and Biological Process Engineering I (responsible)
Chemical and Biological Process Engineering II (responsible) |
| 2 nd Semester: | Chemical and Biological Process Engineering II (responsible)
Chemical and Biological Process Engineering I (responsible)
Physical Chemistry and Processes Laboratory |

M. Ângela Taipa

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Research Areas and Interests

Biomolecular Engineering: Biomimetics; combinatorial approaches; molecular recognition; synthetic mimic affinity ligands for identification, separation and stabilization of biomolecules (antibodies, enzymes, plasmid DNA)
Nanobiotechnology: Bio-inspired affinity nanoparticles for antibody recognition

Selected Publications

A.C.A. Roque, Silva, C.S.O., Taipa, M.A., “Affinity-based methodologies and ligands for antibody purification: Advances and perspectives”, *J. Chromat. A* **1160**, 44-55 (2007)

M.A. Taipa, “Immunoassays: Biological tools for high throughput screening and characterisation of combinatorial libraries“, *CC&HTS* **11**, 325-335 (2008)

I.T. Sousa, L. Ruiu, C.R. Lowe, M.A. Taipa, “Synthetic affinity ligands as a novel tool to improve protein stability“, *J. Molec. Recognit.* **22**, 83-90 (2009)

I.T. Sousa, N.M.T Lourenço, C.A.M. Afonso, M.A. Taipa, “Protein Stabilization with a triazine-scaffolded dipeptide-mimic synthetic affinity ligand” (2013)
(<http://onlinelibrary.wiley.com/doi/10.1002/jmr.2252/pdf>)

Academic Info

Classes in 2011/12: Biomolecular and Cellular Engineering; Biological Engineering Laboratory II (1st semester); Biological Engineering Laboratory I (2nd semester)

Miguel Cacho Teixeira

Ph.D. Instituto Superior Técnico, 2004
Assistant Professor

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Research Areas and Interests

Mechanisms of antifungal drug resistance in *Candida glabrata*
Yeast physiology and Molecular Biology
Environmental stress response
Proteomics and Transcriptomics
Systems biology tools for the study of transcriptional regulatory networks

Selected Publications

Lourenço, A.B., Roque, F.C., Teixeira, M.C., Ascenso, J.R., Sá-Correia, I., Quantitative 1H-NMR-metabolomics reveals extensive metabolic reprogramming and the effect of the aquaglyceroporin *FPS1* in ethanol-stressed yeast cells, PLOS One, accepted for publication.

Teixeira, M.C., Godinho, C.P., Cabrito, T.R., Mira, N.P., Sá-Correia, I., Increased expression of the yeast multidrug resistance ABC transporter Pdr18 leads to increased ethanol tolerance and ethanol production in high gravity alcoholic fermentation, Microbial Cell Factories, 11, 98, 2012.

dos Santos, S.C., Teixeira, M.C., Cabrito, T.R., Sá-Correia, I., Yeast Toxicogenomics: genome-wide responses to chemical stresses with impact in Environmental Health, Pharmacology and Biotechnology. Frontiers in Genetics, 3, 63, 2012.

Remy, E., Cabrito, T.R., Baptista, R., Teixeira, M.C., Sá-Correia, I., Duque, P., The Pht1;9 transporter mediates inorganic Pi acquisition by the *Arabidopsis thaliana* root during phosphorus starvation. The New Phytologist, 195, 356–371, 2012.

Teixeira, M.C., "Complex regulatory interplay between multidrug resistance and oxidative stress response in yeast: the *FLR1* regulatory network as a systems biology case-study", In: Oxidative Stress - Molecular Mechanisms and Biological Effects (Lushchak V.I. & Semchyshyn H., Eds), INTECH, Vienna, Austria, 323-340, 2012.

Awards in 2012

Researcher award UTL/Santander (honourable mention in the field of Biological Engineering, Biochemistry and Biotechnology)

Academic Info

Assistant Professor. Member of the coordination team and scientific committee of the Masters Degree in Bioengineering and Nanosystems and of the ERASMUS MUNDUS Masters Degree in Systems Biology EuSysBio.

Classes in 2011/12: Biotechnology Lab I (as coordinator); Functional Genomics and Bioinformatics; Molecular and Cellular Microbiology; Biochemistry and Molecular Biology; Genetic Engineering; Molecular Biotechnology; Computational Biology; Pharmaceutical Biotechnology and Bioengineering; Biosystems Science and Engineering.

Cristina Anjinho Viegas

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Research Areas and Interests

Current research interests include the biodegradation and toxicity of *s*-triazine herbicides and their degradation products in soil microcosms, optimization of bioremediation strategies for soils contaminated with *s*-triazine herbicides, and development of yeast-based bioassays for the assessment of the toxicity of xenobiotics (e.g. pesticides) and of environmental samples, focused on worst-case scenarios of environment contamination.

Selected Publications

C. A. Viegas, S. Chelinho, M. Moreira-Santos, C. Costa, F. N. Gil, C. Silva, D. Lima, R. Ribeiro, J.P. Sousa, A.M. Fialho, 2012. "Bioremediation of soils contaminated with atrazine and other *s*-triazine herbicides: current state and prospects", In: Justin A. Daniels (ed), "Advances in Environmental Research. Volume 6", ISBN 978-1-61728-163-1, Nova Science Publishers, Inc., NY, USA, pp. 1-49 (Open Access: https://www.novapublishers.com/catalog/product_info.php?products_id=31032).

Viegas, C.A., Costa, C., André, S., Viana, P., Ribeiro, R., Moreira-Santos, M. 2012. Does S-metolachlor affect the performance of *Pseudomonas* sp. Strain ADP as bioaugmentation bacterium for atrazine-contaminated soils? PLoS ONE 7(5): e37140 (doi:10.1371/journal.pone.0037140).

Chelinho, S., Moreira-Santos, M., Silva, C., Costa, C., Viana, P., Viegas, C.A., Fialho, A.M., Ribeiro, R., Sousa, J.P. 2012. Semi-field testing of a bioremediation tool for atrazine contaminated soils: evaluating the efficacy on soil and aquatic compartments. Environmental Toxicology and Chemistry, 31: 1564-1572. (doi: 10.1002/etc.1840)

F.N. Gil, A.C. Gonçalves, J.D. Becker, C.A. Viegas, "Genome-wide transcriptional response to pesticide exposure in the model yeast *Saccharomyces cerevisiae*", 37th FEBS and 22nd IUBMB Congress, Sevilha, Espanha, September 2012, abstract published in *the FEBS journal*, 279 (suppl 1), 230, 2012.

Academic Info

Responsible for the Biological Sciences Teaching Laboratory.

Classes in 2011/12: Environmental Biotechnology/Biotechnology and Environment, Genetic Engineering/Molecular Biotechnology (1st semester); Microbiology, Biotechnology (2nd semester)

