annual report 2011

INSTITUTO DE TECNOLOGIA QUÍMICA E BIOLÓGICA /UNL

Knowledge Creation

UNIVERSIDADE NOVA DE LISBOA
OMNIS CIVITAS CONTRA SE DIVISA NON STABIT

2011 Snapshots

7315 Citations in 2011

300 Communications to International Conferences (approx.)

Articles in 2011 (peer-reviewed) 274

PhD holders 184

Ongoing, financed projects 146

PhD students 145

55 % Articles ranked as Q1 (WoS 2011)

PhD theses awarded 45

27 Highly Cited Papers (world top 1%)

20 % National publications in *Nature* and *Science* (as leading institution / 2006-2010)

10 % Above world-average Leiden normalized impact index (2004-2010)

10 % Marie Curie Grants in Portugal (all fields, 2008-2011)

2 Start Up companies launched (last 2 years)

Index

What is ITQB

The *Instituto de Tecnologia Química e Biológica* (ITQB) is an academic research centre of the Universidade Nova de Lisboa. Its mission is to carry out scientific research and post-graduate teaching in Chemistry, Life Sciences, and associated technologies, while also serving the community and performing university extension activities for the promotion of science and technology.
ITQB's highly multidisciplinary nature makes it a leading centre for advanced training of researchers in Portugal. With 63 independent teams in 2011, ITQB hosts over 400 researchers, including 145 PhD students, with different backgrounds and research interests, who benefit from outstanding research facilities, equipment, and scientific support services, some of which unique in the country.
ITQB further coordinates the largest *Laboratório Associado*, a status attributed by the Portuguese Government in recognition of scientific excellence, as determined by international evaluation panels. This consortium includes the *Instituto Gulbenkian de Ciência* (IGC), the *Instituto de Biologia Experimental e Tecnológica* (IBET), and the *Centro de Estudos de Doenças Crónicas* (CEDOC), and has competencies and expertise ranging from the molecule to clinical trials.

Research

The quality of the research at ITQB is reflected in its contribution to the overall national publications in Nature and Science as leading instituion (20% in 2006-2010), in the number of papers annually published in WoS journals and in the impact of research (263 papers and over 7300 citations in 2011).
Research at ITQB is mainly supported by contracted projects (upon evaluation) with national and international R&D funding agencies such as *Fundação para a Ciência e Tecnologia* and the European Commission.
Opportunities for industrial applications sometimes arise from research developed at ITQB. Collaboration with industry, patent submissions or the creation of start-up companies are the paths to follow from lab to business. This competence is mainly carried out by ITQB´s association with IBET, the largest private, non-profit biotechnology research organization in Portugal.
ITQB Research Groups are organized into five Research Divisions - Chemistry, Biological Chemistry, Biology, Plant Sciences, and Technology. Collaboration between divisions is strongly encouraged.
All scientific matters at ITQB are overseen by the Scientific Council, formed by elected PhD holders, and the Scientific Advisory Board.

Education

ITQB's highly multidisciplinary nature makes it a leading centre for the advanced training of researchers in Portugal. Education at ITQB is thus strongly embedded in its research activities. The Pedagogical Council oversees the educational activities at ITQB.

ITQB PhD Program
The focus of research education at ITQB is the PhD Program, with a strong component of research complemented by seven curricular units to which students should commit a tenth of their time. The PhD course reflects the highly multidisciplinary nature of the institute and aims to provide a broad perspective of Chemistry, Life Sciences and Bioengineering, and prepare students for their future careers.

- Advances in Chemistry and Structural Biology (4 ECTS)
- Trends in Microbial and Cell Biology (4 ECTS)
- Frontiers in Biotechnology (3 ECTS)
- Research Training (9 ECTS)
- Free Option (4 ECTS)
- Bioentrepeneurship (3 ECTS)
- Science, Culture and Society (3 ECTS)
- Thesis (270 ECTS)

Master Research Projects
ITQB welcomes master's students who wish to develop their research at the institute; students then defend their theses at their host universities. Every year, in March, ITQB laboratories announce the available research projects for the coming curricular year. Potential students are invited to visit the labs and talk directly with the researchers and other students.

Master's Degree Programs
ITQB participates in two master's degree programs in collaboration with other units from *Universidade NOVA de Lisboa*.
Master's Course in Medical Microbiology with the *Instituto de Higiene e Medicina Tropical*, *Faculdade de Ciências Médicas*, and *Faculdade de Ciências e Tecnologia*, aims to train specialists in microbiology skilled in the application of advanced laboratory techniques for diagnoses, for microbiological research, and for quality control and certification of microbiology laboratories.
Master's Course in Science Communication with the *Faculdade de Ciências Sociais e Humanas* focuses on the particularities of communicating science to different audiences, be this via media, via formal and informal education, or directly from research institutions.

Research Training
Training can take different formats, ranging from a small regular participation in the lab activities to a one- year research project.

Post-Graduation Courses
- Scientific Research Training A - 60 ECTS

University Extension Courses
- Scientific Research Training B (Graduates / Masters) - 40 ECTS
- Scientific Research Training C (Graduates / Masters) - 30 ECTS
- Scientific Research Training D (Graduates / Masters / Undergraduates) - 15 ECTS
- Research Integration (Undergraduates) - 16 ECTS

PhD Program Scientific Committee
M. Margarida Oliveira
Adriano O. Henriques
Júlia Costa
Lígia Saraiva

Coordination of MSc Medical Microbiology at ITQB
Hermínia de Lencastre (chair)
Adriano O. Henriques
Cecília Arraiano

Coordination of MSc in Science Communication at ITQB
Ana M. Sanchez

Coordinators of Research Training Courses
Célia Miguel
Cláudio Gomes

Support Services

Researchers at ITQB are supported by technical and administrative staff in a number of areas (see organizational flowchart). These support services include:
Science Management collaborates with researchers in identifying potential funding sources and in the application process.
Projects Office supports researchers in applying for and managing projects.
Academics Office centralizes information regarding advanced education at ITQB.
Accounting and Treasury offers accounting support to all financed projects, manages all purchases and payroll processing, and is responsible for the inventory and property.
Lab Management coordinates the purchase and maintenance of scientific equipment for the institute and supervises common scientific equipment .
Washing Room conducts washing and sterilization of material and culture media.
Industry Liaison Office offers support in the management of intellectual property and technology transfer, and contracts with industry.
Information Technology (IT) Support offers computational support
Storages handles the purchase, storage, and supply of materials and reagents.
Maintenance support oversees the maintenance of the building and all infrastructures.
Communication office manages institutional and scientific communication.
Additionally, some scientific support services are also available to outside researchers and companies:
Analytical Services Unit ITQB/IBET analytical development, validation and testing of chemicals and biologicals and studies on candidate pharmaceutical products according to OECD Good Laboratory Practices Principles.
Centro de Ressonância Magnética António Xavier **(CERMAX)** with several NMR spectrometers (300, 400, 500 and 800 MHz), including the highest field NMR spectrometer in Portugal. It is part of the National NMR Facility.
Library maintains ITQB publication records and manages bibliographic databases.
Teaching Laboratory designed and equipped to support the teaching activities in areas ranging from Biochemistry to Genetics.
Greenhouses manages the cultivation of plants for research purposes.

See full list of staff in the appendix (page iii)

Infrastructure and Support Committee
Luís Paulo N. Rebelo
Cláudio M. Soares
Margarida Oliveira
Margarida Martinez
Fernando Jorge Tavares
Maria Cristina Pinto
Maria de Lurdes Conceição
Ana M. Sanchez
João Rodrigues
Susana Lopes
Teresa Baptista da Silva
Teresa Crespo
Cláudia Almeida
Daniel F. Branco / Carlos Cordeiro / Carlos Frazão
Henrique Campas Nunes / Nuno Monteiro
Pedro Domingos
Rita Ventura

Health and Safety Committee
Margarida Oliveira
Luís Paulo N. Rebelo
Helena Matias
Henrique Campas Nunes, (Alexandre Maia)
Fernando Jorge Tavares (Cristina Afonso)
Cláudio M. Gomes (Ricardo Louro)
Abel Oliva (Júlia Costa)
Mariana Pinho (Ana Rute Neves)
Cândido Pinto Ricardo (Nelson Saibo)
Rita Delgado (Margarida Archer)
Jaime Mota (Pedro Domingos)
António Cunha (João Clemente)
Christopher Maycock (Rita Ventura)
Beatriz Royo
Sérgio Filipe
Cecília M. Arraiano
Teresa Baptista da Silva
Helena Santos MD

Research Groups

Chemistry

Bioinorganic Chemistry and Peptide Design
Olga Iranzo

Bioorganic Chemistry
Rita Ventura

Colloids Polymers & Surfaces
António Lopes

Coordination and Supramolecular Chemistry
Rita Delgado

Homogeneous Catalysis
Beatriz Royo Cantabrana

Micro-Heterogeneous Systems
Eurico de Melo

Organic Synthesis
Christopher Maycock

Organometallic Chemistry
Carlos C. Romão

Single Molecule Processes
Yann Astier

Biological Chemistry

Bacterial Energy Metabolism
Inês Cardoso Pereira

Metalloproteins and Bioenergetics Unit
Biological Energy Transduction
Manuela M. Pereira
Metalloenzymes and Molecular Bioenergetics
Miguel Teixeira

Biomolecular NMR
Manolis Matzapetakis

Genomics and Stress
Claudina Rodrigues-Pousada

Macromolecular Crystallography Unit
Structural Biology
Carlos Maria Franco Frazão
Industry and Medicine Applied Crystallography
Pedro Manuel Marques Matias
Membrane Protein Crystallography
Margarida Archer Frazão
Structural Genomics
Maria Arménia Carrondo

Inorganic Biochemistry and NMR
Ricardo Saraiva L. Oliveira Louro

Microbial & Enzyme Technology
Lígia O. Martins

Molecular Genetics of Microbial Resistance
Lígia M. Saraiva

Molecular Interactions and NMR
Patrick Groves

Molecular Simulation
António Baptista
Mössbauer Spectroscopy
Filipe Tiago de Oliveira

Protein Biochemistry Folding & Stability
Cláudio M. Gomes

Protein Modelling
Cláudio M. Soares

Raman Spectroscopy
Smilja Todorovic

Biology

Bacterial Cell Biology
Mariana G. Pinho

Bacterial Cell Surfaces and Pathogenesis
Sérgio R. Filipe

Bacterial Signaling
Karina B. Xavier

Cell Physiology and NMR
Helena Santos

Cell Signaling in *Drosophila*
Pedro Domingos

Control of Gene Expression
Cecília M. Arraiano

Glycobiology
Júlia Costa

Infection Biology
Luís Jaime Mota

Lactic Acid Bacteria & In Vivo NMR
Ana Rute Ramos Neves

Microbial Development
Adriano O. Henriques

Microbiology of Human Pathogens Unit
Molecular Genetics
Hermínia de Lencastre
Molecular Microbiology of Human Pathogens
Raquel Sá-Leão

Plant Sciences

Disease and Stress Biology
Ricardo Boavida Ferreira

Forest Biotech
Célia Miguel

Genomics of Plant Stress
Margarida Oliveira

Plant Biochemistry
Cândido Pinto Ricardo

Plant Cell Biology
Rita Abranches

Plant Cell Biotechnology
Pedro Fevereiro

Plant Cell Wall
Philip Jackson

Plant Developmental Genetics
Jorge Almeida

Plant Molecular Ecophysiology
Manuela Chaves

Technology

Analytical Chemistry
Luís Vilas Boas / Maria do Rosário Bronze

Antibiotic Stress and Virulence of Enterococci
Fátima Lopes

Applied and Environmental Mycology
Cristina Silva Pereira

Biomolecular Diagnostic
Abel Oliva

Animal Cell Technology Unit
Cell Bioprocesses
Ana Sofia Coroadinha
Cell Line Development and Molecular Biotechnology
Paula M. Alves
Engineering Cellular Applications
Manuel J.T. Carrondo

Food Microbial Technology
Cidália Peres

Mass Spectrometry
Ana V. Coelho

Microbiology of Man-Made Environments
Teresa Crespo

Molecular Thermodynamics
Luís Paulo N. Rebelo

Nutraceuticals and Delivery
Catarina Duarte

Pharmacokinetics and Biopharm. Analysis
Ana L. Simplício

Phys. of Environm. Conditioned Microbiota
Vitória San Romão

Systems Biodynamics
Andreas Bohn

Invited and Visiting Professors

Alessandro Giuffrè | Fast Kinetics

Alexander A. Konstantinov | Bioenergetics

Alexander Tomasz | Microbiology

Daniel H. Murgida | Raman Spectroscopy

David Edward Onions | Virology / Vectorology

David L. Turner | Biology

Hansjörg Hauser | Eukaryotic Molecular Biology

John G. Aunins | Bioprocess Engineering

Jonas Almeida | Biomathematics

José Artur Martinho Simões | Chemistry

José Canongia Lopes | Molecular Simulation

Maria Teresa N. Duarte | Crystallography

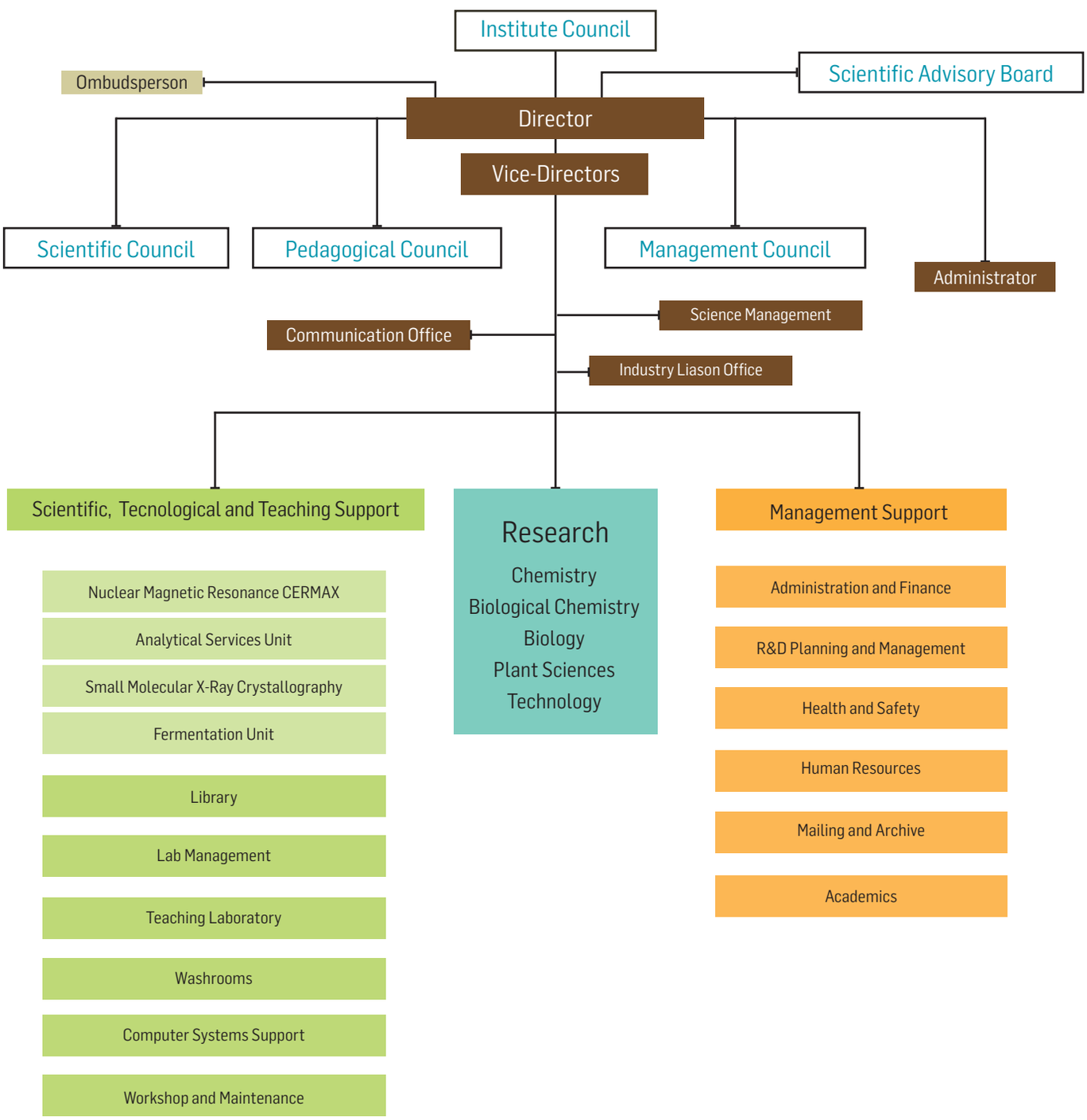
Kenneth R. Seddon | Ionic Liquids

Peter Alfred Donner | Biotechnology

Peter F. Lindley | Structural Biology

Peter G. Hildebrandt | Raman Spectroscopy

Robert Archibald Samson | Plant Pathology


Institute Council
Ombudsperson
Scientific Advisory Board
Director
Vice-Directors
Scientific Council
Pedagogical Council
Management Council
Administrator
Science Management
Communication Office
Industry Liason Office
Scientific, Tecnological and Teaching Support
Nuclear Magnetic Resonance CERMAX
Analytical Services Unit
Small Molecular X-Ray Crystallography
Fermentation Unit
Library
Lab Management
Teaching Laboratory
Washrooms
Computer Systems Support
Workshop and Maintenance
Research
Chemistry
Biological Chemistry
Biology
Plant Sciences
Technology
Management Support
Administration and Finance
R&D Planning and Management
Health and Safety
Human Resources
Mailing and Archive
Academics

Statistics 2011

63 Research Groups

423 Researchers
(plus 47 trainees)

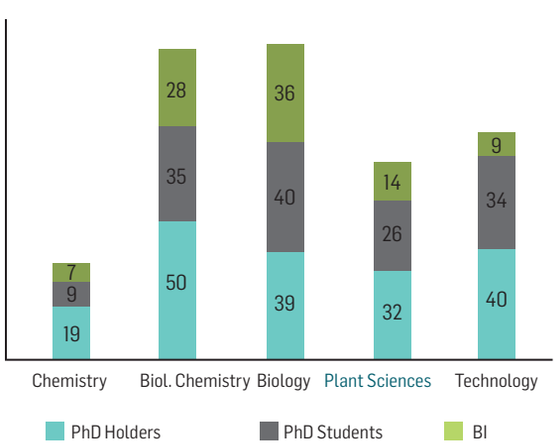
PhD students **145**
integrated into research groups

BI fellows **94**

PhD holders **184**

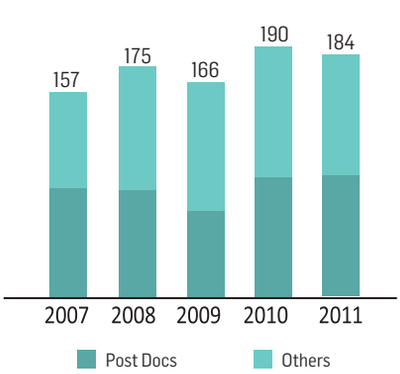
Permanent staff	25
Other institutions	22
Laboratorio Associado	19
Ciencia 2007	18
Ciencia 2008	6
MIT-Portugal	2
Post Doctoral Fellows	92

Researchers in the last five years

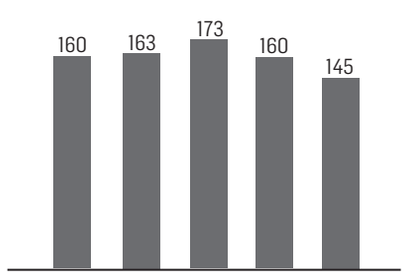


Average group size	6.8 researchers
Group leaders by gender	33 female / 29 male
Group leaders by nationality	53 Portuguese / 9 other
PhD holders by gender	119 female / 65 male
PhD holders by nationality	145 Portuguese / 39 other
PhD students by gender	106 female / 39 male
PhD students by nationality	134 Portuguese / 11 other

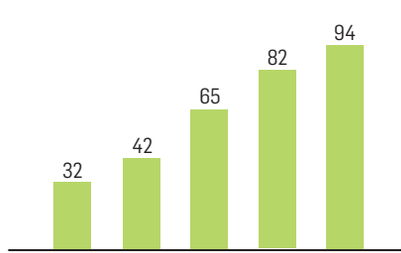
PhD holders in the last five years



PhD students in the last five years



BI fellows in the last five years



274 Research Articles

ISI journals **263**
Other peer review articles **10**
Book chapters **26**
(see full list in the Research Output Section)

Average number of papers per group 4.4
Average number of papers per PhD holder 2.97
(excluding post-docs)

Citations **7315**

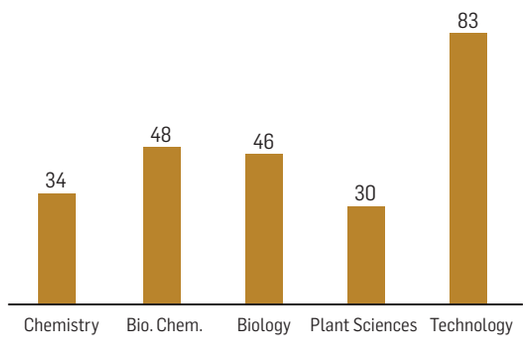
Total ITQB papers (1990-2011) **2,626**
Total ITQB citations (1990-2011) **51,300**

h-index 83

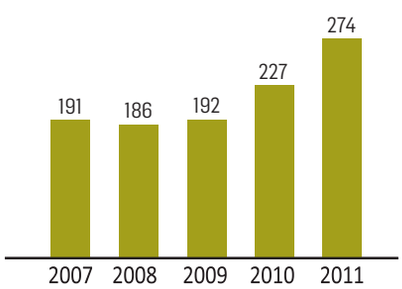
Average citations per paper **27.4**
Considering a paper's maturation time of three years (includes all ITQB papers until 2008 and the corresponding total citations to date)

Highly Cited Papers **27**
Papers included in the Highly Cited Papers list by Essential Science Indicators SM (Thompson Reuters): top 1% of articles by total citations in each annual cohort from each of the 22 disciplines (updated as of Jul 1, 2012 to cover a 10-year plus 4-month period, Jan1, 2002-Apr 30, 2012)

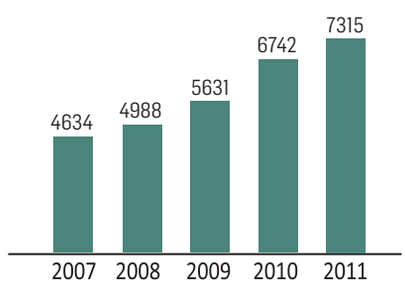
Articles by division



Publications in peer review journals in the last five years



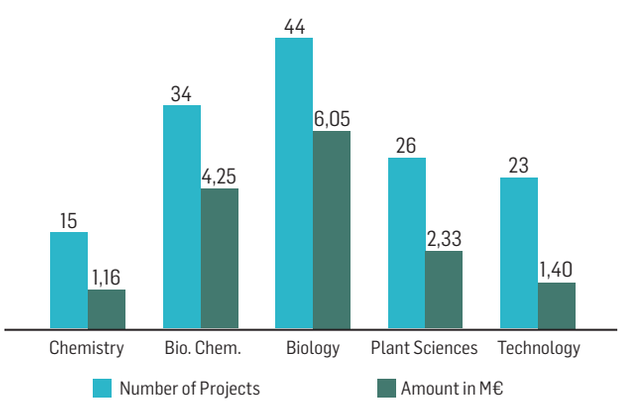
Citations in the last five years



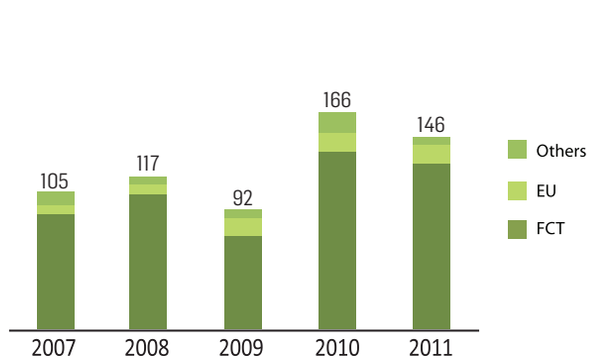
146 Research Projects

124 Fundação para a Ciência e a Tecnologia | **9** European Commission | **7** European Commission (individual grants)
1 Fundação Calouste Gulbenkian | **1** Ministério da Defesa | **2** Pfizer Contract
1 Sudoe Interreg Iv B Programme | **1** Georgia Institute of Technology

Projects by division (number and amount in M€)



Projects in the last five years



In the 2011 FCT call for projects, ITQB researchers successfully secured 17projects (and 7 as participants). These are not included here.

45 PhD Theses

PhD Theses distribution

23 Biology
14 Biochemistry
4 Chemistry
4 Technological and Engineering Sciences

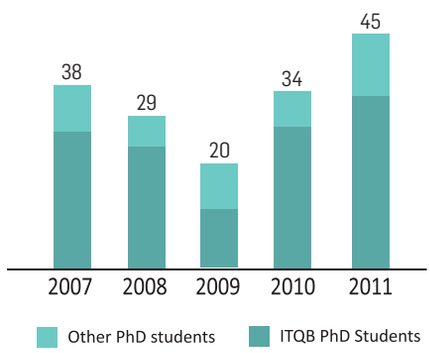
PhD Theses since 1995 **268**

Registered PhD students **249**
including 104 PhD students from IGC (as of 31 December 2011)

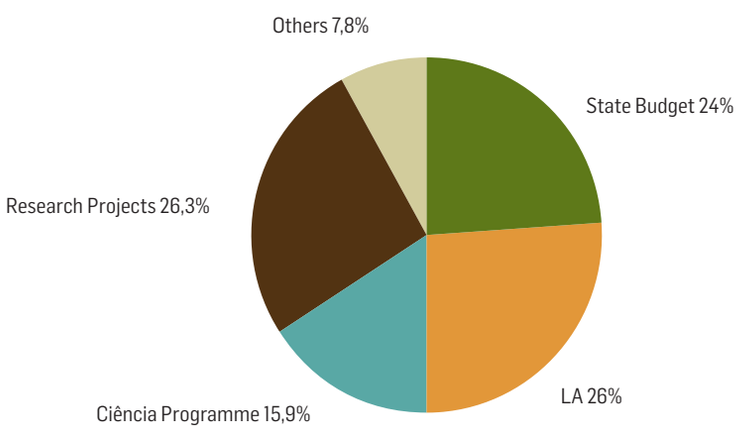
New PhD students in 2011 **56**

Concluded Post-graduation Courses **11**

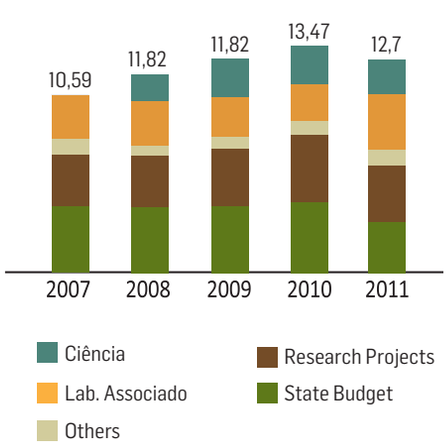
PhD theses in the last five years



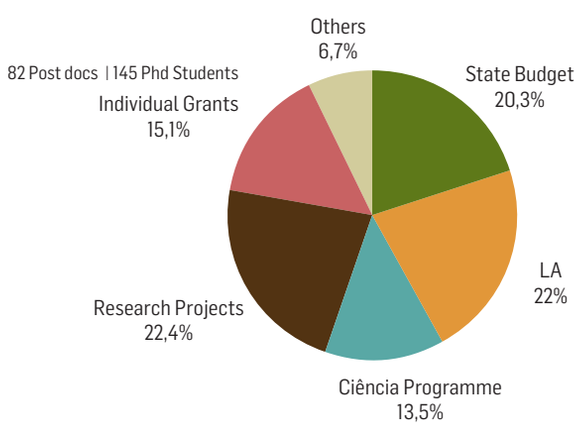
Overall budget 12.76 M€



Funding sources in the last five years



Most ITQB PhD students and post-docs are financed directly through FCT fellowships. The chart below depicts ITQB's budget including this figure (2,3 M€).



News 2011

Prizes and Awards

Individual distinctions

Karina B. Xavier
Appointed as International Early Career Scientist of the Howard Hughes Medical Institute.

Cristina Silva Pereira
Selected for 2nd evaluation round (inteview) of ERC Starting Grant Call (classification excellent; not funded).

Hermínia de Lencastre
Professor Nicolau van Uden Prize attributed by The Portuguese Society for Microbiology (SPM) to award an outstanding researcher for his/her lifetime contributions in the field of microbiology.

Rita Ventura
Selection and Participation in Cohitec Program 2011 (successfully concluded in 2012).

Claudina Rodrigues-Pousada
Elected fellow of the AAAS (American Association for the Advancement of Science).

Research distinctions

Cláudio Gomes
Award Terry Fox - *Liga Portuguesa contra o Cancro* for project 'Amyloidogenesis of the S100A8/A9 cytokine as an anti-proliferative mechanism in prostate cancer' (2011-2013) .

Catarina Duarte
First prize of the 2nd edition of the "Nutrition Awards" promoted by the Portuguese Association of Nutritionists, in the category of "Innovation and Development of Products and Services", with the project " *Extracto de cereja obtido por tecnologia supercritica – um agente quimioterapêutico natural para o cancro do cólon".*

António Roldão
Best ITQB PhD Thesis 2011 entitled "Production Optimization of Rotavirus-Like Particles: A Systems Biology Approach" (PhD in Engineering and Technology Sciences, 2010; supervisors: Manuel Carrondo and Rui Oliveira).

Leonor Norton
Best PhD Thesis of Helmholtz Centre for Infection Research GmbH - 2010 with thesis "Expression of Antibodies and Retroviral Vectors from Defined Chromosomal Sites: Strategies towards Reliable Production Systems" (PhD in Engineering and Technology Sciences, 2010; supervisors: Hansjörg Hauser and Paula M. Alves).

Maria Miragaia
51st ICAAC Infectious Disease Fellows Award. Chicago, USA.

Rita Sobral
European Society of Clinical Microbiology and Infectious Diseases (ESCMID) Research Grant "The association of extracellular DNA to the *Staphylococcus aureus* surface: roles and mechanisms."

In scientific meetings

Best oral communication
Catarina Franco, Romana Santos, Ana Varela Coelho
"Exploring the proteome of an echinoderm nervous system: 2-DE of the sea star radial nerve cord and the synaptosomal membranes subproteome"
7th European Conference on Echinoderms: Echinoderm Research 2011, Göttingen, Germany.

Best poster
Bruno Fonseca, Catarina Paquete, Alexandra Alves, Ricardo O. Louro
"Characterization of multiheme cytochromes from Shewanella oneidensis MR-1: A key step for the optimization of Microbial Fuel Cells"
MFC Conference, Leeuwarden, The Netherlands.

Best poster award in Bacterial and Animal Proteomics
Catarina Franco, Renata Soares, Romana Santos, Ana Varela Coelho
"Differential phosphoproteome of the regenerating radial nerve cord of the sea star M. glacialis"
2nd International Congress on Analytical Proteomics, Ourence, Spain.

Best poster on Microbiology Research
Catarina S. Pereira
"Phosphoenolpyruvate phosphotransferase system regulates detection and processing of the quorum sensing signal Autoinducer-2".
Attributed by The Portuguese Society for Microbiology and sponsored by The American Society for Microbiology in MICROBIOTEC'11.

Best poster
Mafalda Xavier Henriques
"Synthesis of capsular polysaccharide at the divsision septum of Streptococcus pneumoniae is dependent on a bacterial tyrosine kinase" at the Cellular Microbiology and Pathogenesis Symposium.

In Scientific Journals

L.P.N. Rebelo et al., J. Chem. Eng. Data (2010), 55, 3-12.
Awarded with the Editors selection of the American Chemical Society (2011) as ranked 1st of JCED among circa 500 publications of high impact in the field.

Ranked 1st in the Most Read Articles of JCED in 2011.

Happenings

Happenings at ITQB in 2011
For a full list of seminars at ITBQ in 2011, see appendix

New ITQB Direction appointed
Luís Paulo N. Rebelo
M. Margarida Oliveira
Cláudio M. Soares

4th CERMAX practical course on basic NMR
14 - 17 June 2011, ITQB, Oeiras, Portugal
Helena Matias, Manolis Matzapetakis, Patrick Groves, Pedro Lamosa

Open Day – "*Aqui há química!*"
Celebrating the International Year of Chemistry, the 7th annual Open Day was organized with the theme of the Nobel Prizes.

What would you ask a Nobel Prize winner?
Discussion session with Ada Yonath, Nobel Prize in Chemistry 2009

January | March | May | June | July

ITQB PhD Course '11
The 2011 ITQB PhD course started in January 17 with an informal opening session presenting the structure and the contents of the curricular units.

ITQB Day
Celebrating ITQB's integration in UNL
8 July 2011

Awarded Best PhD Thesis Prize 2010
Thesis on systems biology
by António Roldão

INTERBIO
Symposium Frontiers in Protein Research
5 - 7 May, 2011, Oeiras, Portugal
Cláudio M. Gomes & Miguel Teixeira, Chairs
Organising committee C. Gomes, M. Teixeira, A. Sanchez, A. Veiga, L. Conceição

Protein Data Bank roadshow
5 May, 2011, ITQB, Oeiras, Portugal
Pedro Matias, local organizer

2nd ITQB PhD Students Meeting starts
Young scientists discuss ongoing research projects

CCPN Europa 2011
Supporting best practices in Biomolecular NMR

"Differential gel electrophoresis (ETTANTM 2D-DIGE) - Check it with your own samples"
GE Healthcare hands-on training workshop
October 2011, ITQB, Oeiras, Portugal
Carla Pinheiro and Ana Coelho, organizers

Present and Future of Cork Oak in Portugal
21 October 2011, ITQB, Oeiras, Portugal
Margarida Oliveira, Nelson Saibo, Célia Miguel and Cândido Pinto Ricardo, organizers

Business opportunity for vaccine stabiliser
ITQB's team successfully completes COHiTEC Program

Extraordinary success of internal fundraising campaign
An open letter from the Director of ITQB

August | September | October | November | December

Masters Course in Science Communication starts
Innovative course coordinated by FCSH and ITQB

European Researchers Night
Pavilhão do Conhecimento, Lisboa
23 September

Workshop on "Basic Experimental Techniques in Biological Dynamics",
European Science Foundation (ESF) Networking Program "Functional Dynamics in Complex Chemical and Biological Systems"
5-9 September 2011, ITQB, Oeiras
Adriano Henriques, scientific and organizing committee

International Interbio Summer School on Structural Biology
"NMR applications in Protein Research"
26 September - 1 October, 2011, Oeiras, Portugal
Manolis Matzapetakis, local organizer

Be Green Challenge
Relaunch of the energy saving campaign with a new challenge: video competition of green ideas

Green Re_Store
A new system for researchers to recycle and trade laboratory items

RNEM Course on Protein identification by Mass Spectrometry
2 November 2011, ITQB, Oeiras, Portugal
Ana Coelho, organizer

Science & Technology Week
During the Science & Technology Week, researchers went to schools to talk with students about what is like to be a researcher at ITQB.

Other Meetings and Courses organized by ITQB Researchers

Annual Meeting of the EU project
Sustainable water use securing food production in dry areas of the mediterranean region (SWUPMED) and an Open Seminar
3-6 May 2011, University of Évora, Évora, Portugal
Manuela Chaves, member of the organizing committee

FEBS combined practical and lecture course Chemistry of Metals in Biological Systems
15-22 May 2011, Louvain-la-Neuve, Belgium
Ricardo Louro, member of the organizing committee

Young Scientist Forum
23 - 25 June 2011, Torino, Italy
Claudina Rodrigues-Pousada,member of the organizing committee

2nd Great Wall Symposium "The Dynamics of Peptidoglycan Structure and Function: New Insights into the 'Great Wall'
9-12 September 2011, Cascais, Portugal
Mariana G. Pinho, Sérgio R. Filipe, and Adriano Henriques, local organizing committee

Floresta 2050 Pensar o Futuro
6-7 October 2011, INRB, Oeiras, Portugal
Pedro Fevereiro and Célia Miguel, members of the organizing committee

10th Short course of the Portuguese Biophysical Society "Nanosciences for Life"
17-19 November 2011, Santarém, Portugal
Cláudio M. Soares, Lígia Martins, and Manuela M. Pereira, members of the organizing committee

Forest sustainability and the global climate changes
Seminar in the context of the International Year of the Forests
25 November 2011, *Academia de Ciências de Lisboa*, Lisboa, Portugal
Manuela Chaves, member of the organizing committee

International Symposium on Applied Bioinorganic Chemistry
2-5 December 2011, Barcelona, Spain
Olga Iranzo, member of the organizing committee

Members of scientific committees

Cândido Pinto Ricardo
Portuguese member of the Managing Committee COST Action nº FA0603 "Plant Proteomics in Europe"

Carla Pinheiro
Portuguese member of the Managing Committee COST Action nº FA0603 "Plant Proteomics in Europe"

Catarina Duarte
Member of the Scientific Committee of the 1st Iberian Meeting on Natural Bioctives Entrapment for Food Industry- Challenges and Perspectives, from nanotecnology to bioavailability
May, 2011, Lisbon, Portugal

Cecília M. Arraiano
Member of the Scientific Committee of the XXXVI Jornadas Portuguesas de Genética
May 2011 , Coimbra, Portugal

Member of Scientific Committee of the Microbiotec11 - *Congresso Nacional de Microbiologia e Biotecnologia*
December 2011, Braga, Portugal

Claudina Rodrigues-Pousada
Member of Scientific Committee of the 36th of the FEBS Congress
June 2011, Torino, Italy

Helena Santos
Permanent Member of the "International Organizing Committee" in the series of conferences "International Congress on Extremophiles"

Member of Scientific Committee of the Microbiotec11 - *Congresso Nacional de Microbiologia e Biotecnologia*
December 2011, Braga, Portugal

Júlia Costa
Member of Scientific Committee of the 9th International Meeting of the Portuguese Carbohydrate Group / 5th Iberian Carbohydrate Meeting.
4-7 September 2011, Vila Real, Portugal

Karina B. Xavier
Member of the searchcommittee for Associate Professorship at the Department of Biology, University of Copenhagen

Luís Paulo N. Rebelo
Permanent member of the council of chairs, congresses on Ionic Liquids (COIL)

Member International Scientific Advisory Committee for the 4th Congress on Ionic Liquids (COIL4)
2011, Washington D.C., USA

Member International Scientific Committee for the Faraday Discussions on Ionic Liquids
August 2011, Queens University, Belfast

Member Scientific Committee of the 2nd Iberian Meeting on Ionic Liquids
July 20-22, 2011, Corunha and Santiago de Compostela, Spain

Member of "*Comissão Científica na área da Química-Física no XXII ENSPQ*"
3-6 June, 2011, Braga, Portugal

Member of Editorial Board Program Harvard Medical School Portugal

Member Scientific Committee, Basic Experimental Techniques in Biological Dynamics
September 2011, ITQB, Oeiras, Portugal

Manuel J. T. Carrondo
Member of the Scientific Committee of Clinigene Network of Excellence.

Member of the Advisory Board of PBS Biotech (California 2010)

Margarida Oliveira
Member Scientific Committee of workshop "Present and Future of Cork Oak in Portugal"
21 October 2011, ITQB, Oeiras, Portugal

Member Scientific Committee of Congress "XXXVI Jornadas Portuguesas de Genética", 30 May - 1 June, 2011, University of Coimbra, Coimbra, Portugal

Member Scientific Committee of XII Congreso Hispano-Luso de Fisiologia Vegetal, 21-24 June, 2011, Universidad Jaume I de Castellón, Spain"

Paula M. Alves
Member of Scientific Board, PEACE Protein Expression in Animal Cells (PEACE) Conference

Member of Scientific Board, RPP Conference on Recombinant

Protein Expression organized by the Section on Microbial Physiology of the European Federation of Biotechnology

Pedro Fevereiro
Member Scientific Committee of Model Legume Congress
15 – 19 May, 2011, Sainte Maxime, France

Raquel Sá Leão
Invited member of the Technical Advisory Group for Systematic Review to Assess Pneumococcal Serotype Replacement of World Health Organization (WHO)

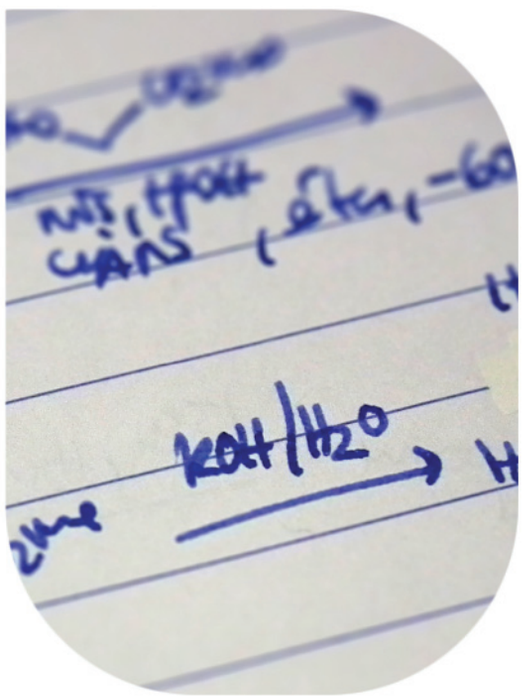
Vanessa J. Pereira
Member of Programme Committee of the International Conference Micropol & Ecohazard 2010-2011 - the 7th International Water Association specialist conference on assessment and control of micropollutants/hazardous substances in water
11-13 July 2011, Sydney, NSW, Australia

C

Bioorganic Chemistry

Rita Ventura rventura@itqb.unl.pt

Bacterial populations use cell-cell communication in order to coordinate their behaviour and functiongin such a way that they can adapt to changing environments. Chemical communication among bacteria is called "quorum sensing". Autoinducer-2 (AI-2) regulates inter-species quorum sensing. Because AI-2 regulates behaviours of human pathogens such as Vibrio cholerae, there is great interest in the discovery of non-natural quorum sensing modulators for applications in the treatment of bacterial infections.



In 2011, our group synthesised new DPD analogs with a new stereocenter at C-5 (4,5-dihydroxyhexanediones (DHDs))1, using the same synthetic strategy developed to synthesise DPD,2 but starting from (R)- and (S)-methyl lactate instead of methyl glycolate. (S)-4,5-dihydroxypentane-2,3-dione (DPD) is the uncyclized precursor of AI-2.
The biological activity of the new analogues was tested by the Bacterial Signaling group in two bacteria with different AI-2 receptors. (4S,5R)-DHD was a synergistic agonist in E. coli while it was an agonist in Vibrio harveyi, displaying the strongest agonistic activity reported so far (EC50 = 0.65 μM) in this organism. Thus, introduction of a substituent at C-5 has an influence on biological activity, the configuration of the newly created stereocenter was very important as shown by the (5R)-isomer being more active than the (5S)-compound. These results open the way to developing novel methods to manipulate quorum sensing for controlling bacteria.

Rui F. et al. (2012) Bioorg Med Chem, 20, 249
Ascenso O.S.(2011) Bioorg Med Chem, 19, 1236

C

Colloids Polymers and Surfaces

António Lopes alopes@itqb.unl.pt

Recently, controlled release from biocompatible materials has received much attention for biomedical applications. Due to their biocompatibility and biodegradability dextrans appear as promising polymeric materials if one is able to regulate their rheological properties and encapsulation efficiency. In 2011 we developed and characterized graft polymer temperature responsive hydrogels from dextran and N-isopropylacrylamide (NIPAAm).

The medium swelling ratio obtained (correlated with the gel degree of substitution) is of crucial importance for any material to be applied as biomaterial. Moreover, the surface energy values obtained suggest that adhesive forces between the gel and the skin will prevail against the intermolecular forces of the gel, resulting in the adherence of the films to the epidermis.

The gels obtained possess a thermosensitive behavior at temperatures close to physiological temperature (the so called LCST, a thermal transition occurring at 32.5°C). This property is mainly due to changes in the balance between hydrophilic/hydrophobic forces with the surrounding medium molecules and the break of hydrogen bonds between PNIPAAm and water molecules. This is also the driving force for the fine tuning of the release pattern of an antiemetic drug (used to treat nausea and vomiting, frequently following chemotherapy) -Ondansetron®- which was entrapped in the final gel and which exhibits a huge differentiation on the release profile at 25 and 37°C.

C

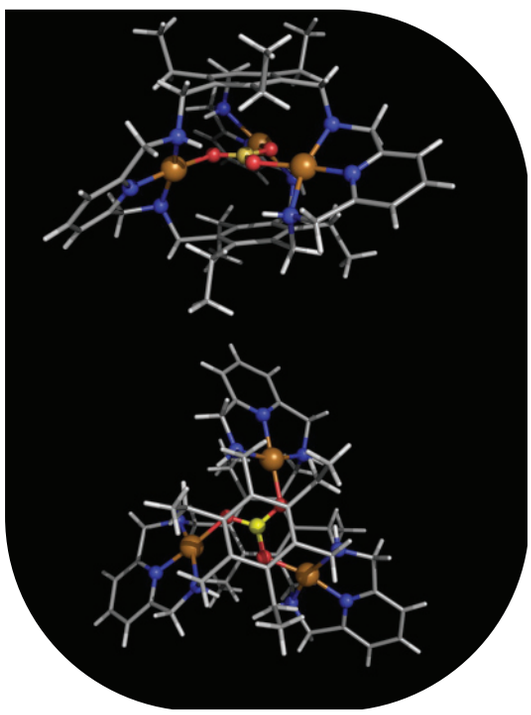
Coordination and Supramolecular Chemistry

Rita Delgado delgado@itqb.unl.pt

Trinuclear copper clusters play a central role in biological catalysis by ubiquitous multicopper oxidases. The study of model complexes of these systems should provide better understanding of the biological molecules and assist in the development of new catalysts and new types of magnetic materials.

With this in mind we have studied a macrobicyclic hexaamine with pyridyl spacers (pyr) which is able to coordinate three copper(II) ions within its cavity. Our results showed that the trinuclear species predominate in solution from pH 5.0, and that the hydroxo complexes start forming at unusually low pH values in order to minimize the electrostatic repulsions arising from the build up of positive charge in the macrobicyclic cavity.

X-ray diffraction determination of crystals of the trinuclear copper complex grown at pH ≈ 6, revealed the presence of carbonate (formed by spontaneous CO^2 uptake from air) bridging the three copper centres, see Figure. CO^2 fixation derives from the nucleofilic attack of the hydroxo group of the $[Cu3pyrOH]5^+$ complex on the electrophilic carbon of CO^2. Apparently, the ability of pyr to bring into close proximity three metal ions plays a crucial role in lowering the pKa of coordinated water molecules, which permits CO^2 fixation to occur without need for high pH. In addition the architecture of pyr allows a perfect fit of the carbonate anion between the copper centres promoting its encapsulation.



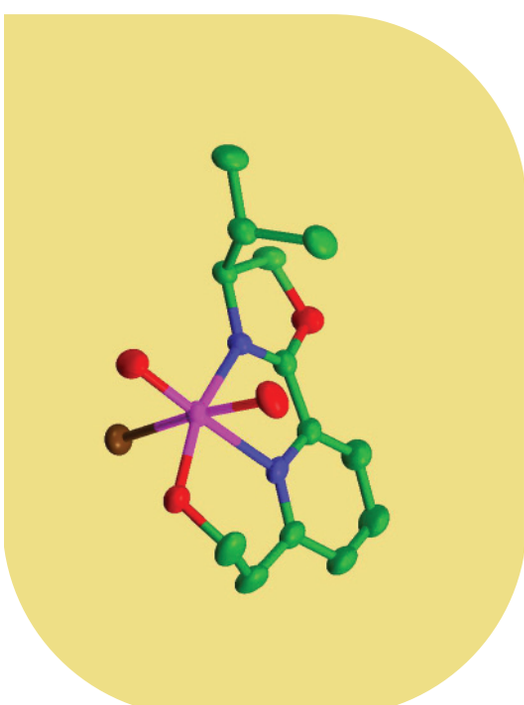
Mateus P. et al. (2011) Chem Eur J, 17, 11193

C

Homogeneous Catalysis

Beatriz Royo broyo@itqb.unl.pt

In 2011, we were exploring the use of chiral oxo-molybdenum complexes as catalysts for the asymmetric epoxidation of olefins. Catalytic olefin epoxidation is a major industrial technology. During the last decade, considerable effort has been directed towards the development of enantioselective epoxidation protocols using chiral molybdenum catalysts. However, little success has been achieved up to now. The weak coordination of ligands to molybdenum center is probably the main reason why all attempts to develop enantioselective epoxidations have failed.
In our group, we have prepared new cis-dioxomolybdenum complexes containing non-labile chiral oxazoline ligands in order to obtain robust catalysts. We have investigated the catalytic efficiency of these novel species in the epoxidation reaction using conventional solvents and ionic liquids (ILs) as reaction medium. Our oxazoline-based catalysts exhibited excellent activity and chemoselectivity when the epoxidation reaction was carried out in a pyrrolidium-based IL; epoxidation of (R)-limonene exclusively gave trans (R)-limonene 1,2-epoxide.
In addition, we have disclosed a synthetic pathway for the preparation of pure chiral cyclopentadienyl-functionalised ligands bearing N-heterocyclic carbenes and oxazoline ligands. Coordination of these ligands to Ir, Rh, and Mo allowed the preparation of enantiomerically pure metal complexes. Preliminary catalytic studies showed the promising potential of these novel species in catalysis.



Brito J.A. et al. (2011) Appl Catal A-Gen, 398, 88
Reis P.M. et al. (2011) Eur J Inorg Chem, 2011(5), 666
da Costa A.P. et al. (2011) Organometallics, 30(16)4437

C

Micro-heterogeneous Systems

Eurico Melo eurico@itqb.unl.pt

Our work in 2011 continued the current research line in structural properties of lipid assemblies. Along this year we studied the lateral thermal expansion of lipid bilayers and the structure of the stacking of ceramides and ceramide-containing mixtures.

The lateral thermal expansion of bilayers was, until our work last year', a very difficult parameter to determine and the only measurements made were done in systems far from the conditions found in the membranes of living organisms. Another key value in lipid research unknown until now, the equilibrium lamellar repeat distance, was also determined as a function of temperature for POPC, the main constituent of most biological membranes [1].

In mammals the main barrier against transepidermal water loss and external xenobiotic aggression is the lipid-filled extracellular space of the cornified part of the epidermis, the stratum corneum, which is mainly composed of ceramides, cholesterol and fatty acids. The way in which the lipids are organized seems to be the key to the stratum corneum protective properties but is still a question of debate. The work developed this year intends to prove that the supramolecular lipid organization is a consequence of the presence of fatty acids and of their state of ionization.

Valério J. et al. J Phys Chem B, 166(1)168

C

Organic Synthesis

Chris Maycock maycock@itqb.unl.pt

Small nitrogen containing molecules have been shown to be good candidates for screening for kinase inhibition and possible treatments for tumor control. A great deal of effort has been expended on the formation of diarylamines and arylated amines in general.

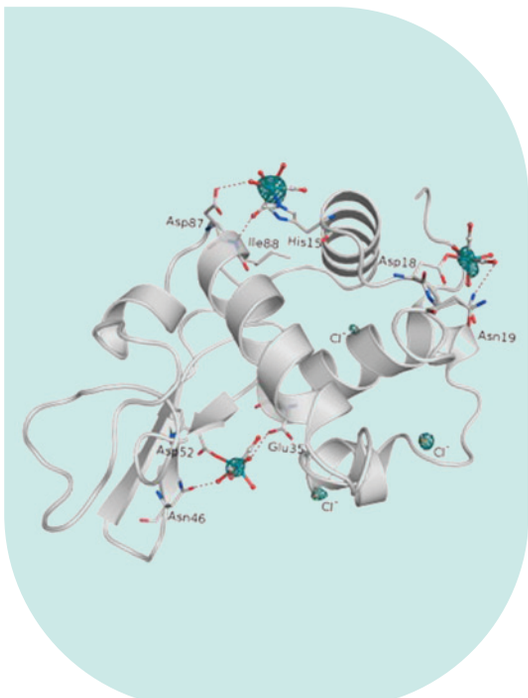
The formation of the amino-aromatic (C-N) bond has been the subject of many research papers but most methods use expensive metal catalysts. Aliphatic ketones of cyclohexene in principle could serve as precursors to aromatic (phenyl) rings. During the acid catalysed ring opening of strained nitrogen containing containing the bicycloheptane system, arylamines were formed albeit in small quantities. By adjusting the acidity of the medium we were able to obtain N-phenylated amines in good yield from the bicyclic aziridines.

Using mechanistic logic we were able to find a one pot method to carry out this transformation starting from the corresponding cyclohexenone and a primary amine in the presence of a catalyst. This gave very good yields of arylamines. Changing the substitution patterns we have been able to make a very wide range of compounds in a very simple way thus demonstrating the scope of the method. Using parallel reaction technology it will be possible to generate large libraries of new compounds for biological screening.

C Organometallic Chemistry

Carlos Romão ccr@itqb.unl.pt

Carbon Monoxide (CO) is a feared poisonous gas formed by incomplete combustion of fuels. Being colourless, tasteless and odourless its concentrations rise unnoticed to toxic levels that cause a large number of casualties every year, worldwide. Surprisingly, CO is constantly produced in our body, and even more surprisingly, it plays a large number of physiological roles. Its anti-inflammatory and anti-apoptotic properties, among others, are extremely useful for therapeutic purposes, and exposing sick animals to a CO containing atmosphere cures many diseases. However, for many reasons CO inhalation is not an adequate practical therapy. Instead, CO-Releasing Molecules (CO-RM) have been developed. These prodrugs survive in circulation and reach the diseased tissues where some specific stimulus triggers their decomposition, and delivers CO where it is needed. In this way, sub-toxic CO levels are enough to achieve therapeutic efficacy. Organometallic compounds containing CO are the best CO-RMs so far. Our group and Alfama Lda, have led this research since its inception in 2002. The main hurdle is to design biocompatible, stable, non-toxic CO-RMs that only decompose where CO is needed. This implies the understanding of the reactions of organometallic CO-RMs with biomolecules. In 2011 we obtained the first structure of a CO-RM fragment attached to a protein [[Ru(CO)$_2$(H$_2$O)$_3$(his)]@lysozyme]1; see picture), and patented the first drug-like CO-RMs for the treatment of liver diseases.

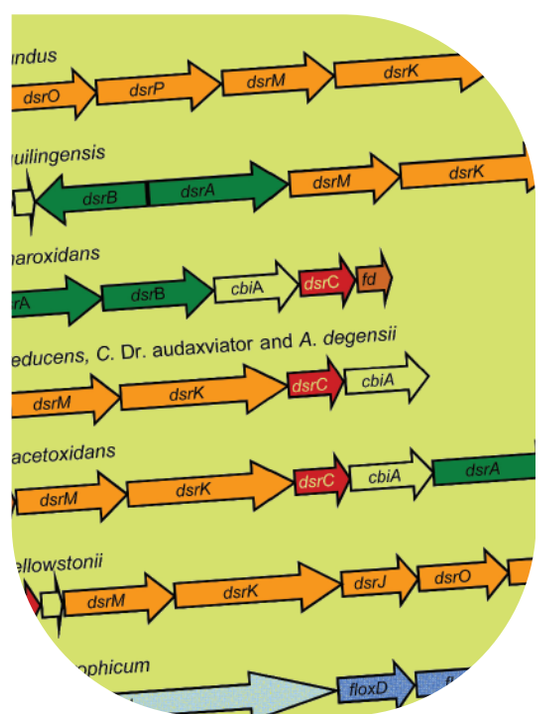


Santos-Silva T., et al. (2011) JACS 133(5): 1192-1195.

BC Bacterial Energy Metabolism

Inês A. Cardoso Pereira ipereira@itqb.unl.pt

The BEM lab studies energy metabolism in environmentally important organisms with the aim to exploit their biotechnological potential. We have focused on a widespread group of organisms that breathe sulfur compounds, in particular sulfate reducing prokaryotes, which play a key role in the biogeochemical cycles of sulfur and carbon in anaerobic habitats, and are important players in Environmental Biotechnology. This group comprises organisms from quite different phylogenetic backgrounds including members of Archaea, Proteobacteria, Gram-positive organisms and thermophilic bacteria. In 2011 we carried out a comparative study of energy metabolism genes in 25 sequenced genomes of sulfate reducing prokaryotes. By comparing phylogenetically distinct organisms we identified the proteins that may comprise the minimal set required for this metabolic activity. In addition, this analysis revealed a higher diversity of possible energy conserving pathways than classically believed to be present in these organisms, and permitted the identification of new proteins not previously recognized in this group. This study allows a deeper understanding of the physiology of this group of organisms and provides a roadmap for future engineering of the organisms to enhance their technological applications.



Pereira, I. A. C. et al. (2011) Frontiers in Microbiology 2, 69

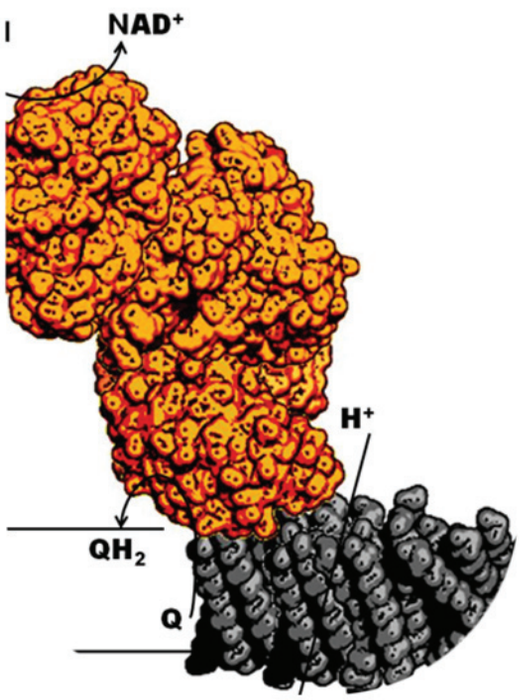
BC

Metalloproteins and Bioenergetics Unit

Biological Energy Transduction

Manuela M. Pereira mpereira@itqb.unl.pt

Energy transduction is the basis of life. Cells use different forms of energy, ATP or electrochemical membrane potentials, for solute import, building of their components, and motility. In living cells most energy is transduced by membrane proteins of the electron transfer chains during the processes of cellular respiration or photosynthesis. Complex I of respiratory chains catalyses NADH:quinone oxidoreduction, coupled to cation translocation across the membrane, thereby contributing to the establishment of the electrochemical potential. Complex I deficiencies have been implicated in several pathologies, namely neurodegenerative diseases such as Parkinson disorder.
Although structural and functional data have been gathered for more than half a century, the mechanisms of energy transduction by complex I are still unknown. We made a major contribution to this subject by developing an original approach using ^{23}Na-NMR spectroscopy, which allowed monitoring Na^+ transport in membrane vesicles. We observed that *Rhodothermus marinus* complex I has two H^+ translocating sites, one operating independently of the presence of Na^+ and the other working as a Na^+/H^+ antiporter. Further studies showed that this observation extended to complex I from *E. coli* but not to that from *P. denitrificans*. We hypothesized a correlation between the type of quinone used as substrate and the presence of the antiporter activity1. Furthermore, based on results using a typical inhibitor of Na^+/H^+ antiporters, we suggest that energy coupling in complex I occurs through an indirect mechanism.



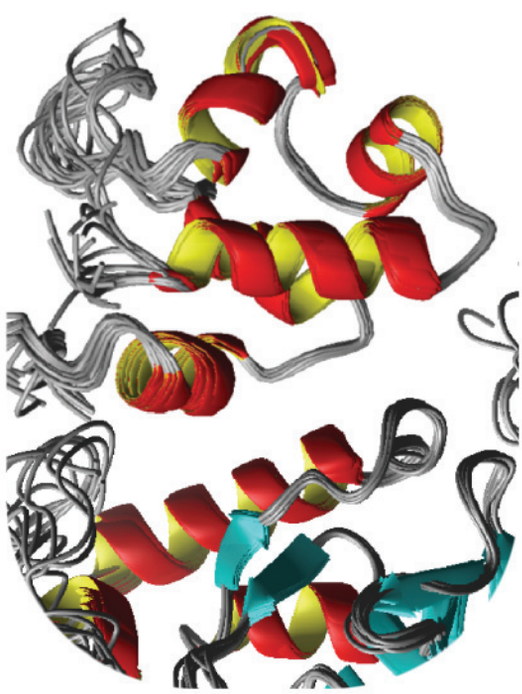
Batista A.P. and Pereira M. M. (2011) BBA - Bioenergetics, 1807(3) 286
Batista A.P., Marreiros B.C. and Pereira M. M. (2011) ACS Chem Biol, 6(5) 477

BC

Biomolecular NMR Laboratory

Manolis Matzapetakis matzman@itqb.unl.pt

Our group is focusing on the structural and functional studies of proteins in solution using NMR. We have recently solved two protein structures by NMR in collaboration with the groups of Microbial Development and Cell Physiology and NMR. The first, RodZ, is a multidomain protein, involved in morphogenesis and is widely conserved in both gram negative and gram positive bacteria. Its N-terminal domain (RodZ-N), located in the cytoplasm, has been shown to interact with Actin by functional and crystallographic studies in Thermotoga maritima. The *Bacillus subtilis* RodZ-N, has low homology (<30%) compared to its *Thermotoga maritima* homologue. Recent data on *Bacillus subtilis* suggest a potentially different cellular function for it possibily being involved in DNA organization. Our structural studies have revealed that the region of RodZ-N that is potentially interacting with DNA is more flexible than usual, a feature that is consistent with the potential for interaction.
The second study was on the structure of a triple mutant of the staphylococcal nuclease, a protein that has been used as a model for protein folding and stability by many groups. However the specific mutant that is of particular interest was not characterized in solution at high temperatures. The structure of that mutant was used as a basis for an extensive study of the dynamics behavior of the protein and the influence of compatible solutes on the mobility of the protein.



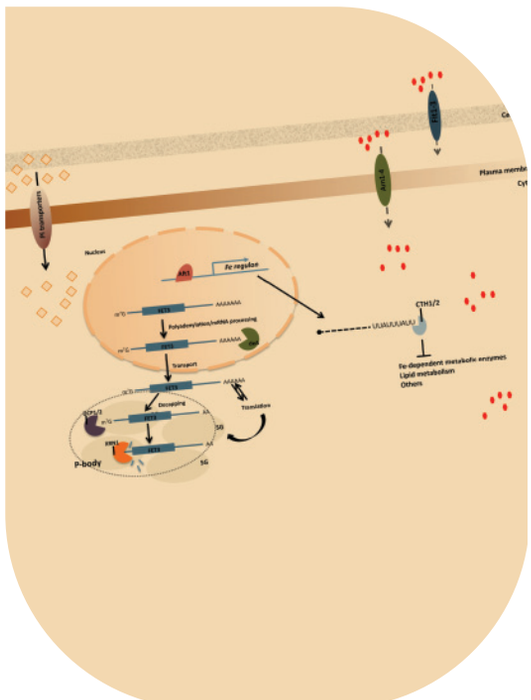
Pais T.M. et al. (2012) Protein Sci, 21(8)1126

BC

Genomics and Stress Laboratory

Claudina R. Pousada claudina@itqb.unl.pt

Arsenic (As) is an environmental pollutant thought to be a serious worldwide health threat. Chronic arsenic exposure is a cause of immense health distress as it accounts for the increased risk of various disorders including cancer. In spite of its toxic effects, this metalloid was first used to treat periodic fever and malaria, and actually is used as a potent agent against Acute Promyelocytic Leukaemia. The cellular As metabolism has been extensively studied by our group in order to understand its mechanisms of function. We have performed the genome-wide response of yeast to As having found the upregulation of genes encoding the anti-oxidant defenses as well as genes involved in the cellular iron (Fe) homeostasis. The mRNAs levels encoding genes collectively known as the Fe regulon are significantly induced with the exception of the FET3 and FTR1, of the high affinity iron uptake complex. FET3 mRNA destabilization under conditions of As stress is independent of ROS generation and is mediated by the major pathway for mRNA decay via the 5'-3' exonuclease Xrn1. Moreover phenotypic analyses show that a fet3 mutant is more tolerant to As compared to the wildtype or xrn1 mutant, suggesting that Fet3, the mammalian ceruloplasmin ortholog, plays a role in As toxicity. In addition we also show that As specifically disrupts Fe homeostasis in mammalian cells, by decreasing the Ferritin levels. Our work highlights a connection between arsenic and iron homeostasis, which could be relevant for clinical applications.



Batista-Nascimento L. et al. (2012) J Biol Chem (under revision)

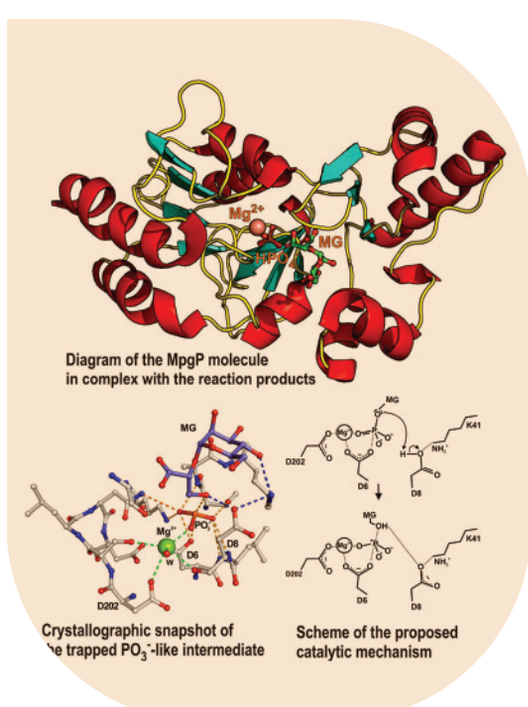
BC

Macromolecular Crystallography Unit

Industry and Medicine Applied Crystallography

Pedro Matias matias@itqb.unl.pt

Extremophiles are microorganisms that can thrive under extreme environmental conditions (e.g., salinity, temperature, pH). Their resistance is due to the fact that they can synthesize a wide array of small molecular compounds (compatible solutes) which protect their cells against the deleterious environment. These substances have potential applications in biotechnology.
One of those substances is α mannosylglycerate (MG), produced by the combined action of two enzymes: mannosyl-3-phosphoglycerate synthase,
that catalyzes the transfer of a sugar ring from GDP-mannose to 3-phosphoglycerate, yielding mannosyl-3-phosphoglycerate; and mannosyl-3-phosphoglycerate phosphatase (MpgP) that removes the extra phosphate to produce the final product. A metal ion (Mg^{2+}) is essential to the activity of these enzymes.
In 2011 we completed the structural elucidation of the two enzymes from the thermophilic bacterium *Thermus thermophilus* HB28, with the publication of the MpgP structure 1. This work was a collaboration with the Cell Physiology and NMR Laboratory (Helena Santos) and was funded by an FCT grant.
During catalysis, the enzyme oscillates between an open and a closed state and the enzyme activation results from binding of Mg^{2+}. In addition, we uncovered structural evidence for the formation of a short-lived PO3- intermediate, which is attacked by a nucleophilic water molecule to complete the catalytic reaction.



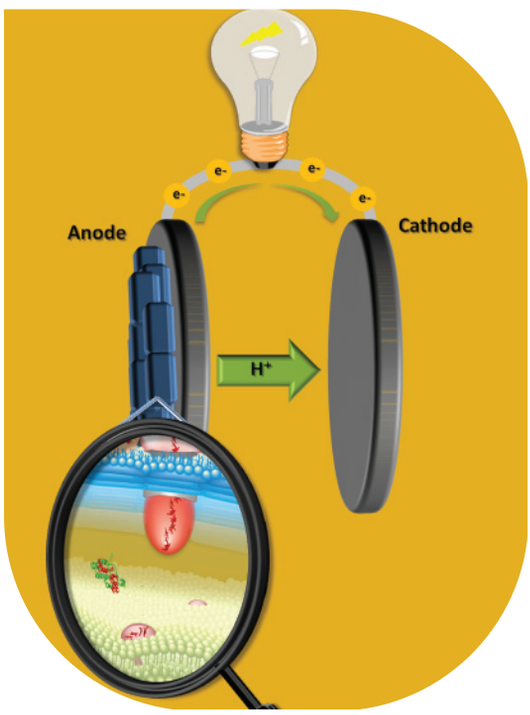
Gonçalves et al. (2011) Biochemistry 50(44) 9551

BC

Inorganic Biochemistry and NMR

Ricardo O. Louro louro@itqb.unl.pt

The Inorganic and Biochemistry and NMR group is currently engaged in the study of the molecular bases for coupling exchange of electrons with exogenous solid substrates to energy conservation in several anaerobic organisms. These phenomena are at the basis of extracellular respiration or ore based anoxygenic photosynthesis carried out by sediment organisms, and it was shown that several multiheme cytochromes (MHCs) are responsible for the electron transfer between the cell and the solid substrate. However, although several of these proteins have been identified, the molecular details of the electron transfer process remains to be elucidated in most cases. In the IBN group this issue is being tackled by integrating structural, thermodynamic and kinetic data on the proteins of these bioenergetic networks. NMR spectroscopy is uniquely suited for collecting structural and functional information from several MHCs. However, in order to fully elucidate the role of MHCs in the biotechnological applications of these organisms for bioremediation and energy production, new approaches have to be developed to analyze cytochromes that are larger and contain more hemes. In 2011, a new strategy to produce recombinant MHCs in E. coli with isotopically labeled hemes was developed. This allows the 'illumination' of specific atoms in the hemes facilitating the spectral analysis and extraction of the functional and structural information.



Alves A. S. et al. (2011) Metallomics, 3(4) 349
Qian Y. F. et al. (2011) Biochemistry, 50(28) 6217
Dantas, J. M. et al. (2011) Dalton Trans 40(47) 12713

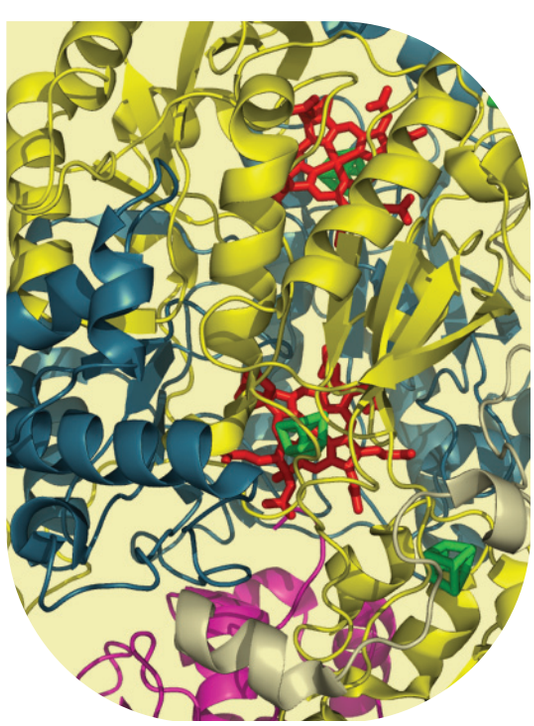
BC

Macromolecular Crystallography Unit

Membrane Protein Crystallography

Margarida Archer archer@itqb.unl.pt

We have been working on the structural and functional characterization of enzymes involved in dissimilatory sulfite reduction. This work is developed in collaboration with the Bacterial Energy Metabolism Laboratory at ITQB. Sulfate reduction is one of the earliest types of energy metabolism used by ancestral organisms to sustain life. Despite extensive studies, many questions remain about the way respiratory sulfate reduction is associated with energy conservation. A crucial enzyme in this process is the dissimilatory sulfite reductase (dSiR), which contains a unique siroheme-[4Fe4S] coupled cofactor. We have determined, by X-ray Crystallography, the first three-dimensional structure of a dissimilatory sulfite reductase isolated from a sulfate-reducing bacteria Desulfomicrobium norvegicum. dSiR DsrAB subunits are bound to the DsrC protein forming an $\alpha_2\beta_2\gamma_2$ assembly (see figure). A sulfite molecule, coordinating the siroheme, is found at the active site. The DsrC protein is bound in a cleft between DsrA and DsrB with its conserved C-terminal cysteine reaching the distal side of the siroheme. We proposed a novel mechanism for the process of sulfite reduction involving DsrAB, DsrC and a membrane complex. In light of this mechanism, a reassessment may be required for the models used to date ancient sulfur metabolism on geological samples based on sulfur isotope fractionations. A more detailed understanding of the steps involved in sulfate and sulfite reduction is requested.



Oliveira T.F. et al. (2008) J Biol Chem, 283(49) 34141
Oliveira T.F. et al. (2011) Frontiers Microbiol, 2, 71

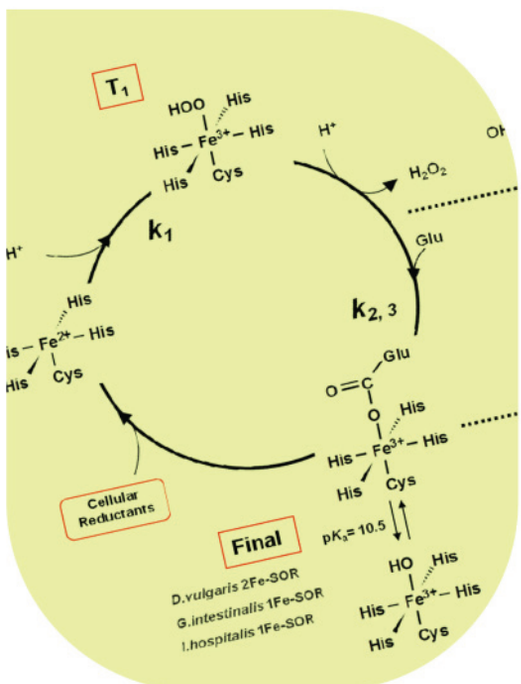
BC

Metalloproteins and Bioenergetics Unit

Metalloenzymes and Molecular Bioenergetics

Miguel Teixeira miguel@itqb.unl.pt

Although oxygen is essential for many life forms, its presence in the cell leads inevitably to the formation of toxic products, such as hydrogen peroxide and the superoxide anionic radical (theso-called oxygen paradox). This occurs both in aerobes (namely at the level of the respiratory chain), and anaerobes, upon transient exposure to oxygen. Due to their toxicity, these Reactive Oxygen Species (ROS) are used by the innate immune system to combat invading pathogens. We have been studying enzymes that detoxify these species, in particular the superoxide reductases, to establish their catalytic mechanisms and the underlying principles of action. This has been accomplished by a combination of approaches – the study of site directed mutants and "natural variants" to elucidate the catalytic function of specific aminoacids, and the study of enzymes from different microbial sources. In 2011, we have studied the first example of a superoxide reductase from a eukaryotic human pathogen, the protozoan *Giardia intestinalis*, acquired from a prokaryote through horizontal gene transfer. We have determined that it is quite similar to the prokaryotic homologues, and that the reduction of superoxide by this enzyme occurs through an apparent two-steps process, resulting from a particular combination of the several microscopic rate constants. Its 3D structure was also determined, together with those from other organisms, enabling us to obtain structures of analogues of the catalytic states, i.e., to establish a firm ground for the proposed catalytic mechanism.



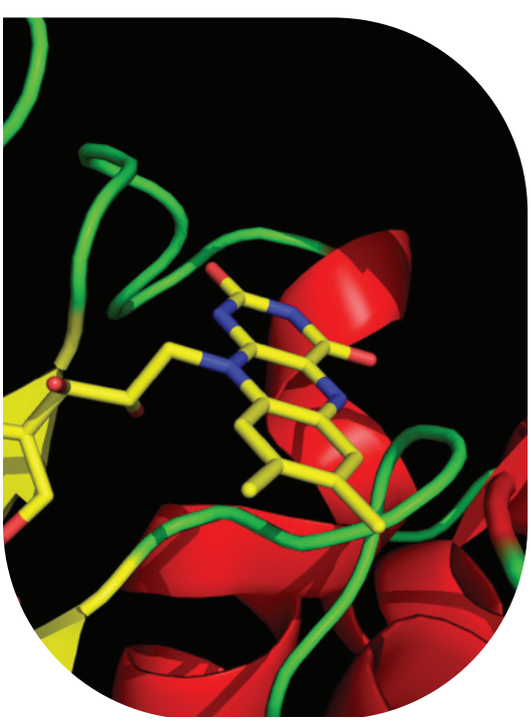
Testa F et al. (2011) Free Radical Bio Med, 51(8) 1567

BC

Microbial & Enzyme Technology

Ligia O. Martins lmartins@itqb.unl.pt

Azo dyes are the major group of synthetic colourants used in industry and are serious environmental pollutants. The bacterial strain *Pseudomonas putida* MET94 was selected on the basis of its superior ability to degrade a wide range of structurally diverse azo dyes. Furthermore, by in silico screening, we have identified, cloned and characterized the enzyme involved in the decolourisation process of P. putida MET94: the azoreductase PpAzoR, shown to be a FMN dependent NADPH:quinone oxidoreductase. A bacterial system co-expressing the reductase ppazoR and the oxidase cotA-laccase was constructed and the utilization of this engineered strain for the treatment of model dye-containing wastewater resulted in up to 60-80% decolourisation and detoxification levels. Therefore this is a promising candidate for the biological treatment of industrial dye containing effluents.



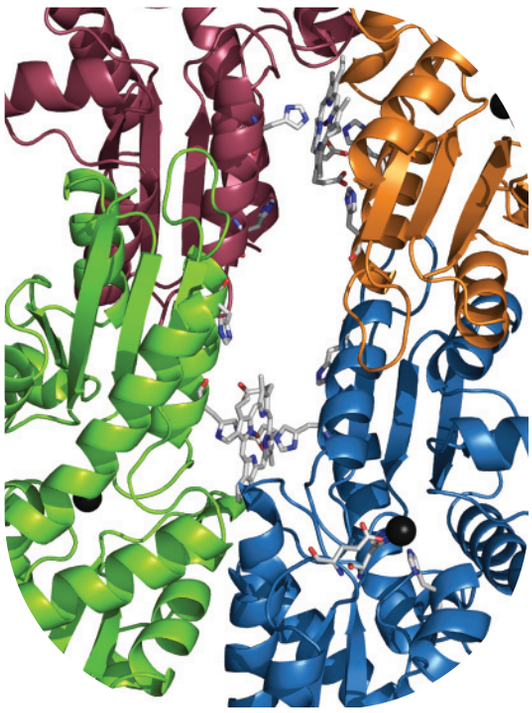
Flavin-dependent azoreductases, such as PpAzoR, share strong similarities with regard to sequence, structure, and reaction mechanism with the larger family of quinone reductases, which are assumed to take part in the organism's detoxification systems. Future studies with PpAzoR for which a crystal structure is already available provides a rich opportunity to probe structure-function relationships that are determinants of substrate specificity and mechanisms of promiscuity among the family of flavoproteins. Understanding the relative contributions of substrate binding vs. chemistry will enrich our understanding of enzyme evolution and ligand-protein interaction with important biotechnological implications.

BC

Molecular Genetics of Microbial Resistance

Ligia M. Saraiva lst@itqb.unl.pt

Modified tetrapyrroles such as chlorophyll, heme, siroheme, vitamin B(12), coenzyme F(430), and heme d(1) perform essential biological functions in all domains of life. In 2011, we unraveled a new biosynthetic pathway of the prosthetic heme group, formed by an atom of iron contained in the center of an organic cyclic compound named porphyrin, a non-protein chemical compound required for the function of several essential proteins. Earlier studies suggested that heme biosynthesis in the sulfate reducing bacteria *Desulfovibrio* was different from the typical pathway known in other microorganisms. In fact, analysis of the *Desulfovibrio* genome showed the absence of the canonical genes involved in key steps of the tetrapyrrole biosynthesis. In the search for alternative enzymes, the biosynthetic pathway was in vitro stepwise reconstructed. By analyzing the several intermediate products it was possible to show that in *Desulfovibrio* the classical pathway branches and that siroheme is instead used for synthesizing heme. This pathway, designated as alternative pathway, is predicted to be also active in archaea.



Romão C.V. et al. (2011) PNAS, 108(1) 97
Bali S. et al. (2011) PNAS, 108(45) 8260

BC

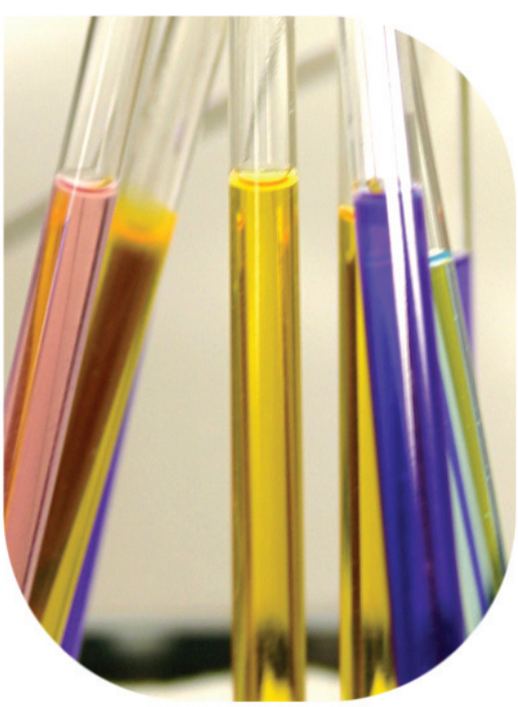
Molecular Interactions and NMR

Patrick Groves pgroves@itqb.unl.pt

The MI-NMR lab uses DOSY methods to study molecules that have NMR spectra: proteins, DNA, polymers, detergents, ionic liquids, etc. We collaborate with a large number of labs.

Diffusion NMR (DOSY) provides a technique to measure the size of a molecule. This means DOSY can tell us if a molecule is singular (monomer) or interacts with itself to form a discrete complex (dimer, tetramer etc.). DOSY is also sensitive to some changes in molecular shape. In paper 1, DOSY is used to show that the association of a steroid with a RNA structure results in a more compact structure. This data agrees with other experimental data collected in Australia and Canada.

We also used DOSY to study the physical properties of ionic liquids that were correlated with their crystallization properties (paper 2).



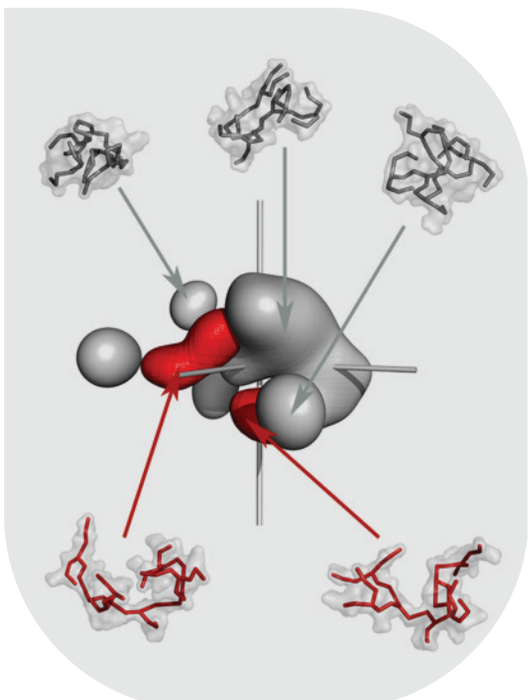
Reinstein O. et al. (2011) Biochemistry, 50(43) 9368
Kowacz M. et al. (2011) Cryst Growth Des, 11(3) 684

BC

Molecular Simulation

António M. Baptista baptista@itqb.unl.pt

Our group used computational simulation methods to perform the first extensive structural characterization of peptide dendrimers, which are tree-like synthetic molecules composed of standard and bifurcated amino acids. Often used as agents for catalysis, binding and drug delivery, their bio-compatibility and proteolytic resistance makes them promising biomedical targets. Their behavior should be largely determined by itheir three-dimensional structure, but all experimental attempts were unable to reveal any structural details, thus hindering their truly rational design.
Our simulations indicated that, unlike globular proteins, none of the studied dendrimers favors a preferential folded structure, displaying instead a very high conformational diversity. Despite this lack of a folded structure, two clearly distinct behaviors were observed in terms of compactness. The analysis of conformational clusters indicated that the energy landscapes depicting their structural preferences are mostly flat, markedly contrasting with the funnel-like landscapes of proteins.
This study shows that peptide dendrimers have a complex conformational behavior that cannot be easily inferred from their chemical formula. Together with available experimental data, molecular simulation studies can help to reveal the function-structure determinants of these molecules and lead to a more rational design.



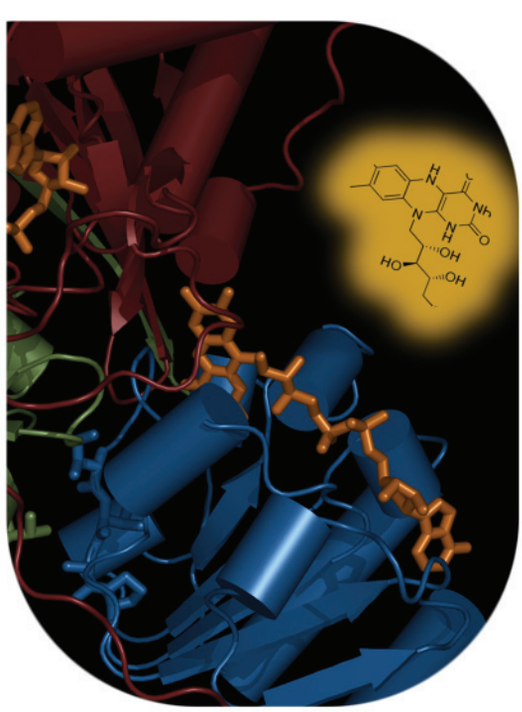
Filipe L.C.S., Machuqueiro M. and Baptista A.M. (2011) J Am Chem Soc, 133(13) 5042

BC

Protein Biochemistry Folding & Stability

Cláudio M. Gomes gomes@itqb.unl.pt

The laboratory investigates the biology and biophysics of protein folding, an essential cellular process through which proteins acquire a functional conformation. Protein misfolding is a hallmark in several human diseases, and in recent years we have been investigating this process fromdifferent perspectives: protein aggregation mechanisms in neurodegeneration (toxic gain of function) and protein misfolding and destabilization in metabolic disease (loss of function). The latter include defects in fatty acid oxidation, a group of rare diseases in which genetic mutations inactivate key metabolic enzymes by affecting their biogenesis, stability and degradation. In these cases, small molecules with the ability to raise functional levels of the affected protein above the disease threshold have proven valuable tools for effective drug design.
In 2011 we published a pioneer study showing that cell metabolites such as cofactors and substrates are stabilizers of enzymes affected in these folding disorders. We found that physiological concentrations of these small molecules resulted in a spectacular enhancement of enzyme stabilities and prevented inactivation during conditions simulating in vitro fever episodes. The relevance of these findings is two-fold. First, it contributes to understanding how proteins behave under conditions near those of cell physiology. Secondly, it points that substrate analogs and cofactor precursors (e.g. Vit B2) which recover proteins with inherited folding difficulties have the potential to become lead compounds for drug development.



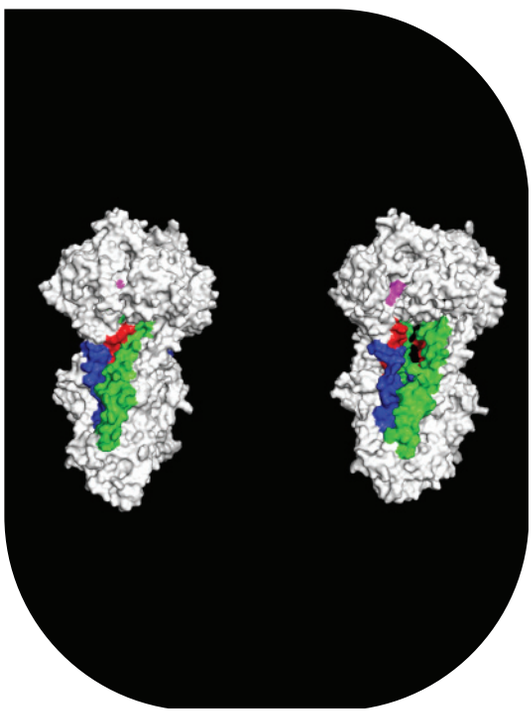
Lucas T.G. et al. (2011) BBA - Mol Basis Dis, 1812(12) 658

BC

Protein Modeling

Cláudio M. Soares claudio@itqb.unl.pt

Living cells must exchange products with their surroundings. Some of these changes require specific membrane proteins, which at the expense of energy, transport substances into out of the cell. ITQB researchers from the Protein Modeling and Molecular Simulation Labs set out to see how energy promotes transport and by computer simulation obtained a picture of the protein structural changes occurring in the process. The findings, published in the journal Proteins, provide new clues to the mechanism of the so called ABC transporters. The cellular energy currency is ATP: when ATP molecules are broken down, the released energy can be used. ATP binding cassette (ABC) transporters are able to break down ATP – in their catalytic domain - for unidirectional transport of solutes across the membrane – through their transmembrane domain. In their work, researchers compared the structure of an ABC transporter before and after ATP hydrolysis and observed that the structural changes at the catalytic sites are propagated throughout the transporter, leading to the opening of the channel. This observation suggests that the ATP energy is only required for the gate opening.Researchers believe that these computational results provide further details about the transport process that may now be tested experimentally.



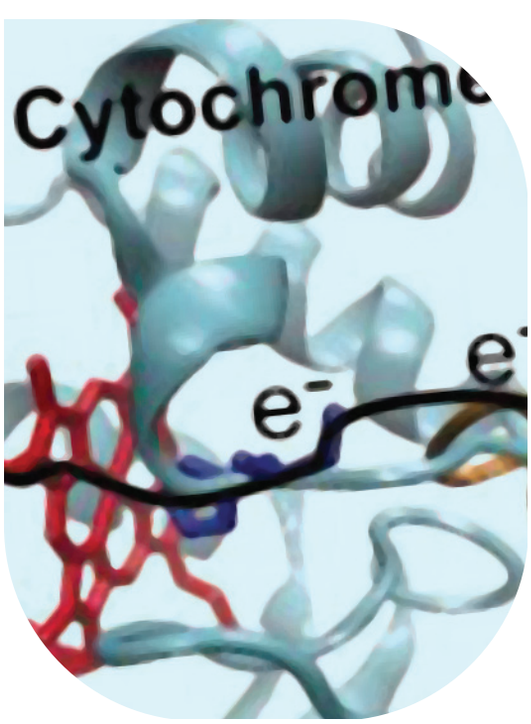
Oliveira A.S., Baptista A.M., and Soares C.M. (2011) Proteins, 79(6) 1977

BC

Raman Spectroscopy of Metalloproteins

Smilja Todorovic smilja@itqb.unl.pt

We have employed a combination of recently developed experimental and computational methods in the studies of caa3 oxygen reductase and its truncated subunit II (Cyt-D) in the presence /absence of the physiological electron donor, HiPIP. The main experimental technique was time-resolved surface-enhanced resonance Raman (TR-SERR) spectroscopy under Q-band excitation, which is capable of providing simultaneous information on the structure of the adsorbed protein, electron transfer (ET) kinetics and orientational dynamics. The results reveal the domains of Cyt-D that are most likely involved in binding to HiPIP and to the CuA-containing domain of subunit II. In addition, we have identified the optimal electron transfer pathways in terms of electronic couplings, both for electron entry and exit, and determined the ET reorganization energy of Cyt-D. This work represents a first step towards disentangling the inter- and intra-protein ET mechanisms in a complex multi-subunit protein using a novel strategy that is likely to be effective in assessing redox properties in similar systems.



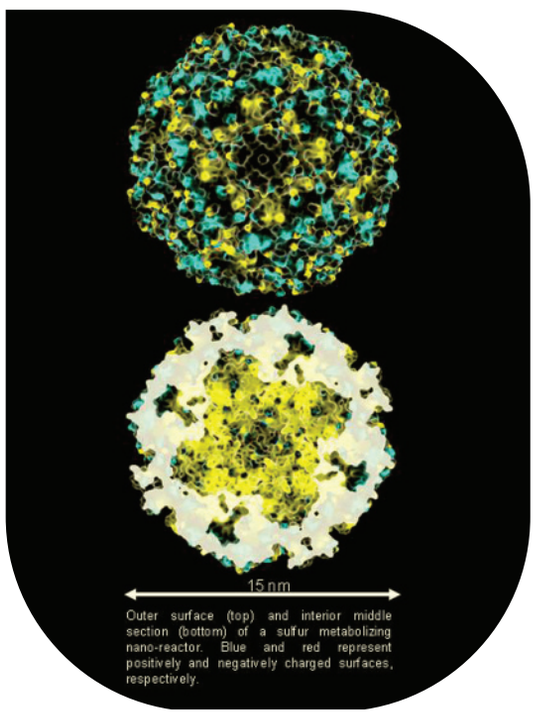
Molinas M.F. et al. (2011) Phys Chem Chem Phys, 13(40) 18088

BC

Macromolecular Crystallography Unit
Structural Biology

Carlos Frazão frazao@itqb.unl.pt

We have been using X-ray diffraction to determine 3D pictures of minute biological reactors, aiming to understand their working mechanisms.
Numerous microorganisms oxidize sulfur for energy conservation and contribute to the global biogeochemical sulfur cycle. *Acidianus ambivalens*, a thermoacidophilic archaeon found in volcanic vents, transforms inorganic sulphur with assistance of oxygen into sulphur metabolites. The reaction occurs within nano-reactors built up by 24 sulphur oxygenase reductase molecules. Their surface contains 6 hydrophobic chimney-like protrusions that work as elemental sulphur entry portals. Reactors include24 catalytic centres composed of iron sites and cysteine persulfides, at positively charged inner compartments accessible only from the inside.
In order to map sulfur internal pathways and to highlight catalytic residues, several point mutations and inhibition procedures were constructed, and corresponding 3D structures determined. Surface "chimneys" are not essential for the reactor activity, they presumably control the access of hydrophobic sulphur to the inner hollow. Products exit might occur via hydrophilic channels, with 8 outlets at 3-fold symmetry axes. Enlargement of both openings increased enzyme activity by several-fold. In contrast, the inner passage to the catalytic centre cannot be opened without decreasing the specific enzyme activity. Further studies are under way.



Outer surface (top) and interior middle section (bottom) of a sulfur metabolizing nano-reactor. Blue and red represent positively and negatively charged surfaces, respectively.

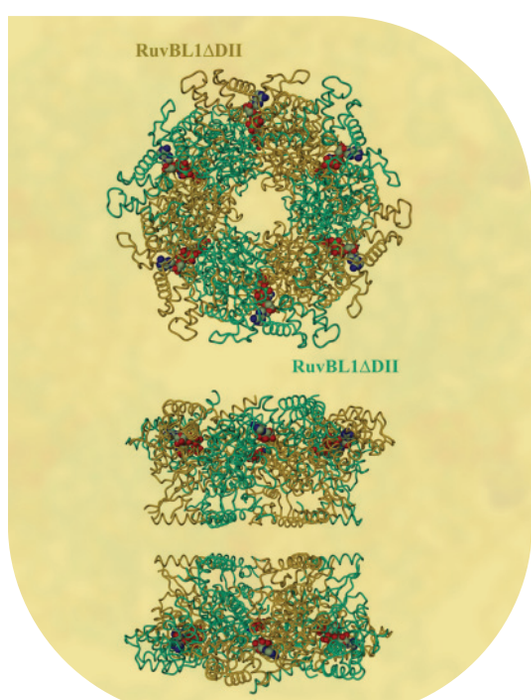
Urich T. et al. (2006) Science, 311(5763) 996
Veith A. et al. (2011) Frontiers Microbiol, 2, 37

BC

Macromolecular Crystallography Unit
Structural Genomics

Maria Arménia Carrondo carrondo@itqb.unl.pt

RuvBL1 and its homolog RuvBL2 are evolutionarily highly conserved AAA+ ATPases essential cellular activities. They play an important role in chromatin remodeling, transcriptional regulation and DNA damage repair. RuvBL1 and RuvBL2 are overexpressed in different types of cancer and interact with major oncogenic factors, such as β-catenin and c-myc, regulating their function. We solved first three-dimensional crystal structure of the human RuvBL complex with a truncated domain II and showed that this complex is competent for helicase activity. The complex is a dodecamer consisting of two heterohexameric rings with alternating RuvBL1 and RuvBL2 monomers bound to ADP/ATP, that interact with each other via the retained part of domain II. Interestingly, the truncation of domain II led to a substantial increase in ATP consumption of RuvBL1, RuvBL2 and their complex. In addition, we gathered experimental data to demonstrate that DNA unwinding of the human RuvBL proteins can be autoinhibited by domain II. Our data give new insights into the molecular arrangement of RuvBL1 and RuvBL2 and strongly suggest that the in vivo activities of these highly interesting therapeutic drug targets are regulated by cofactors inducing conformational changes via domain II in order to modulate the enzyme complex into its active state.



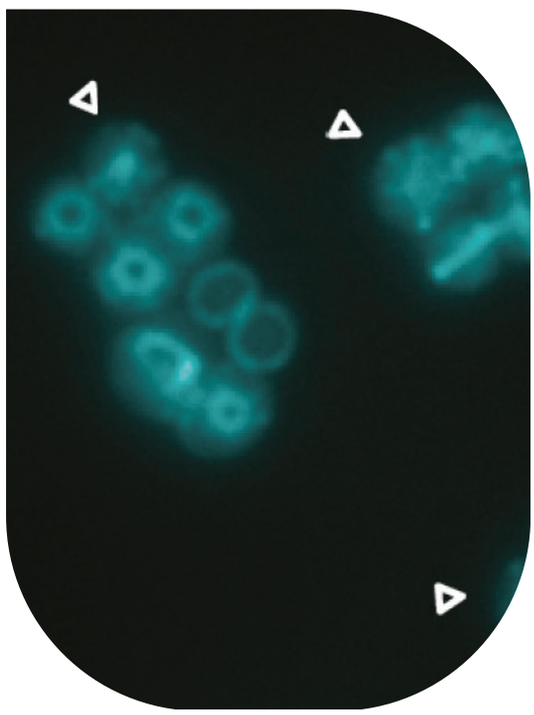
Gorynia S. et al. (2011) J Struct Biol, 176(3) 279

B

Bacterial Cell Biology

Mariana G. Pinho mgpinho@itqb.unl.pt

In the laboratory of Bacterial Cell Biology we study cell division and antibiotic resistance, using as a model organism the Gram positive pathogen Staphylococcus aureus, one of the major causes of antibiotic resistant hospital-acquired infections worldwide. Besides its clinical relevance, S. aureus is also a very interesting model to study cell division because it has a different shape and mode of division from the traditional, widely used, model organisms Escherichia coli and Bacillus subtilis: it has spherical cells and, more interestingly, it divides in three consecutive perpendicular division planes over three division cycles, similarly to the first divisions of a fertilized egg. We are very interested in understanding how staphylococcal cells "remember" previous division planes so that they keep dividing in orthogonal planes. We have recently discovered that the direction of chromosome segregation determines the plane of division in S. aureus. The information regarding the space occupied by the chromosome is transmitted to the division apparatus via a protein, called Noc, which binds to specific regions of the DNA, more abundant near the origin of replication. As Noc is an inhibitor of the initiation of the formation of the division septum, its presence close to DNA origin of replication prevents the formation of the septum in that region of the cell, therefore determining the localization of the division plane. Understanding how bacterial cells divide is of major importance for the development of new strategies to prevent bacterial division, which constitutes the ultimate aim of antibiotics.



B

Bacterial Cell Surfaces and Pathogenesis

Sérgio R. Filipe sfilipe@itqb.unl.pt

We recently reported two observations that highlight how the highly organized cell surface of bacteria may reduce the ability of the infected host to detect an invading bacterial pathogen.

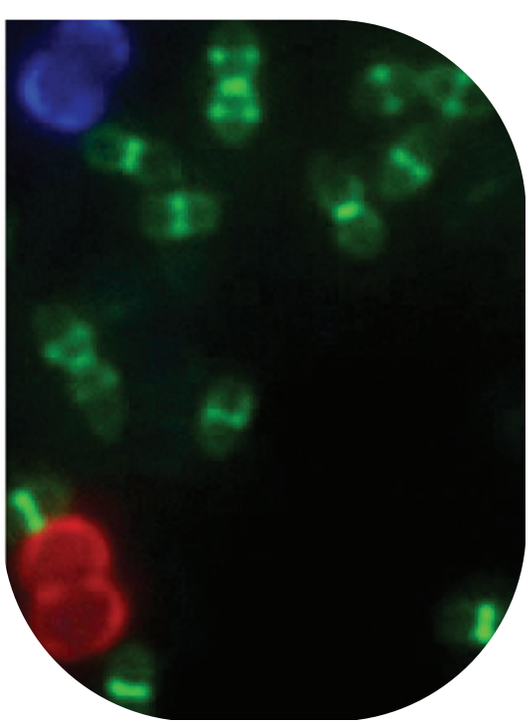
Streptococcus pneumoniae are encapsulated bacteria normally found encircled by one of the more than 90 different capsule types. These polysaccharides can reduce the deposition of complement host proteins and prevent trapping of the bacteria by the host immune defenses.

We have shown that pneumococcal bacteria rely on two proteins, Wzd and Wze, expressed by almost all the different serotypes, to guarantee their full encapsulation. These proteins localize at the bacterial division septum and coordinate, through a yet unknown mechanism, the synthesis of capsule with the synthesis of the other components of the cell surface.

*Staphylococcus aureus i*s a proficient bacterial pathogen, known for its ability to cause lethal infections and resist different classes of antibiotics.

We reported that the absence of wall teichoic acids, phosphate rich glycopolymers that are attached to peptidoglycan, can lead to increased binding of a peptidoglycan receptor produced by Drosophila flies. Lack of teichoic acids can also result in a reduction of the host susceptibility to infection by *S. aureus* bacteria.

We have proposed that wall teichoic acids limit the access of innate immune receptors to peptidoglycan at the bacterial surface allowing the bacteria to evade detection by the host.



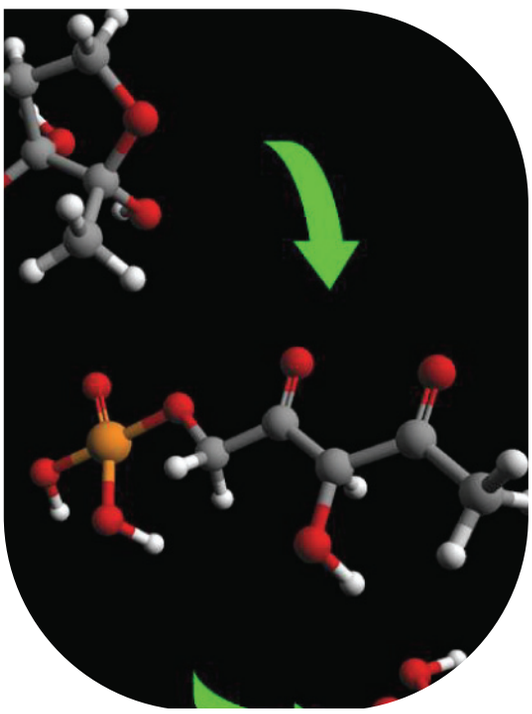
Henriques M.X. et al. (2011) Mol Microbiol, 82(2) 515
Atilano M.L. et al. (2011) PLoS Path, 7(12) e1002421

B

Bacterial Signaling

Karina Xavier karina@itqb.unl.pt

In 2011 our laboratory and the "Centro de Ressonância Magnética António Xavier" at ITQB, in collaboration with the Swarthmore College in Pennsylvania, have revealed, how Escherichia coli catabolises the signal molecule used by several species of microorganisms to count their numbers.
Many bacteria regulate gene expression as a function of the density of the population in a process called quorum sensing, which enables these organisms to coordinate important bacterial behaviours such as biofilm formation and the production of virulence factors. Quorum sensing is mediated by signal molecules called autoinducers. One autoinducer, Autoinducer-2 (AI-2), is produced by many species and can facilitate inter-species bacterial communication. The way the production of AI-2 is regulated has been known for some time, but its degradation was still not clear. Using in vivo and in vitro NMR, we have identified the key metabolites involved in the first step of AI-2 processing which involves the isomerisation of the phosphorylated signal molecule into an unstable intermediate (3,4,4-trihydroxy-2-pentanona-5-phosphate). The X-ray structure of this new isomerase allowed us to determine its active site, which was confirmed by site-directed mutagenesis. This discovery is important for new methodologies of quenching the interspecies signalling mechanisms, which are expected to be of great utility in the development of therapies to control bacterial behaviour as new alternatives to traditional antibiotics.



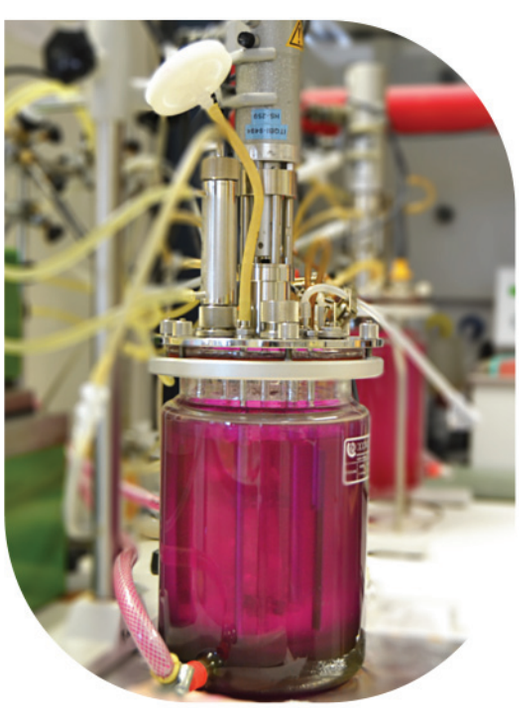
Marques J.C. et al. (2011) J Biol Chem, 286(20) 18331

B

Cell Physiology and NMR

Helena Santos santos@itqb.unl.pt

Lactococcus lactis, a fermentative bacterium used worldwide in the manufacture of dairy products, is among the best characterized species of Lactic Acid Bacteria. The wealth of knowledge in the fields of lactococcal genetics and physiology, combined with a "generally recognized as safe" status, a relatively simple metabolism, and a small genome, rendered *L. lactis* an attractive model to implement metabolic engineering strategies.
For the last decade our team has invested in the development of *L. lactis* strains with improved traits, such as higher acid resistance, or ability to produce useful chemicals. This goal involves an iterative optimization step in which strain characterization by *in vivo* NMR provides useful guidelines for further strain improvement. In 2011 our team constructed *L. lactis* strains able to produce high yields of 2,3-butanediol, a valuable bulk chemical, and mannitol, a natural sweetener with nutraceutical properties. The engineering strategy involved the overexpression of the pathways for the synthesis of these two polyols in a background with deficient lactate dehydrogenase activity.
Moreover, capitalizing on our earlier studies on acid stress response of Propionibacteria, we decided to introduce in *L. lactis* the missing genes for the synthesis of trehalose. This strategy led to de novo accumulation of trehalose by a strain that showed improved resistance to acid stress, a beneficial trait in the industrial and clinical applications of this bacterium.



Gaspar P. et al. (2011) Appl Environ Microbiol, 77(19) 6826
Carvalho A.L. et al. (2011) Appl Environ Microbiol, 77(12) 4189

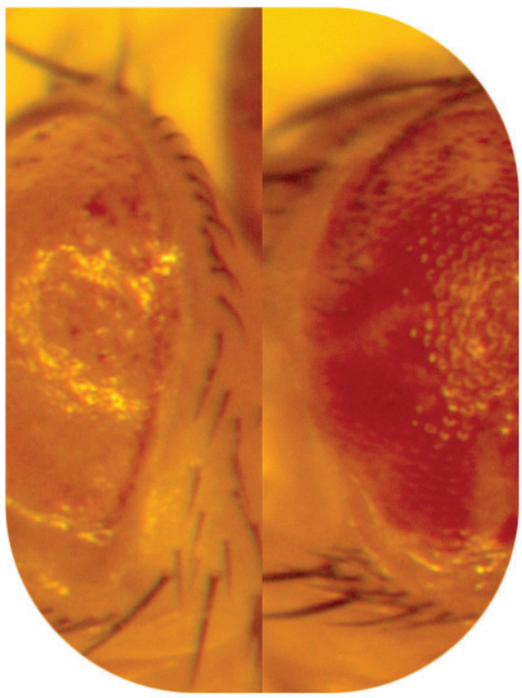
B

Cell Signaling in Drosophila

Pedro Domingos domingp@itqb.unl.pt

The aim of our research is to understand the molecular mechanisms that regulate degeneration of the photoreceptors, the cells that sense light in the visual system, using *Drosophila* as our biological model. Our most recent work focuses on the role of the Unfolded Protein Response (UPR), a cellular signaling pathway activated by the presence of unfolded proteins in the Endoplamic Reticulum (ER), during photoreceptor degeneration in a *Drosophila* model for Autossomal Dominant Retinitis Pigmentosa. We use the tools of modern genetics, cell biology and imaging to pursue the signaling mechanisms that regulate cell death/cell protection in our biological model system.

We are performing a screen to identify modulators of UPR induced cell death in the *Drosophila* eye. The normal *Drosophila* eye is composed of around 800 clusters with 8 photoreceptors each. Over activation of the UPR induces a “glossy” eye phenotype , caused by the death of the exterior cell types of the eye. This “glossy” eye phenotype is used as an assay to identify suppressors or enhancers of UPR-induced cell death.

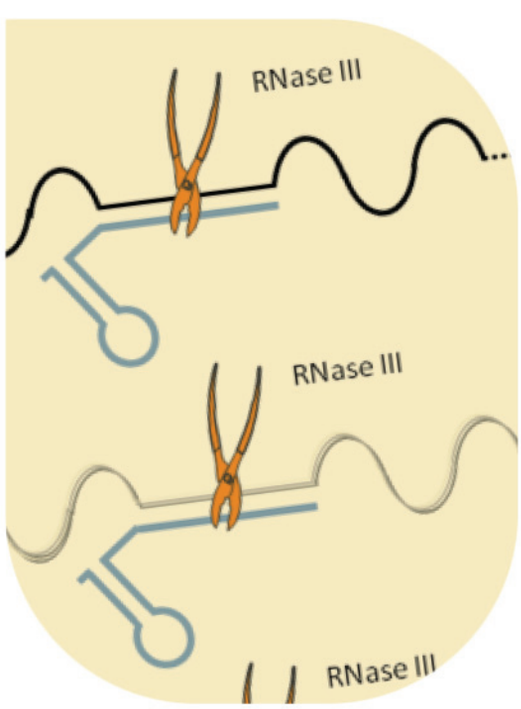


B

Control of Gene Expression

Cecilia Arraiano cecilia@itqb.unl.pt

Bacteria have intricate strategies to cope with changes in the outside world. For instance, the expression of the main outer membrane proteins is regulated by small RNA molecules, which do not encode for proteins. These small RNAs are in turn regulated by the activity of RNA-degrading enzymes. Our group has uncovered this regulation in the pathogenic bacterium *Salmonella typhimurium*, pointing to a gene silencing mechanism similar to that of higher organisms.
Small RNAs bind specifically to messenger RNAs (the ones encoding proteins) and can trigger their degradation and thus control protein expression. One of the stories in which our group was involved in 2011 focus on MicA, a small non-coding RNA (70nt), implicated in the regulation of the bacterial envelope composition. We discovered that the fine tuning of MicA requires mainly two ribonucleases; RNase E which degrades isolated MicA molecules, and RNase III which degrades MicA bound to its target.
Proteins similar to RNase III are major actors in RNA regulation in eukaryotes (higher organisms). In a process known as RNA interference or gene silencing, small RNAs bind to the RNA of specific target genes, promoting their degradation and impeding the production of the respective protein. The fact that, in *Salmonella*, MicA is cleaved by RNase III in a target-dependent fashion, with the concomitant decay of the mRNA target, strengthens the RNase III role in the regulation of gene expression, also in the bacteria.



Viegas S.C. et al. (2011) Nucleic Acids Res, 39 (7) 2918
Silva I.J. et al. (2011) Wiley Interdiscip Rev RNA, 2(6) 818

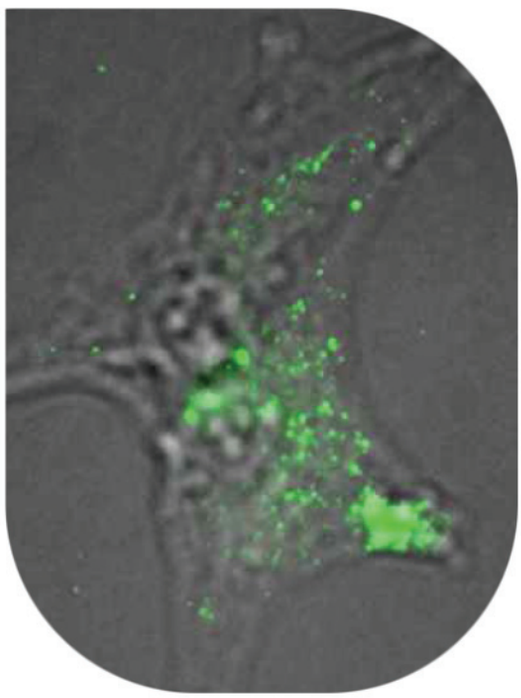
B

Glycobiology

Júlia Costa jcosta@itqb.unl.pt

Glycosylation is a common post-translational modification of proteins with more than 50% of glycoproteins being glycosylated in eukaryotes. It involves more than 500 glycosyltransferases in vertebrates. Since the glycosyltransferases that are expressed vary between cell types and under different conditions, the glycomes are characteristic of a certain cell or organism in specific conditions (physiological, pathological, etc.). A hallmark of tumor cell phenotype consists of changes in glycosylation of cell surface glycoproteins.

In 2011, we have used glycomics technology to characterize protein N-glycosylation from ovarian carcinoma cells. N-glycans from total proteins, secreted proteins, cellular fractions and secreted vesicles, also known as exosomes, have been analysed by lectin blotting, high performance anion exchange chromatography with pulsed amperometric detection and MALDITOF mass spectrometry. Most striking was the identification of the LacdiNAc structure (GalNAcβ4GlcNAc) in specific secreted proteins from the SKOV3 ovarian carcinoma cell line. Furthermore, secreted vesicles showed characteristic glycoprotein and N-glycosylation profiles. This work contributed to the knowledge about protein glycosylation in ovarian carcinoma cells and derived exosomes. The results may provide the basis for future identification of cancer markers.



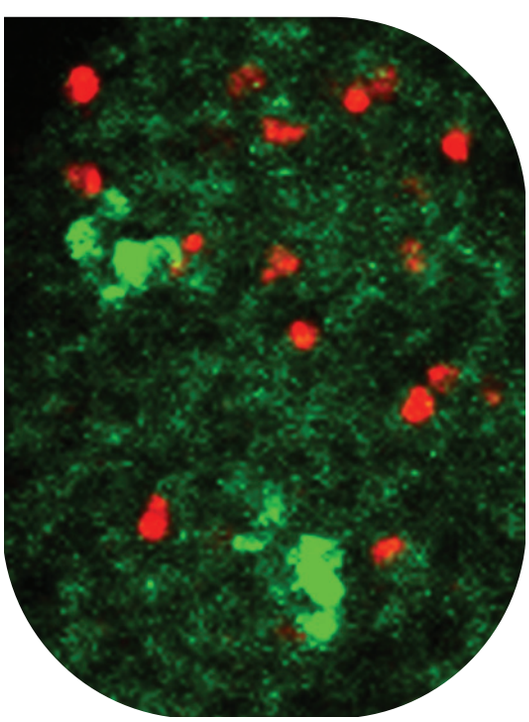
Machado E. et al. (2011) Glycobiology, 21(3) 376
Escrevente C. et al. (2011) BMC Can, 11, 108

B

Infection Biology Head

Jaime Mota jmota@itqb.unl.pt

We study molecular and cellular mechanisms underlying bacterial virulence, focusing on intracellular bacterial pathogens that multiply within host cells in unique pathogen-containing vacuoles. We aim to understand the mechanisms by which these pathogens manipulate mammalian host cells. As experimental models we use *Chlamydia trachomatis*, which belong to a large group of highly related obligate intracellular bacteria (Chlamydiae) and cause genital and ocular infections in humans, and *Salmonella enterica*, which are facultative intracellular bacteria that cause gastrointestinal and systemic diseases in humans. Like other bacterial pathogens, *Chlamydia* and *Salmonella* employ specialised secretion systems to inject mammalian host cells with effector proteins, which subvert host cell functions to benefit the bacteria. Ongoing research includes: i) identification and characterisation of novel *C. trachomatis* effectors and of effector-chaperone pairs (effector secretion frequently involves characteristic chaperones - with a low MW, an acidic pI, and which do not bind or hydrolyze ATP); ii) functional analyses of Inc proteins of *C. trachomatis* (Incs are a group of Chlamydiae-specific effectors, representing ~5 % of the coding capacity of chlamydial genomes); and iii) function of *Salmonella* effectors that subvert host cell membrane transport trafficking, a theme about which we co-authored a review article in 2011.



Schröeder N., Mota L.J. and Meresse S. (2011) Trends Microbiol, 19(6) 268

B

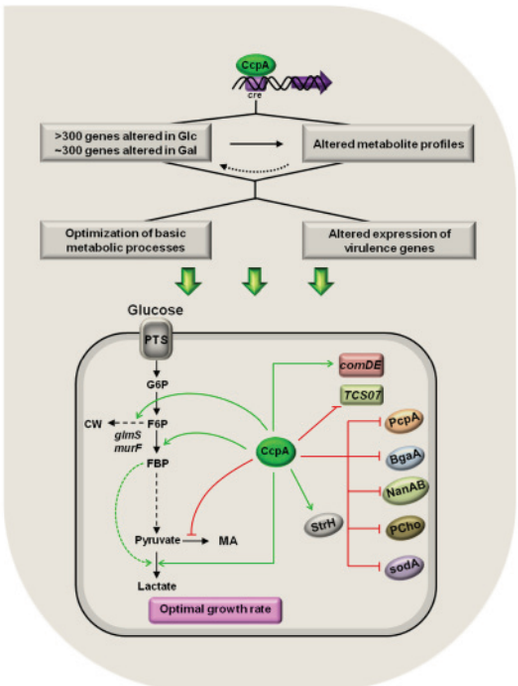
Lactic Acid Bacteria & In Vivo NMR

Ana Rute Neves arn@itqb.unl.pt

Streptococcus pneumoniae is a major human pathogen that causes a multitude of diseases. Given this, the majority of pneumococcal studies have focused on factors related to host-pathogen interactions. Thus, the knowledge of basic physiology is limited, even though the ability to cause disease relies largely on the metabolism of nutrients.

In Gram-positive bacteria, the transcriptional regulator CcpA is at the core of catabolite control mechanisms. In *S. pneumoniae*, links between CcpA and virulence has been established, but the role of CcpA in life-style has not been studied. In 2011 we were involved in a project that investigated the impact of CcpA on pneumococcal physiology by combining genome-wide transcriptomics with metabolite analysis. This work was performed in collaboration with the team of Prof. Kuipers (RUG, NL).

We showed that CcpA is a global regulator influencing multiple cellular processes including virulence, regulatory networks and central metabolism. Our results support the view that *S. pneumoniae* optimizes basic metabolic processes, likely enhancing in vivo fitness, in a CcpA-mediated manner. We found that CcpA modulates the expression of virulence factors and unveiled an unforeseen link between CcpA and the association of surface macromolecules, generally key players during the infectious process, to the cell wall. The insights gained from this comprehensive analysis foresee CcpA as a key factor in the interaction between *S. pneumoniae* and its host.



B

Microbial Development

Adriano O. Henriques aoh@itqb.unl.pt

Positive auto-regulation of a transcriptional activator during cell differentiation or development often allows the rapid and robust deployment of cell- and stage-specific genes and the routing of the differentiating cell down a specific path. Positive auto-regulation, however, raises the potential for inappropriate activity of the transcription factor. We have unraveled the role of an anti-sigma factor, CsfB, in a negative feedback loop that prevents ectopic expression of the cell type-specific sigma factor σG of *Bacillus subtilis*. Normally, σG is activated in the forespore, one of the two chambers of the developing cell, at an intermediate stage in spore development. Once active, a positive feedback loop allows the rapid accumulation of σG, and the robust expression of a large gene regulon. The study of the ITQB team now shows that activation of this positive feedback loop is prevented in non-sporulating (vegetative) cells, through the σG-dependent production of CsfB. The negative feedback loop thus established, effectively counteracts the positive loop involving σG, thereby limiting the ectopic activation of the sigma factor across the cell population. The study also identifies an asparagine residue conserved among σG orthologues, which is critical for the binding and inhibition of σG by CsfB, and whose substitution is sufficient to confer immunity to the anti-sigma factor.

Serrano M. et al. (2011) PLoS Genet, 7(9) e1002220

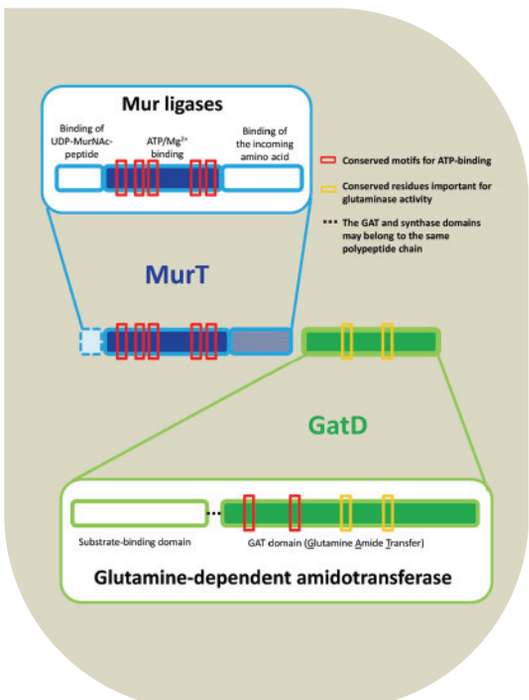
B

Microbiology of Human Pathogens Unit

Molecular Genetics

Hermínia de Lencastre hml@itqb.unl.pt

The genetic determinants and enzymes that catalyze the multiple steps in the assembly of bacterial cell wall peptidoglycan have been known for some time. However, the mechanism by which the glutamic acid residues of this structure undergo modification to glutamine has remained unknown. In 2011, our laboratory has identified the two genetic determinants, widespread among gram-positive bacteria, murT and gatD, that are responsible for the completion of the chemical structure of the cell wall of the important human pathogen *Staphylococcus aureus*. The MurT and GatD proteins have sequence similarity to the substrate-binding domains of Mur ligases (MurT) and to the catalytic domain of CobB/CobQ-like glutamine amidotransferases (GatD), respectively. We observed that the reaction of amidation of the stem peptide of *S. aureus* peptidoglycan takes place in the lipid phase of biosynthesis and is totally dependent on the activity of both proteins which operate as an enzymatic complex. The availability of a conditional mutant allowed us to modulate this system and thus recognize the importance of glutamine residues for growth rate, β-lactam antibiotic resistance and sensitivity of the staphylococcal cell wall to the host defense factor lysozyme. In summary, the MurT/GatD enzymatic complex is responsible for catalyzing a secondary modification of S. aureus peptidoglycan, suggested to be an essential factor for bacterial survival and at the same time, an important virulence factor.



Figueiredo T.A. et al. (2012) PLoS Pathog, 8(1) e1002508

B

Microbiology of Human Pathogens Unit

Molecular Microbiology of Human Pathogens

Raquel Sá-Leão rsaleao@itqb.unl.pt

In our group we are studying the nasopharyngeal ecosystem, a niche frequently inhabited by potentially pathogenic bacteria such as *Streptococcus pneumoniae* (or pneumococcus). Colonization by pneumococci, which is typically asymptomatic, is frequent among young children. Although disease, per se, is incidental in the lifestyle of these bacteria, the overall burden is substantial worldwide.
In recent years, multivalent pneumococcal conjugate vaccines, targeting a limited subset of the circulating capsular types, have been introduced in several countries. As the capsular types targeted by these vaccines are the ones most frequently associated with antibiotic resistance, widespread use of conjugate vaccines has been postulated to result in a decline of antibiotic resistance rates. In Portugal, although use of these vaccines has been high, surveillance studies showed that no changes in antibiotic resistance rates have occurred among pneumococci colonizing young children. In 2011, we conducted a study aimed to elucidate the mechanisms underlying this surprising observation. By using a combination of molecular typing techniques, we were able to demonstrate that, in the vaccine era, maintenance of antibiotic resistance levels has resulted mainly from the expansion of antibiotic resistance lineages that are not covered by the vaccine and that were already circulating in the country – in low abundance – in the pre-vaccine era.

P

Disease and Stress Biology

Ricardo Ferreira rbferreira@itqb.unl.pt

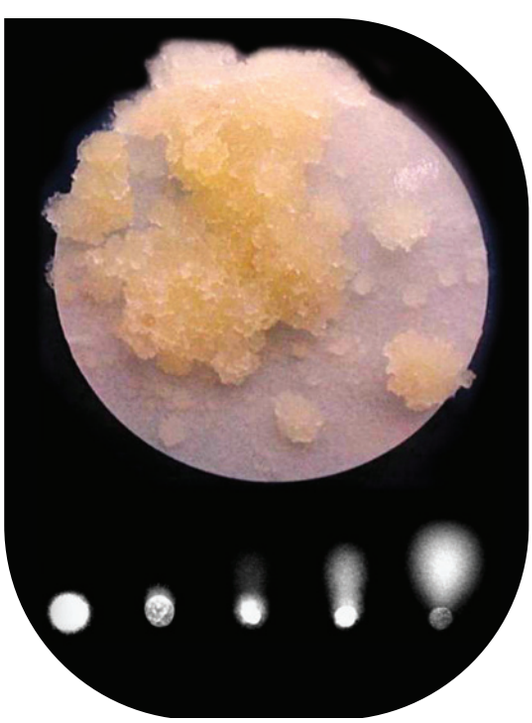
In 2011 we were involved in a project that disclosed blackberries as a promising dietary approach to degenerative disease prevention, functional food development and new breeding programmes targeted on specific bioactivities. This project was conducted in collaboration with Animal Cell Technology Unit, Biology of Cytoprotection laboratory at CEDOC and The James Hutton Institute (Dundee, UK). Initially, we demonstrated the need to reproduce physiological conditions when using human cell models. Ascertaining the beneficial health effects of berries requires taking into account their journey through the body once eaten, which includes metabolite alterations as well as their physiological concentrations in human plasma. We found that digestion altered the phenolic chemical profile and antioxidant capacity of blackberry extract. Digestion also potentiated the neuroprotective effect: digested extracts were more effective than non-digested extracts in protecting brain cells from oxidation in vitro. Furthermore, this protection was not related to the antioxidant ability.
In a second stage of our study, we showed that digested extracts of wild blackberries native to the Portuguese flora (*Rubus brigantinus* and *R. vagabundus*) had a stronger neuroprotective effect than commercially available varieties. Further molecular analysis showed that the observed neuroprotection results from cellular adaptative responses that go beyond simple antioxidant effects. These findings also open a window for the protection of Portuguese native flora.

Tavares L. et al. (2012) Food Chem, 131(4) 1443
Tavares L. et al. (2012) Eur J Nutr, DOI: 10.1007/s00394-012-0307-7

P

Forest Biotech

Célia Miguel cmiguel@itqb.unl.pt



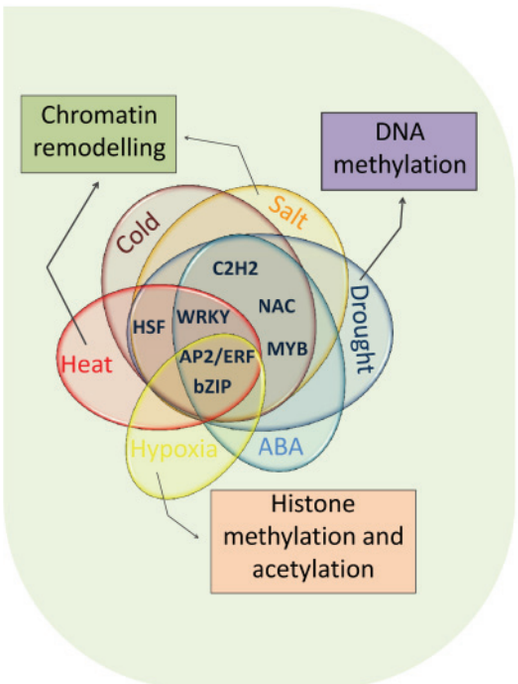
Although a routine procedure to detect mutagenesis by DNA strand breakage in animal cells, the single-cell gel electrophoresis ("comet") assay, is difficult to apply in plant material due to difficulties in obtaining suitable nucleoids (formed by DNA trapped in the agarose matrix after the cell lysis process) in either quality or quantity. A suitable protocol is described for the first time to perform the comet assay in conifer somatic embryogenic cultures by determining total DNA strand breakage in protoplasts, after having failed to acquire nuclei by standard mechanical techniques. The results show that protoplasts obtained from embryogenic cultures of the Norway spruce (*Picea abies*) are suitable to be lysed and surveyed for DNA damage through the standard alkaline version of the comet assay.
Several common comet metrics were compared and all were found suitable for analysis, with the percentage of DNA in the comets' tail (constituted by DNA fragments that migrated during electrophoresis), calculated by the proportion between tail fluorescence intensity and total nucleoid intensity, being simplest and the most sensitive to compare between control and hydrogen peroxide-treated cells. The established procedures may be useful, for instance, for a comparative evaluation of somatic embryogenesis protocols and the selection of less damaging treatments for clonal propagation or for mutagenesis-related studies with conifer cell cultures.

Costa P.M. (2012) Tree Genet Genomes, 8(2) 425

P Genomics of Plant Stress (GPlantS)

Margarida Oliveira mmolive@itqb.unl.pt

Over 2011, we have focused on the transcriptional regulation of the rice gene OsDREB1B that we showed to be highly induced by cold and also regulated by light. To identify novel TFs that bind to its promoter, a Yeast One-Hybrid system was used to screen a cold-induced cDNA expression library. Thus seven novel Zn Finger TFs were identified as binding to the promoter of OsDREB1B. Among them, there were four Zn Finger Homeodomain (ZF-HD) and three C2H2-type Zn Finger TFs. Protein-protein interaction studies revealed the formation of homo and heterodimers among the identified ZF-HD TFs, but not for the C2H2-type. The transactivation assays in Arabidopsis protoplasts, showed that all these TFs repressed the expression of OsDREB1B and that the dimerization observed between the ZF-HD TFs may play a role on their transactivation activity. Our results suggest a prominent role of Zn Finger TFs in the regulation of OsDREB1B.
In addition, we have shown that the inducible expression of the OsDREB1B gene in response to both cold stress and light strictly correlates to an enrichment of specific histone modification marks related to a higher chromatin competency for transcription, e.g. acetylation and methylation of histone 3, namely H3K4me2, H3K9ac, H3K9me2, and H3K27me3. A huge network of transcription and epigenetic factors was identified. However, their interaction and functional meaning on the transcription regulation of stress-responsive genes must still be further investigated.



Figueiredo D.D. et al.(2012) J Exp Bot, 63(10)3643
Santos A.P. et al. (2011) OMICS, 15(12) 839

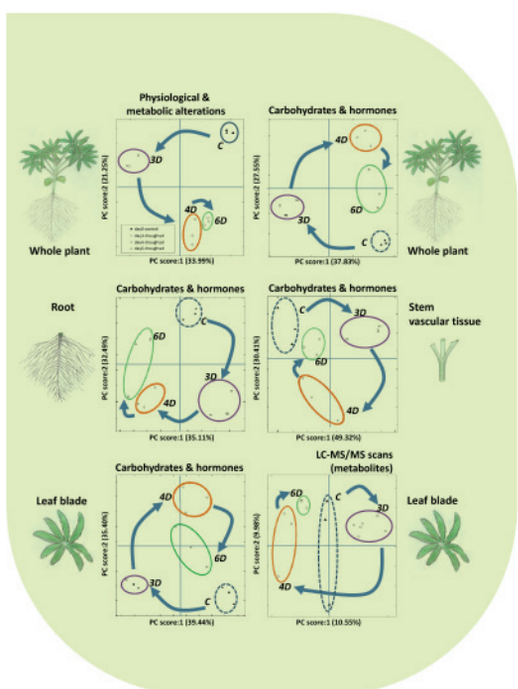
P Plant Biochemistry

Cândido Pinto Ricardo ricardo@itqb.unl.pt

Water deficit (WD) accounts for high plant productivity losses. Physiological effects of WD are widely investigated but the early stages (2-4 days) of a slowly imposed plant WD have received less attention. Also, an integrated metabolic picture of the several plant organs is usually lacking. In a lupin drought study, water was withheld up to 13 days (13 DAW) and we daily monitored the soil water content (SWC) and measured the plant water status, the leaf gas-exchange, water-soluble carbohydrates, starch and hormones (1).

Principal component analysis (PCA) of the data shows all sampling dates as separate entities (figure). At 3 DAW, SWC had decreased by 12%, metabolic alterations had taken place and leaf conductance was affected, but plant water status and CO2 assimilation rate remained unaltered.

The initial soil WD effect on hormone balance does not seem to be explained just by long-distance transport effects, since transpiration was not significantly affected until 6 DAW.
We conclude that metabolic balances (hormone/hormone, hormone/sugar) of roots and leaves are responsible for triggering initial adjustment mechanisms not previously reported.

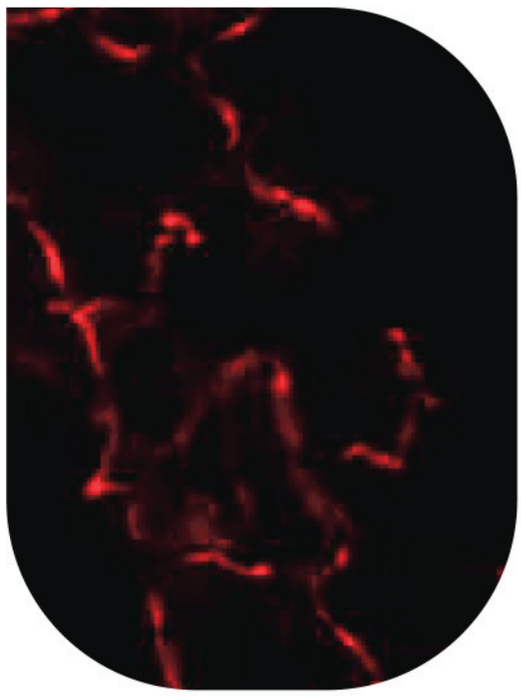


Pinheiro C. et al. (2011) J. Exp. Botany, 62(14) 4965

P Plant Cell Biology

Rita Abranches ritaa@itqb.unl.pt

In 2011 we continued our focus on the production of recombinant proteins in plant based systems. We had shown earlier that Medicago truncatula cell suspension cultures are a good platform for production of recombinant proteins attaining high yields of the production at low cost with easy purification schemes. For this we used phytase, a glycosylated enzyme of fungal origin, as a model protein. We then moved to the more challenging production of human proteins and at the same time tested two other plant cell systems, Arabidopsis thaliana and Nicotiana tabacum. We expressed erythropoietin and prostaglandin D syntase of the lipocalin type (also known as ß-trace). Erythropoietin is a glycoprotein hormone that controls erythropoiesis and is used in the treatment of chronic anaemia. The current treatment for this condition is recombinant erythropoietin produced in mammalian cells which is an expensive system. ß-trace is the major protein in the human cerebrospinal fluid and is known to be involved in several physiological processes and disease onset. Given the high number of potential applications for this enzyme, the recombinant production of ß-trace can be a new and important research path for the putative use of this protein in therapeutics and diagnostics. So far we were able to produce both human proteins in our different plant cell systems and we are now optimizing production and purification processes. We also studied the subcellular deposition of the recombinant products in the plant cells, using immunolocalization and fluorescence and electron microscopy, in order to understand the subcellular trafficking of the proteins and better characterize our production platforms. In this figure we can observe the deposition pattern of ß-trace in the apoplast of transgenic *Medicago truncatula* leaves.

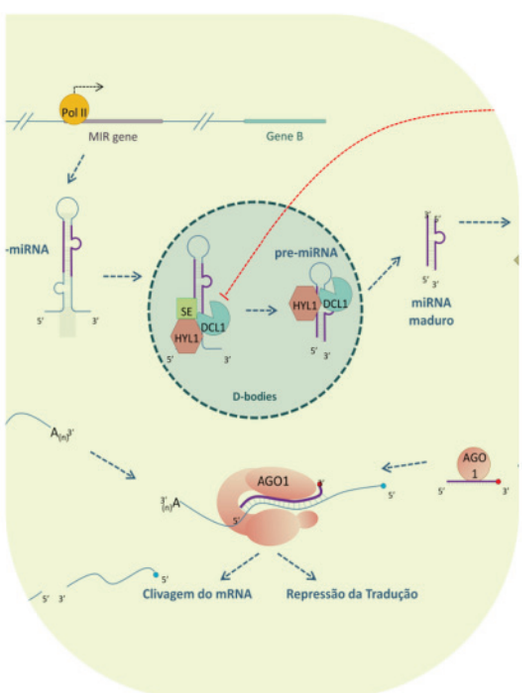


P Plant Cell Biotechnology

Pedro Fevereiro psalema@itqb.unl.pt

In 2011, we showed that not only are microRNAs involved in the plant response to water deficit but also that the metabolic machinery involved in the biogenesis of these and other smallRNAs is modulated in plants by water depletion.

Our work demonstrates that in *Medicago truncatula* the transcript accumulation of the components of small RNA pathways is being modulated under water deficit. This shows that the transcriptional and post-transcriptional control of gene expression mediated by sRNAs is probably involved in plant adaptation to abiotic environmental changes. In the future this will allow the manipulation of these pathways, to provide a more efficient response of legumes towards water shortage
We identified and characterized three Dicer Like and twelve Argonaut genes in the genome of *M. truncatula*. These genes probably encode enzymes that integrate different sRNA pathways and their transcript levels are modulated in response to water deficit. This modulation is more evident in roots. The processing and activation of microRNAs are up regulated as well as the sRNAs mediated DNA methylation mechanisms and the production of transacting small interfering RNAs. Our observations opened avenues for the study of the impact of sRNA metabolism on the response of legumes toward water deficit.

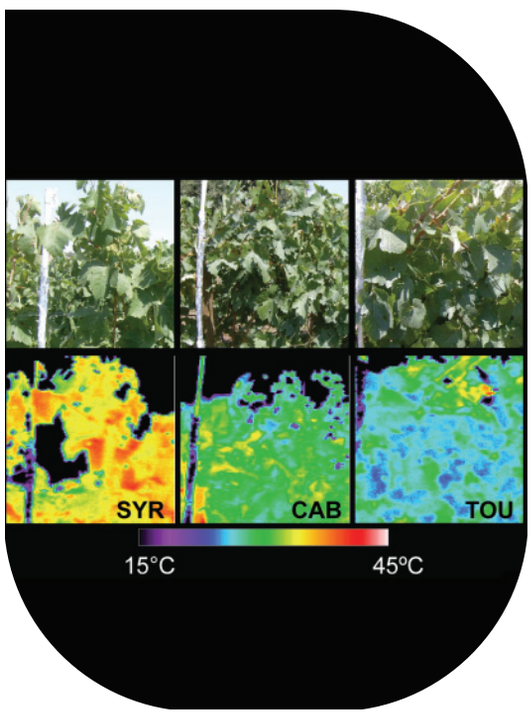


Capitão C. et al. (2011) BMC Plant Biol, 11, 79

P Plant Molecular Ecophysiology

Manuela Chaves mchaves@itqb.unl.pt

Grapevine varieties exhibiting differences in stomatal response to water deficit. Vitis vinifera has large genetic variation and knowledge of genotype/variety traits and related physiological responses to abiotic stress is still scarce. This limits the optimization of irrigation and breeding strategies for higher water use efficiency. Thermal imaging is feasible technique to remotely measure plant's temperature, and indirectly, assess plant's transpiration and water status. The physiology behind this lies in the fact that when leaf stomata close, transpiration is reduced, leading to higher leaf temperatures as compared to leaves with open stomata. In field trials, we characterized five varieties by using thermal imaging and leaf gas-exchange: Aragonez, Trincadeira, Cabernet-Sauvignon, Syrah and Touriga Nacional.
Leaf temperature (T_{leaf}) determined by thermal imaging correlated negatively with stomatal conductance to water vapour (gs) in both trials. The inverse relationship between gs and Tleaf was highly significant in the afternoon. When comparing the five genotypes, they showed different Tleaf for similar water status (Ψpd). Leaf stomatal density did not correlate with gs suggesting that varieties have different stomatal control. Our results also show that combined measurements of canopy temperature and Ψpd can lead to better understanding of stomatal regulation in different grapevine varieties. Such variation in stomatal regulation should be taken into account in determining irrigation strategies.

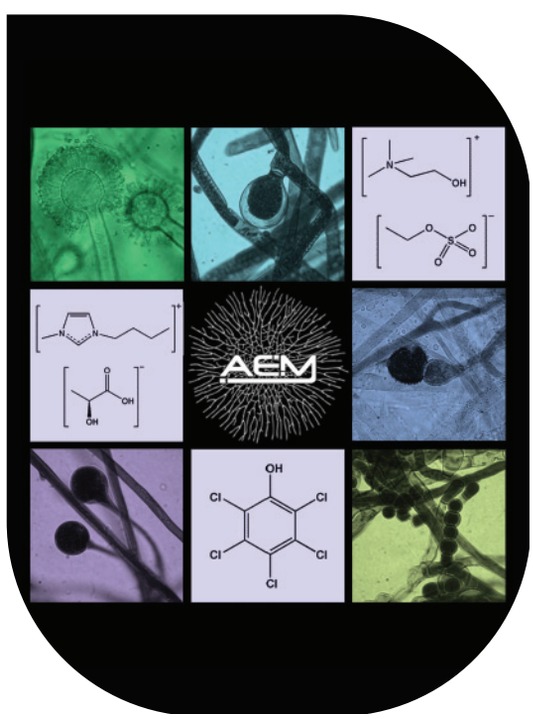


Costa J.M. et al. (2012) Funct Plant Biol, 39(3)179

T Applied and Environmental Mycology

Cristina Silva Pereira spereira@itqb.unl.pt

Environmental pollution is a critical concern worldwide and fungal bioremediation constitutes an elegant and environment-friendly solution. In 2011, we conducted studies which unravelled the degradation pathway of pentachlorophenol by Mucor plumbeus. This fungus efficiently transforms the xenobiotic to less toxic compounds through a series of oxidative–reductive dechlorinations and taking advantage of phase II conjugation reactions to keep low toxic intracellular levels. For the first time, sulfate–glucose conjugates were identified in fungi. Mucor plumbeus might play an important role in the protection of less tolerant strains in pentachlorophenol contaminated environments.
In the context of the remedial potential of filamentous fungi, we have identified several fungal strains from extreme soil biotypes, able to survive high concentrations of ionic liquids. This capacity might be related to the environmental pressure caused by high petroleum hydrocarbon load and, secondarily, by high salinity in soil. Our aspiration is to develop novel technologies, exploiting ionic liquids' ability to augment fungal bioremediation. Ionic liquids' rapid advance towards applications requires a comprehensive determination of their environmental, health and safety impact. Inspired by this, we have compiled an extensive and critical review focusing on ionic liquid environmental acceptability.

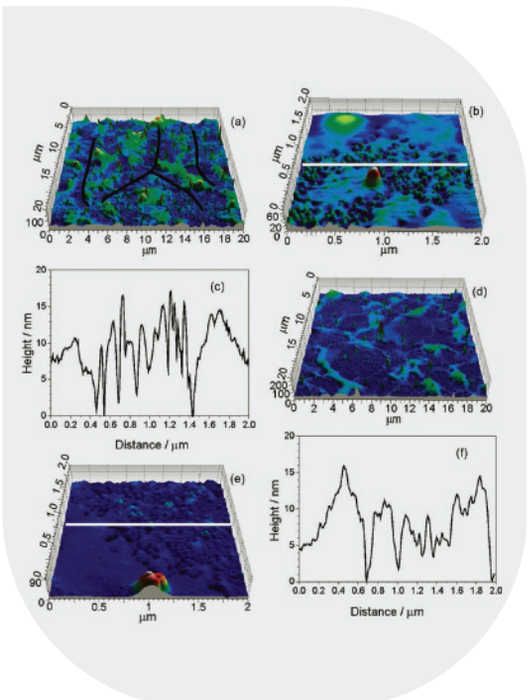


Carvalho M.B. et al. (2011) J Haz Mat, 198, 133
Deive F.J. et al. (2011) Green Chem, 13(3) 687
Petkovic M. et al. 82011) Chem Soc Rev, 40(3)1383

Biomolecular Diagnostics

Abel Gonzalez Oliva oliva@itqb.unl.pt

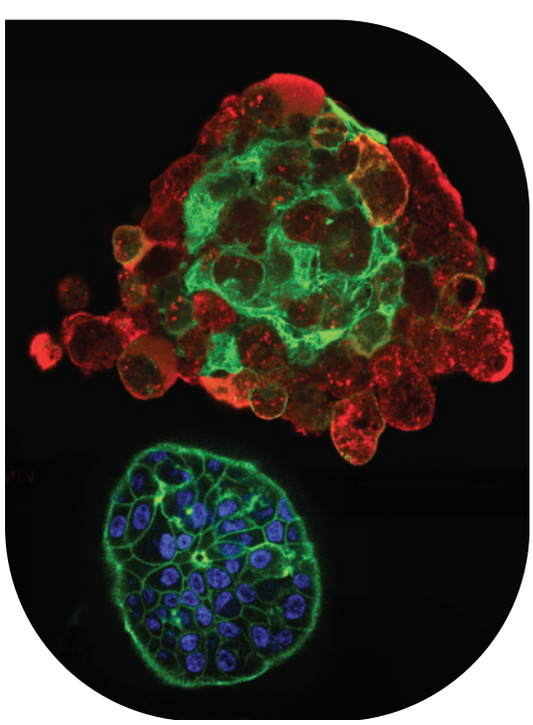
The Biomolecular Diagnostic laboratory is a multidisciplinary research group specialized in the development of diagnostic tools applied in veterinary and biotechnology process. The group is collaborating with the Organic Chemistry lab in the development of nanoparticles (Quantum dots) towards application in veterinary or plant studies. The synthesis of CdS/ZnS nanoparticles, by an optimized laboratory protocol, has been achieved. The functionalization towards making it water soluble for application in biological experiments has been optimized and the conjugation of the functionalized nanoparticles with sugars or larger molecules like antibodies or antigenic proteins has been achieved. These highly stable fluorescence nanoparticles can be size-tuned for specific fluorescence emission. In a collaborative work with the CIN2 (Centre D'Investigació en Nanociencia) of the University of Barcelona, we achieved the deposition of the QDs onto surfaces using a ultraviolet matrix-assisted pulsed laser evaporation (UV-MAPLE) onto SiO2 glass substrates covered by silica thin films. The immobilized materials form self-organized 2D arrays constituted by complex CdSe/ZnS core_shell QDs preserving the functional properties of the base material used for the preparation of the MAPLE targets, which allows us to explore the nanoparticle-coated surface for key applications such as biosensors, lasers, or high performance electronic devices.



Animal Cell Technology Unit

Ana S. Coroadinha avalente@itqb.unl.pt | Paula M. Alves marques@itqb.unl.pt | Manuel J. T. Carrondo mjtc@itqb.unl.pt

Human liver cell spheroids in extended perfusion bioreactor culture for repeated dose drug testing.
Primary cultures of human hepatocyte spheroids are a promising in vitro model for studies of hepatic metabolism and cytotoxicity. The lack of robust methods to culture cell spheroids, a poor characterization of the human hepatocyte spheroids architecture and of the liver-specific functionality has hampered the widespread adoption of this 3D culture format.
At the Animal Cell Technology Unit, we developed long-term automated perfusion bioreactor cultures of primary human hepatocyte spheroids that maintain liver-specific activity. These cultures are suitable for drug testing in a long term, repeated dose format.
The spheroids cultured for 3-4 weeks in serum-free conditions sustained phase I enzyme expression and permitted repeated induction cycles; the rate of albumin and urea synthesis, as well as phase I and II drug metabolizing enzymes' gene expression and activity presented reproducible profiles, despite the basal inter-donor variability. Immunofluorescence microscopy after 3-4 weeks of culture confirmed the presence of liver-specific markers and suggested that the spheroids spontaneously assemble bile canalicular networks extending from the surface to the interior of the spheroids (Figure). Moreover, the excretion of a fluorescent dye by phase III membrane transporter activity was observed by live imaging, proving the functionality of the bile canalicular networks.



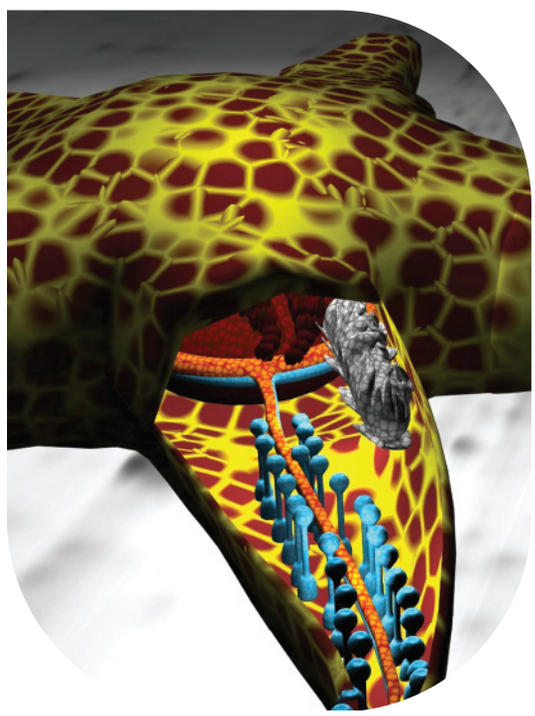
Tostões R.M. et al. (2012) Hepatology, 55(4)1227

T

Mass Spectrometry

Ana Coelho varela@itqb.unl.pt

One of the most striking characteristics of echinoderms is their outstanding capacity for regeneration. Regeneration in echinoderms serves a wide range of biological purposes, the reconstruction of internal and external organs that are often subject to predation or amputation, allowing the complete functional regrowth of lost parts. Although echinoderms were the preferred animal models of the pioneer regenerationists, recently most areas of echinoderm research have been severely neglected. In our laboratory we aim to demonstrate that echinoderms are valuable and tractable animal models in different research areas. We do this by using different proteomic and mass spectrometry tools that allow us to characterize and relatively quantify the proteins being expressed in echinoderm tissues. In 2011 we brought new evidences to an old discussion concerning the similarity of echinoderms' and vertebrates' nervous systems. Sea stars lack a centralized brain. Instead, five radial nerve cords derive from a circular nerve ring that surrounds the mouth. The high throughput protein analysis of the radial nerve cord of the sea star *Marthasterias glacialis* revealed that many echinoderms' nervous system proteins are similar to those of the rat's spinal cord. Because the echinoderms and the vertebrates are actually more related than their appearance would suggest the work published was a significant contribution to understanding how the central nervous system has evolved.



Franco C. F., Santos R., and Coelho A. V. (2011) Proteomics, 11(7) 1359

T

Microbiology of Man-made Environments

Teresa Crespo tcrespo@itqb.unl.pt

In 2011, we were involved in projects that focused on testing and combining different water treatment processes - nanofiltration, direct photolysis and advanced oxidation processes - as a multi-barrier approach to guaranteeing the production of water with high microbiological and chemical quality.
Experimental and model fluency, and time-based direct and indirect rate constants were obtained and the model used to predict how the degradation of different compounds could be improved under different experimental setups. Several parameters that influence photolysis were determined and photolysis by-products were identified by mass spectrometry. The formation of photolysis by-products was found to be highly dependent on the source waters. The integration of nanofiltration previously to low pressure ultraviolet direct or indirect photolysis reduces the level of turbidity as well as the micropollutant contamination levels in drinking water supplies, due to rejection based on size exclusion and molecular interactions with the nanofiltration membrane surface.
The integrated process is extremely efficient at removing all the target microorganisms and chemical pollutants from real water matrices and guarantees the production of water of extremely high quality, able to cope with future more stringent regulations. This multi-barrier approach will also reduce the amount of final disinfection needed and thus the level of disinfection by-products in the water.

Pereira V.J. et al. (2010) Water Res, 44(17) 4850
Sanches S. et al. (2011) J Haz Mat, 192(3)1458
Pereira V.J. et al. (2012) Sep Purif Technol, 95, 89

T Molecular Thermodynamics

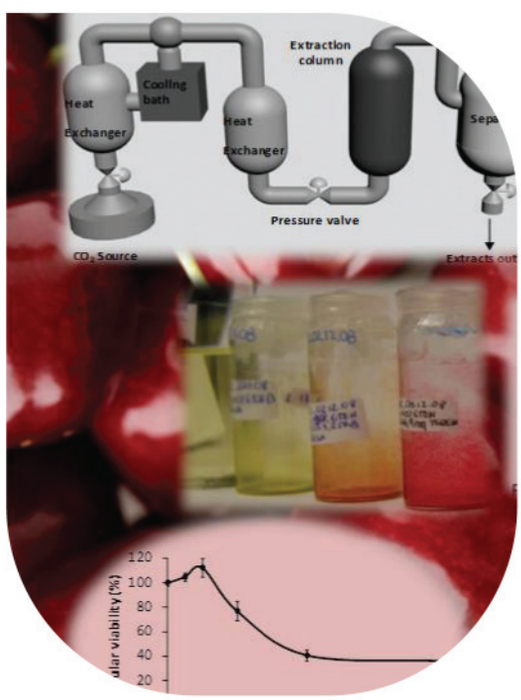
Luís Paulo N. Rebelo lrebelo@itqb.unl.pt

Increasing concern about environmental issues, as well as the establishment of new regulations, has recently directed the attention of the scientific community to novel processes based on greener technologies. Ionic liquids have been seen as a possible alternative in an uncommonly broad range of research areas.
In 2011 we published our first results on the use of ionic liquids to tune crystallization of inorganic salt solutions. A systematic dependence between the size of the precipitating crystalline particles and the limiting molar conductivity of ILs has been found. The response of the crystal formation process to the presence of specific ILs has been used to extract information about some particular properties of ILs that modify the crystal hydration environment.
In parallel, a successful process to extract lipolytic enzymes based on an aqueous biphasic system, which uses both ILs and a high charge-density inorganic salt, was revealed. In the proposed methodology, ILs are exploited both as withdrawal solvents and as media for catalytic applications.
Another example of our current research includes the use of NMR studies to reveal the dissolution mechanism of nucleic acid bases in ILs. The results show that hydrogen bonds dictate the dissolution mechanism and that both cations and anions participate in the solvation process.
Lastly, studies of the thermophysical properties of ILs and mixtures over broad ranges of temperatures and pressures have been measured. For the first time an extensive assessment of viscosity was reported.

Kowacz M. et al. (2011) Cryst Growth Des, 11(3) 684
Deive F.J. et al. (2011) Green Chem, 13(2) 390
Araújo J.M.M. et al. (2011) J Phys Chem B, 115(36) 10739
Tariq M. et al. (2011) Fluid Phase Equilib, 301(1) 22

T Nutraceuticals and Delivery

Catarina Duarte cduarte@itqb.unl.pt



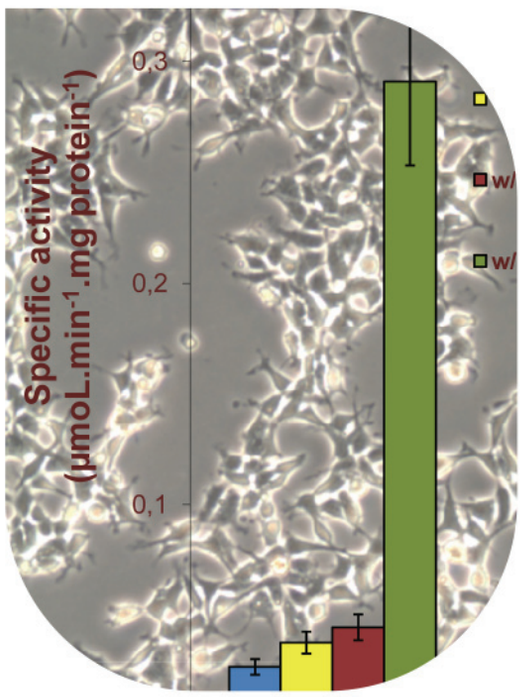
In 2011, the team of the Nutraceuticals and Controlled Delivery lab was awarded the 1st prize of the second edition of the "Nutrition Awards", in the category of " Innovation and Development of Products and Services".
The awarded project on "Cherry extract obtained from supercritical technology – a natural chemotherapeutical agent against colon cancer" aimed at developing functional ingredients with applications in the pharmaceutical and food industries. The project follows a sustainability strategy. On the one hand, it makes use of waste from processing cherries of the Portuguese variety, "Saco da Cova da Beira". On the other hand, it applies supercritical fluids, a clean technology, that allows the extraction of pure compounds of increased value, with high pressure gas (e.g. CO2) leaving no trace of solvents, a downfall of traditional methodologies. The cherry extract contains a powerful anticancer compound, namely perillyl alcohol, and has been shown to inhibit the proliferation of human colon cancer cells. Additionally, it induced cell cycle arrest at a different checkpoint than doxorubicin (a well-known anticancer active principle) suggesting that it can be used in combination with this drug to enhance the inhibition of tumor survival.

Serra A.T. et al. (2011) J Supercrit Fluid, 55(3)1007

Pharmacokinetics and Biopharmaceutical Analysis

Ana Luísa Simplicio anas@itqb.unl.pt

In 2011, we initiated a project for studying carboxylesterase 2 (CES2), which is an enzyme that is responsible for the metabolism of certain ester drugs in the intestine. Most people are interested in studying liver metabolism. In our group, we believe that a deeper insight into what happens prior and during drug absorption in the intestine is at least as relevant in pre-clinical development of orally administrated drugs as what happens in the liver.
Currently available in vitro methods for human intestinal metabolism still lack some biological relevance and, therefore, one of our research interests lies in the development of improved cell lines for metabolism. We came across some difficulties with the distinction between the activity of different esterases and this has motivated us to develop a capillary electrophoresis method to solve this problem. We have therefore devised a rationale involving specific substrates and inhibitors which do not interfere with the detection of the product, the capillary electrophoresis method. The method is successfully and routinely applied to the evaluation of cells overexpressing human CES2 and to several mammalian sera, using extremely small amounts of sample in comparison with traditional spectrophotometric methods.

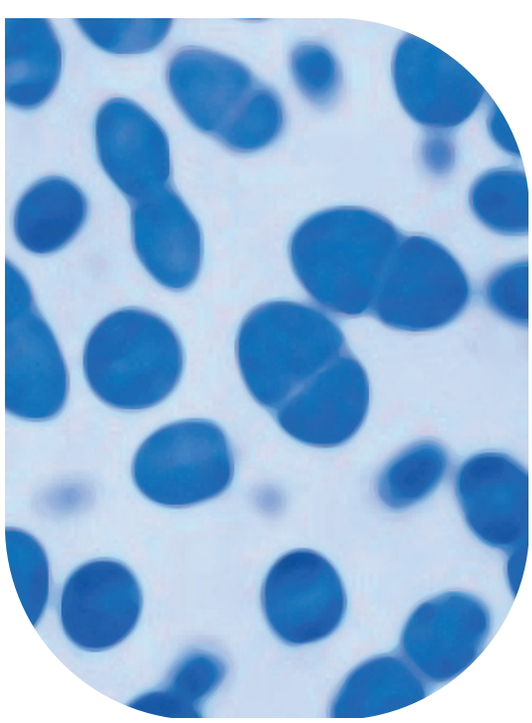


Lamego J., Coroadinha A.S., Simplício A.L. (2011) Anal Chem 83(3) 881-887

Stress by Antibiotics and Virulence of Enterococci

Maria de Fatima Silva Lopes flopes@itqb.unl.pt

Have you ever wondered how bacteria realize they are inside the host? And once there, where in the host? These questions are particularly important for bacteria, such as *Enterococcus faecalis*, that are both part of our body's commensal microbes and able to cause serious infections in hospitalized patients. In an attempt find answers, we together with Jan Kok (University of Groningen, NL) analyzed the E. faecalis response to three metal ions that could help bacteria discriminate between different environments.
When entering the body, both via mouth or through the skin, *E. faecalis* come across different tissues and barriers. Since their behavior is different in different organs, tissues or body fluids, bacteria must be able to modulate gene expression according to the environment. Metal ions, such as zinc, copper and manganese, have different concentrations in different fluids and are thus likely candidates for discrimination. By comparing *E. faecalis* subject to low and high concentrations of ions, we were able to identify genes that behave differently, more or less active, under different circumstances. Further analysis revealed that metal ions trigger, or tone down, the expression of genes necessary for *E. faecalis* colonization and virulence and might thus be important for the outcome of the interaction between bacteria and host.



Abrantes M.C., Lopes M.D. and Kok J. (2011) PLoS ONE, 6(10) e26519

T

Systems Biodynamics

Andreas Bohn abohn@itqb.unl.pt

In 2011, the Systems Biodynamics Group, in close collaboration with the Bioinformatics and Computational Biology Unit of the Instituto Gulbenkian de Ciências, concluded the development of the bioinformatics platform CorkOakDB ( ).

This platform consists of a database which harbors so called Expressed Sequence Tags (ESTs) of the Portuguese national tree, the cork oak (Quercus suber), which were obtained from RNA samples taken by the member laboratories of the Cork Oak ESTs Consortium (http://coec.fc.ul.pt) from diverse tissues of cork oaks growing under a variety of environmental conditions.

In order to extract this biological knowledge from the pool of ESTs, a computational workflow, or pipeline, was deployed to the CorkOakDB platform. This pipeline assembles the ESTs into longer sequences, which are then annotated, i.e. compared with genomic information obtained in other organisms, in pre-established association with proteins, metabolic pathways etc. These annotations can be accessed through the platform's web-interface and are used in studies related to the physiology, ecology and biotechology of cork oaks.

A specific feature of the CorkOakDB its highly transparent workflow, which allows us to understand exactly how the output of the pipeline was generated; thus it fosters its reuse in future cork oak research projects.

Two publications describing the functionality and obtained sequence information are currently in preparation.

annual report 2011

INSTITUTO DE TECNOLOGIA QUÍMICA E BIOLÓGICA /UNL

Knowledge Creation

appendix

Appendix

Full List of Staff
as per December 31rd 2011

Director
Luís Paulo N. Rebelo

Vice-Directors
M. Margarida Oliveira
Cláudio M. Soares

Administrator
Margarida Martinez

Secretariat to the Direction
Rosina Gadit

Ombudsperson
Manuela Chaves

Science Management
Alexandra Veiga

Industry Liaison Office
Francisco Pereira do Valle

Communication Office
Head: Ana M. Sanchez
Cláudia Lopes Pinheiro
Luís Morgado

Management Support

Administration and Finance
Head: Fernando Jorge Tavares

Accounting
Ana Almada
Ana Cristina Afonso Silva
Mónica Adriano Vieira
Helena Cordeiro
Isabel Mestre
Nuno Lopes
Sónia Ermida

Treasury Section
Ana Freire
Anabela Bernardo Costa

Storages
Ana Isabel Santos
Bruno Gouveia
Carlos Martins
João Rodrigues
Ricardo Pinto

Human Resources
Head: Maria Cristina Pinto
Ana Luísa Cruz
Goretti Rocha
Maria Madalena Pereira

Mailing and Archives
Artur Freitas

R&D Planning and Management
Head: Maria de Lurdes Conceição
Cristina Amaral
Cristina Lopes
Cristina Oliveira
Isabel Murta

Legal Advisor
Anabela Simões

Academics
Ana Portocarrero
Fátima Madeira

Scientific, Technological and Teaching Support

Scientific Services

Nuclear Magnetic Resonance CERMAX
Coordinator: Helena Santos
Manager: Pedro Miguel Lamosa
Helena Pereira Matias
João Pires

Analytical Services Unit
Coordinator: Teresa Crespo
Vice-coordinator: Rosário Bronze
Quality Assurance Unit: Ana Luísa Simplício

Analytical Team
Ana Maria Varela Coelho
Elizabete Pires
Maria da Conceição Almeida
Kamila Kocci
Renata Soares
Rui Palhinhas
António Ferreira
Sandra Silva
Mário Patrício
Paula Chicau
António Pires
Fernanda Spínola Rodrigues
Cristina Pereira
Ana Fulgêncio
Paula Isabel Alves

Archive
Paula Neves
Isabel Ribeiro

Small Molecule X-Ray Crystallography
Isabel Bento

Fermentation Unit
Coordinator: Miguel S. Teixeira
João Carita

Lab Manager
Cláudia Almeida

Teaching Laboratory
Coordinator: Adriano O. Henriques
Teresa Baptista da Silva

Library
Librarian: Susana Lopes
Library Advisory Committee
Chairman: Miguel Teixeira
Carlos C. Romão
Adriano O. Henriques
Margarida Oliveira

Washrooms
Coordinator: Teresa B. da Silva
Ana Cristina Barreiros
Carmen Fernandes
Helena Vilaranda
Lúcia David
Maria Alice Ferreira
Maria Eugénia Santos
Pilar Campos
Sónia Serrano
Sónia Moita

Workshop and Maintenance
Head: Henrique Campas Nunes
Alexandre Maia
Aníbal Ribeiro
António Ramalho
Miguel Rodrigues
João Carlos Zanão Simões
José Luís Liberato
Luís Gonçalves
Nuno Soares
Nuno Monteiro
Rómulo Correia
Tiago Escóbar

Computer Systems Support
Coordinator: Carlos Frazão
Executive coord.: Daniel F. Branco
Carlos Manuel Cordeiro
Hugo Gonçalo Cordeiro
José Miguel Loureiro
Maria Manuel Rato
Rui Miguel Alves

Research Divisions

Chemistry

Bioinorganic Chemistry and Peptide Design

Olga Iranzo, Investigador Auxiliar

Kotha Laxma Reddy	Post Doc
Íris Cristina da Luz Batalha	PhD Student
Ana Margarida Carvalho Dias	PhD Student
Sara Raquel Rato Pires	BI
Ana Filipa Pereira Fragoso	BI

Bioorganic Chemistry

Rita Ventura, Investigador Auxiliar

Fábio Rui	Post Doc
Eva Correia Lourenço	PhD Student
Osvaldo Ascenso	BI

Colloids Polymers & Surfaces

António Lopes, Professor Associado U. Lusófona

João Cortez	Investigador Auxiliar
Lstvan Joakim Balogh	Post Doc
Carla Teresa Ribeiro Antunes	PhD Student

Coordination and Supramolecular Chemistry

Rita Delgado, Professor Associado com Agregação IST

Pedro Miguel Veríssimo Mateus	Post Doc
Luís Miguel Barroso Pereira Lima	Post Doc
Catarina Alexandra Veríssimo Esteves	BI
Judite da Conceição Nunes Costa	Invited Researcher

Homogeneous Catalysis

Beatriz Royo Cantabrana, Investigador Auxiliar

André Filipe Pontes da Costa	PhD Student
Lorena Postigo Galindo	Post Doc
Srinivas Pottabathula	Post Doc
João Martinho Silva Ramalho Cardoso	PhD Student
Rita Isabel Lourenço da Silva Lopes	BI

Micro-Heterogeneous Systems

Eurico de Melo, Professor Auxiliar IST

Maria Helena Lopes Lameiro	PhD Student
Sofia Cristina Leite de Souza	PhD Student
Joana Rita Ripado Valério	BI

Organic Synthesis

Christopher Maycock, Professor Associado FCUL

Suvendu Sekhar Dey	Post Doc
Ana Sofia da Cunha Miguel	PhD Student
Paula Alexandra Carvalho Rodrigues	PhD Student
Vanessa Alexandra Miranda	BII
Osvaldo Santiago Ascenso	BI
Saúl Alves Graça da Silva	BII

Organometallic Chemistry

Carlos C. Romão, Professor Catedrático

Carla Alexandra Gamelas Reis	Invited Researcher
Ana Catarina Martins Coelho	Post Doc
Ana Isabel Carita Valente Melato	Post Doc
Patricia Matias Reis Francisco	Post Doc

Single Molecule Processes

Yann Astier, Investigador Auxiliar

João Carlos de Sá Nogueira Sousa Dias	Post Doc
James Yates	Post Doc
Elisa Campos	PhD Student

Biological Chemistry

Bacterial Energy Metabolism

Inês Cardoso Pereira, Investigador Principal

Mónica Sofia Martins Neves	Post Doc
Fabian Grein	Post Doc
Sofia Cristina dos Santos Venceslau	PhD Student
Ana Raquel Martinho Ramos	PhD Student
Marta Coimbra Marques	PhD Student
André Fernando Anastácio dos Santos	BI

Metalloproteins and Bioenergetics Unit

Biological Energy Transduction

Manuela M. Pereira, Investigador Auxiliar

Ana Patricia Refojo (cosup. Miguel Teixeira)	Post Doc
Ana Paula Batista (cosup. Miguel Teixeira)	PhD Student
Filipa L. Sousa (cosup. Miguel Teixeira)	PhD Student
Lara Paulo	BI
Bruno Marreiros	BI
Mariana Gameiro	Trainee
Rute Isabel Correia	Trainee

Biomolecular NMR

Manolis Matzapetakis, Investigador Auxiliar

Meire Coelho de Almeida	PhD Student
Ana Catarina Silva Pereira	Trainee
Vanessa Cristina Carvalho Vieira	Trainee

Genomics and Stress

Claudina Rodrigues-Pousada, Prof. Catedrático Convidado

Tracy Laura Nevitt Gonçalves	Post Doc
Regina Andrade Menezes	Post Doc
Catarina Isabel Ribeiro Pimentel	Post Doc
Catarina Sá Almeida Amaral	Post Doc
Sofia Isabel Marques da Silva	Post Doc
Fábio de Oliveira	PhD Student
Liliana Sofia Batista Nascimento	PhD Student
Ana Rita Tomé Ferreira	PhD Student
Ana Rita Ladeira Courelas da Silva	BI
Ana Catarina Varela Raposo	BI
Soraia Cristina Marques Caetano	BI
Cátia Inês Baptista Santos	BI
Cristina Maria Teixeira Vicente	Trainee
Mariana Lobato de Oliveira	Trainee
Ana Filipa Nunes Leitão Alegre	Trainee
Raquel Sofia Santos Silva	Trainee
André Nunes Nascimento	Trainee

Macromolecular Crystallography Unit

Industry and Medicine Applied Crystallography

Pedro Manuel Marques Matias, Investigador Principal

Susana Margarida Pires Gonçalves	PhD Student
Micael Correira Freitas	BI
Ana Rita Grilo Barradas	BI
Sara Teresa Silva	BI

Inorganic Biochemistry and NMR

Ricardo Saraiva L. Oliveira Louro, Investigador Auxiliar

Catarina Morais Vaz Paquete	Post Doc
Bruno Miguel Oliveira Maia da Fonseca	PhD Student
Ivo Miguel Henriques Saraiva	PhD Student
Maria Alexandra Alves	PhD Student
Nelson Andrade Pestana	BI
Nazua Lima Costa	BI
Sónia Estevão Neto	BI

Macromolecular Crystallography Unit

Membrane Protein Crystallography

Margarida Archer Frazão, Investigador Auxiliar

Miguel Pedro Januário Pessanha	Post Doc
Pik Yee Ma	Post Doc
José Artur Alves de Brito	Post Doc
Tânia Pais	Post Doc
Przemyslaw Nogly	PhD Student
Ana Lúcia Rebelo do Rosário	BI
Filipa Alexandra Varela	BI
Malgorzata Magoch	BI

Metalloproteins and Bioenergetics Unit

Metalloenzymes and Molecular Bioenergetics

Miguel Teixeira, Professor Catedrático

Célia Romão (colab. Mª Arménia Carrondo)	Investigador Auxiliar
Ana Patricia Refojo (cosup. Manuela Pereira)	Post Doc
Ana Filipa Carapinha Pinto	PhD Student
Pedro Miguel de Sousa	PhD Student
Vera Lúcia Gonçalves	PhD Student
Filipa L. Sousa (cosup. Manuela Pereira)	PhD Student
Liliana Carreira Pinto	BTI
Mafalda Rodrigues	BTI
Sandra Isabel dos Santos	BI
Miguel Ribeiro	BI
Cecilia Sá de Miranda	BI
Cristina Isabel Oliveira	BI
Joana Lúcia Carrilho	Trainee

Microbial & Enzyme Technology

Lígia O. Martins, Professor Auxiliar Convidado

Vânia Sofia Brissos	Post Doc
Zhenjia Chen	Post Doc
Bruno Patrick Reynolds	Post Doc
Sónia Alexandra Gonçalves Mendes	BI
Pedro Ribeiro Bernardo	BI
Nádia Gonçalves	Trainee
Ana Filipa dos Santos	Trainee

Molecular Genetics of Microbial Resistance

Lígia M. Saraiva, Investigador Principal

Marta Sofia Guedes de Campos Justino	Post Doc
Susana André Lima Lobo	Post Doc
Lígia Isabel Santos Nobre	Post Doc
Joana Morais Baptista	PhD Student
Ana Filipa Nogueira Tavares	PhD Student
Mafalda Cristina de Oliveira Figueiredo	PhD Student
André Filipe Grácio Fernandes	BI
Adelina Margarida Lima Pereira R. Parente	BI
Fábio Pereira	Trainee
Luís Miguel Sobral	Trainee
Catarina Godinho	Trainee

Molecular Interactions and NMR

Patrick Groves, Investigador Auxiliar

Malgorzata Palczewska-Groves	Post Doc
Magdalena Komiazyk	BI

Molecular Simulation

António M. Baptista, Investigador Auxiliar

Dragana Popovic de Barros	Post Doc
Sara Isabel Rasteiro Campos	Post Doc
Pedro Rafael Silva Álvaro Magalhães	PhD Student
Luís Carlos Santos Filipe	BI
Catarina Azevedo Carvalheda dos Santos	BII

Mössbauer Spectroscopy

Filipe Tiago de Oliveira, Professor Auxiliar FCT-UNL

Américo José Duarte BI

Protein Biochemistry Folding & Stability

Cláudio M. Gomes, Investigador Auxiliar

Sónia Cristina Alves Dickson Leal Solano	Post Doc
João Vieira Rodrigues	Post Doc
Bárbara Joana de Almeida Henriques	Post Doc
Hugo Miguel Raposo Correia Botelho	PhD Student
Lara da Luz Paulo	BII
Tânia Gomes Lucas	Trainee
Joana Margarida Cristovão	Trainee
Sofia Baptista de Carvalho	Trainee

Protein Modelling

Cláudio M. Soares, Professor Associado

Bruno Lourenço da Silva Victor	Post Doc
Maria Luísa Rodrigues	Post Doc IGC
Ana Sofia Fernandes de Oliveira	Post Doc
Diana Andreia Pereira Lousa	PhD Student
João Miguel Marques Martins Damas	PhD Student
Carla Baltazar	PhD Student
Jorge Miguel Antunes	Trainee
Marcelo David da Silva	BII

Raman Spectroscopy

Smilja Todorovic, Investigador Auxiliar

Zélia Licínia Ferreira Gouveia	PhD Student
Murat Sezer	BI
Amit Koul	BI
Tânia Isabel Genebra	BI

Macromolecular Crystallography Unit

Structural Biology

Carlos Maria Franco Frazão, Investigador Principal

Patrícia Alexandra Teixeira Borges	BI

Macromolecular Crystallography Unit

Structural Genomics

Maria Arménia Carrondo, Professor Catedrático

Isabel Maria Almeida de Jesus Bento	Investigador Auxiliar
Colin Edward McVey	Investigador Auxiliar
Célia Romão (colab. Miguel Teixeira)	Investigador Auxiliar
Tiago Bandeiras	Investigador Auxiliar
Ricardo Emanuel Sirgado Miranda Coelho	Technician
Catarina Isabel Simões Pires da Silva	PhD Student
Ana Teresa da Silva Gonçalves	PhD Student
Bruno Manuel Castelões Gonçalves Correia	PhD Student
Ana Maria Gonçalves	PhD Student

Biology

Bacterial Cell Biology

Mariana G. Pinho, Investigador Auxiliar

Patrícia Reed	Post Doc
Ana Maria Rodrigues Jorge	PhD Student
Helena Maria Pinto Veiga	PhD Student
Pedro Matos Pereira	PhD Student
João Miguel da Silva Queiroga Monteiro	PhD Student
Ana Raquel Ramos Pereira	BI
Maria Teresa Ferreira (col. Ana Rute Neves)	BI
Vanessa Fernandes Correia	BII
Pedro Escada Fernandes	Trainee

Bacterial Cell Surfaces and Pathogenesis

Sérgio R. Filipe, Investigador Auxiliar

James Yates	Post Doc
Maria João Catalão	Post Doc
Mafalda Soeiro Xavier Henriques	PhD Student
Magda Luciana Dias Pereira Atilano	PhD Student
Filipa Baltazar da Costa Vaz	BI
Tatiana Justo Machado Rodrigues	BI
Joana Silva Figueiredo	Trainee
Catarina Andreia Gouveia	Trainee

Bacterial Signaling

Karina B. Xavier, Investigador Auxiliar

Michal Bejerano-Sagie - IGC	Post Doc
Catarina Sim-Sim Pereira - IGC	PhD student
João Carlos Bento Marques	PhD Student
Jorge André Pereira	Trainee
Paulo José Correira	BI

Cell Physiology and NMR

Helena Santos, Professor Catedrático

Teresa Catarino	Professor Auxiliar
Nuno Miguel Formiga Borges	Investigador Auxiliar
Pedro Miguel Lamosa António	Investigador Auxiliar
Luís Pedro Gafeira Gonçalves	Post Doc
Carla Jorge	Post Doc
Luís Lopes da Fonseca	Post Doc
Marco António Saraiva	Post Doc
Marta Viseu Rodrigues	Post Doc
Tiago Vasconcelos Duarte Moreira Pais	PhD Student
Ana Carvalho (cosup. Ana Rute Neves)	PhD Student
Ana Maria da Silva Esteves	PhD Student
Pedro Oliveira Quintas	PhD Student
Nádia Luísa Castanheira	PhD Student
Marta Alexandra Silva	PhD Student
Dusica Rados	PhD Student
Cristiana da Silva Faria	BI
Andreia Filipa Cepeda	BI
Ana Isabel Mingote	BI
Marta Raquel Marques	BI

Cell Signaling in *Drosophila*

Pedro Domingos, Investigador Auxiliar

Maria de Fátima Afonso Cairrão	Post Doc
Vanya Ivanova Rasheva	Post Doc
Dina Coelho	PhD Student
Gonçalo Poças	PhD Student
Nadine Simone Schweizer	PhD Student
Rita Cristina Esperto Costa	BI

Control of Gene Expression

Cecília M. Arraiano, Investigador Principal com Agregação

Sandra Cristina de Oliveira Viegas	Post Doc
Susana Margarida L. Martins Domingues	Post Doc
José Eduardo Marques Andrade	Post Doc
Clémentine Dressaire	Post Doc
Michal Malecki	Post Doc
Ana Filipa de Melo Tadeu Pereira dos Reis	PhD Student
Inês de Jesus de Almeida e Silva	PhD Student
Inês Gabriel e Silva Batista e Guinote	PhD Student
Rute Margarida Gonçalves Matos	PhD Student
Vânia Sofia Fidalgo Pobre	PhD Student
Ricardo António Neves Moreira	PhD Student
Ana Margarida Teixeira Saramago	PhD Student
Joana da Silva Pissarra	BI
Andreia Aires	BTI
Cátia Cláudia Bárria da Silva	BI

Glycobiology

Júlia Costa, Investigador Principal

Adriana Gomes	BI

Infection Biology

Luís Jaime Mota, Investigador Auxiliar

Maria Raposo da Cunha	PhD Student
Lia Dora David Domingues	PhD Student
Filipe Manuel Baeta da Silva Almeida	PhD Student
Sara Raquel Vilela Pais	BI
Ana Catarina Milho	BI

Lactic Acid Bacteria & In Vivo NMR

Ana Rute Ramos Neves, Investigador Auxiliar

Paula Gaspar	Post Doc
Ana Carvalho Machado	PhD Student
Sandra Costa Carvalho	PhD Student
Ana Laura M. dos Santos Seara Paixão	PhD Student
João Manuel Pereira Jorge	BI
Ricardo Manuel Sequeira	BI
Ana Mafalda de Almeida Cavaleiro	BI
Joana Rita Oliveira	BTI
Anabela Carvalho Vieira	BTI

Microbial Development

Adriano O. Henriques, Professor Associado

Mónica Paula Fernandes Serrano Miranda	Post Doc
Teresa Parente M. Vasconcelos Costa	Post Doc
Tiago Joel Vultos Santos	Post Doc
Catarina Alexandra Gonçalves Fernandes	PhD Student
Cláudia Alexandra dos Reis Serra	PhD Student
Filipa Andreia Portugal Nunes	PhD Student
Maria de Fátima Cardoso Pereira	PhD Student
Maria Luísa Gouveia e Freitas Côrte	PhD Student
Wilson David Antunes	PhD Student
João Pedro Vieira Bota	BI
Ana Margarida Oliveira Paiva	BI
Maria Teresa Maio	BI
Carolina Piçarra Cassona	Trainee
Gabriela Pires Drabek	Trainee

Microbiology of Human Pathogens Unit

Molecular Genetics

Hermínia de Lencastre, Professor Catedrático

Ana Madalena de Drummond Ludovice	Professor Auxiliar
Maria Leopoldina Amorim Miragaia Ryder	Investigador Auxiliar
Rosario Mato Labajos	Investigador Auxiliar
Susana Maria Lavado de Oliveira Gardete	Post Doc
Catarina Isabel Catarino Milheiriço	Post Doc
Nuno Alexandre Gomes Faria	Post Doc
Nelson Emanuel da Silva Frazão	Post Doc
Teresa Margarida Gomes da Conceição	Post Doc
Ana Lopes Tavares	PhD Student
Teresa Carla de Almeida Figueiredo	PhD Student
Maria Inês Ramos Grilo	PhD Student
Joana Rita Gonçalves Araújo Rolo	PhD Student
Céline Catherine Coelho	BI
Diana Sofia Pereira E. de Oliveira Costa	BI
Ons Bouchami	BI
Raquel Pereira Portela	BI

Microbiology of Human Pathogens Unit

Molecular Microbiology of Human Pathogens

Raquel de Sá Leão, Investigador Auxiliar

Ana Cristina Almeida Paulo	Post Doc
Alexandra Sofia Oliveira Simões	Post Doc
Débora Tavares	PhD Student
Carina Alexandra Pereira Valente	PhD Student
Soinia Nunes	PhD Student
Sofia Félix Fernandes	BI
Sónia Margarida Tavares Matos Almeida	BI

Plant Sciences

Disease and Stress Biology

Ricardo Boavida Ferreira, Professor Catedrático ISA-UTL

Maria Paula Marinho Pinto	Invited Researcher
Maria Cláudia Godinho Nunes Santos	Post Doc
Marta Alexandra Marques Alves	Post Doc
Lucélia Rodrigues Tavares	PhD Student
Paula Cristina Branco Cabrita Cunha	PhD Student
Alexandre Filipe Guerreiro Borges	PhD Student
Rui Carlos Soares Pimpão	PhD Student
Diana Leonor Constantino Macedo	PhD Student
Sofia Isabel Almeida Fortalezas	BI
Catarina Isabel Freitas da Fonseca	BI
Andreia Filipa Gomes	BI
Inês Margarida Lourenço Figueira	BI
Carolina Emanuel Jardim	Trainee

Forest Biotech

Célia Miguel, Investigador Auxiliar

Liliana Maria Bota Marum	Post Doc
José Javier de Vega-Bartol	Post Doc
Mariagrazia Tonelli	Post Doc
Inês Chaves (col. C. Pinto Ricardo)	Post Doc
Andreia Miguel	PhD Student
Ana Filipa Gonçalves Milhinhos	PhD Student
Marta Andreia Horta Simões	PhD Student
Diogo Nuno Silva	PhD Student
Tânia Raquel Almeida (col. M. Oliveira)	PhD Student
Ana Maria Vieira Oliveira	BI
Raquen Raissa Santos	BI
Andreia Patrícia Valentim de Matos	BI
Andreia Sofia Santos Rodrigues	BI

Plant Biochemistry

Cândido Pinto Ricardo, Prof. Catedrático Jubilado ISA-UTL

Carla Maria Alexandre Pinheiro	Investigador Auxiliar
José António Pires Passarinho	Investigador INRB
Ana Isabel Faria Ribeiro	Invest. Auxiliar IICT
Ana Sofia Fortunato	Post Doc IICT
Inês Chaves (colab. Célia Miguel)	Post Doc
Vagner Tebaldi de Queiroz	Post Doc
Isa Catarina Monteiro Brás Ribeiro	PhD Student
Ana Cristina Magalhães Vieira	Phd Student
João Miguel Vitorino Bento	BTI
Adelaide João Machado	BI

Plant Cell Biology

Rita Abranches, Investigador Auxiliar

Ana Sofia Pires	Post Doc
Sílvia Andreia Godinho Barquinha Tavares	Post Doc
Ana Isabel Braz Opinião	Master's Student
Ana Cláudia Nogueira	Master's Student
Ana Rita Basílio Santos	Master's Student
Helena Sofia da Silva	Trainee

Plant Cell Biotechnology

Pedro Fevereiro, Professor Auxiliar FCUL com Agregação ITQB

Maria Carlota Morais Cunha Vaz Patto	Investigador Auxiliar
Jorge Almiro Caldeira Pinto Paiva	Invited Researcher
Susana de Sousa Araújo	Invited Researcher
Changhe-He Zhang	Invited Researcher
Susana Maria Neves	Post Doc
Ana Sofia Amaral Duque	Post Doc
Rita de Sousa Caré	Science Com. (CiB)
Cátia Maria de Jesus Nunes	PhD Student
Inês Garcia de Oliveira Trindade	PhD Student
Matilde Cordeiro	PhD Student
Nuno Felipe Alves de Almeida	PhD Student
Pedro Manuel Reis Mendes Moreira	PhD Student
Victor João Taveira Carocha	PhD Student
Susana Rodrigues Ribeiro	Master's Student
Mara Lisa Vieira Alves	BI
Susana Murtinheira da Trindade Leitão	BI
Marco André Dinis	BI
Ana Rita Morgado	BI
Clara Susana Marques Graça	BI
Maria Joana Teixeira Pinto	BI
Beatriz Margarida Moço	Trainee
Tomás Viana Carvalho	Trainee

Plant Cell Wall

Philip Jackson, Investigador Auxiliar

Luís Filipe Sanches Goulão	Invited Researcher
Ada Doroteia Vatulescu	PhD Student
Samarpita Lahiri	BI

Plant Developmental Genetics

Jorge Almeida, Professor Associado ISA-UTL

Maria Lisete Galego Dias	Investigador Auxiliar

Technology

Genomics of Plant Stress

Margarida Oliveira, Professor Associado com Agregação

Isabel Alexandra Aguiar de Abreu	Invited Researcher
Nelson José Madeira Saibo	Investigador Auxiliar
Ana Paula Leitão dos Santos	Post Doc
Ana Paula Farinha Resende	Post Doc
Sónia Sandra Cabrita Negrão	Post Doc
Tiago Filipe dos Santos Lourenço	Post Doc
Subhash Chander	Post Doc
Ana Margarida Sarrilho Ferro	PhD Student
Duarte Dionísio Figueiredo	PhD Student
Inês Silva Pires	PhD Student
Pedro Miguel Rodrigues de Barros	PhD Student
Tânia Sofia Lobato Paulo Serra	PhD Student
Liliana de Jesus Duarte Ferreira	PhD Student
Maria Cecilia Almadanim Pina	PhD Student
Tânia Raquel Almeida (col. Célia Miguel)	PhD Student
André Miguel Henriques Cordeiro	PhD Student
Diego Melo Almeida	PhD Student
Nuno Gonçalves	Master's Student
João Guilherme Cortes	Master's Student
Helena Pires Sapeta	BI
Ana Margarida Azevedo	BI
Moumita Gangopadhyay	BI
Alicja Marta Góvska	BI
João Manuel Fradique	Trainee

Plant Molecular Ecophysiology

Manuela Chaves, Professor Catedrático Aposentado ISA-UTL

Alla Schvaleva	Post Doc
Ana Paula Martins Alves Ferreira Regalado	Post Doc
Olfa Zarrouk	Post Doc
Marta Pinto Marijuan	Post Doc
Joaquim Miguel Costa	Post Doc
Rita Maria de Brito Francisco	PhD Student
Ana Rita Leandro dos Santos	PhD Student
Nuno Miguel Lopes da Silva Santos Simões	BI
Maria Catarina Bicho	BI

Analytical Chemistry

Luís Filipe Silva Castro Vilas Boas, Professor Associado IST

Maria do Rosário Beja F. G. Bronze, Professor Auxiliar FFUL

Antero Augusto Ramos	Acessor
Carla Alexandra Lopes Graça	Lab Technician
Elsa Velez Mecha	BI

Stress by Antibiotics and Virulence of Enterococci

Fátima Lopes, Investigador Auxiliar

Paulo Emanuel de Oliveira Marujo	Invited Researcher
Marta Maria Coelho dos Santos Abrantes	PhD Student
Renata Filipa Cruz de Matos	PhD Student
Neuza Prazeres Teixeira	PhD Student

Applied and Environmental Mycology

Cristina Silva Pereira, Investigador Auxiliar

Tiago Lopes Martins	Post Doc
Mariana Boavida Lopes Carvalho	PhD Student
Isabel Martins (cosup. Luís Paulo N . Rebelo)	PhD Student
Adélia Varela Castro	PhD Student
Helga Garcia (cosup. Luís Paulo N . Rebelo)	PhD Student
Paula Cristina de Azevedo Alves	PhD Student
Diego de Oliveira Hartmann	PhD Student
Joana Pinto Magalhães de Medeiros	BI
Rafael Hartmann	Trainee

Biomolecular Diagnostic

Abel Oliva, Investigador Auxiliar

Ana Raquel da Silva Santos	BI
Joana Monteiro de Campos	BI
Iracema Campos Martinho	BI
Ana Patricia Caeiros	BI

Animal Cell Technology Unit

Cell Bioprocesses

Paula M. Alves, Investigador Principal

Ana Catarina Ataíde Montes	Investigador Auxiliar
Marco Patrone	Post Doc
Rute Almeida Ferreira Castro	Post Doc
Patricia Isabel Alves	Post Doc
Maria Margarida Negrão Serra	Post Doc
Ana Carina Santos Ferreira da Silva	PhD Student
Cláudia Queiroga	PhD Student
Nuno Eduardo Buxo Carinhas	PhD Student

Sofia Margarida Leite	PhD Student
Ricardo Perdigão Henriques	PhD Student
Francisca Sarreira Simões Horta Monteiro	PhD Student
Paulo Fernandes	PhD Student
Daniel Filipe Mestre Simão	PhD Student
Sofia Raquel Rebelo	PhD Student
Claúdia Susana Pedreira Correia	PhD Student
Marcos Filipe Quintino de Sousa	Graduate Technician
Carina Vieira Brilha	Technician
Ana Catarina Pinto	Master´s Student
Inês Barros Ferreira da Costa	BTI
Ana Sofia Cabral e Sousa de Almeida	BI
Tiago Martinhs Duarte	BI
João Miguel Nunes Vidigal	BI
Marta Maria Estrada	BI
Marta Marques Silva	BI
Patricia Roch	BI
Raquel Maria Azeitão Alves	Trainee
Ana Paulo Terrasso	Trainee

Animal Cell Technology Unit

Cell Line Development and Molecular Biology

Ana Sofia Coroadinha, Investigador Auxiliar

Fabiana Carreira Fernandes	PhD Student
Ana Filipa Rodrigues	PhD Student
Hugo Ricardo Soares	PhD Student
Miguel Ricardo Guerreiro	BI
Vanessa Sofia Lúcio Bandeira	BI
Vanessa Isabel Ferreira Veríssimo	BI
Hélio Antunes Tomás	BI
Ana Sofia Oliveira	Trainee
Ana Isabel Almeida	Trainee

Animal Cell Technology Unit

Engineering Cellular Applications

Manuel J. T. Carrondo, Professor Catedrático FCT-UNL

Ana Margarida Palma Teixeira	Investigador Auxiliar
Cristina Maria da Costa Peixoto Lisboa	Research Technician
Rui Tostões	PhD Student (MIT)
Ana Margarida Prado	Post Doc
Piergiuseppe Nestola	BI
Mafalda Marques Dias	BTI

Food Microbial Technology

Cidália Peres, Investigador Principal INRB

Cátia Maria Morgado Peres	Invited Researcher
Mohamed Abdel-Hamid Rabie	Post Doc
Adrian Hernandez Mendoza	Post Doc
Luís Filipe Duarte Catulo	Technician INRB
Cláudia Lima Neves	Trainee
Liliana de Pinho Pinhal Ferraz Moreira	Technician
Marta Sofia Alves	Trainee
Maria José Carvalho	Trainee

Mass Spectrometry

Ana V. Coelho, Professor Auxiliar Convidado

André Martinho de Almeida	Invited Researcher
Renata Filipe Soares	Investigador Auxiliar
Kamila Koci	Post Doc
Catarina de Matos Ferraz Franco	PhD Student
Miguel André Lourenço da Luz Ventosa	BI
Elisabete Andrade Alves Pires	Technician
Joana Filipa Martins	Trainee
Luís Filipe Domingues	Trainee

Microbiology of Man-Made Environments

Teresa Crespo, Investigador Principal IBET

Maria Dulce de Azevedo Carneiro de Brito	Invited Researcher
Vanessa Ranhada Pinto Jorge Pereira	Post Doc
Gilda Sousa de Carvalho	Post Doc
Patrícia Rodrigues Noronha da Costa	Post Doc
Cristina Isabel Tavares Pereira	Technician
Ana Filipa Correia Silva	PhD Student
Frédérique Bustos Gaspar	PhD Student
Bárbara Fonseca de Almeida	PhD Student
Sandra Marisa Lourenço Sanches	PhD Student
Paula Isabel Loução Lopes Alves	Technician
Ana Catarina Mendonça Dourado	Technician
Sara do Carmo da Kruz	Master´s Student

Molecular Thermodynamics

Luís Paulo N. Rebelo, Professor Catedrático

Isabel Maria Delgado Jana M. Ferreira	Investigador Auxiliar
José Manuel da Silva Simões Esperança	Investigador Auxiliar
Mara Guadalupe Freire Martins	Post Doc
Mohammad Tariq	Post Doc
Magdalena Kowacz	Post Doc
Ana Belén Pereiro Estévez	Post Doc
João Miguel Mendes de Araújo	Post Doc
Helena Veiga	Post Doc
Marija Petkovic (cosup. Cristina S. Pereira)	PhD Student
Isabel Martins (cosup. Cristina S. Pereira)	PhD Student
Rui Ferreira	PhD Student
Sowmiah Subbiah	PhD Student
Diana Carolina Vaz Ruivo de Oliveira	PhD Student
Liliana Sofia Tomé	PhD Student
Filipe Serrão Santos Oliveira	PhD Student
Mário Rui Costa Soromenho	BI
Anabela de Jesus Lobo da Costa	BI
Filipa Cristina Alves	BI
Marta Raquel Figueiredo	Trainee
Catarina Isabe Florindo	Trainee

Nutraceuticals and Delivery

Catarina Duarte, Investigador Auxiliar

Ana Alexandra Figueiredo Matias	Post Doc
Ana Teresa de Carvalho Negrão Serra	Post Doc
Vanessa Santos Gonçalves	PhD Student
Catarina Amélia Miguel	PhD Student
Joana Silveira Cruz	PhD Student
Joana Margarida de Andrade Poejo	BI
Sara Alexandra Luís Nunes	BI
Ana Patrícia Correia de Almeida	BI
Dora Alexandra dos Santos Pereira	BI
Ana Nunes Nunes	BI
Rita João Ramos	Master Student
Ana Catarina Jorge Semedo	Trainee
Daniel Deodato Lopes	Trainee
Ana Sofia Joaquim	Trainee
André Vieira das Neves	Trainee

Pharmacokinetics and Biopharmaceutical Analysis

Ana L. Simplício, Investigador Auxiliar

Hugo Ortolá de Abreu e Serra	PhD Student
Joana Catarina Rocha Lamego	PhD Student
Hélder João Vilareal	BTI
Pedro Garcia Ferreira	Trainee
Bárbara Martins Paiva da Cunha	Trainee

Physiology of Environmental Conditioned Microbiota

Vitória San Romão, Investigador Coordenador INRB

Ana Paula Gomes Marques	PhD Student
Maria do Carmo Barreto Baptista Basílio	PhD Student
Beatriz Reis Oliveira	BI

Systems Biodynamics

Andreas Bohn, Investigador Auxiliar

Daniel Santa Cruz Damineli	PhD Student

Jonas Almeida* collaborators

Helen Andrade Arcuri	Post Doc
Cândida Filipa Delgado	BI

** Invited Professor at ITQB*

Research Output

Project Coordination and Publications (WoS) by Group

please refer to full list of publications and projects / (projects submitted via IBET)

Institutional Projects

MIT - Bioengineering Systems
Ref. #1
Coordinator: Cláudio Soares

INTERBIO
Ref. #146
Coordinator: Miguel S. Teixeira

Rede Nacional Mass Spec
Ref. #14 (also included in group)
Coordinator: Ana Varela Coelho

Rede Nacional de NMR
Ref. #74 (also included in group)
Coordinator: Helena Santos

Research Projects by Division

Chemistry

Bioinorganic Chemistry and Peptide Design
Head: Olga Iranzo
Project Refs: 30; 92; 98; 136
Publications Refs: 111; 112

Bioorganic Chemistry
Head: Rita Ventura
Project Refs: 111
Publications Refs: 14; 115; 129; 130; 143

Colloids; Polymers and Surfaces
Head: António Lopes
Project Refs: --
Publications Refs: 6

Coordination and Supramolecular Chemistry
Head: Rita Delgado
Project Refs: 7;16
Publications Refs: 26; 77; 124; 145; 146; 147

Homogeneous Catalysis
Head: Beatriz Royo
Project Refs: 32; 61; 103
Publications Refs: 33; 34; 59; 193

Microheterogeneous Systems
Head: Eurico Melo
Project Refs: 21; 119
Publications Refs: 236; 237

Organic Synthesis
Head: Christopher Maycock
Project Refs: 71
Publications Refs: 14; 106; 115; 143

Organometallic Chemistry
Head: Carlos C. Romão
Project Refs: --
Publications Refs: 74; 80; 90; 110; 141; 163; 193; 214; 215; 241; 256

Single Molecule Processes
Head: Yann Astier
Project Refs: 33; 143
Publications Refs: 15

Biological Chemistry

Bacterial Energy Metabolism
Head: Inês A. Cardoso Pereira
Project Refs: 50; 82
Publications Refs: 18; 105; 228; 257

Biological Energy Transduction
Metalloproteins and Bioenergetics Unit
Head: Manuela M. Pereira
Project Refs: 37; 38
Publications Refs: 22; 23; 155; 234

Biomolecular NMR Laboratory
Head: Manolis Matzapetakis
Project Refs: --
Publications Refs: --

Genomics and Stress
Head: Claudina R. Pousada
Project Refs: 15; 93
Publications Refs: 24; 228

Industry and Medicine Applied Crystallography
Macromolecular Crystallography Unit
Head: Pedro Matias
Project Refs: --
Publications Refs: 18; 97; 98; 100; 178; 206

Inorganic Biochemistry and NMR
Head: Ricardo O. Louro
Project Refs: 23; 75
Publications Refs: 7; 64; 93; 182

Membrane Protein Crystallography
Macromolecular Crystallography Unit
Head: Margarida Archer
Project Refs: 49; 90; 128
Publications Refs: 32

Metalloenzymes and Molecular Bioenergetics
Metalloproteins and Bioenergetics Unit
Head: Miguel Teixeira
Project Refs: 36; 39; 48; 118; 121; 122
Publications Refs: 70; 78; 91; 99; 155; 178; 179; 206; 234; 241; 248

Microbial and Enzyme Technology
Head: Ligia O. Martins
Project Refs: 70; (5)
Publications Refs: 55; 78; 150; 151

Molecular Genetics of Microbial Resistance
Head: Lígia M. Saraiva
Project Refs: 27; 28
Publications Refs: 17; 99; 206; 241; 248

Molecular Interactions and NMR
Head: Patrick Groves
Project Refs: 73; 114
Publications Refs: 52; 116; 191

Molecular Simulation
Head: António M. Baptista
Project Refs: 40; 52; 55
Publications Refs: 5; 63; 82; 132; 135; 165; 166

Mössbauer Spectroscopy
Head: Filipe Tiago de Oliveira
Project Refs: 86
Publications Refs: --

Protein Biochemistry Folding and Stability
Head: Cláudio M. Gomes
Project Refs: 3
Publications Refs: 28; 107; 133; 204

Protein Modelling Laboratory
Head: Cláudio M. Soares
Project Refs: 109; 112
Publications Refs: 18; 63; 132; 165; 166; 253;

Raman spectroscopy of Metalloproteins
Head: Smilja Todorovic
Project Refs: 84
Publications Refs: 155; 179; 185

Structural Biology
Macromolecular Crystallography Unit
Head: Carlos Frazão
Project Refs: 57; 72; 101
Publications Refs: 198

Structural Genomics
Macromolecular Crystallography Unit
Head: Maria Arménia Carrondo
Project Refs: 36; 39; 108; 123; 135; (26; 38)
Publications Refs: 55; 78; 100; 178; 179; 206

Biology

Bacterial Cell Biology
Head: Mariana G. Pinho
Project Refs: 76; 77
Publications Refs: 57; 95; 114; 190; 255

Bacterial Cell Surfaces and Pathogenesis
Head: Sérgio R. Filipe
Project Refs: 43; 106; 107
Publications Refs: 16; 108

Bacterial Signalling
Head: Karina Xavier
Project Refs: --
Publications Refs: 14; 143

Cell Physiology & NMR
Head: Helena Santos
Project Refs: 10; 17; 25; 74; 96; 97; 113; 147
Publications Refs: 32; 45; 84; 85; 92; 97; 98; 115; 118; 143; 158; 159; 185; 210

Cell Signaling in Drosophila
Head: Pedro Domingos
Project Refs: 54; 91; 138
Publications Refs: --

Control of Gene Expression Laboratory
Head: Cecília M. Arraiano
Project Refs: 41; 42; 46; 124; 134; 140; (3; 4; 27)
Publications Refs: 103; 148; 154; 156; 224; 261

Glycobiology
Head: Júlia Costa
Project Refs: 22; 83
Publications Refs: 40; 72; 115; 134

Infection Biology
Head: Jaime Mota
Project Refs: 80; 125; 137
Publications Refs: 217

Lactic Acid Bacteria & in vivo NMR
Head: Ana Rute Neves
Project Refs: 35; 85; 110
Publications Refs: 36; 45; 49; 92

Microbial Development
Head: Adriano O. Henriques
Project Refs: 20; 24; 31
Publications Refs: 221

Molecular Genetics
Microbiology of Human Pathogens Unit
Head: Hermínia de Lencastre
Project Refs: 5; 44; 126; 129; 130; 131
Publications Refs: 29; 30; 53, 68; 71; 109; 122; 153, 167; 207; 230; 231; 232

Molecular Microbiology of Human Pathogens
Microbiology of Human Pathogens Unit
Head: Raquel Sa-Leão
Project Refs: 19; 29; 144; 145
Publications Refs: 71; 109; 207; 230; 231

Plant Sciences

Disease and Stress Biology
Head: Ricardo Ferreira
Project Refs: 104; (38)
Publications Refs: --

Forest Biotechnology
Head: Célia Miguel
Project Refs: 100; (11; 20; 35)
Publications Refs: 61; 128; 152

Genomics of Plant Stress Lab (GPlantS Lab)
Head: Margarida Oliveira
Project Refs: 4; 11; 34; 45; 65; 78; 95; 105
Publications Refs: 4; 62; 75; 131; 160; 161; 172; 211; 212

Plant Biochemistry
Head: Cândido Pinto Ricardo
Project Refs: 2; 63; 99; 116
Publications Refs: 8; 9; 50; 51; 131; 176; 177; 196

Plant Cell Biology
Head: Rita Abranches
Project Refs: 102
Publications Refs: --

Plant Cell Biotechnology
Head: Pedro Fevereiro
Project Refs: 79; 81; 89; 120; 132
Publications Refs: 39; 51; 73; 83; 144; 169; 196;

Plant Cell Wall
Head: Phil Jackson
Project Refs: --
Publications Refs: 101; 173; 233

Plant Developmental Genetics
Head: Jorge Almeida
Project Refs: 58
Publications Refs: --

Plant Molecular Ecophysiology Laboratory (LEM)
Head: Manuela Chaves
Project Refs: 59; 60; 62; 64; 127
Publications Refs: 51; 54; 126; 176; 177; 222; 254;

Technology

Analytical Chemistry
Head: Luís Filipe Vilas Boas & Maria Rosario Bronze
Project Refs: --
Publications Refs: 19; 27; 89; 218; 219

Applied and Environmental Mycology
Head: Cristina Silva Pereira
Project Refs: 9; (9)
Publications Refs: 48; 67; 173; 175

Animal Cell Technology Unit
Head: Paula M. Alves
(Cell Bioprocesses + Cell Line Development and Molecular Biotechnology + Engineering Cellular Applications)
Project Refs: (8; 12; 15; 17; 18; 19; 21; 25; 29; 30; 31; 32; 33; 34; 39; 40;41)
Publications Refs: 10; 41; 42; 43; 44; 117; 121; 123; 141; 183; 189; 201; 205; 213; 219; 220; 223; 245; 246; 247; 252; 258; 259; 260; 262

Biomolecular diagnostic
Head: Abel Gonzalez Oliva
Project Refs: 26; 87; (36)
Publications Refs: 38; 106; 225

Food Microbial Technology
Head: Cidalia Peres
Project Refs: --
Publications Refs: 94

Mass Spectrometry
Head: Ana V. Coelho
Project Refs:8; 14; 51; 67; 94; 117
Publications Refs: 35; 60; 86; 87; 119; 120; 149; 168; 181; 195;

Microbiology of Man-made Environments
Head: Teresa Crespo
Project Refs: (1; 2; 13; 16; 23; 37; 43)
Publications Refs: 47; 208; 209;

Molecular Thermodynamics
Head: Luís Paulo N. Rebelo
Project Refs: 12; 18; 53; 66; 68; 69; 115; 139; 142
Publications Refs: 2; 12; 25; 58; 65; 66; 67; 76; 81; 88; 96; 116; 127; 171; 174; 175; 200; 204; 216; 238; 239; 240; 249; 250

Nutraceuticals and Controlled Delivery
Head: Catarina Duarte
Project Refs: (7; 10; 14; 22)
Publications Refs: 13; 164; 218; 219; 263

Pharmacokinetics and Biopharmaceutical Analysis
Head: Ana Luísa Simplício
Project Refs: (6; 24)
Publications Refs: 117; 251

Physiology of Environmentally Conditioned Microbiota
Head: Maria Vitória San Romão
Project Refs: (42)
Publications Refs: 19; 20; 21; 142

Stress by Antibiotics and Virulence of Enterococci
Head: Maria de Fatima Silva Lopes
Project Refs: --
Publications Refs: 1; 31; 194; 197

Systems Biodynamics
Head: Andreas Bohn
Project Refs: 6
Publications Refs: 45; 69

Not assigned to any group
Publications Refs: 104 (Dirk Jan Sheffers); 235 (João Carita); 162 (Patricia Noronha); 20, 21 (Vitória S. Romão); 11, 46, 73, 102, 136, 137, 138, 139, 140, 186, 187, 188, 192, 199, 203, 226, 227, 229, 242, 243, 244 (Xavier Malcata); 37; 56; 79; 113; 126; 157; 170; 180; 184
Project Refs: 13; 47 (Isabel Sá Nogueira); 56 (Jonas Almeida); 133 (Mara Almeida); 88 (Xavier Malcata)

Internationalization

International collaborations in 2011

142 publications with international teams

Countries with more than 20 papers
USA, Spain, Germany

Between 10 and 20 papers
England, France, Italy, The Netherlands

Between 3 and 9 papers
Denmark. Belgium, Switzerland, Brazil, Czech Republic, Egipt, Finland, Greece, Ireland, North Ireland

With two papers or less
Argentina, Canada, Japan, Norwei, Scothland, Slovakia, Sweeden, Tunisia, Australia, Austria, Croatia, Israel, Luxembourg, Mexico, Philippines, Poland, Romania, Serbia, South Africa, Taiwan

148 international collaboration within projects

Through FCT projects
Argentina (1), Austria (1), Brasil (1), France (7), Germany (7), Slovenia (1), Spain (6), The Netherlands (3), UK (2), USA (1)

Through EU projects
Australia (1), Austria (4), Belgium (2), Bulgaria (1), Czech Republic (1), Denmark (5), Egypt (1), Ethiopia (1), Finland (1), France (15), Germany (15), Greece (1), Hungary (1), Hungary (2), Iceland (1), Ireland (1), Israel (1), Italy (9), Mali (1), Morocco (1), Netherlands (10), Norway (1), Poland (2), Spain (13), Sweden (2), Switzerland (8), Syria (2), Turkey (1), UK (14)

40 foreign PhD holder researchers

EU countries: 29
Bulgaria, Czech Republic, France, Germany, Greece, Ireland, Italy, Poland, Spain, Sweeden, UK

Rest of the world: 11
Brazil, China, Egypt, India, Russia, Tunisia, Yugoslavia

Publications

Top 5 most cited papers (last 10 years)

(Times cited from Web of Science as per September 2012)

1. Plechkova N. V. and Seddon K. R. (2008). "Applications of ionic liquids in the chemical industry." Chemical Society Reviews 37(1): 123-150.**Times Cited:** 777

2. Oliveira D. C. and de Lencastre H. (2002). "Multiplex PCR strategy for rapid identifi cation of structural types and variants of the mec element in methicillin-resistant Staphylococcus aureus." Antimicrobial Agents and Chemotherapy 46(7): 2155-2161. **Times Cited:** 640

3. Earle M. J., Esperanca J. M. S. S., Gilea M. A., Canongia Lopes J. N., Rebelo L. P. N., Magee J. W., Seddon K. R. and Widegren J. A. (2006). "The distillation and volatility of ionic liquids." Nature 439(7078): 831-834.
Times : 612

4. Chaves, M. M., J. P. Maroco and J. S. Pereira (2003). "Understanding plant responses to drought - from genes to the whole plant." Functional Plant Biology 30(3): 239-264.
Times Cited: 498

5. Grundmann H., Aires-De-Sousa M., Boyce J. and Tiemersma E. (2006). "Emergence and resurgence of meticillin-resistant Staphylococcus aureus as a public-health threat." Lancet 368(9538): 874-885.
Times Cited: 289

Highly cited papers *

* Papers included in the Highly Cited Papers list by Essential Science Indicators SM (Thompson Reuters): top 1% of articles by total citations in each annual cohort from each of the 22 disciplines (updated as of Jul 1, 2012 to cover a 10-year plus 4-month period, Jan1, 2002-Apr 30, 2012)

1. Plechkova N. V. and Seddon K. R. (2008). "Applications of ionic liquids in the chemical industry." Chemical Society Reviews 37(1): 123-150.

2. Oliveira D. C. and de Lencastre H. (2002). "Multiplex PCR strategy for rapid identifi cation of structural types and variants of the mec element in methicillin-resistant Staphylococcus aureus." Antimicrobial Agents and Chemotherapy 46(7): 2155-2161.

3. Earle M. J., Esperanca J. M. S. S., Gilea M. A., Canongia Lopes J. N., Rebelo L. P. N., Magee J. W., Seddon K. R. and Widegren J. A. (2006). "The distillation and volatility of ionic liquids." Nature 439(7078): 831-834.

4. Chaves, M. M., J. P. Maroco and J. S. Pereira (2003). "Understanding plant responses to drought - from genes to the whole plant." Functional Plant Biology 30(3): 239-264.

5. Oliveira D. C., Tomasz A. and de Lencastre H. (2002). "Secrets of success of a human pathogen: molecular evolution of pandemic clones of meticillin-resistant Staphylococcus aureus." Lancet Infectious Diseases 2(3): 180-189.

6. Chaves M. M., Pereira J. S., Maroco J., Rodrigues M. L., Ricardo C. P. P., Osorio M. L., Carvalho I., Faria T. and Pinheiro C. (2002).“How plants cope with water stress in the fi eld. Photosynthesis and growth." Annals of Botany 89: 907-916.

7. Grundmann H., Aires-De-Sousa M., Boyce J. and Tiemersma E. (2006). “Emergence and resurgence of meticillin-resistant Staphylococcus aureus as a public-health threat.” Lancet 368(9538): 874-885.

8. Lopes, J. N. C., Deschamps J., Pádua A. A. H. (2004). “Modeling ionic liquids using a systematic all-atom force field.” Journal of Physical Chemistry B 108 (6): 2038–2047.

9. Rebelo, L. P. N., V. Najdanovic-Visak, Z. P. Visak, M. N. da Ponte, J. Szydlowski, C. A. Cerdeirina, J. Troncoso, L. Romani, J. M. S. S. Esperanca, H. J. R. Guedes and H. C. de Sousa (2004). “A detailed thermodynamic analysis of [C(4)mim][BF4] plus water as a case study to model ionic liquid aqueous solutions.” Green Chemistry 6(8): 369-381.

10. Pina, C., F. Pinto, J. A. Feijo and J. D. Becker (2005). “Gene family analysis of the Arabidopsis pollen transcriptome reveals biological implications for cell growth, division control, and gene expression regulation." Plant Physiology 138(2): 744-756.

12. Chaves, M. M. and M. M. Oliveira (2004). “Mechanisms underlying plant resilience to water deficits: prospects for water-saving agriculture.” Journal of Experimental Botany 55(407): 2365-2384.

12. Vinga, S. and J. Almeida (2003). “Alignment-free sequence comparison - a review.” Bioinformatics 19(4): 513-523.

13. Santos L., Lopes J. N. C., Coutinho J. A. P., Esperanca J., Gomes L. R., Marrucho I. M. and Rebelo L. P. N. (2007) Ionic liquids: First direct determination of their cohesive energy, Journal of the American Chemical Society 129(2): 284-285.

14. Mwangi M. M., Wu S. W., Zhou Y. J., Sieradzki K., de Lencastre H., Richardson P., Bruce D., Rubin E., Myers E., Siggia E. D. and Tomasz A. (2007) Tracking the in vivo evolution of multidrug resistance in Staphylococcus aureus by whole-genome sequencing, Proceedings of the National Academy of Sciences of the United States of America104(22): 9451-9456.

15. Lopes J. N. C., Gomes M. F. C. and Padua A. A. H. (2006). “Nonpolar, polar, and associating solutes in ionic liquids.” Journal of Physical Chemistry B 110(34): 16816-16818.

16. Blesic M., Marques M. H., Plechkova N. V., Seddon K. R., Rebelo L. P. N. and Lopes A. (2007) Self-aggregation of ionic liquids: micelle formation in aqueous solution, Green Chemistry 9(5): 481-490.

17. Chaves M. M., Flexas J. and Pinheiro C. (2009). “Photosynthesis under drought and salt stress: regulation mechanisms from whole plant to cell.” Annals of Botany 103(4): 551-560.

18. Harris S. R., Feil E. J., Holden M. T. G., Quail M. A., Nickerson E. K., Chantratita N., Gardete S., Tavares A., Day N., Lindsay J. A., Edgeworth J. D., de Lencastre H., Parkhill J., Peacock S. J. and Bentley S. D. (2010). “Evolution of mrsa during hospital transmission and intercontinental spread.” Science 327(5964): 469-474.

19. Henriques A. O. and Moran C. P. (2007) Structure, assembly, and function of the spore surface layers, Annual Review of Microbiology 61: 555-588.

20. Milheirico C., Oliveira D. C. and de Lencastre H. (2007) Update to the multiplex PCR strategy for assignment of mec element types in Staphylococcus aureus, Antimicrobial Agents and Chemotherapy 51(9): 3374-3377.

21. Schaeffer D., Tsanova B., Barbas A., Reis F. P., Dastidar E. G., Sanchez-Rotunno M., Arraiano C. M. and van Hoof A. (2009). “The exosome contains domains with specific endoribonuclease, exoribonuclease and cytoplasmic mRNA decay activities.” Nature Structural & Molecular Biology 16(1): 56-62.

22. Branco-Price C., Kaiser K. A., Jang C. J. H., Larive C. K. and Bailey-Serres J. (2008). “Selective mRNA translation coordinates energetic and metabolic adjustments to cellular oxygen deprivation and reoxygenation in Arabidopsis thaliana.” Plant Journal 56(5): 743-755.

23. Esperança J. M. S. S., Lopes J. N. C., Tariq M., Santos L., Magee J. W. and Rebelo L. P. N. (2010). “Volatility of aprotic ionic liquids - a review.” Journal of Chemical and Engineering Data 55(1): 3-12.

24. Hilty M., Burke C., Pedro H., Cardenas P., Bush A., Bossley C., Davies J., Ervine A., Poulter L., Pachter L., Moffatt M. F. and Cookson W. O. C. (2010). “Disordered microbial communities in asthmatic airways.” PLoS ONE 5(1).

25. Saibo N. J. M., Lourenco T. and Oliveira M. M. (2009). “Transcription factors and regulation of photosynthetic and related metabolism under environmental stresses.” Annals of Botany 103(4): 609-623.

26. Petkovic, M., Seddon, K. R., Rebelo, L. P. N., and Pereira, C. S. (2011) Ionic liquids: a pathway to environmental acceptability, Chemical Society Reviews 40(3): 1383-1403

27. Chaves M. M., Zarrouk O., Francisco R., Costa J. M., Santos T., Regalado A. P., Rodrigues M. L. and Lopes C. M. (2010). “Grapevine under deficit irrigation: hints from physiological and molecular data.” Annals of Botany 105(5): 661-676.

Publication Facts 2011

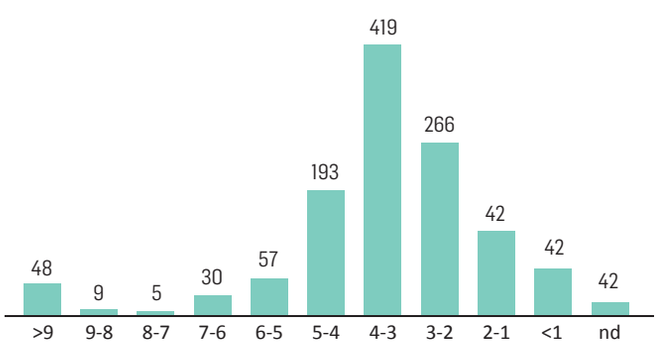
Top 10 journals: number of articles

# papers	Journal	IF
16	PLoS ONE	4.092
5	Journal of Physical Chemistry B	3..696
4	Green Chemistry	6.320
4	Biotechnology and Bioengineering	3.946
4	Dalton Transactions	3.838
4	Journal of Bacteriology	3.825
4	Applied Microbiology and Biotechnology	3.425
4	Biochemistry	3.422
4	Protein Structure Function and Bioinformatics	3.392
4	BMC Systems Biology	3.148

Top 10 journals: impact factor

IF	Journal	# papers
28.760	Chemical Society Reviews	1
9.907	Journal of the American Chemical Society	3
9.681	PNAS USA	2
9.646	Biotechnology Advances	1
9.205	EMBO Journal	1
9.148	Trends in Biotechnology	2
9.127	PLoS Pathogens	1
8.874	Progress in Neurobiology	1
8.694	PLoS Genetics	1
8.349	Small	1

Distribuition of papers (2005-2011) according to the journal impact factor



Journal impact factor 2010 provided by Thompson-Reuters | ND - not determined

Publication List 2011

Articles indexed in Web of Science

1. Abrantes, M., Lopes, M. d. F., and Kok, J. (2011) Impact of manganese,copper and zinc ions on the transcriptome of the nosocomial pathogen *Enterococcus faecalis* V583, PLoS ONE 6(10): e26519 http://dx.doi.org/10.1371/journal.pone.0026519

2. Adamova, G., Gardas, R. L., Rebelo, L. P. N., Robertson, A. J., and Seddon, K. R. (2011) Alkyltrioctylphosphonium chloride ionic liquids: synthesis and physicochemical properties, Dalton Transactions 40(47): 12750-12764 http://dx.doi.org/10.1007/s00122-011-1634-4

3. Adler, S., Basketter, D., Creton, S., Pelkonen, O., van Benthem, J., Zuang, V., Andersen, K. E., Angers-Loustau, A., Aptula, A., Bal-Price, A., Benfenati, E., Bernauer, U., Bessems, J., Bois, F. Y., Boobis, A., Brandon, E., Bremer, S., Broschard, T., Casati, S., Coecke, S., Corvi, R., Cronin, M., Daston, G., Dekant, W., Felter, S., Grignard, E., Gundert-Remy, U., Heinonen, T., Kimber, I., Kleinjans, J., Komulainen, H., Kreiling, R., Kreysa, J., Leite, S. B., Loizou, G., Maxwell, G., Mazzatorta, P., Munn, S., Pfuhler, S., Phrakonkham, P., Piersma, A., Poth, A., Prieto, P., Repetto, G., Rogiers, V., Schoeters, G., Schwarz, M., Serafimova, R., Tahti, H., Testai, E., van Delft, J., van Loveren, H., Vinken, M., Worth, A., and Zaldivar, J. M. (2011) Alternative (non-animal) methods for cosmetics testing: current status and future prospects-2010, Archives of Toxicology 85(5): 367-485 http://dx.doi.org/10.1007/s00204-011-0693-2

4. Ahmadi, N., Negrao, S., Katsantonis, D., Frouin, J., Ploux, J.,Letourmy, P., Droc, G., Babo, P., Trindade, H., Bruschi, G., Greco, R.,Oliveira, M. M., Piffanelli, P., and Courtois, B. (2011) Targeted association analysis identified japonica rice varieties achieving Na(+)/K(+) homeostasis without the allelic make-up of the salt tolerant indica variety Nona Bokra, Theoretical and Applied Genetics 123(6): 881-895 http://dx.doi.org/10.1007/s00122-011-1634-4

5. Alexov, E., Mehler, E. L., Baker, N., Baptista, A. M., Huang, Y., Milletti, F., Nielsen, J. E., Farrell, D., Carstensen, T., Olsson, M. H. M., Shen, J. K., Warwicker, J., Williams, S., and Word, J. M. (2011) Progress in the prediction of pK(a) values in proteins, Proteins-Structure Function and Bioinformatics 79(12): 3260-3275 http://dx.doi.org/10.1002/prot.23189

6. Almeida, J. F., Ferreira, P., Lopes, A., and Gil, M. H. (2011) Photocrosslinkable biodegradable responsive hydrogels as drug delivery systems, International Journal of Biological Macromolecules 49(5): 948-954 http://dx.doi.org/10.1016/j.ijbiomac.2011.08.010

7. Alves, A. S., Paquete, C. M., Fonseca, B. M., and Louro, R. O. (2011) Exploration of the 'cytochromome' of Desulfuromonas acetoxidans, a marine bacterium capable of powering microbial fuel cells, Metallomics 3(4): 349-353 http://dx.doi.org/10.1039/c0mt00084a

8. Alves, M., Chicau, P., Matias, H., Passarinho, J., Pinheiro, C., and Ricardo, C. P. (2011) Metabolic analysis revealed altered amino acid profiles in Lupinus albus organs as a result of boron deficiency, Physiologia Plantarum 142(3): 224-232 http://dx.doi.org/10.1111/j.1399-3054.2011.01462.x

9. Alves, M., Moes, S., Jeno, P., Pinheiro, C., Passarinho, J., and Ricardo, C. P. (2011) The analysis of Lupinus albus root proteome revealed cytoskeleton altered features due to long-term boron deficiency, Journal of Proteomics 74(8): 1351-1363 http://dx.doi.org/10.1016/j.jprot.2011.03.002

10. Amaral, A. I., Teixeira, A. P., Sonnewald, U., and Alves, P. M. (2011) Estimation of intracellular fluxes in cerebellar neurons after hypoglycemia: importance of the pyruvate recycling pathway and glutamine oxidation, Journal of Neuroscience Research 89(5): 700-710 http://dx.doi.org/10.1002/jnr.22571

11. Amaro, H. M., Guedes, A. C., and Malcata, F. X. (2011) Advances and perspectives in using microalgae to produce biodiesel, Applied Energy 88(10): 3402-3410 http://dx.doi.org/10.1016/j.apenergy.2010.12.014

12. Araujo, J. M. M., Ferreira, R., Marrucho, I. M., and Rebelo, L. P. N. (2011) Solvation of nucleobases in 1,3-dialkylimidazolium acetate ionic liquids: NMR spectroscopy insights into the dissolution mechanism, Journal of Physical Chemistry B 115(35): 10739-10749 http://dx.doi.org/10.1021/jp203282k

13. Argemi, A., Domingo, C., de Sousa, A. R. S., Duarte, C. M. M., Garcia-Gonzalez, C. A., and Saurina, J. (2011) Characterization of new topical ketoprofen formulations prepared by drug entrapment in solid lipid matrices, Journal of Pharmaceutical Sciences 100(11): 4783-4789 http://dx.doi.org/10.1002/jps.22684

14. Ascenso, O. S., Marques, J. C., Santos, A. R., Xavier, K. B., Ventura, M. R., and Maycock, C. D. (2011) An efficient synthesis of the precursor of AI-2, the signalling molecule for inter-species quorum sensing, Bioorganic & Medicinal Chemistry 19(3): 1236-1241 http://dx.doi.org/10.1016/j.bmc.2010.12.036

15. Astier, Y., Datas, L., Carney, R., Stellacci, F., Gentile, F., and Di-Fabrizio, E. (2011) Artificial surface-modified Si3N4 nanopores for single surface-modified gold nanoparticle scanning, Small 7(4): 455-459 http://dx.doi.org/10.1002/smll.201002113

16. Atilano, M. L., Yates, J., Glittenberg, M., Filipe, S. R., and Ligoxygakis, P. (2011) Wall teichoic acids of *Staphylococcus aureus* limit recognition by the drosophila peptidoglycan recognition protein-SA to promote pathogenicity, Plos Pathogens 7(12): 2421-2421 http://dx.doi.org/10.1371/journal.ppat.1002421

17. Bali, S., Lawrence, A. D., Lobo, S. A., Saraiva, L. M., Golding, B. T., Palmer, D. J., Howard, M. J., Ferguson, S. J., and Warren, M. J. (2011) Molecular hijacking of siroheme for the synthesis of heme and d(1) heme, Proceedings of the National Academy of Sciences of the United States of America 108(45): 18260-18265 http://dx.doi.org/10.1073/pnas.1108228108

18. Baltazar, C. S. A., Marques, M. C., Soares, C. M., DeLacey, A. M., Pereira, I. A. C., and Matias, P. M. (2011) Nickel-iron-selenium hydrogenases - an overview, European Journal of Inorganic Chemistry , 2011(7)948-962 http://dx.doi.org/10.1002/ejic.201001127

19. Barreto, M. C., Boas, L. V., Carneiro, L. C., and Romão, M. V. S. (2011) Volatile compounds in samples of cork and also produced by selected fungi, Journal of Agricultural and Food Chemistry 59(12): 6568-6574 http://dx.doi.org/10.1021/jf200560e

20. Barreto, M. C., Frisvad, J. C., Larsen, T. O., Mogensen, J., and Romão, M. V. S. (2011) Exo-metabolome of some fungal isolates growing on cork-based medium, European Food Research and Technology 232(4): 575-582 http://dx.doi.org/10.1007/s00217-011-1426-8

21. Barreto, M. C., Houbraken, J., Samson, R. A., Frisvad, J. C., and Romão, M. V. S. (2011) Taxonomic studies of the Penicillium glabrum complex and the description of a new species P. subericola, Fungal Diversity 49(5): 23-33 http://dx.doi.org/10.1007/s13225-011-0090-4

22. Batista, A. P., Marreiros, B. C., and Pereira, M. M. (2011) Decoupling of the catalytic and transport activities of complex I from Rhodothermus marinus by sodium/proton antiporter inhibitor, ACS Chemical Biology 6(5): 477-483 http://dx.doi.org/10.1021/cb100380y

23. Batista, A. P., and Pereira, M. M. (2011) Sodium influence on energy transduction by complexes I from Escherichia coli and Paracoccus denitrificans, Biochimica Et Biophysica Acta-Bioenergetics 1807(3): 286-292 http://dx.doi.org/10.1016/j.bbabio.2010.12.008

24. Batista-Nascimento, L., Neef, D. W., Liu, P. C. C., Rodrigues-Pousada, C., and Thiele, D. J. (2011) Deciphering human heat shock transcription factor 1 regulation via post-translational modification in yeast, PLoS ONE 6(1): e15976 http://dx.doi.org/10.1371/journal.pone.0015976

25. Bernardes, C. E. S., da Piedade, M. E. M., and Lopes, J. N. C. (2011) The structure of aqueous solutions of a hydrophilic ionic liquid: the full concentration range of 1-ethyl-3-methylinnidazolium ethylsulfate and water, Journal of Physical Chemistry B 115(9): 2067-2074 http://dx.doi.org/10.1021/jp1113202

26. Bernier, N., Costa, J., Delgado, R., Felix, V., Royal, G., and Tripier, R. (2011) trans-Methylpyridine cyclen versus cross-bridged trans-methylpyridine cyclen. Synthesis, acid-base and metal complexation studies (metal = Co2+, Cu2+, and Zn2+), Dalton Transactions 40(17): 4514-4526 http://dx.doi.org/10.1039/c0dt01191f

27. de Bettencourt, A. M., Duarte, M. F., Florencio, M. H., Henriques, F. F., Madeira, P. A., Maria, I. P. A., and Vilas-Boas, L. F. (2011) Possible key intermediates in arsenic biochemistry: synthesis and identification by liquid chromatography electrospray ionization mass spectrometry and high resolution mass spectrometry, Microchemical Journal 99(2): 218-234 http://dx.doi.org/10.1016/j.microc.2011.05.007

28. Botelho, H. M., and Gomes, C. M. (2011) Structural reorganization renders enhanced metalloprotein stability, Chemical Communications 47(39): 11149-11151 http://dx.doi.org/10.1039/c1cc13354c

29. Bouchami, O., Achour, W., Mekni, M. A., Rolo, J., and Ben Hassen, A. (2011) Antibiotic resistance and molecular characterization of clinical isolates of methicillin-resistant coagulase-negative staphylococci isolated from bacteremic patients in oncohematology, Folia Microbiologica 56(2): 122-130 http://dx.doi.org/10.1007/s12223-011-0017-1

30. Bouchami, O., Ben Hassen, A., de Lencastre, H., and Miragaia, M. (2011) Molecular epidemiology of methicillin-resistant Staphylococcus hominis (MRSHo): low clonality and reservoirs of SCCmec structural elements, PLoS ONE 6(7): e21940 http://dx.doi.org/10.1371/journal.pone.0021940

31. Braga, T. M., Marujo, P. E., Pomba, C., and Lopes, M. F. S. (2011) Involvement, and dissemination, of the enterococcal small multidrug resistance transporter QacZ in resistance to quaternary ammonium compounds, Journal of Antimicrobial Chemotherapy 66(2): 283-286 http://dx.doi.org/10.1093/jac/dkq460

32. Brito, J. A., Borges, N., Vonrhein, C., Santos, H., and Archer, M. (2011) Crystal structure of archaeoglobus fulgidus CTP:inositol-1-phosphate cytidylyltransferase, a key enzyme for di-myo-inositol-phosphate synthesis in (hyper) thermophiles, Journal of Bacteriology 193(9): 2177-2185 http://dx.doi.org/10.1128/jb.01543-10

33. Brito, J. A., Ladeira, S., Teuma, E., Royo, B., and Gomez, M. (2011) Dioxomolybdenum(VI) complexes containing chiral oxazolines applied in alkenes epoxidation in ionic liquids: a highly diastereoselective catalyst, Applied Catalysis A-General 398(1-2): 88-95 http://dx.doi.org/10.1016/j.apcata.2011.03.024

34. Brito, J. A., Royo, B., and Gomez, M. (2011) An overview of chiral molybdenum complexes applied in enantioselective catalysis, Catalysis Science & Technology 1(2): 1109-1118 http://dx.doi.org/10.1039/c1cy00123j

35. Caldeira, A. T., Arteiro, J. M. S., Coelho, A. V., and Roseiro, J. C. (2011) Combined use of LC-ESI-MS and antifungal tests for rapid identification of bioactive lipopeptides produced by Bacillus amyloliquefaciens CCMI 1051, Process Biochemistry 46(9): 1738-1746 http://dx.doi.org/10.1016/j.procbio.2011.05.016

36. Campelo, A. B., Gaspar, P., Roces, C., Rodriguez, A., Kok, J., Kuipers, O. P., Neves, A. R., and Martinez, B. (2011) The Lcn972 bacteriocin-encoding plasmid pBL1 impairs cellobiose metabolism in Lactococcus lactis, Applied and Environmental Microbiology 77(21): 7576-7585 http://dx.doi.org/10.1128/aem.06107-11

37. Campos, E., Cordeiro, R., Santos, A. C., Matos, C., and Gil, M. H. (2011) Design and characterization of bi-soft segmented polyurethane microparticles for biomedical application, Colloids and Surfaces B-Biointerfaces 88(1): 477-482 http://dx.doi.org/10.1016/j.colsurfb.2011.07.037

38. Campos, E., Moura, T. F., Oliva, A., Leandro, P., and Soveral, G. (2011) Lack of Aquaporin 3 in bovine erythrocyte membranes correlates with low glycerol permeation, Biochemical and Biophysical Research Communications 408(3): 477-481 http://dx.doi.org/10.1016/j.bbrc.2011.04.057

39. Capitao, C., Paiva, J. A. P., Santos, D. M., and Fevereiro, P. (2011) In Medicago truncatula, water deficit modulates the transcript accumulation of components of small RNA pathways, BMC Plant Biology 11, ART79 http://dx.doi.org/10.1186/1471-2229-11-79

40. Carilho, R., de Carvalho, M., Kuehl, U., Pinto, S., Pinto, A., Krominga, A., and Costa, J. (2011) Erythropoietin and amyotrophic lateral sclerosis: plasma level determination, Amyotrophic Lateral Sclerosis 12(6): 439-443 http://dx.doi.org/10.3109/17482968.2011.584881

41. Carinhas, N., Bernal, V., Teixeira, A. P., Carrondo, M. J. T., Alves, P. M., and Oliveira, R. (2011) Hybrid metabolic flux analysis: combining stoichiometric and statistical constraints to model the formation of complex recombinant products, BMC Systems Biology 5, ART34 http://dx.doi.org/10.1186/1752-0509-5-34

42. Carinhas, N., Robitaille, A. M., Moes, S., Carrondo, M. J. T., Jenoe, P., Oliveira, R., and Alves, P. M. (2011) Quantitative proteomics of Spodoptera frugiperda cells during growth and baculovirus infection, PLoS ONE 6(10): e26444 http://dx.doi.org/10.1371/journal.pone.0026444

43. Carrondo, M., Panet, A., Wirth, D., Coroadinha, A. S., Cruz, P., Falk, H., Schucht, R., Dupont, F., Geny-Fiamma, C., Merten, O. W., and Hauser, H. (2011) Integrated strategy for the production of therapeutic retroviral vectors, Human Gene Therapy 22(3): 370-379 http://dx.doi.org/10.1089/hum.2009.165

44. Carvalhal, A. V., Santos, S. S., and Carrondo, M. J. T. (2011) Extracellular purine and pyrimidine catabolism in cell culture, Biotechnology Progress 27(5): 1373-1382 http://dx.doi.org/10.1002/btpr.656

45. Carvalho, A. L., Cardoso, F. S., Bohn, A., Neves, A. R., and Santos, H. (2011) Engineering trehalose synthesis in Lactococcus lactis for improved stress tolerance, Applied and Environmental Microbiology 77(12): 4189-4199 http://dx.doi.org/10.1128/aem.02922-10

46. Carvalho, A. P., Silva, S. O., Baptista, J. M., and Malcata, F. X. (2011) Light requirements in microalgal photobioreactors: an overview of biophotonic aspects, Applied Microbiology and Biotechnology 89(5): 1275-1288 http://dx.doi.org/10.1007/s00253-010-3047-8

47. Carvalho, G., Almeida, B., Fradinho, J., Oehmen, A., Reis, M. A. M., and Crespo, M. T. B. (2011) Microbial characterization of mercury-reducing mixed cultures enriched with different carbon sources, Microbes and Environments 26(4): 293-300 http://dx.doi.org/10.1264/jsme2.ME11112

48. Carvalho, M. B., Tavares, S., Medeiros, J., Nunez, O., Gallart-Ayala, H., Leitao, M. C., Galceran, M. T., Hursthouse, A., and Pereira, C. S. (2011) Degradation pathway of pentachlorophenol by Mucor plumbeus involves phase II conjugation and oxidation-reduction reactions, Journal of Hazardous Materials 198, 133-142 http://dx.doi.org/10.1016/j.jhazmat.2011.10.021

49. Carvalho, S. M., Kloosterman, T. G., Kuipers, O. P., and Neves, A. R. (2011) CcpA ensures optimal metabolic fitness of Streptococcus pneumoniae, PLoS ONE 6(10): e26707 http://dx.doi.org/10.1371/journal.pone.0026707

50. Chaves, I., Alves, M., Carrilho, D., Duque-Magalhaes, M. C., Ricardo, C. P., and Regalado, A. P. (2011) Protein changes during programmed cell death in tobacco, Biologia Plantarum 55(1): 153-158 http://dx.doi.org/10.1007/s10535-011-0021-y

51. Chaves, I., Passarinho, J. A. P., Capitao, C., Chaves, M. M., Fevereiro, P., and Ricardo, C. P. P. (2011) Temperature stress effects in Quercus suber leaf metabolism, Journal of Plant Physiology 168(15): 1729-1734 http://dx.doi.org/10.1016/j.jplph.2011.05.013

52. Cmoch, A., Strzelecka-Kiliszek, A., Palczewska, M., Groves, P., and Pikula, S. (2011) Matrix vesicles isolated from mineralization-competent Saos-2 cells are selectively enriched with annexins and S100 proteins, Biochemical and Biophysical Research Communications 412(4): 683-687 http://dx.doi.org/10.1016/j.bbrc.2011.08.025

53. Conceicao, T., Aires-de-Sousa, M., Pona, N., Brito, M. J., Barradas, C., Coelho, R., Sardinha, T., Sancho, L., de Sousa, G., Machado, M. D., and de Lencastre, H. (2011) High prevalence of ST121 in community-associated methicillin-susceptible *Staphylococcus aureus* lineages responsible for skin and soft tissue infections in Portuguese children, European Journal of Clinical Microbiology & Infectious Diseases 30(2): 293-297 http://dx.doi.org/10.1007/s10096-010-1087-8

54. Conde, A., Chaves, M. M., and Geros, H. (2011) Membrane transport, sensing and signaling in plant adaptation to environmental stress, Plant and Cell Physiology 52(9): 1583-1602 http://dx.doi.org/10.1093/pcp/pcr107

55. Correia, B., Chen, Z. J., Mendes, S., Martins, L. O., and Bento, I. (2011) Crystallization and preliminary X-ray diffraction analysis of the azoreductase PpAzoR from Pseudomonas putida MET94, Acta Crystallographica Section F-Structural Biology and Crystallization Communications 67, 121-123 http://dx.doi.org/10.1107/s1744309110048220

56. Correia, B. E., Ban, Y. E. A., Friend, D. J., Ellingson, K., Xu, H. Y., Boni, E., Bradley-Hewitt, T., Bruhn-Johannsen, J. F., Stamatatos, L., Strong, R. K., and Schiefl, W. R. (2011) Computational protein design using flexible backbone remodeling and resurfacing: case studies in structure-based antigen design, Journal of Molecular Biology 405(1): 284-297 http://dx.doi.org/10.1016/j.jmb.2010.09.061

57. Correia, V. G., Bonifacio, V. D. B., Raje, V. P., Casimiro, T., Moutinho, G., da Silva, C. L., Pinho, M. G., and Aguiar-Ricardo, A. (2011) Oxazoline-based antimicrobial oligomers: synthesis by CROP using supercritical CO(2), Macromolecular Bioscience 11(8): 1128-1137 http://dx.doi.org/10.1002/mabi.201100126

58. Costa, A. J. L., Esperanca, J. M. S. S., Marrucho, I. M., and Rebelo, L. P. N. (2011) Densities and vscosities of 1-ehyl-3-methylimidazolium n-akyl sulfates, Journal of Chemical and Engineering Data 56(8): 3433-3441 http://dx.doi.org/10.1021/je200434a

59. da Costa, A. P., Lopes, R., Cardoso, J. M. S., Mata, J. A., Peris, E., and Royo, B. (2011) Enantiomerically pure cyclopentadienyl- and indenyl-functionalized N-heterocyclic carbene complexes of iridium and rhodium, Organometallics 30(16): 4437-4442 http://dx.doi.org/10.1021/om200523h

60. da Costa, G., Gomes, R. A., Guerreiro, A., Mateus, E., Monteiro, E., Barroso, E., Coelho, A. V., Freire, A. P., and Cordeiro, C. (2011) Beyond genetic factors in familial amyloidotic polyneuropathy: protein glycation and the loss of fibrinogen's chaperone activity, PLoS ONE 6(10):e24850 http://dx.doi.org/10.1371/journal.pone.0024850

61. Costa, P. M., Miguel, C., Caeiro, S., Lobo, J., Martins, M., Ferreira, A. M., Caetano, M., Vale, C., DelValls, T. A., and Costa, M. H. (2011) Transcriptomic analyses in a benthic fish exposed to contaminated estuarine sediments through laboratory and in situ bioassays, Ecotoxicology 20(8): 1749-1764 http://dx.doi.org/10.1007/s10646-011-0708-z

62. Courtois, B., Greco, R., Bruschi, G., Frouin, J., Ahmadi, N., Droc, G., Hamelin, C., Ruiz, M., Evrard, J. C., Katsantonis, D., Oliveira, M., Negrao, S., Cavigiolo, S., Lupotto, E., and Piffanelli, P. (2011) Molecular characterization of the European rice collection in view of association mapping, Plant Genetic Resources-Characterization and Utilization 9(2): 233-235 http://dx.doi.org/10.1017/s147926211100027x

63. Damas, J. M., Oliveira, A. S. F., Baptista, A. M., and Soares, C. M. (2011) Structural consequences of ATP hydrolysis on the ABC transporter NBD dimer: molecular dynamics studies of HlyB, Protein Science 20(7): 1220-1230 http://dx.doi.org/10.1002/pro.650

64. Dantas, J. M., Saraiva, I. H., Morgado, L., Silva, M. A., Schiffer, M.,Salgueiro, C. A., and Louro, R. O. (2011) Orientation of the axial ligands and magnetic properties of the hemes in the cytochrome c(7)family from Geobacter sulfurreducens determined by paramagnetic NMR, Dalton Transactions 40(47): 12713-12718 http://dx.doi.org/10.1039/c1dt10975h

65. Deive, F. J., Rodriguez, A., Marrucho, I. M., and Rebelo, L. P. N. (2011) Aqueous biphasic systems involving alkylsulfate-based ionic liquids, Journal of Chemical Thermodynamics 43(11): 1565-1572 http://dx.doi.org/10.1016/j.jct.2011.04.024

66. Deive, F. J., Rodriguez, A., Pereiro, A. B., Araujo, J. M. M., Longo, M. A., Coelho, M. A. Z., Lopes, J. N. C., Esperanca, J. M. S. S., Rebelo, L. P. N., and Marrucho, I. M. (2011) Ionic liquid-based aqueous biphasic system for lipase extraction, Green Chemistry 13(2): 390-396 http://dx.doi.org/10.1039/c0gc00075b

67. Deive, F. J., Rodriguez, A., Varela, A., Rodrigues, C., Leitao, M. C., Houbraken, J., Pereiro, A. B., Longo, M. A., Sanroman, M. A., Samson, R. A., Rebelo, L. P. N., and Pereira, C. S. (2011) Impact of ionic liquids on extreme microbial biotypes from soil, Green Chemistry 13(3): 687-696 http://dx.doi.org/10.1039/c0gc00369g

68. Deus, H. F., Correa, M. C., Stanislaus, R., Miragaia, M., Maass, W., de Lencastre, H., Fox, R., and Almeida, J. S. (2011) S3QL: A distributed domain specific language for controlled semantic integration of life sciences data, BMC Bioinformatics 12, ART285 http://dx.doi.org/10.1186/1471-2105-12-285

69. Di Pippo, F., Bohn, A., Cavalieri, F., and Albertano, P. (2011) H-1-NMR analysis of water mobility in cultured phototrophic biofilms, Biofouling 27(3): 327-336 http://dx.doi.org/10.1080/08927014.2011.565123

70. Diaz-Moreno, I., Garcia-Heredia, J. M., Diaz-Quintana, A., Teixeira, M., and De la Rosa, M. A. (2011) Nitration of tyrosines 46 and 48 induces the specific degradation of cytochrome c upon change of the heme iron state to high-spin, Biochimica Et Biophysica Acta-Bioenergetics 1807(12): 1616-1623 http://dx.doi.org/10.1016/j.bbabio.2011.09.012

71. Elberse, K. E. M., Nunes, S., Sa-Leao, R., van der Heide, H. G. J., and Schouls, L. M. (2011) Multiple-locus variable number tandem repeat analysis for Streptococcus pneumoniae: comparison with PFGE and MLST, PLoS ONE 6(5): e19668 http://dx.doi.org/10.1371/journal.pone.0019668

72. Escrevente, C., Keller, S., Altevogt, P., and Costa, J. (2011) Interaction and uptake of exosomes by ovarian cancer cells, BMC Cancer 11, ART108 http://dx.doi.org/10.1186/1471-2407-11-108

73. Esquivel, M. G., Amaro, H. M., Pinto, T. S., Fevereiro, P. S., and Malcata, F. X. (2011) Efficient H(2) production via Chlamydomonas reinhardtii, Trends in Biotechnology 29(12): 595-600 http://dx.doi.org/10.1016/j.tibtech.2011.06.008

74. Fagone, P., Mangano, K., Quattrocchi, C., Motterlini, R., Di Marco, R., Magro, G., Penacho, N., Romão, C. C., and Nicoletti, F. (2011) Prevention of clinical and histological signs of proteolipid protein (PLP)-induced experimental allergic encephalomyelitis (EAE) in mice by the water-soluble carbon monoxide-releasing molecule (CORM)-A1, Clinical and Experimental Immunology 163(3): 368-374 http://dx.doi.org/10.1111/j.1365-2249.2010.04303.x

75. Farinha, A. P., Irar, S., de Oliveira, E., Oliveira, M. M., and Pages, M. (2011) Novel clues on abiotic stress tolerance emerge from embryo proteome analyses of rice varieties with contrasting stress adaptation, Proteomics 11(12): 2389-2405 http://dx.doi.org/10.1002/pmic.201000570

76. Fernandes, A. M., Rocha, M. A. A., Freire, M. G., Marrucho, I. M., Coutinho, J. A. P., and Santos, L. M. N. B. F. (2011) Evaluation of cation-anion interaction strength in ionic liquids, Journal of Physical Chemistry B 115(14): 4033-4041 http://dx.doi.org/10.1021/jp201084x

77. Fernandes, A. S., Cabral, M. F., Costa, J., Castro, M., Delgado, R., Drew, M. G. B., and Felix, V. (2011) Two macrocyclic pentaaza compounds containing pyridine evaluated as novel chelating agents in copper(II) and nickel(II) overload, Journal of Inorganic Biochemistry 105(3): 410-419 http://dx.doi.org/10.1016/j.jinorgbio.2010.11.014

78. Fernandes, A. T., Pereira, M. M., Silva, C. S., Lindley, P. F., Bento, I., Melo, E. P., and Martins, L. O. (2011) The removal of a disulfide bridge in CotA-laccase changes the slower motion dynamics involved in copper binding but has no effect on the thermodynamic stability, Journal of Biological Inorganic Chemistry 16(4): 641-651 http://dx.doi.org/10.1007/s00775-011-0768-9

79. Fernandes, H. L., Albert, M. V., and Kording, K. P. (2011) Measuring generalization of visuomotor perturbations in wrist movements using mobile phones, PLoS ONE 6(5): e20290 http://dx.doi.org/10.1371/journal.pone.0020290

80. Fernandes, J. A., Paz, F. A. A., and Romão, C. C. (2011) cis-Di-mu-oxido-bis (N,N-diethyldithiocarbamato-kappa S-2,S ') oxidomolybdenum(V) (Mo-Mo) tetrahydrofuran monosolvate, Acta Crystallographica Section E-Structure Reports Online 67, M288-U2128 http://dx.doi.org/10.1107/s1600536811003187

81. Ferreira, A. R., Dias, J. M. L., Teixeira, A. P., Carinhas, N., Portela, R. M. C., Isidro, I. A., von Stosch, M., and Oliveira, R. (2011) Projection to latent pathways (PLP): a constrained projection to latent variables (PLS) method for elementary flux modes discrimination, BMC Systems Biology 5, ART181 http://dx.doi.org/10.1186/1752-0509-5-181

82. Filipe, L. C. S., Machuqueiro, M., and Baptista, A. M. (2011) Unfolding the conformational behavior of peptide dendrimers: insights from molecular dynamics simulations, Journal of the American Chemical Society 133(13): 5042-5052 http://dx.doi.org/10.1021/ja111001v

83. Fondevilla, S., Almeida, N. F., Satovic, Z., Rubiales, D., Patto, M. C. V., Cubero, J. I., and Torres, A. M. (2011) Identification of common genomic regions controlling resistance to Mycosphaerella pinodes, earliness and architectural traits in different pea genetic backgrounds, Euphytica 182(1): 43-52 http://dx.doi.org/10.1007/s10681-011-0460-8

84. Fonseca, C., Olofsson, K., Ferreira, C., Runquist, D., Fonseca, L. L., Hahn-Hagerdal, B., and Liden, G. (2011) The glucose/xylose facilitator Gxf1 from Candida intermedia expressed in a xylose-fermenting industrial strain of Saccharomyces cerevisiae increases xylose uptake in SSCF of wheat straw, Enzyme and Microbial Technology 48(6-7): 518-525 http://dx.doi.org/10.1016/j.enzmictec.2011.02.010

85. Fonseca, L. L., Sanchez, C., Santos, H., and Voit, E. O. (2011) Complex coordination of multi-scale cellular responses to environmental stress, Molecular Biosystems 7(3): 731-741 http://dx.doi.org/10.1039/c0mb00102c

86. Franco, C. F., Santos, R., and Coelho, A. V. (2011) Exploring the proteome of an echinoderm nervous system: 2-DE of the sea star radial nerve cord and the synaptosomal membranes subproteome, Proteomics 11(7): 1359-1364 http://dx.doi.org/10.1002/pmic.201000541

87. Franco, C. F., Santos, R., and Coelho, A. V. (2011) Proteome characterization of sea star coelomocytes - the innate immune effector cells of echinoderms, Proteomics 11(17): 3587-3592 http://dx.doi.org/10.1002/pmic.201000745

88. Freire, M. G., Louros, C. L. S., Rebelo, L. P. N., and Coutinho, J. A. P. (2011) Aqueous biphasic systems composed of a water-stable ionic liquid plus carbohydrates and their applications, Green Chemistry 13(6): 1536-1545 http://dx.doi.org/10.1039/c1gc15110j

89. Galego, L. R., Da Silva, J. P., Almeida, V. R., Bronze, M. R., and Boas, L. V. (2011) Preparation of novel distinct highly aromatic liquors using fruit distillates, International Journal of Food Science and Technology 46(1): 67-73 http://dx.doi.org/10.1111/j.1365-2621.2010.02452.x

90. Gamelas, C. A., Bandeira, N. A. G., Pereira, C. C. L., Calhorda, M. J., Herdtweck, E., Machuqueiro, M., Romão, C. C., and Veiros, L. F. (2011) Indenyl ring slippage in crown thioether complexes IndMo(CO)(2)L (+) and C-S activation of trithiacyclononane: experimental and theoretical studies, Dalton Transactions 40(40): 10513-10525 http://dx.doi.org/10.1039/c1dt10607d

91. Garcia-Heredia, J. M., Diaz-Quintana, A., Salzano, M., Orzaez, M., Perez-Paya, E., Teixeira, M., De la Rosa, M. A., and Diaz-Moreno, I. (2011) Tyrosine phosphorylation turns alkaline transition into a biologically relevant process and makes human cytochrome c behave as an anti-apoptotic switch, Journal of Biological Inorganic Chemistry 16(8): 1155-1168 http://dx.doi.org/10.1007/s00775-011-0804-9

92. Gaspar, P., Neves, A. R., Gasson, M. J., Shearman, C. A., and Santos, H. (2011) High yields of 2,3-butanediol and mannitol in Lactococcus lactis through engineering of NAD(+) cofactor recycling, Applied and Environmental Microbiology 77(19): 6826-6835 http://dx.doi.org/10.1128/aem.05544-11

93. Gaspar, V. M., Correia, I. J., Sousa, A., Silva, F., Paquete, C. M., Queiroz, J. A., and Sousa, F. (2011) Nanoparticle mediated delivery of pure P53 supercoiled plasmid DNA for gene therapy, Journal of Controlled Release 156(2): 212-222 http://dx.doi.org/10.1016/j.jconrel.2011.08.007

94. Ghabbour, N., Lamzira, Z., Thonart, P., Peres, C., Markaoui, M., and Asehraou, A. (2011) Selection of oleuropein-degrading lactic acid bacteria strains isolated from fermenting Moroccan green olives, Grasas y aceites 62(1): 84-89 http://dx.doi.org/10.3989/gya.055510

95. Gohring, N., Fedtke, I., Xia, G. Q., Jorge, A. M., Pinho, M. G., Bertsche, U., and Peschel, A. (2011) New Role of the Disulfide Stress Effector YjbH in beta-Lactam Susceptibility of *Staphylococcus aureus*, Antimicrobial Agents and Chemotherapy 55(12): 5452-5458 http://dx.doi.org/10.1128/aac.00286-11

96. Goncalves, C. M. B., Tome, L. C., Coutinho, J. A. P., and Marrucho, I. M. (2011) Addition of alpha-tocopherol on poly(lactic acid): thermal, mechanical, and sorption properties, Journal of Applied Polymer Science 119(4): 2468-2475 http://dx.doi.org/10.1002/app.32952

97. Goncalves, S., Esteves, A. M., Borges, N., Santos, H., and Matias, P. M. (2011) Crystallization and preliminary X-ray analysis of mannosyl-3-phosphoglycerate phosphatase from Thermus thermophilus HB27, Acta Crystallographica Section F-Structural Biology and Crystallization Communications 67, 390-396 http://dx.doi.org/10.1107/s1744309111002843

98. Goncalves, S., Esteves, A. M., Santos, H., Borges, N., and Matias, P. M. (2011) Three-dimensional structure of mannosyl-3-phosphoglycerate phosphatase from Thermus thermophilus HB27: a new member of the haloalcanoic acid dehalogenase superfamily, Biochemistry 50(44): 9551-9567 http://dx.doi.org/10.1021/bi201171h

99. Goncalves, V. L., Saraiva, L. M., and Teixeira, M. (2011) Gene expression study of the flavodi-iron proteins from the cyanobacterium Synechocystis sp PCC6803, Biochemical Society Transactions 39, 216-218 http://dx.doi.org/10.1042/bst0390216

100. Gorynia, S., Bandeiras, T. M., Pinho, F. G., McVey, C. E., Vonrhein, C., Round, A., Svergun, D. I., Donner, P., Matias, P. M., and Carrondo, M. A. (2011) Structural and functional insights into a dodecameric molecular machine - the RuvBL1/RuvBL2 complex, Journal of Structural Biology 176(3): 279-291 http://dx.doi.org/10.1016/j.jsb.2011.09.001

101. Goulao, L. F., Vieira-Silva, S., and Jackson, P. A. (2011) Association of hemicellulose- and pectin-modifying gene expression with Eucalyptus globulus secondary growth, Plant Physiology and Biochemistry 49(8): 873-881 http://dx.doi.org/10.1016/j.plaphy.2011.02.020

102. Guedes, A. C., Amaro, H. M., and Malcata, F. X. (2011) Microalgae as sources of carotenoids, Marine Drugs 9(4): 625-644 http://dx.doi.org/10.3390/md9040625

103. Guinote, I. B., Matos, R. G., Freire, P., and Arraiano, C. M. (2011) BolA affects cell growth, and binds to the promoters of penicillin-binding proteins 5 and 6 and regulates their expression, Journal of Microbiology and Biotechnology 21(3): 243-251 http://dx.doi.org/10.4014/jmb.1009.09034

104. Gundogdu, M. E., Kawai, Y., Pavlendova, N., Ogasawara, N., Errington, J., Scheffers, D. J., and Hamoen, L. W. (2011) Large ring polymers align FtsZ polymers for normal septum formation, Embo Journal 30(3): 617-626 http://dx.doi.org/10.1038/emboj.2010.345

105. Gutierrez-Sanchez, C., Olea, D., Marques, M., Fernandez, V. M., Pereira, I. A. C., Velez, M., and De Lacey, A. L. (2011) Oriented immobilization of a membrane-bound hydrogenase onto an electrode for direct electron transfer, Langmuir 27(10): 6449-6457 http://dx.doi.org/10.1021/la200141t

106. Gyorgy, E., del Pino, A. P., Roqueta, J., Ballesteros, B., Miguel, A. S., Maycock, C. D., and Oliva, A. G. (2011) Synthesis and laser immobilization onto solid substrates of CdSe/ZnS core shell quantum dots, Journal of Physical Chemistry C 115(31): 15210-15216 http://dx.doi.org/10.1021/jp203051b

107. Henriques, B. J., Fisher, M. T., Bross, P., and Gomes, C. M. (2011) A polymorphic position in electron transfer flavoprotein modulates kinetic stability as evidenced by thermal stress, FEBS Letters 585(3): 505-510 http://dx.doi.org/10.1016/j.febslet.2011.01.002

108. Henriques, M. X., Rodrigues, T., Carido, M., Ferreira, L., and Filipe, S. R. (2011) Synthesis of capsular polysaccharide at the division septum of *Streptococcus pneumoniae* is dependent on a bacterial tyrosine kinase, Molecular Microbiology 82(2): 515-534 http://dx.doi.org/10.1111/j.1365-2958.2011.07828.x

109. Hiller, N. L., Eutsey, R. A., Powell, E., Earl, J. P., Janto, B., Martin, D. P., Dawid, S., Ahmed, A., Longwell, M. J., Dahlgren, M. E., Ezzo, S., Tettelin, H., Daugherty, S. C., Mitchell, T. J., Hillman, T. A., Buchinsky, F. J., Tomasz, A., de Lencastre, H., SÃ¡-LeÃ£o, R., Post, J. C., Hu, F. Z., and Ehrlich, G. D. (2011) Differences in genotype and virulence among four multidrug-resistant Streptococcus pneumoniae isolates belonging to the PMEN1 clone, PLoS ONE 6(12): e28850 http://dx.doi.org/10.1371/journal.pone.0028850

110. Honzicek, J., Romão, C. C., Calhorda, M. J., Mukhopadhyay, A., Vinklarek, J., and Padelkova, Z. (2011) Reaction of spiro 2.4 hepta-4,6-diene with molybdenum(II) indenyl compounds: effects of substitution in the indenyl ligand, Organometallics 30(4): 714-722 http://dx.doi.org/10.1021/om100840r

111. Iranzo, O. (2011) Manganese complexes displaying superoxide dismutase activity: a balance between different factors, Bioorganic Chemistry 39(2): 73-87 http://dx.doi.org/10.1016/j.bioorg.2011.02.001

112. Iranzo, O., Chakraborty, S., Hemmingsen, L., and Pecoraro, V. L. (2011) Controlling and fine tuning the physical properties of two identical metal coordination sites in de novo designed three stranded coiled coil peptides, Journal of the American Chemical Society 133(2): 239-251 http://dx.doi.org/10.1021/ja104433n

113. Jin, Y., Amaral, A., McCann, A., and Brennan, L. (2011) Homocysteine levels impact directly on epigenetic reprogramming in astrocytes, Neurochemistry International 58(7): 833-838 http://dx.doi.org/10.1016/j.neuint.2011.03.012

114. Jorge, A. M., Hoiczyk, E., Gomes, J. P., and Pinho, M. G. (2011) EzrA contributes to the regulation of cell size in *Staphylococcus aureus*, PLoS ONE 6(11): e27542 http://dx.doi.org/10.1371/journal.pone.0027542

115. Jorge, C. D., Ventura, R., Maycock, C., Outeiro, T. F., Santos, H., and Costa, J. (2011) Assessment of the efficacy of solutes from extremophiles on protein aggregation in cell models of Huntington's and Parkinson's diseases, Neurochemical Research 36, 1005-1011 http://dx.doi.org/10.1007/s11064-011-0440-3

116. Kowacz, M., Groves, P., Esperanca, J. M. S. S., and Rebelo, L. P. N. (2011) On the use of ionic liquids to tune crystallization, Crystal Growth & Design 11(3): 684-691 http://dx.doi.org/10.1021/cg101061p

117. Lamego, J., Coroadinha, A. S., and Simplicio, A. L. (2011) Detection and quantification of carboxylesterase 2 activity by capillary electrophoresis, Analytical Chemistry 83(3): 881-887 http://dx.doi.org/10.1021/ac102547c

118. Lamosa, P., Mingote, A. I., Groudieva, T., Klippel, B., Egorova, K., Jabbour, D., Santos, H., and Antranikian, G. (2011) Gluconeotrehalose is the principal organic solute in the psychrotolerant bacterium Carnobacterium strain 17-4, Extremophiles 15(4): 463-472 http://dx.doi.org/10.1007/s00792-011-0377-0

119. Lamy, E., da Costa, G., Santos, R., Silva, F. C. E., Potes, J., Pereira, A., Coelho, A. V., and Baptista, E. S. (2011) Effect of condensed tannin ingestion in sheep and goat parotid saliva proteome, Journal of Animal Physiology and Animal Nutrition 95(3): 304-312 http://dx.doi.org/10.1111/j.1439-0396.2010.01055.x

120. Lamy, E., Rawel, H., Schweigert, F. J., Silva, F. C. E., Ferreira, A., Costa, A. R., Antunes, C., Almeida, A. M., Coelho, A. V., and Sales-Baptista, E. (2011) The effect of tannins on mediterranean ruminant ingestive behavior: the role of the oral cavity, Molecules 16(4): 2766-2784 http://dx.doi.org/10.1016/j.tiv.2011.02.002

121. Leite, S. B., Teixeira, A. P., Miranda, J. P., Tostoes, R. M.,Clemente, J. J., Sousa, M. F., Carrondo, M. J. T., and Alves, P. M. (2011) Merging bioreactor technology with 3D hepatocyte-fibroblast culturing approaches: improved in vitro models for toxicological applications, Toxicology in Vitro 25(4): 825-832 http://dx.doi.org/10.1016/j.tiv.2011.02.002

122. de Lencastre, H., and Tomasz, A. (2011) The CEM-NET initiative: molecular biology and epidemiology in alliance - tracking antibiotic-resistant staphylococci and pneumococci in hospitals and in the community, International Journal of Medical Microbiology 301(8): 623-629 http://dx.doi.org/10.1016/j.ijmm.2011.09.010

123. Lesch, H. P., Laitinen, A., Peixoto, C., Vicente, T., Makkonen, K. E., Laitinen, L., Pikkarainen, J. T., Samaranayake, H., Alves, P. M., Carrondo, M. J. T., Yla-Herttuala, S., and Airenne, K. J. (2011) Production and purification of lentiviral vectors generated in 293T suspension cells with baculoviral vectors, Gene Therapy 18(6), 531-538 http://dx.doi.org/10.1038/gt.2010.162

124. Lima, L. M. P., Delgado, R., Plutnar, J., Hermann, P., and Kotek, J. (2011) A new tris(phosphonomethyl) monoacetic acid cyclam derivative: synthesis, acid-base and metal complexation studies, European Journal of Inorganic Chemistry 2011(4): 527-538 http://dx.doi.org/10.1002/ejic.201000919

125. Locke, D. P., Hillier, L. W., Warren, W. C., Worley, K. C., Nazareth, L. V., Muzny, D. M., Yang, S. P., Wang, Z. Y., Chinwalla, A. T., Minx, P., Mitreva, M., Cook, L., Delehaunty, K. D., Fronick, C., Schmidt, H., Fulton, L. A., Fulton, R. S., Nelson, J. O., Magrini, V., Pohl, C., Graves, T. A., Markovic, C., Cree, A., Dinh, H. H., Hume, J., Kovar, C. L., Fowler, G. R., Lunter, G., Meader, S., Heger, A., Ponting, C. P., Marques-Bonet, T., Alkan, C., Chen, L., Cheng, Z., Kidd, J. M., Eichler, E. E., White, S., Searle, S., Vilella, A. J., Chen, Y. A., Flicek, P., Ma, J. A., Raney, B., Suh, B., Burhans, R., Herrero, J., Haussler, D., Faria, R., Fernando, O., Darre, F., Farre, D., Gazave, E., Oliva, M., Navarro, A., Roberto, R., Capozzi, O., Archidiacono, N., Della Valle, G., Purgato, S., Rocchi, M., Konkel, M. K., Walker, J. A., Ullmer, B., Batzer, M. A., Smit, A. F. A., Hubley, R., Casola, C., Schrider, D. R., Hahn, M. W., Quesada, V., Puente, X. S., Ordonez, G. R., Lopez-Otin, C., Vinar, T., Brejova, B., Ratan, A., Harris, R. S., Miller, W., Kosiol, C., Lawson, H. A., Taliwal, V., Martins, A. L., Siepel, A., RoyChoudhury, A., Ma, X., Degenhardt, J., Bustamante, C. D., Gutenkunst, R. N., Mailund, T., Dutheil, J. Y., Hobolth, A., Schierup, M. H., Ryder, O. A., Yoshinaga, Y., de Jong, P. J., Weinstock, G. M., Rogers, J., Mardis, E. R., Gibbs, R. A., and Wilson, R. K. (2011) Comparative and demographic analysis of orang-utan genomes, Nature 469(7331): 529-533 http://dx.doi.org/10.1038/nature09687

126. Lopes, C. M., Santos, T. P., Monteiro, A., Rodrigues, M. L., Costa, J. M., and Chaves, M. M. (2011) Combining cover cropping with deficit irrigation in a Mediterranean low vigor vineyard, Scientia Horticulturae 129(4) : 603-612 http://dx.doi.org/10.1016/j.scienta.2011.04.033

127. Lopes, J. N. C., Gomes, M. F. C., Husson, P., Padua, A. A. H., Rebelo, L. P. N., Sarraute, S., and Tariq, M. (2011) Polarity, viscosity, and ionic conductivity of liquid mixtures containing C(4)C(1)im Ntf(2) and a molecular component, Journal of Physical Chemistry B 115(19): 6088-6099 http://dx.doi.org/10.1021/jp2012254

128. Lorenz, W. W., Alba, R., Yu, Y. S., Bordeaux, J. M., Simoes, M., and Dean, J. F. D. (2011) Microarray analysis and scale-free gene networks identify candidate regulators in drought-stressed roots of loblolly pine (P. taeda L.), BMC Genomics 12, ART264 http://dx.doi.org/10.1186/1471-2164-12-264

129. Lourenço, E. C., and Ventura, M. R. (2011) The synthesis of compatible solute analogues-solvent effects on selective glycosylation, Carbohydrate Research 346(2): 163-168 http://dx.doi.org/10.1016/j.carres.2010.08.007

130. Lourenço, E. C., and Ventura, M. R. (2011) Synthesis of potassium (2R)-2-O-alpha-D-mannopyranosyl-(1 -> 2)-alpha-D-glucopyranosyl-2,3-dihydroxypropanoate: a naturally compatible solute, European Journal of Organic Chemistry 2011(33): 6698-6703 http://dx.doi.org/10.1002/ejoc.201100934

131. Lourenço, T., Saibo, N., Batista, R., Ricardo, C. P., and Oliveira, M. M. (2011) Inducible and constitutive expression of HvCBF4 in rice leads to differential gene expression and drought tolerance, Biologia Plantarum 55(4): 653-663 http://dx.doi.org/10.1007/s10535-011-0164-x

132. Lousa, D., Baptista, A. M., and Soares, C. M. (2011) Structural determinants of ligand imprinting: a molecular dynamics simulation study of subtilisin in aqueous and apolar solvents, Protein Science 20(2): 379-386 http://dx.doi.org/10.1002/pro.569

133. Lucas, T. G., Henriques, B. J., Rodrigues, J. V., Bross, P., Gregersen, N., and Gomes, C. M. (2011) Cofactors and metabolites as potential stabilizers of mitochondrial acyl-CoA dehydrogenases, Biochimica Et Biophysica Acta-Molecular Basis of Disease 1812(12): 1658-1663 http://dx.doi.org/10.1016/j.bbadis.2011.09.009

134. Machado, E., Kandzia, S., Carilho, R., Altevogt, P., Conradt, H. S., and Costa, J. (2011) N-Glycosylation of total cellular glycoproteins from the human ovarian carcinoma SKOV3 cell line and of recombinantly expressed human erythropoietin, Glycobiology 21(3): 376-386 http://dx.doi.org/10.1093/glycob/cwq170

135. Machuqueiro, M., and Baptista, A. M. (2011) Is the prediction of pK(a) values by constant-pH molecular dynamics being hindered by inherited problems?, Proteins-Structure Function and Bioinformatics 79(12): 3437-3447 http://dx.doi.org/10.1002/prot.23115

136. Madureira, A. R., Amorim, M., Gomes, A. M., Pintado, M. E., and Malcata, F. X. (2011) Protective effect of whey cheese matrix on probiotic strains exposed to simulated gastrointestinal conditions, Food Research International 44(1): 465-470 http://dx.doi.org/10.1016/j.foodres.2010.09.010

137. Madureira, A. R., Brandao, T., Gomes, A. M., Pintado, M. E., and Malcata, F. X. (2011) Technological optimization of manufacture of probiotic whey cheese matrices, Journal of Food Science 76(2): E203-E211 http://dx.doi.org/10.1111/j.1750-3841.2010.02008.x

138. Madureira, A. R., Pintado, A. I., Gomes, A. M., Pintado, M. E., and Malcata, F. X. (2011) Rheological, textural and microstructural features of probiotic whey cheeses, Lwt-Food Science and Technology 44(1): 75-81 http://dx.doi.org/10.1016/j.lwt.2010.06.030

139. Madureira, A. R., Pintado, M. E., Gomes, A. M. P., and Malcata, F. X. (2011) Incorporation of probiotic bacteria in whey cheese: decreasing the risk of microbial contamination, Journal of Food Protection 74(7): 1194-1199 http://dx.doi.org/10.4315/0362-028x.jfp-10-217

140. Malcata, F. X. (2011) Microalgae and biofuels: a promising partnership?, Trends in Biotechnology 29(11): 542-549 http://dx.doi.org/10.1016/j.tibtech.2011.05.005

141. Marazioti, A., Bucci, M., Coletta, C., Vellecco, V., Baskaran, P., Szabo, C., Cirino, G., Marques, A. R., Guerreiro, B., Goncalves, A. M. L., Seixas, J. D., Beuve, A., Romão, C. C., and Papapetropoulos, A. (2011) Inhibition of nitric oxide-stimulated vasorelaxation by carbon monoxide-releasing molecules, Arteriosclerosis Thrombosis and Vascular Biology 31(11): 2570-U2519 http://dx.doi.org/10.1161/atvbaha.111.229039

142. Marques, A. P., Duarte, A. J., Chambel, L., Teixeira, M. F., San Romão, M. V., and Tenreiro, R. (2011) Genomic diversity of Oenococcus oeni from different winemaking regions of Portugal, International Microbiology : the official journal of the Spanish Society for Microbiology 14(3): 155-162 http://dx.doi.org/10.2436/20.1501.01.144

143. Marques, J. C., Lamosa, P., Russell, C., Ventura, R., Maycock, C., Semmelhack, M. F., Miller, S. T., and Xavier, K. B. (2011) Processing the interspecies quorum-sensing signal autoinducer-2 (AI-2) CHARACTERIZATION OF PHOSPHO-(S)-4,5-DIHYDROXY-2,3-PENTANEDIONE ISOMERIZATION BY LsrG PROTEIN, Journal of Biological Chemistry 286(20) 18331-18343 http://dx.doi.org/10.1074/jbc.M111.230227

144. Martinez-Barajas, E., Delatte, T., Schluepmann, H., de Jong, G. J., Somsen, G. W., Nunes, C., Primavesi, L. F., Coello, P., Mitchell, R. A. C., and Paul, M. J. (2011) Wheat grain development is characterized by remarkable trehalose 6-phosphate accumulation pregrain filling: tissue distribution and relationship to SNF1-related protein kinase1 activity, Plant Physiology 156(1): 373-381 http://dx.doi.org/10.1104/pp.111.174524

145. Mateus, P., Delgado, R., Brandao, P., and Felix, V. (2011) Recognition of oxalate by a copper(II) polyaza macrobicyclic complex, Chemistry-a European Journal 17(25): 7020-7031 http://dx.doi.org/10.1002/chem.201100428

146. Mateus, P., Delgado, R., Lloret, F., Cano, J., Brandao, P., and Felix, V. (2011) A trinuclear copper(II) cryptate and its mu(3)-CO(3) cascade complex: thermodynamics, structural and magnetic properties, Chemistry-a European Journal 17(40): 11193-11203 http://dx.doi.org/10.1002/chem.201101372

147. Mateus, P., Li, F., Esteves, C. V., Delgado, R., Brandao, P., and Felix, V. (2011) Properties of metal complexes of a new dioxadiaza macrocycle containing a dibenzofuran unit and acetate pendant arms, European Journal of Inorganic Chemistry 2011(30): 4700-4708 http://dx.doi.org/10.1002/ejic.201100612

148. Matos, R. G., Barbas, A., Gomez-Puertas, P., and Arraiano, C. M. (2011) Swapping the domains of exoribonucleases RNase II and RNase R: conferring upon RNase II the ability to degrade ds RNA, Proteins-Structure Function and Bioinformatics 79(6): 1853-1867 http://dx.doi.org/10.1002/prot.23010

149. Mau, M., de Almeida, A. M., Coelho, A. V., and Sudekum, K. H. (2011) First identification of tannin-binding proteins in saliva of Papio hamadryas using MS/MS mass spectrometry, American Journal of Primatology 73(9): 896-902 http://dx.doi.org/10.1002/ajp.20958

150. Mendes, S., Farinha, A., Ramos, C. G., Leitao, J. H., Viegas, C. A., and Martins, L. O. (2011) Synergistic action of azoreductase and laccase leads to maximal decolourization and detoxification of model dye-containing wastewaters, Bioresource Technology 102(21): 9852-9859 http://dx.doi.org/10.1016/j.biortech.2011.07.108

151. Mendes, S., Pereira, L., Batista, C., and Martins, L. O. (2011) Molecular determinants of azo reduction activity in the strain Pseudomonas putida MET94, Applied Microbiology and Biotechnology 92(2): 393-405 http://dx.doi.org/10.1007/s00253-011-3366-4

152. Miguel, C., and Marum, L. (2011) An epigenetic view of plant cells cultured in vitro: somaclonal variation and beyond, Journal of Experimental Botany 62(11): 3713-3725 http://dx.doi.org/10.1093/jxb/err155

153. Milheirico, C., Portelinha, A., Krippahl, L., de Lencastre, H., and Oliveira, D. C. (2011) Evidence for a purifying selection acting on the beta-lactamase locus in epidemic clones of methicillin-resistant *Staphylococcus aureus*, BMC Microbiology 11, ART76 http://dx.doi.org/10.1186/1471-2180-11-76

154. Mira, N. P., Henriques, S. F., Keller, G., Teixeira, M. C., Matos, R. G., Arraiano, C. M., Winge, D. R., and Sa-Correia, I. (2011) Identification of a DNA-binding site for the transcription factor Haa1, required for Saccharomyces cerevisiae response to acetic acid stress, Nucleic Acids Research 39(16): 6896-6907 http://dx.doi.org/10.1093/nar/gkr228

155. Molinas, M. F., De Candia, A., Szajnman, S. H., Rodriguez, J. B., Marti, M., Pereira, M., Teixeira, M., Todorovic, S., and Murgida, D. H. (2011) Electron transfer dynamics of Rhodothermus marinus caa(3) cytochrome c domains on biomimetic films, Physical Chemistry Chemical Physics 13(40): 18088-18098 http://dx.doi.org/10.1039/c1cp21925a

156. Moreira, R. N., Dressaire, C., Domingues, S., and Arraiano, C. M. (2011) A new target for an old regulator: H-NS represses transcription of bolA morphogene by direct binding to both promoters, Biochemical and Biophysical Research Communications 411(1): 50-55 http://dx.doi.org/10.1016/j.bbrc.2011.06.084

157. Morgado, L., Paixao, V. B., Salgueiro, C. A., and Bruix, M. (2011) Backbone, side chain and heme resonance assignments of the triheme cytochrome PpcA from Geobacter sulfurreducens, Biomolecular NMR Assignments 5(1): 113-116 http://dx.doi.org/10.1007/s12104-010-9280-3

158. Muller, S., Hoffmann, T., Santos, H., Saum, S. H., Bremer, E., and Muller, V. (2011) Bacterial abl-like genes: production of the archaeal osmolyte N(epsilon)-acetyl-beta-lysine by homologous overexpression of the yodP-kamA genes in Bacillus subtilis, Applied Microbiology and Biotechnology 91(3): 689-697 http://dx.doi.org/10.1007/s00253-011-3301-8

159. Ndukum, J., Fonseca, L. L., Santos, H., Voit, E. O., and Datta, S. (2011) Statistical inference methods for sparse biological time series data, BMC Systems Biology 5, ART57 http://dx.doi.org/10.1186/1752-0509-5-57

160. Negrao, S., Almadanim, C., Pires, I., McNally, K. L., and Oliveira, M. M. (2011) Use of EcoTILLING to identify natural allelic variants of rice candidate genes involved in salinity tolerance, Plant Genetic Resources-Characterization and Utilization 9(2): 300-304 http://dx.doi.org/10.1017/s1479262111000566

161. Negrao, S., Courtois, B., Ahmadi, N., Abreu, I., Saibo, N., and Oliveira, M. M. (2011) Recent updates on salinity stress in rice: from physiological to molecular responses, Critical Reviews in Plant Sciences 30(4): 329-377 http://dx.doi.org/10.1080/07352689.2011.587725

162. Noronha, P. (2011) Yeast biopaintings: biofilms as an artistic instrument, Leonardo 44(1): 38-+ http://dx.doi.org/10.1162/LEON_a_00091

163. de Noronha, R. G., Romão, C. C., and Fernandes, A. C. (2011) MoO2Cl2 as a novel catalyst for the synthesis of alpha-aminophosphonates, Catalysis Communications 12(5): 337-340 http://dx.doi.org/10.1016/j.catcom.2010.10.005

164. Nunes, A. V. M., and Duarte, C. M. M. (2011) Dense CO(2) as a Solute, Co-Solute or Co-Solvent in Particle Formation Processes: A Review, Materials 4(11): 2017-2041 http://dx.doi.org/10.3390/ma4112017

165. Oliveira, A. S., Baptista, A. M., and Soares, C. M. (2011) Conformational changes induced by ATP-hydrolysis in an ABC transporter: a molecular dynamics study of the Sav1866 exporter, Proteins-Structure Function and Bioinformatics 79(6): 1977-1990 http://dx.doi.org/10.1002/prot.23023

166. Oliveira, A. S. F., Baptista, A. M., and Soares, C. M. (2011) Interdomain communication mechanisms in an ABC importer: a molecular dynamics study of the MalFGK(2)E complex, PLoS Computational Biology 7(8): e1002128 http://dx.doi.org/10.1371/journal.pcbi.1002128

167. Oliveira, D. C., and de Lencastre, H. (2011) Methicillin-resistance in *Staphylococcus aureus* is not affected by the overexpression in trans of the mecA gene repressor: a surprising observation, PLoS ONE 6(8): e23287 http://dx.doi.org/10.1371/journal.pone.0023287

168. Oliveira, L. M. A., Lages, A., Gomes, R. A., Neves, H., Familia, C., Coelho, A. V., and Quintas, A. (2011) Insulin glycation by methylglyoxal results in native-like aggregation and inhibition of fibril formation, BMC Biochemistry 12, ART41 http://dx.doi.org/10.1186/1471-2091-12-41

169. Paiva, J. A. P., Prat, E., Vautrin, S., Santos, M. D., San-Clemente, H., Brommonschenkel, S., Fonseca, P. G. S., Grattapaglia, D., Song, X. A., Ammiraju, J. S. S., Kudrna, D., Wing, R. A., Freitas, A. T., Berges, H., and Grima-Pettenati, J. (2011) Advancing Eucalyptus genomics: identification and sequencing of lignin biosynthesis genes from deep-coverage BAC libraries, BMC Genomics 12, ART137 http://dx.doi.org/10.1186/1471-2164-12-137

170. Paulo, A. C., Sampaio, A., Santos, N. C., Costa, P. S., Cunha, P., Zihl, J., Cerqueira, J., Palha, J. A., and Sousa, N. (2011) Patterns of cognitive performance in healthy ageing in northern Portugal: a cross-sectional analysis, PLoS ONE 6(9): e24553 http://dx.doi.org/10.1371/journal.pone.0024553

171. Pensado, A. S., Gomes, M. F. C., Lopes, J. N. C., Malfreyt, P., and Padua, A. A. H. (2011) Effect of alkyl chain length and hydroxyl group functionalization on the surface properties of imidazolium ionic liquids, Physical Chemistry Chemical Physics 13(30): 13518-13526 http://dx.doi.org/10.1039/c1cp20563c

172. Pereira, A. L., Martins, M., Oliveira, M. M., and Carrapico, F. (2011) Morphological and genetic diversity of the family Azollaceae inferred from vegetative characters and RAPD markers, Plant Systematics and Evolution 297(3-4): 213-226 http://dx.doi.org/10.1007/s00606-011-0509-0

173. Pereira, C. S., Ribeiro, J. M. L., Vatulescu, A. D., Findlay, K., MacDougall, A. J., and Jackson, P. A. P. (2011) Extensin network formation in Vitis vinifera callus cells is an essential and causal event in rapid and H(2)O(2)-induced reduction in primary cell wall hydration, BMC Plant Biology 11, ART106 http://dx.doi.org/10.1186/1471-2229-11-106

174. Pereiro, A. B., Rodriguez, A., Blesic, M., Shimizu, K., Lopes, J. N. C., and Rebelo, L. P. N. (2011) Mixtures of pyridine and nicotine with Pyridinium-based ionic liquids, Journal of Chemical and Engineering Data 56(12): 4356-4363 http://dx.doi.org/10.1021/je2001446

175. Petkovic, M., Seddon, K. R., Rebelo, L. P. N., and Pereira, C. S. (2011) Ionic liquids: a pathway to environmental acceptability, Chemical Society Reviews 40(3): 1383-1403 http://dx.doi.org/10.1039/c004968a

176. Pinheiro, C., Antonio, C., Ortuno, M. F., Dobrev, P. I., Hartung, W., Thomas-Oates, J., Ricardo, C. P., Vankova, R., Chaves, M. M., and Wilson, J. C. (2011) Initial water deficit effects on Lupinus albus photosynthetic performance, carbon metabolism, and hormonal balance: metabolic reorganization prior to early stress responses, Journal of Experimental Botany 62(14): 4965-4974 http://dx.doi.org/10.1093/jxb/err194

177. Pinheiro, C., and Chaves, M. M. (2011) Photosynthesis and drought: can we make metabolic connections from available data?, Journal of Experimental Botany 62(3): 869-882 http://dx.doi.org/10.1093/jxb/erq340

178. Pinho, F. G., Pinto, A. F., Pinto, L. C., Huber, H., Romão, C. V., Teixeira, M., Matias, P. M., and Bandeiras, T. M. (2011) Superoxide reductase from Nanoarchaeum equitans: expression, purification, crystallization and preliminary x-ray crystallographic analysis, Acta Crystallographica Section F-Structural Biology and Crystallization Communications 67(5): 591-595 http://dx.doi.org/10.1107/s1744309111009432

179. Pinto, A. F., Todorovic, S., Hildebrandt, P., Yamazaki, M., Amano, F., Igimi, S., Romão, C. V., and Teixeira, M. (2011) Desulforubrerythrin from Campylobacter jejuni, a novel multidomain protein, Journal of Biological Inorganic Chemistry 16(3): 501-510 http://dx.doi.org/10.1007/s00775-010-0749-4

180. Pinto, R. M., Dias, A. A., Costa, M. L., Rodrigues, P., Barros, M. T., Ogden, J. S., and Dyke, J. M. (2011) Thermal decomposition of methyl 2-azidopropionate studied by UV photoelectron spectroscopy and matrix isolation IR spectroscopy: heterocyclic intermediate vs imine formation, Journal of Physical Chemistry A 115(30): 8447-8457 http://dx.doi.org/10.1021/jp2036845

181. Puerto, M., Campos, A., Prieto, A., Camean, A., de Almeida, A. M., Coelho, A. V., and Vasconcelos, V. (2011) Differential protein expression in two bivalve species; Mytilus galloprovincialis and Corbicula fluminea; exposed to Cylindrospermopsis raciborskii cells, Aquatic Toxicology 101(1): 109-116 http://dx.doi.org/10.1016/j.aquatox.2010.09.009

182. Qian, Y. F., Paquete, C. M., Louro, R. O., Ross, D. E., LaBelle, E., Bond, D. R., and Tien, M. (2011) Mapping the iron binding site(s) on the small tetraheme cytochrome of Shewanella oneidensis MR-1, Biochemistry 50(28): 6217-6224 http://dx.doi.org/10.1021/bi2005015

183. Queiroga, C. S. F., Almeida, A. S., Alves, P. M., Brenner, C., and Vieira, H. L. A. (2011) Carbon monoxide prevents hepatic mitochondrial membrane permeabilization, BMC Cell Biology 12, ART10 http://dx.doi.org/10.1186/1471-2121-12-10

184. Quintal, S., Fedi, S., Barbetti, J., Pinto, P., Felix, V., Drew, M. G. B., Zanello, P., and Calhorda, M. J. (2011) Synthesis and properties of new Mo(II) complexes with N-heterocyclic and ferrocenyl ligands, Journal of Organometallic Chemistry 696(10): 2142-2152 http://dx.doi.org/10.1016/j.jorganchem.2010.11.024

185. Quintas, P. O., Catarino, T., Todorovic, S., and Turner, D. L. (2011) Highly selective ligand binding by Methylophilus methylotrophus cytochrome c '', Biochemistry 50(25): 5624-5632 http://dx.doi.org/10.1021/bi200480a

186. Rabie, M. A., Elsaidy, S., El-Badawy, A. A., Siliha, H., and Malcata, F. X. (2011) Biogenic amine contents in selected Egyptian fermentedf foods as determined by ion-exchange chromatography, Journal of Food Protection 74(4): 681-685 http://dx.doi.org/10.4315/0362-028x.jfp-10-257

187. Rabie, M. A., Siliha, H., el-Saidy, S., el-Badawy, A. A., and Malcata, F. X. (2011) Reduced biogenic amine contents in sauerkraut via addition of selected lactic acid bacteria, Food Chemistry 129(4): 1778-1782 http://dx.doi.org/10.1016/j.foodchem.2011.05.106

188. Rabie, M. A., Siliha, H. I., El-Saidy, S. M., El-Badawy, A. A., and Malcata, F. X. (2011) Effect of gamma-irradiation upon biogenic amine formation in blue cheese during storage, International Dairy Journal 21(5): 373-376 http://dx.doi.org/10.1016/j.idairyj.2010.11.009

189. Real, G., Monteiro, F., Burger, C., and Alves, P. M. (2011) Improvement of lentiviral transfer vectors using cis-acting regulatory elements for increased gene expression, Applied Microbiology and Biotechnology 91(6): 1581-1591 http://dx.doi.org/10.1007/s00253-011-3392-2

190. Reed, P., Veiga, H., Jorge, A. M., Terrak, M., and Pinho, M. G. (2011) Monofunctional transglycosylases are not essential for *Staphylococcus aureus* cell wall synthesis, Journal of Bacteriology 193(10): 2549-2556 http://dx.doi.org/10.1128/jb.01474-10

191. Reinstein, O., Neves, M. A. D., Saad, M., Boodram, S. N., Lombardo, S., Beckham, S. A., Brouwer, J., Audette, G. F., Groves, P., Wilce, M. C. J., and Johnson, P. E. (2011) Engineering a structure switching mechanism into a steroid-binding aptamer and hydrodynamic analysis of the ligand binding mechanism, Biochemistry 50(43): 9368-9376 http://dx.doi.org/10.1021/bi201361v

192. Reis, P. J. M., and Malcata, F. X. (2011) Ripening-related changes in Serra da Estrela cheese: a stereological study, Journal of Dairy Science 94(3): 1223-1238 http://dx.doi.org/10.3168/jds.2010-3416

193. Reis, P. M., Gamelas, C. A., Brito, J. A., Saffon, N., Gomez, M., and Royo, B. (2011) Chiral cationic Cp ' Mo(CO)(2)(NCMe) (+) species - catalyst precursors for olefin epoxidation with H2O2 and tert-butyl hydroperoxide, European Journal of Inorganic Chemistry 2011(5): 666-673 http://dx.doi.org/10.1002/ejic.201001065

194. Ribeiro, T., Santos, S., Marques, M. I. M., Gilmore, M., and Lopes, M. D. S. (2011) Identification of a new gene, vanV, in vanB operons of *Enterococcus faecalis*, International Journal of Antimicrobial Agents 37(6): 554-557 http://dx.doi.org/10.1016/j.ijantimicag.2011.01.024

195. Ribeiro-Silva, C., Gilberto, S., Gomes, R. A., Mateus, E., Monteiro, E., Barroso, E., Coelho, A. V., da Costa, G., Freire, A. P., and Cordeiro, C. (2011) The relative amounts of plasma transthyretin forms in familial transthyretin amyloidosis: a quantitative analysis by Fourier transform ion-cyclotron resonance mass spectrometry, Amyloid-Journal of Protein Folding Disorders 18(4): 191-199 http://dx.doi.org/10.3109/13506129.2011.614295

196. Ricardo, C. P. P., Martins, I., Francisco, R., Sergeant, K., Pinheiro, C., Campos, A., Renaut, J., and Fevereiro, P. (2011) Proteins associated with cork formation in Quercus suber L. stem tissues, Journal of Proteomics 74(8): 1266-1278 http://dx.doi.org/10.1016/j.jprot.2011.02.003

197. Rigottier-Gois, L., Alberti, A., Houel, A., Taly, J. F., Palcy, P., Manson, J., Pinto, D., Matos, R. C., Carrilero, L., Montero, N., Tariq, M., Karsens, H., Repp, C., Kropec, A., Budin-Verneuil, A., Benachour, A., Sauvageot, N., Bizzini, A., Gilmore, M. S., Bessieres, P., Kok, J., Huebner, J., Lopes, F., Gonzalez-Zorn, B., Hartke, A., and Serror, P. (2011) Large-scale screening of a targeted *Enterococcus faecalis* mutant library identifies envelope fitness factors, PLoS ONE 6(12): e29023 http://dx.doi.org/10.1371/journal.pone.0029023

198. Rocha, J., Popescu, A. O., Borges, P., Mil-Homens, D., Moreira, L. M., Sa-Correia, I., Fialho, A. M., and Frazao, C. (2011) Structure of Burkholderia cepacia UDP-glucose dehydrogenase (UGD) BceC and role of Tyr10 in final hydrolysis of UGD thioester intermediate, Journal of Bacteriology 193(15): 3978-3987 http://dx.doi.org/10.1128/jb.01076-10

199. Rocha, J. M., Kalo, P. J., and Malcata, F. X. (2011) Neutral lipids in free, bound, and starch lipid extracts of flours, sourdough, and Portuguese sourdough bread determined by NP-HPLC-ELSD, Cereal Chemistry 88(4): 400-408 http://dx.doi.org/10.1094/cchem-11-10-0157

200. Rocha, M. A. A., Lima, C., Gomes, L. R., Schroder, B., Coutinho, J. A. P., Marrucho, I. M., Esperanca, J. M. S. S., Rebelo, L. P. N., Shimizu, K., Lopes, J. N. C., and Santos, L. M. N. B. F. (2011) High-accuracy vapor pressure data of the extended C(n)C(1)im Ntf(2) ionic liquid series: trend changes and structural shifts, Journal of Physical Chemistry B 115(37): 10919-10926 http://dx.doi.org/10.1021/jp2049316

201. Rodrigues, A. F., Guerreiro, M. R., Santiago, V. M., Dalba, C., Klatzmann, D., Alves, P. M., Carrondo, M. J. T., and Coroadinha, A. S. (2011) Down-regulation of CD81 tetraspanin in human cells producing retroviral-based particles: tailoring vector composition, Biotechnology and Bioengineering 108(11): 2623-2633 http://dx.doi.org/10.1002/bit.23231

202. Rodrigues, C. A. B., de Matos, M. N., Guerreiro, B. M. H., Goncalves, A. M. L., Romão, C. C., and Afonso, C. A. M. (2011) Water as efficient medium for mild decarbonylation of tertiary aldehydes, Tetrahedron Letters 52(22): 2803-2807 http://dx.doi.org/10.1016/j.tetlet.2011.03.012

203. Rodrigues, D., Rocha-Santos, T. A. P., Pereira, C. I., Gomes, A. M., Malcata, F. X., and Freitas, A. C. (2011) The potential effect of FOS and inulin upon probiotic bacterium performance in curdled milk matrices, Lwt-Food Science and Technology 44(1): 100-108 http://dx.doi.org/10.1016/j.lwt.2010.05.021

204. Rodrigues, J. V., Prosinecki, V., Marrucho, I., Rebelo, L. P. N., and Gomes, C. M. (2011) Protein stability in an ionic liquid milieu: on the use of differential scanning fluorimetry, Physical Chemistry Chemical Physics 13(30): 13614-13616 http://dx.doi.org/10.1039/c1cp21187k

205. Roldao, A., Vicente, T., Peixoto, C., Carrondo, M. J. T., and Alves, P. M. (2011) Quality control and analytical methods for baculovirus-based products, Journal of Invertebrate Pathology 107(suppl): S94-S105 http://dx.doi.org/10.1016/j.jip.2011.05.009

206. Romão, C. V., Ladakis, D., Lobo, S. A. L., Carrondo, M. A., Brindley, A. A., Deery, E., Matias, P. M., Pickersgill, R. W., Saraiva, L. M., and Warren, M. J. (2011) Evolution in a family of chelatases facilitated by the introduction of active site asymmetry and protein oligomerization, Proceedings of the National Academy of Sciences of the United States of America 108(1): 97-102 http://dx.doi.org/10.1073/pnas.1014298108

207. Sa-Leao, R., Pinto, F., Aguiar, S., Nunes, S., Carrico, J. A., Frazao, N., Goncalves-Sousa, N., Melo-Cristino, J., de Lencastre, H., and Ramirez, M. (2011) Analysis of invasiveness of Pneumococcal serotypes and clones circulating in Portugal before widespread use of conjugate vaccines reveals heterogeneous behavior of clones expressing the same serotype, Journal of Clinical Microbiology 49(4): 1369-1375 http://dx.doi.org/10.1128/jcm.01763-10

208. Sanches, S., Leitao, C., Penetra, A., Cardoso, V. V., Ferreira, E., Benoliel, M. J., Crespo, M. T. B., and Pereira, V. J. (2011) Direct photolysis of polycyclic aromatic hydrocarbons in drinking water sources, Journal of Hazardous Materials 192(3): 1458-1465 http://dx.doi.org/10.1016/j.jhazmat.2011.06.065

209. Sanches, S., Penetra, A., Granado, C., Cardoso, V. V., Ferreira, E., Benoliel, M. J., Crespo, M. T. B., Pereira, V. J., and Crespo, J. G. (2011) Removal of pesticides and polycyclic aromatic hydrocarbons from different drinking water sources by nanofiltration, Desalination and Water Treatment 27(1-3): 141-149 http://dx.doi.org/10.5004/dwt.2011.2087

210. Sand, M., de Berardinis, V., Mingote, A., Santos, H., Gottig, S., Muller, V., and Averhoff, B. (2011) Salt adaptation in Acinetobacter baylyi: identification and characterization of a secondary glycine betaine transporter, Archives of Microbiology 193(10): 723-730 http://dx.doi.org/10.1007/s00203-011-0713-x

211. Santos, A. P., Ferreira, L., Maroco, J., and Oliveira, M. M. (2011) Abiotic stress and induced DNA hypomethylation cause interphase chromatin structural changes in rice rDNA Loci, Cytogenetic and Genome Research 132(4): 297-303 http://dx.doi.org/10.1159/000322287

212. Santos, A. P., Serra, T., Figueiredo, D. D., Barros, P., Lourenço, T., Chander, S., Oliveira, M. M., and Saibo, N. J. M. (2011) Transcription regulation of abiotic stress responses in rice: a combined action of transcription factors and epigenetic mechanisms, Omics-a Journal of Integrative Biology 15(12): 839-857 http://dx.doi.org/10.1089/omi.2011.0095

213. Santos, S. S., Sonnewald, U., Carrondo, M. J. T., and Alves, P. M. (2011) The role of glia in neuronal recovery following anoxia: in vitro evidence of neuronal adaptation, Neurochemistry International 58(6): 665-675 http://dx.doi.org/10.1016/j.neuint.2011.02.005

214. Santos-Silva, T., Mukhopadhyay, A., Seixas, J. D., Bernardes, G. J. L., Romão, C. C., and Romão, M. J. (2011) Towards improved therapeutic CORMs: understanding the reactivity of CORM-3 with proteins, Current Medicinal Chemistry 18(22): 3361-3366 http://dx.doi.org/10.2174/092986711796504583

215. Santos-Silva, T., Mukhopadhyay, A., Seixas, J. D., Bernardes, G. J. L., Romão, C. C., and Romão, M. J. (2011) CORM-3 reactivity toward proteins: the crystal structure of a Ru(II) dicarbonyl-lysozyme complex, Journal of the American Chemical Society 133(5): 1192-1195 http://dx.doi.org/10.1021/ja108820s

216. Schroder, B., Freire, M. G., Varanda, F. R., Marrucho, I. M., Santos, L. M. N. B. F., and Coutinho, J. A. P. (2011) Aqueous solubility, effects of salts on aqueous solubility, and partitioning behavior of hexafluorobenzene: experimental results and COSMO-RS predictions, Chemosphere 84(4): 415-422 http://dx.doi.org/10.1016/j.chemosphere.2011.03.055

217. Schroeder, N., Mota, L. J., and Meresse, S. (2011) Salmonella-induced tubular networks, Trends in Microbiology 19(6): 268-277 http://dx.doi.org/10.1016/j.tim.2011.01.006

218. Serra, A. T., Duarte, R. O., Bronze, M. R., and Duarte, C. M. M. (2011) Identification of bioactive response in traditional cherries from Portugal, Food Chemistry 125(2): 318-325 http://dx.doi.org/10.1016/j.foodchem.2010.07.088

219. Serra, A. T., Matias, A. A., Almeida, A. P. C., Bronze, M. R., Alves, P. M., de Sousa, H. C., and Duarte, C. M. M. (2011) Processing cherries (Prunus avium) using supercritical fluid technology. Part 2. Evaluation of SCF extracts as promising natural chemotherapeutical agents, Journal of Supercritical Fluids 55(3) 1007-1013 http://dx.doi.org/10.1016/j.supflu.2010.06.006

220. Serra, M., Correia, C., Malpique, R., Brito, C., Jensen, J., Bjorquist, P., Carrondo, M. J. T., and Alves, P. M. (2011) Microencapsulation technology: a powerful tool for integrating expansion and cryopreservation of human embryonic stem cells, PLoS ONE 6(8): e23212 http://dx.doi.org/10.1371/journal.pone.0023212

221. Serrano, M., Real, G., Santos, J., Carneiro, J., Moran, C. P., and Henriques, A. O. (2011) A negative feedback loop that limits the ectopic activation of a cell type-specific sporulation sigma factor of Bacillus subtilis, PLoS Genetics 7(9): e1002220 http://dx.doi.org/10.1371/journal.pgen.1002220

222. Shvaleva, A., Lobo-do-Vale, R., Cruz, C., Castaldi, S., Rosa, A. P., Chaves, M. M., and Pereira, J. S. (2011) Soil-atmosphere greenhouse gases (CO(2): CH(4) and N(2)O) exchange in evergreen oak woodland in southern Portugal, Plant Soil and Environment 57(10): 471-477

223. Silva, A. C., Carrondo, M. J. T., and Alves, P. M. (2011) Strategies for improved stability of Peste des Petits Ruminants Vaccine, Vaccine 29(31): 4983-4991 http://dx.doi.org/10.1016/j.vaccine.2011.04.102

224. Silva I. J., Saramago M., Dressaire C., Domingues S., Viegas S. C. and Arraiano C. M. (2011) Importance and key events of prokaryotic RNA decay: the ultimate fate of an RNA molecule, Wiley Interdisciplinary Reviews: RNA 2(6): 818-836. http://dx.doi.org/10.1002/wrna.94

225. Silva, M. G., Ueti, M. W., Norimine, J., Florin-Christensen, M., Bastos, R. G., Goff, W. L., Brown, W. C., Oliva, A., and Suarez, C. E. (2011) Babesia bovis expresses Bbo-6cys-E, a member of a novel gene family that is homologous to the 6-cys family of Plasmodium, Parasitology International 60(1): 13-18 http://dx.doi.org/10.1016/j.parint.2010.09.004

226. Silva, S., Frazao, O., Viegas, J., Ferreira, L. A., Araujo, F. M., Malcata, F. X., and Santos, J. L. (2011) Temperature and strain-independent curvature sensor based on a singlemode/multimode fiber optic structure, Measurement Science & Technology 22(8): ART085201 http://dx.doi.org/10.1088/0957-0233/22/8/085201

227. Silva, S., Santos, J. L., Malcata, F. X., Kobelke, J., Schuster, K., and Frazao, O. (2011) Optical refractometer based on large-core air-clad photonic crystal fibers, Optics Letters 36(6): 852-854 10.1364/OL.36.000852

228. da Silva, S. M., Pimentel, C., Valente, F. M. A., Rodrigues-Pousada, C., and Pereira, I. A. C. (2011) Tungsten and molybdenum regulation of formate dehydrogenase expression in Desulfovibrio vulgaris Hildenborough, Journal of Bacteriology 193(12): 2909-2916 http://dx.doi.org/10.1128/jb.00042-11

229. Silva, T., Reto, M., Sol, M., Peito, A., Peres, C. M., Peres, C., and Malcata, F. X. (2011) Characterization of yeasts from Portuguese brined olives, with a focus on their potentially probiotic behavior, Lwt-Food Science and Technology 44(6): 1349-1354 http://dx.doi.org/10.1016/j.lwt.2011.01.029

230. Simoes, A. S., Pereira, L., Nunes, S., Brito-Avo, A., de Lencastre, H., and Sa-Leao, R. (2011) Clonal evolution leading to maintenance of antibiotic resistance rates among colonizing Pneumococci in the PCV7 era in Portugal, Journal of Clinical Microbiology 49(8): 2810-2817 http://dx.doi.org/10.1128/jcm.00517-11

231. Simoes, A. S., Valente, C., de Lencastre, H., and Sa-Leao, R. (2011) Rapid identification of noncapsulated Streptococcus pneumoniae in nasopharyngeal samples allowing detection of co-colonization and reevaluation of prevalence, Diagnostic Microbiology and Infectious Disease 71(3): 208-216 http://dx.doi.org/10.1016/j.diagmicrobio.2011.07.009

232. Simoes, R. R., Aires-de-Sousa, M., Conceicao, T., Antunes, F., da Costa, P. M., and de Lencastre, H. (2011) High prevalence of EMRSA-15 in Portuguese public buses: a worrisome finding, PLoS ONE 6(3): e17630 http://dx.doi.org/10.1371/journal.pone.0017630

233. Soares, N. C., Wojtkowska, J., and Jackson, P. A. (2011) A proteomic analysis of the wound response in Medicago leaves reveals the early activation of a ROS-sensitive signal pathway, Journal of Proteomics 74(8): 1411-1420 http://dx.doi.org/10.1016/j.jprot.2011.03.017

234. Sousa, F. L., Alves, R. J., Pereira-Leal, J. B., Teixeira, M., and Pereira, M. M. (2011) A bioinformatics classifier and database for heme-copper oxygen reductases, PLoS ONE 6(4): e19117 http://dx.doi.org/10.1371/journal.pone.0019117

235. Sousa, P. M. F., Silva, S. T. N., Hood, B. L., Charro, N., Carita, J. N., Vaz, F., Penque, D., Conrads, T. P., and Melo, A. M. P. (2011) Supramolecular organizations in the aerobic respiratory chain of Escherichia coli, Biochimie 93(3): 418-425 http://dx.doi.org/10.1016/j.biochi.2010.10.014

236. Souza, S. L., Hallock, K. J., Funari, S. S., Vaz, W. L. C., Hamilton, J. A., and Melo, E. (2011) Study of the miscibility of cholesteryl oleate in a matrix of ceramide, cholesterol and fatty acid, Chemistry and Physics of Lipids 164(7): 664-671 http://dx.doi.org/10.1016/j.chemphyslip.2011.06.011

237. Souza, S. L., Valerio, J., Funari, S. S., and Melo, E. (2011) The thermotropism and prototropism of ternary mixtures of ceramide C16, cholesterol and palmitic acid. An exploratory study, Chemistry and Physics of Lipids 164(7): 643-653 http://dx.doi.org/10.1016/j.chemphyslip.2011.06.009

238. Tariq, M., Carvalho, P. J., Coutinho, J. A. P., Marrucho, I. M., Lopes, J. N. C., and Rebelo, L. P. N. (2011) Viscosity of (C-2-C-14) 1-alkyl-3-methylimidazolium bis(trifluoromethylsulfonyl)amide ionic liquids in an extended temperature range, Fluid Phase Equilibria 301(1): 22-32 http://dx.doi.org/10.1016/j.fluid.2010.10.018

239. Tariq, M., Podgorsek, A., Ferguson, J. L., Lopes, A., Gomes, M. F. C., Padua, A. A. H., Rebelo, L. P. N., and Lopes, J. N. C. (2011) Characteristics of aggregation in aqueous solutions of dialkylpyrrolidinium bromides, Journal of Colloid and Interface Science 360(2): 606-616 http://dx.doi.org/10.1016/j.jcis.2011.04.083

240. Tariq, M., Serro, A. P., Colaco, R., Saramago, B., Lopes, J. N. C., and Rebelo, L. P. N. (2011) Effect of alkyl chain length on the adsorption and frictional behaviour of 1-alkyl-3-methylimidazolium chloride ionic liquid surfactants on gold surfaces, Colloids and Surfaces A-Physicochemical and Engineering Aspects 377(1-3): 361-366 http://dx.doi.org/10.1016/j.colsurfa.2011.01.036

241. Tavares, A. F. N., Teixeira, M., Romão, C. C., Seixas, J. D., Nobre, L. S., and Saraiva, L. M. (2011) Reactive oxygen species mediate bactericidal killing elicited by carbon monoxide-releasing molecules, Journal of Biological Chemistry 286(30): 26708-26717 http://dx.doi.org/10.1074/jbc.M111.255752

242. Tavares, T., Contreras, M. D., Amorim, M., Pintado, M., Recio, I., and Malcata, F. X. (2011) Novel whey-derived peptides with inhibitory effect against angiotensin-converting enzyme: in vitro effect and stability to gastrointestinal enzymes, Peptides 32(5): 1013-1019 http://dx.doi.org/10.1016/j.peptides.2011.02.005

243. Tavares, T. G., Contreras, M. M., Amorim, M., Martin-Alvarez, P. J., Pintado, M. E., Recio, I., and Malcata, F. X. (2011) Optimisation, by response surface methodology, of degree of hydrolysis and antioxidant and ACE-inhibitory activities of whey protein hydrolysates obtained with cardoon extract, International Dairy Journal 21(12): 926-933 http://dx.doi.org/10.1016/j.idairyj.2011.05.013

244. Tavares, T. G., Monteiro, K. M., Possenti, A., Pintado, M. E., Carvalho, J. E., and Malcata, F. X. (2011) Antiulcerogenic activity of peptide concentrates obtained from hydrolysis of whey proteins by proteases from Cynara cardunculus, International Dairy Journal 21(12): 934-939 http://dx.doi.org/10.1016/j.idairyj.2011.06.004

245. Teixeira, A. P., Dias, J. M. L., Carinhas, N., Sousa, M., Clemente, J. J., Cunha, A. E., von Stosch, M., Alves, P. M., Carrondo, M. J. T., and Oliveira, R. (2011) Cell functional enviromics: unravelling the function of environmental factors, BMC Systems Biology 5, ART92 http://dx.doi.org/10.1186/1752-0509-5-92

246. Teixeira, A. P., Duarte, T. M., Carrondo, M. J. T., and Alves, P. M. (2011) Synchronous fluorescence spectroscopy as a novel tool to enable PAT applications in bioprocesses, Biotechnology and Bioengineering 108(8): 1852-1861 http://dx.doi.org/10.1002/bit.23131

247. Teixeira, A. P., Duarte, T. M., Oliveira, R., Carrondo, M. J. T., and Alves, P. M. (2011) High-throughput analysis of animal cell cultures using two-dimensional fluorometry, Journal of Biotechnology 151(3): 255-260 http://dx.doi.org/10.1016/j.jbiotec.2010.11.015

248. Testa, F., Mastronicola, D., Cabelli, D. E., Bordi, E., Pucillo, L. P., Sarti, P., Saraiva, L. M., Giuffre, A., and Teixeira, M. (2011) The superoxide reductase from the early diverging eukaryote Giardia intestinalis, Free Radical Biology and Medicine 51(8): 1567-1574 http://dx.doi.org/10.1016/j.freeradbiomed.2011.07.017

249. Tome, L. C., Freire, M. G., Rebelo, L. P. N., Silvestre, A. J. D., Neto, C. P., Marrucho, I. M., and Freire, C. S. R. (2011) Surface hydrophobization of bacterial and vegetable cellulose fibers using ionic liquids as solvent media and catalysts, Green Chemistry 13(9): 2464-2470 http://dx.doi.org/10.1039/c1gc15432j

250. Tome, L. C., Goncalves, C. M. B., Boaventura, M., Brandao, L., Mendes, A. M., Silvestre, A. J. D., Neto, C. P., Gandini, A., Freire, C. S. R., and Marrucho, I. M. (2011) Preparation and evaluation of the barrier properties of cellophane membranes modified with fatty acids, Carbohydrate Polymers 83(2): 836-842 http://dx.doi.org/10.1016/j.carbpol.2010.08.060

251. Torres, V. M., Posa, M., Srdjenovic, B., and Simplicio, A. L. (2011) Solubilization of fullerene C-60 in micellar solutions of different solubilizers, Colloids and Surfaces B-Biointerfaces 82(1): 46-53 http://dx.doi.org/10.1016/j.colsurfb.2010.08.012

252. Tostoes, R. M., Leite, S. B., Miranda, J. P., Sousa, M., Wang, D. I. C., Carrondo, M. J. T., and Alves, P. M. (2011) Perfusion of 3D encapsulated hepatocytes-a synergistic effect enhancing long-term functionality in bioreactors, Biotechnology and Bioengineering 108(1): 41-49 http://dx.doi.org/10.1002/bit.22920

253. Varanda, C., Felix, M. D., Soares, C. M., Oliveira, S., and Clara, M. I. (2011) Specific amino acids of Olive mild mosaic virus coat protein are involved in transmission by Olpidium brassicae, Journal of General Virology 92(9): 2209-2213 http://dx.doi.org/10.1099/vir.0.032284-0

254. Vaz, M., Maroco, J., Ribeiro, N., Gazarini, L. C., Pereira, J. S., and Chaves, M. M. (2011) Leaf-level responses to light in two co-occurring Quercus (Quercus ilex and Quercus suber): leaf structure, chemical composition and photosynthesis, Agroforestry Systems 82(2): 173-181 http://dx.doi.org/10.1007/s10457-010-9343-6

255. Veiga, H., Jorge, A. M., and Pinho, M. G. (2011) Absence of nucleoid occlusion effector Noc impairs formation of orthogonal FtsZ rings during *Staphylococcus aureus* cell division, Molecular Microbiology 80(5): 1366-1380 http://dx.doi.org/10.1111/j.1365-2958.2011.07651.x

256. Veiros, L. F., Gamelas, C. A., Calhorda, M. J., and Romão, C. C. (2011) Chemoselective sulfide and sulfoxide oxidations by CpMo(CO)(3)Cl/HOOR: a DFT mechanistic study, Organometallics 30(6): 1454-1465 http://dx.doi.org/10.1021/om101044f

257. Venceslau, S. S., Matos, D., and Pereira, I. A. C. (2011) EPR characterization of the new Qrc complex from sulfate reducing bacteria and its ability to form a supercomplex with hydrogenase and TpIc(3), FEBS Letters 585(14): 2177-2181 http://dx.doi.org/10.1016/j.febslet.2011.05.054

258. Vicente, T., Fabar, R., Alves, P. M., Carrondo, M. J. T., and Mota, J. P. B. (2011) Impact of ligand density on the optimization of ion-exchange membrane chromatography for viral vector purification, Biotechnology and Bioengineering 108(6): 1347-1359 http://dx.doi.org/10.1002/bit.23058

259. Vicente, T., Mota, J. P. B., Peixoto, C., Alves, P. M., and Carrondo, M. J. T. (2011) Rational design and optimization of downstream processes of virus particles for biopharmaceutical applications: current advances, Biotechnology Advances 29(6): 869-878 http://dx.doi.org/10.1016/j.biotechadv.2011.07.004

260. Vicente, T., Roldao, A., Peixoto, C., Carrondo, M. J. T., and Alves, P. M. (2011) Large-scale production and purification of VLP-based vaccines, Journal of Invertebrate Pathology 107(suppl.): S42-S48 http://dx.doi.org/10.1016/j.jip.2011.05.004

261. Viegas, S. C., Silva, I. J., Saramago, M., Domingues, S., and Arraiano, C. M. (2011) Regulation of the small regulatory RNA MicA by ribonuclease III: a target-dependent pathway, Nucleic Acids Research 39(7): 2918-2930 http://dx.doi.org/10.1093/nar/gkq1239

262. Vieira, H. L. A., Alves, P. M., and Vercelli, A. (2011) Modulation of neuronal stem cell differentiation by hypoxia and reactive oxygen species, Progress in Neurobiology 93(3): 444-455 http://dx.doi.org/10.1016/j.pneurobio.2011.01.007

263. Yanez, F., Martikainen, L., Braga, M. E. M., Alvarez-Lorenzo, C., Concheiro, A., Duarte, C. M. M., Gil, M. H., and de Sousa, H. C. (2011) Supercritical fluid-assisted preparation of imprinted contact lenses for drug delivery, Acta Biomaterialia 7(3): 1019-1030 http://dx.doi.org/10.1016/j.actbio.2010.10.003

Articles not indexed in ISI-WoS

1. Braga M. E. M., Costa V. P., Pereira M. J. T., Fiadeiro P. T., Gomes A.P. A. R., Duarte C. M. M. and de Sousa H. C. (2011)Effects of operational conditions on the supercritical solvent impregnation of acetazolamide in Balafilcon A commercial contact lenses. International Journal of Pharmaceutics 420(2): 231-243

2. Brito, J. A., Saffon, N., Gomez, M., and Royo, B. (2011)cis-dioxomolybdenum(VI) complexes containing chiral ligands: synthesis and catalytic application in olefin epoxidation, Current Inorganic Chemistry 1(2): 131-139 http://dx.doi.org/10.2174/1877945X11101020131

3. Delgado, A., Catulo, L., Peres, C. M., and Peres, C. (2011) Azeitona de mesa em Portugal, valor nutricional e perspectivas para novas utilizações, Actas Portuguesas de Horticultura 14: 109-119

4. Lopes J. N. C. and Rebelo L.P.N. (2011) Ionic liquids and reactive azeotropes: the continuity of the aprotic and protic classes and their relation to molten salts, Molten Salts & Ionic Liquids 2011-Fray International Symposium 3: 559-563.

5. Oliveira, T. F., Franklin, E., Afonso, J. P., Khan, A. R.,Oldham, N. J., Pereira, I. A. C., and Archer, M. (2011) Structural insights into dissimilatory sulfite reductases: Structure of desulforubidin from Desulfomicrobium norvegicum, Frontiers in Microbiology 2 http://dx.doi.org/10.3389/fmicb.2011.00071

6. Pereira, I. A. C., Ramos, A. R., Grein, F., Marques, M. C., Da Silva, S. M., and Venceslau, S. S. (2011) A comparative genomic analysis of energy metabolism in sulfate reducing bacteria and archaea, Frontiers in Microbiology 2 http://dx.doi.org/10.3389/fmicb.2011.00069

7. Peres, C. M., Alves, M., Catulo, L., Hérnandez, A., and Peres, C. (2011) Inovação em produtos tradicionais – azeitona de mesa no caminho para a produção de um produto probiótico, Revista da APH 107: 36-38

8. Pinto, M. P., Santos, C. N., Henriques, C., Lima, G., and Quedas, F. (2011) Lycopene content and antioxidant capacity of Portuguese watermelon fruits, Electronic Journal of Environmental, Agricultural and Food Chemistry 10, 2090-2097

9. Sanches, S., Barreto Crespo, M. T., and Pereira, V. J. (2011) Fugacity in the environment and wastewater removal predictions of toxic xenobiotics, Global Journal of Environmental Science and Technology 1: 8

10. Tavares, L., Alves, P. M., Ferreira, R. B., and Santos, C. (2011) Comparison of different methods for DNA-free RNA isolation from SK-N-MC neuroblastoma, BMC Research Notes 4(1): 3 http://dx.doi.org/10.1186/1756-0500-1-140

11. Veith, A., Urich, T., Seyfarth, K., Protze, J., Frazao, C., and Kletzin, A. (2011) Substrate pathways and mechanisms of inhibition in the sulfur oxygenase reductase of Acidianus ambivalens, Frontiers in Microbiology 2 http://dx.doi.org/10.3389/fmicb.2011.00037

Book Chapters

1. Amaro, H. M., and Malcata, F. X. (2011) Carotenoids from microalgae and cyanobacteria: features, production and applications, In Carotenoids: properties, effects and diseases (Yamaguchi, M., Ed.), Nova Science Publishers, Hauppauge, NY, USA

2. Bento, I., Louro, R. O., Soares, C. M., and Carrondo, M. A. (2011) Tetraheme cytochromes C3, In Encyclopedia of Inorganic and Bioinorganic Chemistry, John Wiley & Sons, Ltd. http://dx.doi.org/10.1002/9781119951438.eibc0644

3. Campos, A., Almeida, A. M., and Coelho, A. (2011) Blue native PAGE, basis of the technique and its use in organelle study: the mitochondrial complexome, In Mitochondria: structure,functions and dysfunctions (Svensson, L., Ed.), pp 975-982,Nova Science Publishers, Haupagge, NY, USA

4. Chaves, M. M., Costa, J. M., and Saibo, N. (2011) Recent advances in photosynthesis under drought and salinity, In Plant responses to drought and salinity stress: developments in a post-genomic era (Turkan, I., Ed.), pp 49-104, Academic Press Ltd-Elsevier Science Ltd, London.
http://dx.doi.org/10.1016/b978-0-12-387692-8.00003-5

5. Coelho, L., Silva, S. F. O., Tafulo, P. A. R., Santos, J. L.,Frazao, O., and Malcata, F. X. (2011) Optical fibre hydrogen sensors based on palladium coatings, In International Conference on Applications of Optics and Photonics (Costa, M. F. M., Ed.),Spie-Int Soc Optical Engineering, Bellingham.http://dx.doi.org/10.1117/12.892014

6. Giao, M. S., Guedes, A. C., and Malcata, F. X. (2011)Antioxidants from wild plants: sources, features and assays, In Wild Plants: identification, uses and conservation (Davis, R. E., Ed.), pp 63-104, Nova Science Publishers, Hauppauge, NY, USA

7. Gonçalves V. L., Vicente J. B., Saraiva L. M. and Teixeira M.(2011) Flavodiiron proteins and their role in cyanobacteria. In G. A. Peschek et al. (Eds.), Bioenergetic processes of cyanobacteria: from evolutionary singularity to ecological diversity (pp. 631-653). Dordrecht: Springer Netherlands

8. Kongo, J. M., and Malcata, F. X. (2011) Azorean traditional cheesemaking: a case study pertaining to a unique food chain, In Food chains: new research (Jensen, M. A., and Muller, D. W., Eds.), pp 137-170, Nova Science Publishers, Hauppauge, NY, USA

9. Matos R. G., Pobre V., Reis F. P., Malecki M., Andrade J. M. and Arraiano C. M. (2011) Structure and Degradation Mechanisms of 3' to 5' Exoribonucleases, In Ribonucleases (A. W. Nicholson, Ed.), pp 193-222, Springer Berlin, Heidelberg (Nucleic Acids and Molecular Biology, 26) http://dx.doi.org/10.1007/978-3-642-21078-5_8

10. Neves, S. S., and Forrest, L. L. (2011) Plant DNA sequencing for phylogenetic analyses: from plants to sequences, In Network Biology (Cagney, G., and Emili, A., Eds.), pp 183-235, Humana Press.http://dx.doi.org/10.1007/978-1-61779-276-2_10

11. Neves, S. S. (2011) Eleusine, In Wild crop relatives: genomic and breeding resources (Kole, C., Ed.), pp 113-133, Springer Berlin Heidelberg, Heidelberg.
http://dx.doi.org/10.1007/978-3-642-14255-0_7

12. Newton, A. C., Akar, T., Baresel, J. P., Bebeli, P. J., Bettencourt, E., Bladenopoulos, K. V., Czembor, J. H., Fasoula, D. A., Katsiotis, A., Koutis, K., Koutsika-Sotiriou, M., Kovacs, G., Larsson, H., Carvalho, M. A. A. P., Rubiales, D., Russell, J., Santos, T. M. M. d., and Patto, M. C. V. (2011) Cereal landraces for sustainable agriculture, In Sustainable agriculture (Lichtfouse, E., Hamelin, M., Navarrete, M., and Debaeke, P., Eds.), pp 147-186, Springer Netherlands, Dordrecht.
http://dx.doi.org/10.1007/978-94-007-0394-0_10

13. Pereiro, A. B., and Rodriguez, A. (2011) Applications of ionic liquids in azeotropic mixtures separations, In Ionic liquids: applications and perspectives (Kokorin, A., Ed.), pp 225-242,InTech, [S.l]

14. Peres, C. (2011) As bactérias lácticas na produção de azeitona probiótica, In AGRORRURAL: contributos científicos (Instituto Nacional de Recursos Biológicos, I. P., and Imprensa Nacional-Casa da Moeda, S. A., Eds.), pp 82-91, Imprensa Nacional-Casa da Moeda, S.A., Lisboa

15. Pimentel, L. L., Crespo, M. T. B., and Malcata, F. X. (2011)Introduction: a journey to the world of enterococcus, In Enterococcus and safety (Semedo-Lemsaddek, T., Crespo, M. T. B., and Tenreiro, R., Eds.), Nova Science Publishers, Hauppauge, NY, USA

16. Ramos, O. S., and Malcata, F. X. (2011) Edible and biodegradable packaging for food storage In Food storage (Cohen, G., and Levin, C. M., Eds.), Nova Science Publishers,Hauppauge, NY, USA

17. Rodrigues, A. F., Alves, P. M., and Coroadinha, A. S. (2011)Production of retroviral and lentiviral gene therapy vectors: challenges in the manufacturing of lipid enveloped virus, In Viral gene therapy (Xu, K., Ed.), InTech, [S.l.]

18. Rodrigues, M. L., Pereira, I. A. C., and Archer, M. (2011) The NrfH Cytochrome c Quinol Dehydrogenase, In Encyclopedia of Inorganic and Bioinorganic Chemistry, John Wiley &Sons, Ltd. http://dx.doi.org/10.1002/9781119951438.eibc0648

19. Roldão, A., Silva, A. C., Mellado, M. C. M., Alves, P. M., and Carrondo, M. J. T. (2011) 1.47 - Viruses and virus-like particles in biotechnology: fundamentals and applications, In Comprehensive Biotechnology (Second Edition) (Murray, M.-Y., Ed.), pp 625-649, Academic Press, Burlington.
http://dx.doi.org/10.1016/B978-0-08-088504-9.00072-6

20. Santos, H., Lamosa, P., Borges, N., Gonçalves, L. G., Pais,T., and Rodrigues, M. V. (2011) Organic compatible solutes of prokaryotes that thrive in hot environments: the importance of ionic compounds for thermostabilization, In Extremophiles handbook (Horikoshi, K., Antranikian, G., Bull, A. T., Robb, F. T., and Stetter,K. O., Eds.), pp 497-520, Springer Japan.
http://dx.doi.org/10.1007/978-94-007-1235-5_4

21. Taga, M. E., and Xavier, K. B. (2011) Methods for analysis of bacterial autoinducer-2 production, In Current Protocols in Microbiology (Coico, R., Kowalik, T., Quarles, J. M., Stevenson, B., and Taylor, R. K., Eds.), pp 1C.1.1–1C.1.15, John Wiley & Sons, Inc., [S.l.].
http://dx.doi.org/10.1002/9780471729259.mc01c01s23

22. Teixeira, A. P., Oliveira, R., Alves, P. M., and Carrondo, M. J. T. (2011) 2.63 - Online control strategies, In Comprehensive Biotechnology (Second Edition) (Murray, M.-Y., Ed.), pp 875-882, Academic Press, Burlington.
http://dx.doi.org/10.1016/B978-0-08-088504-9.00143-4

23. Trindade, I., Santos, D., Dalmay, T., and Fevereiro, P. (2011)Facing the environment: small RNAs and the regulation of gene expression under abiotic stress in plants, In Abiotic stress response in plants - physiological, biochemical and genetic perspectives (Shanker, A., and Venkateswarlu, B., Eds.), pp 113-136, InTech, [S.l.]

24. Vaz Patto, M. C., Hanbury, C. D., Van Moorhem, M., Lambein,F., Ochatt, S., and Rubiales, D. (2011) Grass pea (Lathyrus sativus L.), In Genetics, genomics and breeding of cool season grain legumes (Perez de la Vega, M., Torres, A. M., Cubero, J. I.,and Kole, C. R., Eds.), pp 151-204, CRC Press / Science Publishers Inc,Enfield, NH

25. Veiga, A. (2011) Food defence and security: the new reality, In Environmental security and ecoterrorism (Alpas, H., Berkowicz, S. M. M.,and Ermakova, I., Eds.), pp 39-54, Springer Netherlands, Dordrecht.http://dx.doi.org/10.1007/978-94-007-1235-5_4

26. Vicente, J. B., Carrondo, M. A., Teixeira, M., and Frazão, C.(2011) Flavodiiron Proteins: Nitric Oxide and/or Oxygen Reductases, In Encyclopedia of Inorganic and Bioinorganic Chemistry, John Wiley & Sons, Ltd.
http://dx.doi.org/10.1002/9781119951438.eibc0645

Running Projects 2011

Projects coordinated by ITQB Researchers/ Projects where ITQB Researcheres participate

Projects funded by the FCT

	Title	Project reference	Principal Investigator	Amout €	Period
1	MIT – Bioengineering Systems		Claudio Soares	446.672,00	2006-2012
2	The wild relatives of Beta: genetic diversity assessment and biochemical studies	PTDC/AGR-AAM/73144/2006	Cândido Pinto Ricardo	46.740,00	2007-2012
3	Towards the understanding of the energetic and structural interplay between metal sites and protein folding	PTDC/QUI/70101/2006	Cláudio Gomes	70.800,00	2008-2011
4	Analysis of the natural variability in Rice (Oryza sativa L.) through EcoTILLING in salt and cold tolerance genes	PTDC/AGR-GPL/70920/2006	Margarida Oliveira	212.284,00	2008-2011
5	Regulatory networks on *Staphylococcus aureus* cell wall physiology	PTDC/BIA-MIC/71168/2006	Hermínia de Lencastre	136.979,00	2008-2011
6	Multilevel modelling of physical and biochemical processes in phototrophic biofilms	PTDC/BIA-MIC/72512/2006	Andreas Bohn	94.000,00	2008-2011
7	Molecular design of novel aza-bridged calixarene receptors for medicinal chemistry: encapsulation of lanthanide ions and chiral resolution of drugs	PTDC/QUI/68582/2006	Rita Delgado	16.620,00	2008-2011
8	Protein glycation and transthyretin amyloidogenesis in yeast: A model system of neurodegenerative amyloid diseases	PTDC/QUI/70610/2006	Ana Coelho	48.050,00	2008-2011
9	Integrated Isolation, Bio- and Organic-Synthetic Transformations of Portuguese Natural Resources	PTDC/QUI/73061/2006	Cristina Silva Pereira	30.000,00	2008-2011
10	Understanding how hyperthermophilic microorganisms cope with heat stress: the role of unique polyolphosphodiester compounds	PTDC/BIA-MIC/71146/2006	Helena Santos	129.000,00	2008-2012
11	Cromatin remodelling and abiotic stresses responses in rice	PTDC/BIA-BCM/64215/2006	Ana Paula Santos	52.000,00	2008-2012
12	Anchoring Basic Parameters for Fundamental Predictive Models in Liquid Salt Systems	PTDC/QUI/72903/2006	José Esperança	10.800,00	2009-2011
13	Sol-gel entrapped cutinase: Understanding enzyme/matrix interactions via fluorescence, NMR and DRIFT spectroscopies, and site-directed mutagenesis	PTDC/QUI/64744/2006	Isabel Sá Nogueira	15.000,00	2009-2011
14	Rede Nacional de Espectrometria de Massa		Ana Coelho	113.595,00	2009-2011
15	Transcriptional regulation of the genes encoding the flavodiiron protein ROO and the cytochrome BD respectively of the anaerobe bacterium Desulfovibrio gigas upon nitrosative stress	PTDC/BIA-MIC/70650/2006	Claudina Rodrigues Pousada	189.400,00	2009-2012
16	Development of new macrocyclic bifunctional chelators for metalloradiopharmaceuticals	PTDC/QUI/67175/2006	Rita Delgado	101.227,00	2009-2012
17	Investigation of redox-state-specific protein-protein interactions and energy transduction in the electron transfer chains of sulfate reducing bacteria	PTDC/QUI/65640/2006	David Turner	79.085,00	2009-2012
18	Waste Elimination using Ionic Liquid Bio-Engineered Eukariotic Organisms	PTDC/QUI/71331/2006	José Esperança	50.700,00	2009-2012
19	Impact of the conjugate pneumococcal vaccines on pneumococcal ecology	PTDC/SAU-ESA/65048/2006	Raquel Sá Leão	153.667,00	2009-2012
20	Site-specific labeling of proteins in vitro, in vivo and at the cell surface by a novel type of transglutaminase isolated from spores of Bacillus subtilis	PTDC/BIO/73946/2006	Adriano Henriques	87.555,00	2009-2012

	Title	Project reference	Principal Investigator	Amout €	Period
21	Anthocyanins as natural photoprotectors	PTDC/QUI/65728/2006	Eurico de Melo	9.600,00	2009-2012
22	Respiratory rehabilitation in Amyotrophic Lateral Sclerosis: clinical and biochemical impact	PIC/IC/82765/2007	Júlia Costa	86.968,00	2009-2012
23	Structural and functional study of the proteins mediating electron transfer between microorganism and solid substrates with relevance for bio-energy production	MIT-PT/BS-BB/0014/2008	Ricardo Louro	147.936,00	2009-2012
24	Pathogenomics of increased Clostridium difficile virulence	ERA-PTG/SAU/0002/2008	Adriano Henriques	181.800,00	2009-2012
25	Bio-based production of chemical building blocks: Corynebacterium glutamicum as a platform for new and efficient bioprocesses.	ERA-IB-BIO/0002/2008	Helena Santos	185.424,00	2009-2012
26	Development of ultras-sensitive detection methodos and plant Nano-Vacinnes for the Fungi Fusarium spp using nanotechnological devices	Nano/NTec-SQA/0131/2007	Abel Oliva	119.792,00	2009-2012
27	Unraveling the mechanisms of nitrosative stress resistance of Helicobacter pylori: relevance for immune subversion and infectiousness	PTDC/SAU-MII/098086/2008	Marta Justino	153.144,00	2010-2012
28	Functional study of a diiron protein with the unique role of repairing iron-sulphur clusters	PTDC/BIA-PRO/098224/2008	Lígia Saraiva	199.980,00	2010-2012
29	Unravelling pneumococcal interactions in the nasopharyngeal niche	PTDC/BIA-BEC/098289/2008	Raquel Sá Leão	191.740,00	2010-2012
30	Engineering mini Superoxide Dismutases with tunable redox properties	PTDC/QUI-BIQ/098406	Olga Iranzo	162.888,00	2010-2012
31	Proteomics of Bacterial Cell Division	PTDC/BIA-MIC/098637/2008	Adriano Henriques	190.991,00	2010-2012
32	Development of imidazolium and oxazoline derivatized cyclopentadienyl compounds for biphasic catalysis and asymmetric processes	PTDC/QUI-QUI/098682/2008	Beatriz Royo Cantabrana	62.992,00	2010-2012
33	Nanopore based single-molecule ionic current spectroscopy for nanoparticle based catalysis	PTDC/QUI-QUI/099599/2008	Yann Astier	61.352,00	2010-2012
34	Functional analysis of new transcriptional regulators involved in abiotic stress responses in rice	PTDC/BIA-BCM/099836/2008	Nelson Saibo	140.760,00	2010-2012
35	PneumoCaPTS - Regulation of virulence factors by glucose-dependent catabolite repression	PTDC/BIA-MIC/099963/2008	Ana Rute Neves	198.804,00	2010-2012
36	Oxidative stress response mechanisms in Deinococcus radiodruans	PTDC/QUI-BIQ/100007/2008	Célia Romão	88.488,00	2010-2012
37	Structural and functional investigation of type II NADH:quinone oxidoreductases	PTDC/BIA-PRO/100288/2008	Manuela Pereira	124.620,00	2010-2012
38	Energy Transduction by respiratory Complex I	PTDC/QUI-BIQ/100302/2008	Manuela Pereira	124.620,00	2010-2012
39	Small Scale Structural Metallomics Project in Deinococcus radiodurans	PTDC/BIA-PRO/100365/2008	Célia Romão	132.888,00	2010-2012
40	Understanding structure-activity relationships in peptide dendrimers using a molecular modelling approach	PTDC/QUI-QUI/100416/2008	António Baptista	131.220,00	2010-2012
41	Lost in Septation: Characterization of a novel regulatory pathway of cell division and morphology centered on the bolA gene	PTDC/EBB-BIO/100507/2008	Cecília Arraiano	149.000,00	2010-2012
42	Examining a Multifunctional RNA Degrading Machine: the Arabidopsis Catalytic subunit of the Exosome	PTDC/AGR-GPL/100509/2008	Cecília Arraiano	163.491,00	2010-2012

	Title	Project reference	Principal Investigator	Amout €	Period
43	Tracking the synthesis of the Chlamydia cell wall - a biological paradox in intracellular and evasive bacteria	PTDC/BIA-MIC/100747/2008	Sérgio Filipe	160.000,00	2010-2012
44	Metabolic circuits in inflicted bacterial cell death	PTDC/BIA-MIC/101375/2008	Rita Sobral	156.825,00	2010-2012
45	Identification of genes responsible for drought tolerance in Jatropha curcas, an emerging biodiesel plant	PTDC/AGR-GPL/101435/2008	Margarida Oliveira	129.696,00	2010-2012
46	Innovative Strategies to Combat Foodborne Pathogens: Examining the Role of RNases and Small RNAs	PTDC/CVT/102293/2008	Cecília Arraiano	175.588,00	2010-2012
47	Breaking Down The Wall - Microbial Hemicellulases for saccharification	PTDC/AGR-AAM/102345/2008	Isabel Sá Nogueira	125.328,00	2010-2012
48	Molecular mechanisms of energy transduction	PTDC/BIA-PRO/103310/2008	Miguel Teixeira	199.400,00	2010-2012
49	Structural biology of membrane transporters from Archaea	PTDC/BIA-PRO/103718/2008	Margarida Archer	151.800,00	2010-2012
50	Metabolic engineering of an anaerobic bacterium for biological hydrogen production	PTDC/BIA-MIC/104030/2008	Inês C. Pereira	176.484,00	2010-2012
51	Molecular characterization of organ regeneration in starfish - a proteomic approach toward the discovery of new regeneration factors	PTDC/MAR/104058/2008	Ana Coelho	64.800,00	2010-2012
52	Including protonation effects in the simulation of peptides and proteins in membrane environments	PTDC/BIA-PRO/104378/2008	António Baptista	126.240,00	2010-2012
53	The best of two worlds: Ionic liquids as Active Pharmaceutical Ingredients	PTDC/EQU-EPR/104554/2008	Isabel Marrucho	127.068,00	2010-2012
54	Mechanisms of post-transcriptional regulation in the Drosophila Unfolded Protein Response	PTDC/BIA-BCM/105217/2008	Pedro Domingos	199.152,00	2010-2012
55	Study of pH-dependent protein misfolding using state-of-the-art molecular modeling methods	PTDC/QUI-BIQ/105238/2008	António Baptista	151.188,00	2010-2012
56	Integrative Bioinformatics for Molecular Epidemiology of gram-positive pathogens	PTDC/EIA-EIA/105245/2008	Jonas Almeida	110.000,00	2010-2012
57	Exploiting the type II phosphomannose isomerase BceAJ as a new target for the development of new antimicrobials and for biotechnological applications	PTDC/EBB-BIO/098352/2008	Carlos Frazão	48.432,00	2010-2012
58	AsyFlower - Evolution of the gene regulatory network controlling flower dorsoventral asymmetry	PTDC/AGR-GPL/098873/2008	Jorge Almeida	17.340,00	2010-2012
59	AQUAVITIS - Understanding water transport in Vitis vinifera: biochemical characterization of aquaporins upon their heterologous expression in yeast	PTDC/AGR-AAM/099154/2008	Rita Francisco/Manuela Chaves	13.200,00	2010-2012
60	Spheres of Ecosystem Response to Nitrogen (SERN): A case study in a Mediterranean-type ecosystem in southern Portugal	PTDC/BIA-BEC/099323/2008	Alla Shvaleva	53.136,00	2010-2012
61	Please MOC it! - Metal-Organo-Catalysis an emerging concept	PTDC/QUI-QUI/099389/2008	Beatriz Royo	12.000,00	2010-2012
62	Phenotypic plasticity of maritime pine to climate change	PTDC/AGR-CFL/099614/2008	Manuela Chaves	9.000,00	2010-2012
63	Genetic analysis of suber differentiation in Quercus suber L	PTDC/AGR-AAM/100465/2008	Cândido Pinto Ricardo	21.600,00	2010-2012
64	GrapeBerryFactory - Sugars, acids, phenolics and water on grape berry development and ripening	PTDC/AGR-ALI/100636/2008	Manuela Chaves	30.000,00	2010-2012
65	T.caespititius chemotypes: molecular, genetic and biotechnological approaches to understand chemical polymorphism	PTDC/AGR-GPL/101334/2008	Margarida Oliveira	25.040,00	2010-2012

	Title	Project reference	Principal Investigator	Amout €	Period
66	Molecular Modeling of Ionic Liquids: from Structure to Thermodynamics	PTDC/QUI-QUI/101794/2008	Luís Paulo N. Rebelo	33.600,00	2010-2012
67	Plant responses to trace element toxicity: cellular mechanisms for detoxification and tolerance	PTDC/AGR-AAM/102821/2008	Ana Coelho	36.000,00	2010-2012
68	Separation of aromatic/aliphatic hydrocarbon mixtures by simulated countercurrent adsorption using nonvolatile solvents	PTDC/EQU-EQU/102949/2008	José Esperança	28.728,00	2010-2012
69	Development of Novel Organic Energetic Materials based on Ionic Liquids	PTDC/CTM/103664/2008	Luís Paulo N. Rebelo	42.427,00	2010-2012
70	Valorization of the Mediterranean energy crops giant reed and cardoon by integrated bio-chemical conversion to dissolving grade pulps, fuel ethanol, xylitol and lignin-based products - a complex LCF biorefinery concept	PTDC/AGR-CFL/103840/2008	Lígia Martins	27.956,00	2010-2012
71	The Development and Rationalization of Stereoselective Reactions in Some Chiral Systems. A mixed experimental and theoretical approach	PTDC/QUI-QUI/104056/2008	Christopher Maycock	40.900,00	2010-2012
72	BIOMYR: Towards the metabolic engineering of beta-myrcene pathway of Pseudomonas sp. M1: functional genomics and structural biochemistry approaches	PTDC/EBB-BIO/104980/2008	Carlos Frazão	32.242,00	2010-2012
73	Mycobacterium Tuberculosis: bioinformatic and structural strategies towards treatment	NEW INDIGO ERA NET	Patrick Groves	13.600,00	2010-2012
74	Rede Nacional de Ressonância Magnética Nuclear		Helena Santos	389.144,00	2010-2012
75	Mind the gap: How extracellular respiration is linked across the periplasmic space to the cytoplasmic oxidation of substrates. A key step in bioenergy harvesting	PTDC/BIA-PRO/098158/2008	Ricardo Louro	148.320,00	2010-2013
76	The cell wall synthetic machinery of *Staphylococcus aureus* and its response to the presence of antibiotics	PTDC/BIA-MIC/099151/2008	Mariana Pinho	198.420,00	2010-2013
77	Single cell studies of the action of antibiotics	PTDC/BIA-BCM/099152/2008	Mariana Pinho	180.000,00	2010-2013
78	Breeding for salinity tolerance in rice and identification of key genes/proteins affecting seed set under salt stress	PTDC/AGR-AAM/099234/2008	Sónia Negrão	137.916,00	2010-2013
79	Exploiting antioxidants, flavours and aromas diversity on 'broa' bread maize breeding	PTDC/AGR-ALI/099285/2008	Carlota Vaz Patto	103.992,00	2010-2013
80	Functional analyses of inclusion membrane proteins of Chlamydia trachomatis	PTDC/SAU-MII/099623/2008	Jaime Mota	199.377,00	2010-2013
81	Integration of transcriptomic, proteomic and metabolomics profiles to understand the role of T6P in the water deficit response and recovery in Medicago truncatula	PTDC/AGR-GPL/099866/2008	Susana Araújo	189.382,00	2010-2013
82	Study of an ancient mode of energy metabolism: the dissimilatory reduction of sulfite	PTDC/QUI-BIQ/100591/2008	Inês C. Pereira	173.736,00	2010-2013
83	Glycosylation and Lewis X motif in neuronal tissue	PTDC/SAU-NEU/100724/2008	Júlia Costa	100.000,00	2010-2013
84	Disentangling single electron transfer steps in an enzyme: experimental and theoretical approach	PTDC/BIA-PRO/100791/2008	Smilja Todorovic	120.756,00	2010-2013
85	PneumoSyS - A systems biology approach to the role of pneumococcal carbon metabolism in colonization and invasive disease.	PTDC/SAU-MII/100964/2008	Ana Rute Neves	199.650,00	2010-2013
86	Mössbauer spectroscopy and density functional theory studies of NO and O2 reductases	PTDC/BIA-PRO/101837/2008	Filipe Oliveira	148.452,00	2010-2013

	Title	Project reference	Principal Investigator	Amout €	Period
87	Hybrid electro-optical microfluidic device for single cell analysis	PTDC/SAU-BEB/102247/2008	Abel Oliva	188.000,00	2010-2013
88	MICROPHYTE: Metabolic engIneering of Chlamydomonas and enviRonmental OPtimization for HYdrogen producTion and rElease	PTDC/EBB-EBI/102728/2008	F. Xavier Malcata	140.000,00	2010-2013
89	Exploiting transcriptional variation to identify genes underlying quantitative resistance to major grain legume pathogens	PTDC/AGR-GPL/103285/2008	Carlota Vaz Patto	199.668,00	2010-2013
90	Regulation of synaptogenesis by kinase Cdk5 and Shank3: Biochemical and Structural Studies	PTDC/SAU-NEU/103720/2008	Margarida Archer	120.000,00	2010-2013
91	Developmental role of the IRE1/Xbp1 signaling pathway during photoreceptor differentiation in Drosophila melanogaster	PTDC/SAU-OBD/104399/2008	Pedro Domingos	120.000,00	2010-2013
92	Metallo Beta-hairpins: in search of new recyclable catalysts for greener chemistry	PTDC/QUI-QUI/105504/2008	Olga Iranzo	154.128,00	2010-2013
93	Control of Iron Homeostasis by the Yeast Activator proteins (Yaps) in eukaryotic cells	PTDC/BIA-MIC/108747/2008	Claudina R. Pousada	183.648,00	2010-2013
94	Sustainable membrane bioreactors for advanced wastewater treatment: a molecular approach	PTDC/EBB-EBI/098862/2008	Ana Coelho	18.320,00	2010-2013
95	Transgeneration evaluation of rice transcriptomic/proteomic alterations caused by genetic modifications and other stresses	PTDC/EBB-BIO/098983/2008	Margarida Oliveira	18.572,00	2010-2013
96	Nitrogen-fixing biofertilizers for gramineous crops	PTDC/AGR-AAM/100577/2008	Nuno Borges	21.600,00	2010-2013
97	Microbial contribution to the valorization of waste/by-products from biofuels production	PTDC/AAC-AMB/100790/2008	Helena Santos	12.000,00	2010-2013
98	Engineered biomimetics for large-scale enrichment of phosphoproteins	PTDC/EBB-BIO/102163/2008	Olga Iranzo	27.720,00	2010-2013
99	IMPROVIRON: IMproved PROductiVity and IRON nutrition in legume grains	PTDC/AGR-GPL/102861/2008	Cândido Pinto Ricardo	27.741,00	2010-2013
100	Assessment of genetic and genomic resources of Cork Oak: the basis towards a prospective management	PTDC/AGR-GPL/104966/2008	Célia Miguel	21.748,00	2010-2013
101	hCE- expression and characterization in in vitro and in silico models.	PTDC/EBB-BIO/111530/2009	Carlos Frazão	8.400,00	2011-2013
102	The pathogen's perspective of molecular plant-microbe-interactions: genes expressed during the infection process of coffee leaf rust- Hemileia vastarix.	PTDC/AGR-GPL/114949/2009	Rita Abranches	24.000,00	2011-2013
103	Sustainable catalysis based on N-heterocyclic carbene metal complexes	PTDC/QUI-QUI/110349/2009	Beatriz Royo	105.000,00	2011-2014
104	Polyphenols as protective agents in cellular models of alpha-synucleinopaties, in particular Parkinson's diseases.	PTDC/BIA-BCM/111617/2009	Ricardo B. Ferreira	121.979,00	2011-2014
105	Effect of environmental stresses on rice epigenome.	PTDC/BIA-BCM/111645/2009	Ana Paula Santos	79.613,00	2011-2014
106	Small immunoactive peptidoglycan (siPGN) derivates to modulate an host inflammatory response.	PTDC/SAU-IMU/111806/2009	Sérgio Filipe	123.954,00	2011-2014
107	Synthesis of peptidoglycan in *Streptococcus pneumoniae* - where, when and why is it necessary to branch?	PTDC/BIA-MIC/111817/2009	Sérgio Filipe	173.138,00	2011-2014
108	GRIM-19, a novel protein involved in cell apoptosis: struture-function characterization.	PTDC/BIA-PRO/113064/2009	Isabel Bento	95.441,00	2011-2014

	Title	Project reference	Principal Investigator	Amout €	Period
109	Proton transfer and proton pumping in haem-copper oxidases. Methodological dvelopments and their application to unravel the molecular mechanism.	PTDC/QUI-BIQ/113446/2009	Cláudio Soares	130.000,00	2011-2014
110	PhytoLac- Engineered Lactococcus lactics for the optimizes production of nutraceutical plant-derived polyphenols	PTDC/EBB-EBI/113727/2009	Ana Rute Neves	159.024,00	2011-2014
111	Studies on the struture/activity relationship of AI-2, a bacterial signalling molecule for inter-species communication.	PTDC/QUI-BIQ/113880/2009	Rita Ventura	137.000,00	2011-2014
112	Membrane fusion mechanism of Influenza Hemagglutinin: a simulation and biophysical approach.	PTDC/QUI-BIQ/114774/2009	Cláudio Soares	75.814,00	2011-2014
113	Solution struture and mode of action of the dimeric bacteriocin Lcn972	PTDC/QUI-BIQ/114904/2009	David Turner	78.000,00	2011-2014
114	Identification of plants extracts with protective action against bacterial enterotoxins belonging to AB5 group: cholera toxin, heat labile toxin from Escherichia coli and Shiga toxin (dysentery).	PTDC/QUI-BIQ/115298/2009	Patrick Groves	73.000,00	2011-2014
115	Playing with the ionic character of ionic liquids	PTDC/QUE-FTT/116015/2009	Luís Paulo N. Rebelo	88.240,00	2011-2014
116	Search for candidate protein biomarkers of Coffea arabica resistance to Hemileia vastatrix (leaf rust)	PTDC/AGR-GPL/109990/2009	Cândido Pinto Ricardo	70.473,00	2011-2014
117	Hepatic toxicity in HIV-infected individuals exposed to nevirapine.	PTDC/SAU-TOX/111663/2009	Ana Coelho	19.200,00	2011-2014
118	Strutural determinants of superoxide reduction- A detoxification system essential for life.	PTDC/BIA-PRO/111940/2009	Célia Romão	22.200,00	2011-2014
119	On characterization polarity within phospholipid/cholesterol lipid bilayers and its effects in membrane enzymology.	PTDC/QUI-BIQ/112943/2009	Eurico de Melo	6.000,00	2011-2014
120	Deciphering grain filling mechanisms in Phaseolus vulgaris L. under water deficit.	PTDC/AGR-GPL/110244/2009	Pedro Fevereiro	41.400,00	2011-2014
121	Detoxification of nitric ixide and/or oxygen in pathogenic (anaerobic) microbes: exploring the molecular determinants of substrate selectivity	QUI-BIQ/111080/2009	Miguel Teixeira	47.160,00	2011-2014
122	Response to oxidative and nitrosative stress by Entamoeba histolytca: searching for new virlence factors	SAU-MIC/111447/2009	Miguel Teixeira	12.000,00	2011-2014
123	Patogenia da protína LANA do herpesvírus do sarcoma de Kaposi	HMSP-ICP/0021/2010	Mª Armenia Carrondo	304.238,00	2011-2014
124	Global analysis of antisense regulatory mechanisms in *Staphylococcus aureus*: ARMS	ERA-PTG/0002/2010	Susana Domingues	88.275,00	2011-2014
125	Characterisation of host cell pathways altered by effectors of Brucella, Chlamydia, and Coxiella: identification of novel therapeutic targets"	ERA-PT/0005/2010	Jaime Mota	120.000,00	2011-2014

Projects funded by Fundação Calouste Gulbenkian

126	Community-associated methicillin-resistant *Staphylococcus aureus* (CA-MRSA) in Portugal: a pilot study focusing on an emerging public health concern	MM/P-99911	Hermínia de Lencastre	61.918,00	2009-2012

Projects funded by European Comission (1)

127	Sustainable water use Securing Food production in dry areas of the mediterranean region (SWUP-MED)	HEALTH-F3-2008-223031	Manuela Chaves	233.160,00	2008-2012

	Title	Project reference	Principal Investigator	Amout €	Period
128	Structural Biology of Membrane Proteins (SBMPs)	PITN-GA-2008-211800	Margarida Archer	309.082,60	2008-2012
129	A comprehensive dissection of pneumococcal-host interactions (PNEUMOPATH)	HEALTH-F3-2009-222983	Hermínia de Lencastre	150.000,00	2009-2012
130	CONtrol of COmmunity-acquired MRSA: Rationale and Development of counteractions (CONCORD)	HEALTH-F3-2008-222718	Hermínia de Lencastre	202.512,00	2009-2012
131	Translational Research on Combating Antimicrobial Resistance (TROCAR)	HEALTH-F3-2008-22303	Hermínia de Lencastre	196.152,00	2009-2012
132	Strategies for organic and low-input integrated breeding and management (SOLIBAM)	245058	Carlota Vaz Pato	199.999,60	2010-2014
133	Parliaments and Civil Society in Technology Assessment (PACITA)	SIS-CT-2011-266649	Mara Almeida	206.248,45	2011-2015
134	Standarization and orthogonsalization of teh gene expression flow for robust engineering of NTN (new-to-nature) biologival properties (ST-FLOW)	289326	Cecília Arraiano	281.730,00	2011-2015
135	Transnational access and enhancement of integrated Biological Structure determination at synchrotron X-ray radiation facilities (BioStruct-X)	283570	Mª Armenia Carrondo	49.814,92	2011-2015

Individual fellowships by European Commission

136	Designing metallopeptides for the removal of superoxide radicals (MFRosPep)	PIRG03-GA-2008-230896	Olga Iranzo	100.000,00	2009-2013
137	Analysis of the cellular function of type III secretion effectors of Chlamydia trachomatis (CHLTRT3SE)	PERG03-GA-2008-230954	Jaime Mota	45.000,00	2009-2011
138	ER Stress and Photoreceptor Degeneration in Drosophila (DROSOERSTRESS)	PIRG03-GA-2008-230935	Pedro Domingos	100.000,00	2008-2012
139	Crystallization in ionic liquid solutions (CRYSTILS)	PERG-GA-2009-249182	Magdalena Kowacz	36.000,00	2010-2013
140	Spatial organization and dynamics of Escherichia coli RNA degradation machinery (RNaseDYNAMICS)	PIEF-GA-2009-254183	Michal Malacki	149.783,00	2010-2012
141	Structure of herperviral cell access (SHerpA)	PIEF-GA-2009-251982	Marco Patrone	204.903,00	2010-2012
142	New halogenated ionic liquids as a novel task-specific fluids (HALOGENLIS)	PIEF-GA-2009-252355	Ana Belen	153.864,00	2010-2012

Project funded by Ministry of National Defence

143	Chemical and Biological Single Molecule Detection Roaming Robot (SENTINEL)		Yann Astier	160.000,00	2010-2014

Project funded by Pfizer

144	Pneumo Y – Pneumococcal colonization patterns in young children living in urban and rural areas of Portugal in the era of the 13-valent conjugate vaccine.	WS857151	Raquel Sá Leão	225.000,00	2010-2012
145	Pneumococcal colonization patterns in the elderly living urban and rural areas of Portugal	0887X1-4629	Raquel Sá Leão	151.000,00	2010-2012

Project funded by SUDOE Interreg iv b programme

146	Approches Interdisciplinaires et strategies integrees pour les sciences du vivant et leurs applications	SOE1/P1/F079	Miguel Teixeira	168.217,00	2009-2012

Subcontracting Parties – Georgia Institute of Technology (amounts USD)

147	Assessment of pathway design through multi-NSF level modeling and experiments		Helena Santos	30.000,00	2010-2012

Research Projects by ITQB researchers submitted via IBET (not accounted for in the statistics)

Projects funded by the FCT

	Title	Project reference	Principal Investigator	Amout €	Period
1	Remoção biológica de compostos xenobióticos de sistemas de tratamento de águas residuais	PTDC/AMB/65702/2006	Gilda Carvalho	156552	2007/2011
2	Desenvolvimento e validação de processos de tratamento de águas de abastecimento por combinação de foto-catálise de dióxido de titânio e filtração por membranas	PTDC/AMB/66024/2006	Vanessa Pereira	126192	2007/2011
3	Rnase II-like enzymes and non-coding RNAs and their role in the pathogenicity of Streptococcus pneumoniae	PTDC/SAL-MI/71454/2006	Cecília Arraiano	121671	2007/2011
4	Rnase II-like enzymes and non-coding RNAs and their role in the pathogenicity of Streptococcus pneumoniae	PTDC/SAL-MI/71454/2006	Cecília Arraiano	121671	2007/2011
5	Degradação e Síntese de Corantes Azo e Antraquinonas por Via Enzimática	PTDC/BIO/72108/2006	Ligia Martins	64536	2007/2011
6	Desenvolvimento e Aplicação de Novos Liquidos Iónicos Quirais em Catálise assimétrica, Electro-sintese e Separações Quirais	PTDC/QUI/70902/2006	Ana Luísa Simplicio	2400	2008/2011
7	Polymer plasticization and compatability using green technologies. Application of ionic liquids and supercritical fluids	PTDC/QUI/71398/2006	Catarina Duarte	21150	2008/2011
8	Integração de processos de expansão, diferenciação neuronal e criopreservação de células estaminais embrionarias humanas	PTDC/BIO/72755/2006	Paula Alves	123000	2009/2011
9	Eliminação de residuos utilizando biocatálise em liquidos iónicos com organismos eucarióticos	PTDC/QUI/71331/2006	Cristina Silva Pereira	47436	2009/2011
10	Beleza e significado da cor na iluminura medieval portuguesa	PTDC/EAT-EAT/104930/2008	Catarina Duarte	6000	2010/2012
11	Redes de regulação de expressão génica associadas à actividade do felogéneo	PTDC/AGR-GPL/098369/2008	Célia Miguel	115431	2010/2013
12	Precondicionamento induzido por monóxido de carbono: novas estratégias na prevenção de lesão cerebral devido à hipóxia-esquémia e reperfusão	PTDC/SAL-NEU/098747/2008	Helena Vieira	100000	2010/2013
13	Bioreactores de membranas para tratamento avançado de águas residuais: uma abordagem molecular	PTDC/EBB-EBI/098862/2008	Gilda Carvalho	94434	2010/2013
14	Bio-NIO Ingredientes bioactivos extraídos de Opuntia spp. Valorização das plantas do Alentejo	PTDC/AGR-AAM/099645/2008	Catarina Duarte	129900	2010/2013
15	Aplicação da genómica funcional no melhoramento de células de mamifero para a produção de biofármacos virais	PTDC/EBB-BIO/100491/2008	Ana Coroadinha	195000	2010/2013
16	Biofertilizantes fixadores de azoto para culturas de gramíneas	PTDC/AGR-AAM/100577/2008	Teresa Crespo	61620	2010/2013
17	Biologia sintética no desenvolvimento de linhas celulares para produção biofármacos multiproteicos com estequiometria optimizada	PTDC/EBB-EBI/102266/2008	Paula Alves	190000	2010/2013
18	Melhoramento do potencial de particulas idênticas a retrovirus como vacinas para Hepatite C	PTC/EBB-BIO/102649/2008	Manuel Carrondo	156000	2010/2013
19	Aplicação de Fluorimetria 2D para melhorar o desenvolvimento de bioprocessos de células de mamifero	PTDC/EBB-EBI/102750/2008	Ana Teixeira	140000	2010/2013
20	Transcriptómica da embriogénese no pinheiro bravo	PTDC/AGR-GPL/102877/2008	Célia Miguel	111495	2010/2013
21	Baculome - Optimização de bioprocessos baseada na manipulação do estado energético celular: modelação metabólica para produção eficiente de vacinas	PTDC/EBB-EBI/103359/2008	Manuel Carrondo	179000	2010/2013
22	Desenvolvimento de novos sistemas de libertação de fármacos a partir de biomateriais de gelatina utilizando tecnologia supercrítica	PTDC/QUE-QUE/104552/2008	Ana Nunes	85428	2010/2013
23	Beneficios e desvantagens associados com a presença de fungos em captações de água para consumo humano	PTDC/AAC-AMB/108303/2008	Vanessa Pereira	131309	2010/2013
24	hCEI-2 - expressão e caracterização em modelos in vitro e in silico	PTDC/EBB-BIO/111530/2009	Ana Luísa Simplicio	89856	2011/2013

	Title	Project reference	Principal Investigator	Amout €	Period
25	Desenvolvimento e manipulação de células estaminais usando a tecnologia de transferência génica mediada por nanoparticular para aplicação clinica de células modificadas geneticamente	ENMED/0001/2010	Manuel Carrondo	71600	2011/2014
26	Resposta de Entamoeba histolytiva aos stresses pxodativo e nitrosativo: em busca de novos factores de virulência	PTDC/SAL-MIC/111447/2009	Tiago Bandeiras	12000	2011/2014
27	Estudos bioquímicos e funcionais de exoribonucleades focando no seu papel determinante no controlo da expressão génica	PTDC/QUI-BIQ/111757/2009	Cecilia Arraiano	130000	2011/2014
28	Structural determinants of superoxide reduction - A detoxification system essential for life	PTDC/BIA-PRO/111940/2009	Tiago Bandeiras	88586	2011/2014
29	3D in vitro models for reducing animal experimentation in pharmaceutical development: integrative approaches for prediction of hepatic drug metabolism and neurotoxicity	PTDC/EBB-BIO/112786/2009	Catarina Brito	169968	2011/2014
30	Análise do proteoma de Ehrlichia ruminantium: uma análise complementar à transcriptómica para o estudo da patogenese e desenvolvimento de vacinas para a Cowdriose	PTDC/CVT/114118/2009	Isabel Marcelino	155947	2011/2014
	Projects funded by the European Comission				
31	European Network for the Advancement of Clinical Gene Transfer and Therapy	LSHB-CT-2006-018933	Manuel Carrondo	779095	2006/2011
32	Nonhuman Adenovirus vectors for gene transfer to the brain	HEALTH-F5-2008-222992	Manuel Carrondo	379200	2008/2012
33	High yield and performance stem cell lab	F5-2009-223011	Manuel Carrondo	532600	2009/2012
34	Cardio Repair European Multidisciplinary Initiative	HEALTH - F5-2010-242039	Manuel Carrondo	505120	2010/2012
35	Ferramentas genómicas em pinheiro bravo para aumento da produção de biomassa e gestão florestal sustentável (SUSTAINPINE)	P-KBBE/AGR-GPL/0001/2010	Célia Miguel	198600	2010/2013
36	Improvement of current and development of new vaccines for theileriosis and babesios of small ruminants	KBBE-3-245145-PIROVAC	Abel Oliva	173334	2010/2014
37	Towards a Latin America & Caribbean Knowledge Based Bio-Economy (KBBE) in partnership with Europe	KBBE-2010-264266	Teresa Crespo	50290	2011/2013
38	The sustainable improvement of European berry production, quality and nutritional value in a changing environment: Strawberries, Currants, Bkackberries, Blueberries and Raspberries	KBBE-2010-4-265942	Cláudia Santos	197608	2011/2014
39	New Technologies and Production Tools for Complex Protein Biologics	HEALTH-F5-2012-279039	Paula Alves	1412440	2011/2015
40	New Models for Preclinical Evaluation of Deug Efficacy in Common Solid Tumours	115188	Catarina Brito	254600	2011/2016
41	New Technologies and Production Tools for Complex Protein Biologics	FP7-HEALTH-2011-279039	Manuel Carrondo		2011/2015
	Projects funded by NATO				
42	Preventive and Remediation Strategies for Continous Elimination of Poly-Chlorinated Phenols from forest soils and ground waters	ESP.MD.SFPP 98 1674	Vitória San Romão	31620	2007/2011
	Projects funded by QREN				
43	TyphiVac	QREN - 2009/3384 - Genibet	Teresa Crespo	104862	2008/2011

Additionaly, ITQB researchers have established a number of contracts with national and international companies via IBET. In 2011 contracts were estabished with the following companies: Tecnimede, Compal, ABLGVFX -Ass. Benef.Lezíria Grande V. F. Xira, Nutrigreen, Amorim, Sartorius, Merck Serono, Cirad, Bayer, MGVS

Participation in scientific meetings

ITQB researchers presented their work (**about 300 communications**) in the following meetings

10th Conference on Protein Expression in Animal Cells, Cascais, Portugal

10th European Meeting on the Molecular Biology of the Pneumococcus, Amsterdam, The Netherlands

10th Symposium on Lactic Acid Bacteria, Egmond aan Zee, The Netherlands

11th Internacional Symposium on Advances in Synthetic and Medicinal Chemistry, St. Petersburg, Russia.

11th Young Scientist Forum and 36th FEBS Congress, Torino, Italy

12th International Conference on Systems Biology, Heidelberg/Mannheim, Germany

13th Annual EMBL International PhD Symposium, Heidelberg, Germany

1st Iberian Meeting on Natural Bioactives Entrapment for the Food Industry - Challenges and Perspectives, from nanotechnology to bioavailability, Lisbon, Portugal

1st International Conference on Ionic Liquids in Separation and Purification Technology, Sitges, Spain

20th Western Photosynthesis Conference, California, USA

21st European Congress of Clinical Microbiology and Infectious Diseases / 27th International Congress of Chemotherapy (21st ECCMID - 27th ICC), Milan, Italy

21st International Symposium on Glycoconjugates, Vienna, Austria.

22nd Drosophila Research Conference, Lisbon, Portugal

22nd European Society for Animal Cell Technology Meeting on Cell Based Technologies, Vienna, Austria

241st American Chemical Society National Meeting, California, USA

26th New Phytologist Symposium: Bioenergy Trees, Nancy, France

2nd Great Wall Symposium: "The Dynamics of Peptidoglycan Structure and Function: New Insights into the 'Great Wall", Cascais, Portugal

2nd Iberian Meeting on Ionic Liquids, Santiago de Compostela and A Coruña, Spain

2nd International Congress on Analytical Proteomics, Ourense, Spain.

2nd Workshop "Dynamical systems applied to biology and natural sciences", Lisbon, Portugal

36th FEBS congress, Biochemistry for Tomorrow´s Medicine, Torino, Italy.

3rd Annual SBMP meeting, Utrecth, Netherlands

3rd EU/CCPN Conference, Oeiras, Portugal

3rd International Conference on Biodegradable and Biobased Polymers, Strasbourg, France

3rd International Microbial Fuel Cell Conference, Leeuwarden, The Netherlands.

3rd International Seminar on Engineering Fluids, Tarragona, Spain

3rd Marie Curie Annual Meeting, Utrecht, Netherlands

47th Congress of the European Societies of Toxicology, Paris, France

4th Congress of the International BioIron Society /Biennial World Meeting - BioIron 2011, Vancouver, BC, Canada

4th Congress on Ionic Liquids (COIL-4), Washington, USA

4th FEMS Congress of European Microbiologists, Geneva, Switzerland

4th International Chemistry Conference, Riyadh, Saudi Arabia

51st International Conference on Antimicrobial Agents and Chemotherapy, Chicago, USA.

56th Annual Meeting of the German Society for Neuropathology and Neuroanatomy, Tübingen, Germany.

5th Biennial Meeting of the Chlamydia Basic Research Society, Redondo Beach, California, USA,

5th International Conference on Polyphenols and Health, Sitges - Barcelona, Spain

5th International Congress on Stress Response in Biology and Medicine, Quebec, Canada

5th International Symposium on Recent Advances in Food Analysis, Prague, Czech Republic

5th Theoretical Biophysics International Symposium, Madeira, Portugal

6th International Conference on Annexins, Barcelona, Spain

6th International Conference on Biogenesis of Iron Sulphur Proteins and Regulatory Functions, Cambridge, United Kingdom

6th International Conference on Gram-positive Microorganisms, Montecatini, Italy

6th Italian meeting of lignocellulosic chemistry "Science and Technology of Biomass: Advances and Challenges" / COST Action FP0602: Biotechnology for lignocellulose biorefineries – Final Workshop, Viterbo, Italia

7th Conference on New Frontiers in Microbiology and Infection: Helicobacter pylori from basic research to clinical aspects, Villars-sur-Ollon, Suíça

7th European Workshop on Bacterial Respiratory Chain, Lund, Sweden.

7th International Congress of Systematics and Evolutionary Biology, Berlin, Germany

7th International Society for Computational Biology Student Council Symposium, Vienna, Austria.

7th International Symposium on In Vitro Culture and Horticultural Breeding, Biotechnological advances in In Vitro Horticultural Breeding, Ghent, Belgium

7th International Water Association specialist conference on assessment and control of micropollutants/hazardous substances in water, Sydney, Australia

8th European Biophysics Congress Budapest, Hungary

8th European Conference on Mathematical and Theoretical Biology, Cracow, Poland

8th IWA Leading Edge Conference and Exhibition on Water and Wastewater Technologies, Amsterdam, The Netherlands

9th Carbohydrate Bioengineering Meeting, Lisboa, Portugal.

9th International Meeting of the Portuguese Carbohydrate Chemistry Group/5th Iberian Carbohydrate Meeting, Vila Real, Portugal

9th International Symposium of Rice Functional Genomics, Taipei, Taiwan

9th Plant Genomics European Meeting, Istanbul, Turkey.

American Water Works Association. Phoenix, Arizona, USA

Biobanking for Health Research, Lisbon, Portugal

British Mycological Society Meeting: Fungal Development and Pathogenesis. Exeter, UK.

CCPN Europa 2011: Supporting best practices in Biomolecular NMR, Oeiras, Portugal.

Champalimaud Neurosciences Symposium, Lisbon, Portugal

CHEMPOR 2011, Lisboa, Portugal

COIL 4 – 4th Conference on Ionic Liquids, Washington, USA.

CONCORD–PILGRIM Symposium. Brussels, Belgium

COST Action – 871 CryoPlaNet (Final Meeting), Angers, France

COST ACTION FA1005: 2nd Management Committee & Working Group Meetings of, Le Croisic, France

COST Action Organocatalysis (ORCA): 1st Meeting, Berlin, Germany

DrosTuga 2011, Oeiras, Portugal

E3 Forum, Lisbon, Portugal

EMBO Practical Course -Mass Spectrometry and Proteomics, Odense, Denmark.

EMBO Practical Course: High-throughput methods for Protein Production and Crystallization, Marseille, France.

EPSO Workshop, Plant Pigments and Human Health, Gerona, Spain

Eurocereals 2011, Gloucestershire, UK

Education Output

PhD Theses 2011

Tânia Marisa Catarino Ribeiro
"Studies on resistance and response to vancomycin in *Enterococcus faecalis*: a last resort antibiotic"
Supervisor: **Mª Fátima Silva Lopes**

João Daniel da Silva Seixas
"Development of CO-Releasing Molecules for the Treatment of Inflammatory Diseases"
Supervisor: **Carlos Romão**

Tânia Leal da Silva Barreto Vinagre
"Hox genes control the specification of global vertebral domains"
Supervisor: **Moisés Mallo**

Inês Gabriel e Silva Batista e Guinote
"Functional Studies on BolA and related genes: increasing the understanding of a protein with pleiotropic effects"
Supervisor: **Cecília Arraiano**

André João Tavares Fernandes
"Insight over multicopper oxidases stability"
Supervisor: **Lígia Martins**

Maria Margarida de Carvalho Negrão Serra
"Process Engineering of Stem Cells for Clinical Application"
Supervisor: **Paula Alves**

Tânia Filipa Pais de Oliveira
"Crystallographic and Biochemical Studies on Dissimilatory Sulfite Reductases"
Supervisor: **Margarida Archer**

Maria Filipa Baltazar de Lima de Sousa
"Searching for the common denominator of heme-copper oxygen reductases: Evolution and thermodynamic characterization"
Supervisor: **Miguel Teixeira**

Raquel de Amaro Lourenço
"Symmetry-Out, Asymmetry-In: The role of dmrt2"
Supervisor: **Moisés Mallo**

Maria Helena Macieira Pires Futcher de Deus
"Improving discovery in the Life Sciences using Semantic Web Technologies and Linked Data: Design principles for Life Sciences Knowledge Organization Systems"
Supervisor: **Jonas Almeida**

Rui Miguel Tiago Peixoto (PGDB)
"Trans-Synaptic Signaling by Activity-Dependent Cleavage of Neuroligin-1"
Supervisor: **Sukalyan Chatterjee**

Silvana Coelho Cardoso Manuel
"Genetics of berry colou rand anthocyanin content variation in grapvine (Vitis vinifera L. subsp. vinifera)"
Supervisor: **Pedro Fevereiro**

Mafalda Pinto Baptista Lopes da Silva
"Dissecting the molecular interaction between hepatocytes and Plasmodium liver parasites"
Supervisor: **Miguel Seabra**

André Filipe Pontes da Costa
"Cp-Functionalised N-Heterocyclic Carbenes: Coordination to Mo, Ru, Rh and Ir and Catalytic Applications"
Supervisor: **Beatriz Royo**

Teresa Marina Fonseca de Almeida Santos Braga
"Enterococcus and biocides: mechanisms of tolerance and selection for vancomycin resistance"
Supervisor: **Fátima Lopes**

Rita Maria de Brito Francisco
"Biochemistry of Grape Berries: Post-genomics approaches to uncover the effects of water deficits on ripening"
Supervisor: **Maria Manuela Chaves**

Catarina Sim-Sim Pereira
"Bacterial inter-species communication mediated by the autoinducer-2 signal"
Supervisor: **Karina Xavier**

Raquel Alexandra Gaboleiro Antunes
"Neural mechanisms of stimulus generalization in auditory fear conditioning"
Supervisor: **Marta Moita**

Marta Viseu Rodrigues
"Heat Stress Adaptation in Hyperthermophiles: Biosynthesis of Inositol-Containing Compatible Solutes"
Supervisor: **Helena Santos**

Nuno Eduardo Buxo Carinhas
"Systems Biotechnology of baculovirus-producing insect cells"
Supervisor: **Paula Alves**

Sofia Isabel Marques da Silva
"Formate metabolism in sulfate reducing bacteria"
Supervisor: **Inês Cardoso Pereira**

Rute Margarida Gonçalves Matos
"Functional and Structural Characterization of the RNase II-family of enzymes"
Supervisor: **Cecília Arraiano**

Ana Rita Pimenta Falcão Marques
"Mitosis and Protein Nα – Terminal acetylation"
Supervisor: **Rui Gonçalo Martinho**

Martina Bradic
"The Genetic Basis of Morphological Change in Convergent Evolution of Natural Populations: "Identifying Candidate Genes Behind Convergent Evolution in Blind Cave Fish, Astyanax mexicanus"
Supervisor: **Henrique Teotónio**

José Ángel Brito Castro
"Oxo-molybdenum(VI) complexes containing chiral ligands: catalytic applications in selective epoxidations"
Supervisor: **Beatriz Royo Cantabrana**

José Artur Alves de Brito
"Crystallographic studies on two hyperthermophilic enzymes"
Supervisor: **Margarida Archer**

Marija Petkovic
"Revealing fungal activity in the presence of ionic liquids "
Supervisor: **Luís Paulo N. Rebelo**

Pedro Miguel Veríssimo Mateus
"Ditopic molecular architectures for the recognition of anionic species"
Supervisor: **Rita Delgado**

Cristina Isabel Caniço Escrevente
"Protein glycosylation of exosomes from ovarian carcinoma cells"
Supervisor: **Júlia Costa**

Ana Isabel Porém Amaral
"Metabolic Flux Analysis of Neural Cell Metabolism in Primary Cultures"
Supervisor: **Paula Alves**

Stefanie Nunes Rosa
"Transgenic plants as models to study chromatin organization and regulation of gene expression"
Supervisor: **Rita Abranches**

Cátia Gisela Rebordelo Marques Feliciano (PGDB)
"Behavioral and synaptic circuit analysis in models of neuropsychiatric disorders: Dissecting the in vivo role of the postsynaptic density proteins nArgBP2 and Shank3 using genetically engineered mice"
Supervisor: **Sukalyan Chatterjee**

Cátia Cristina Moreira Proença (PGDB)
"Molecular modulation of brain development and function: Lessons from "old" and "new" protein families – Molecular mechanisms of neurotrophin and Slitrk protein families mediating development and function of central nervous system"
Supervisor: **Moisés Mallo**

Raquel Fonseca de Carvalho
"Functional and molecular characterization of SR45: a plant-specific splicing factor involved in sugar and stress signaling in Arabidopsis thaliana"
Supervisor: **Paula Duque Magalhães**

Alexandra Sofia Oliveira Simões
"Molecular nature, population biology and fitness of non-typeable Streptococcus pneumonia"
Supervisor: **Raquel Sá-Leão**

Maria do Carmo Barreto Baptista Basílio
"Dynamics of cork mycobiota throughout stopper manufacturing process: from diversity to metabolite"
Supervisor: **Vitória S.Romão/Teresa Crespo**

Tiago Vasconcelos Duarte Moreira Pais
"Insights into the Molecular Mechanisms of Protein Stabilization by Osmolytes of Hyperthermophiles"
Supervisor: **Helena Santos**

Sofia Cristina dos Santos Venceslau
"Electron transfer chains in sulfate reducing bactéria"
Supervisor: **Inês Cardoso Pereira**

Catarina de Matos Ferraz Franco
"Proteomics based approach to understand tissue regeneration – starfish as a model organism"
Supervisor: **Ana Varela Coelho**

Ivo Marguti
"Immune response and tissue cytoprotection: two sides of the same coin in immunopathology"
Supervisor: **Miguel Soares**, deixou de ser a partir de Set 2011 passou a ser **Thiago Carvalho** (IGC)

Ana Inês da Cunha Ferreira
"Regulation of PLK4 levels and activity to ensure centriole number control"
Supervisor: **Mónica Bettencourt Dias**

Ricardo António Neves Moreira
"Studies on BolA and Ribonuclease R: Two Important Factors in the Control of Bacterial Gene Expression"
Supervisor: **Cecília Arraiano**

Óscar Leandro da Silva Ramos
"Development and characterization of bioactive, edible whey protein films and coatings to improve quality and safety of food products"
Supervisor: **Francisco Xavier Malcata**

Tânia Sofia Granja Tavares
"Production and characterization of the biological activity of peptides obtained via hydrolysis from whey proteins by cardosins"
Supervisor: **Francisco Xavier Malcata**

Fabrizio Testa
"Mechanisms of NO and O2 scavenging in microorganisms and human pathogens"
Supervisor: **Miguel Teixeira** Março 2011 em Itália

Master Theses

No degrees awarded at ITQB in 2011.
Six Master Theses awarded by other institutions whose work was conduted at ITQB.

University Extension Courses

Bethania García Cassani
University Extension Courses/Scientific Research Training C
Macromolecular Crystallography Lab; Supervisor: Tiago Bandeiras

Carla Sofia Arrifes Baltazar
Post-Graduation Course/Scientific Research Training A
Modelação de Proteínas Lab; Supervisor: Cláudio M. Soares

Clara Susana Marques Graça
Post-Graduation Course/Scientific Research Training A
Plant Cell Biotechnology Lab; Supervisor: Jorge Paiva

Jane Bruun Frederiksen
University Extension Courses/Scientific Research TrainingD
Protein Biochemistry Folding & Stability Lab; Supervisor: Cláudio Gomes

Luís Carlos Santos Filipe
Post-Graduation Course/Scientific Research Training A
Simulação Molecular Lab; Supervisor: António Baptista

Sofia Vargas Nobre de Gusmão
University Extension Courses/Research Integration
Infection Biology Lab; Supervisor: Jaime Mota

Other Activities

Presence in Editorial Boards

In 2011, ITQB researchers sat on the editorial boards of the following international journals.

FEMS Microbiological Reviews
Cecília Arraiano

WIRES RNA- Wiley INterdisciplinary Reviews on RNA
Cecília Arraiano is an editor

Microbial Drug Resistance
Hermínia de Lencastre

European Journal of Clinical Microbiology & Infectious Diseases
Hermínia de Lencastre

PLos One
Hermínia de Lencastre

Journal of Berry Research, IOS Press
Ricardo Boavida Ferreira, since 2009

Tree Physiology
Célia Miguel is member of the Editorial Review Board

Plant Cell Tissue and Organ Culture (Elsevier Journal)
Margarida Oliveira is Associated Editor since Jan. 2006

Journal of Integrated Omics
Cândido Pinto Ricardo and Carla Pinheiro are members of the editorial board

Functional Plant Biology
Manuela Chaves is Associate Editor

Journal of Experimental Botany
Manuela Chaves is Advisory Board Member

Open source journal PloS One
Yann Astier is an academic editor since 2008

Frontiers in Microbial Physiology and Metabolism
Inês Cardoso Pereira, Associate Editor

YEAST, Comptes Rendus de l' Académie des Sciences
Claudina Rodrigues-Pousada member of the Editorial Board

Journal of Mycology (The Open Mycology Journal)
Claudina Rodrigues-Pousada

Chemistry Open
Pedro Matias, Editorial Advisory Board

FEBS Letters
Ricardo O. Louro

Acta Crystallographica Section F
Margarida Archer is Member of review panel

Pool of Reviewers
Margarida Archer is Member of the ESF (European Science Foundation)

Postdoctoral grants Assessment
Margarida Archer is Panel Member for IRCSET (Irish Research Council for Science, Engineering and Tecnology), Dublin (April/2011)

Assesment of bilateral cooperation proposals (Fundação para Ciência e Tecnologia, FCT)
Margarida Archer

Bioinorganic Chemistry and Applications
Cláudio M. Gomes

Fatty Acid and Lipid Physiology
Cláudio M. Gomes

Journal of Biomedicine and Biotechnology
Cláudio M. Soares, Associate Editor

Journal of Biological Inorganic Chemistry
Maria Arménia Carrondo, Editor

Journal of Chemical Engineering Data
Luís Paulo N. Rebelo, member of the Editorial Advisory Board

International Journal of Molecular Science
Luís Paulo N. Rebelo, Editorial Advisor

BMC Biotechnology
Paula M. Alves, member of the Editorial Board

Journal of Biotechnology
Paula M. Alves

Journal of Biotechnology
Manuel J. T. Carrondo, Associate Editor

Biotechnology and Bioengineering
Manuel J. T. Carrondo

Biotechnology Letters
Manuel J. T. Carrondo

Current Gene Therapy
Manuel J. T. Carrondo

The Scientific World Journal
Ana Sofia Coroadinha, member of the Editorial Board (Biotechnology panel)

Food Safety Magazine
Alexandra Veiga, member of the Editorial Advisory Board

Seminars at ITQB 2011

Frontier Leaders Seminars

Cyclic-di-GMP signaling in bacterial 'life-style' switching
Regine Hengge, Freie Universitat Berlin, Germany

Antiviral and anticancer metal complexes
Peter Sadler, University of Warwick, Uinted Kingdom

Maternal pathways controlling plant embryogenesis
Ueli Grossniklaus, Universität Zürich, Switzerland

Computer simulation in the life sciences: where do we go?
Wilfred F. van Gunsteren, Swiss Federal Institute of Technology, Zurich, Switzerland

Microbes inside
Willem M. de Vos, Helsinki & Wageningen University, Netherlands

Metal Ions and Metal Ion Complexes Guiding Folding and Function of Single RNA Molecules
Roland Sigel, University of Zurich, Switzerland

AVX Seminars

Peter pan 's syndrome or the search for the permanent youth
Pedro Moradas Ferreira, *Instituto de Ciências Biomédicas Abel Salazar*, *Universidade do Porto*, Portugal

Chromogenic compounds for smart materials
Fernando Pina, *Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa*, Portugal

Differential remodelling of chromatin topology in small and large genomes
Wanda Viegas, *Instituto Superior de Agronomia, Universidade Técnica de Lisboa,* Portugal

Brain biophysics
Eduardo Ducla Soares, *Faculdade de Ciências, Universidade de Lisboa,* Portugal

Cell-Biomaterial Interactions at the Nanoscale
Mário Barbosa, *Faculdade de Engenharia e INEB, Universidade do Porto,* Portugal

Science journalism is dead. Now what?
António Granado, *Faculdade de Ciências Sociais e Humanas, Universidade Nova de Lisboa,* Portugal

Light and water games with porous silicates and metal organic frameworks
João Rocha, *Centro de Investigação em Materiais Cerâmicos e Compósitos* - CICECO, *Universidade de Aveiro*, Portugal

What Surprises can Crystallography (still) Reveal in the Active Sites of Metalloenzymes?
Maria João Romão, *Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa,* Portugal

Micro and Nano engineering of biosensing and cell microenvironment using lab-on-a-chip devices
João Pedro Conde , *Instituto Superior Técnico, Universidade Técnica de Lisboa,* Portugal

Human Enhancement
Alexandre Quintanilha, *Instituto de Biologia Molecular e Celular, Universidade do Porto,* Portugal

Interbio Seminar

Aptamers: clever oligonucleotides for bio- and nanotechnology
Jean Jacques Toulmé, European Institute of Chemistry and Biology, Bordeaux, France

SCAN

Bioinformatics Training: The GTPB Programme
Pedro Fernandes-GTPB Organizer IGC- Oeiras

Tick born diseases in Portugal farms: prevalence and diagnosis
Abel G. Oliva Head of Biomolecular Diagnostic Laboratory

Novel catalysts based on N-heterocyclic carbene metal complexes
Beatriz Royo Head of Homogeneous Catalysis Laboratory

Studies on the post-transcriptional regulation of the small non-coding RNA MicA
Sandra Cristina Viegas-Post-Doc Fellow Control of Gene Expression Laboratory

Studying biomedically relevant systems by molecular simulation
Antonio M. Baptista Head of Molecular Simulation Laboratory

Expression, purification and activities of sensor histidine kinases of Enterococcus faecalis
Pik Yee Ma, Post-Doc Membrane Protein Crystallography Laboratory

Identification of structural regulators for substrate selectivity in different Flavodiiron proteins
Bruno L. Victor Protein Modeling Group-ITQB

A sweet twist in Streptococcaceae: ways that sugar metabolism shape virulence and metabolic traits
Ana Rute Neves Head Of Lactic Acid Bacteria & In Vivo NMR

Subcellular organization in bacteria that divide in orthogonal planes
Mariana Pinho Head of Bacterial Cell Biology Laboratory

Crossing the bridge: the role of an E3-ubiquitin ligase in the modulation
Tiago Lourenço Post-Doc-Genomics of Plant Stress Laboratory

Ionic liquids under common and sometimes not-so-common conditions: Recent experimental results
José Esperança Assistant Researcher at Molecular Thermodynamics Laboratory

Reductive elimination of Reactive Oxygen Species: Structural and Functional Insights
Miguel Sepúlveda Teixeira Head of Metalloenzymes and Molecular Bioenergetics Laboratory

Copper(II) cryptates as receptors for anions and potential radiopharmaceutical use
Rita Delgado Head of Coordination and Supramolecular Chemistry Laboratory

Therapy with CO: where are we?
Carlos C. Romão Head of Organometallic Chemistry Laboratory

A brief journey into the nanoworld of proteins
Margarida Archer Head of Membrane Protein Crystallography Laboratory

Good and bad lipids
Eurico Melo Head of Microheterogeneous Systems

Photoprotection systems in Quercus ilex L. and the application of the Near-Infrared Reflectance Spectroscopy (NIRS) as an ecophysiological tool to detect oxidative stress
Marta Pintó-Marijuan Post-Doctoral

Monofunctional transglycosylases are not essential for ***Staphylococcus aureus*** **cell wall synthesis**
Patricia Reed Post-Doctoral at Bacterial Cell Biology Laboratory

Biochemical Systems Analysis of the trehalose cycle in Saccharomyces cerevisiae
Luís L. Fonseca Post-Doctoral fellow at Cell Physiology and NMR Laboratory

A Structural Biology approach to study protein function
Isabel Bento Auxiliary Investigator at Structural genomics Laboratory

Population genomics of Medicago truncatula to identify mechanisms of salinity adaptation
Matilde Cordeiro PhD student at Plant Cell Biotechnology Laboratory

Deciphering energy metabolism in the earliest life forms: the dissimilatory reduction of sulfur compounds
Inês Cardoso Pereira

Biological Energy Transduction
Manuela M. Pereira, Biological Energy Transduction Laboratory

Primary Cultures and Stem Cells for Drug Discovery and Cell Therapy: Bioprocessing Challenges
Paula M. Alves Head of Cell Bioprocesses Laboratory

Using Drosophila to study the Unfolded Protein Response
Pedro Domingos Head of Laboratory of Cell Signaling in Drosophila

Role, evolution, and biosynthesis of di-myo-inositol-phosphate
Nuno Borges Assistant Researcher Cell Physiology and NMR Laboratory

Applications of Proteomics in Veterinary and Agricultural Sciences
André Martinho de Almeida Researcher of the *Instituto de Investigação Científica Tropical* /invited Researcher of the Mass Spectrometry Laboratory of the ITQB

Other Seminars

Oxidative stress and killing mechanism of bactericidal antibiotics: direct or indirect connection?
Axel Hartke Caen University, France

Partnership and Cooperation in Health R&D and Innovation
Protocol between Universidade Nova de Lisboa and Eurotrials

FCT R&D Projects in all Scientific Domains 2010. How to apply
Informative/ work session by the Research Funding Affairs team, IGC

From Cyanobacterial Hydrogenases to BioModularH2
Paula Tamagnini, IBMC, *Universidade do Porto*, Portugal

Towards Pharmaceutically Acceptable CO-RMs
Fabio Zobia Zurich University, Switzerland

MIT-Portugal innovation and entrepeneurship initiative
this session is open but registration is mandatory

Pathological modeling, drug discovery and toxicity testing using pluripotent stem cells
Marc Peschanski Scientific Director-(I-STEM, INSERM/UEVE)

Exploiting the human immune response for the development of vaccines and therapeutic antibodies against infectious diseases
Andreas Meinke- Intercell

Overview of Vaccine Process Development at RIVM
Leo van der Pol Vaccine Institute, Netherlands

Development and Technology Transfer for Viral Vaccines
Wilfried Bakker Vaccine Institute, Netherlands

Corynebacterium glutamicum tailored for efficient isobutanol production
Bastian Blombach- University of Ulm, Germany

Non-canonical polyadenylation and uridylation in RNA degradation: the Arabidopsis perspective
Dominique Gagliardi, Institut de Biologie Moléculaire des Plantes, CNRS, France

Monolithic chromatography supports
Aleš Štrancar, BIA Separations

A little semantics can go a long way
Helena F. Deus, ITQB and Digital Enterprise Research Institute, Ireland

Mixing Methodologies in Single-use Bioreactors- A Comparative Analysis of Consistency Across Scale
Brian Lee MD PhD President, PBS Biotech, Inc

Linkage disequilibrium mapping: novel insights into the genetics of human complex diseases
Nikolas Maniatis University College of London, United Kingdom

What would you ask a Nobel Prize winner?
Discussion Session with Ada Yonath

Bioprocess Integrated Solutions
Christian Manzke & Etienne Evrard

Targeting bacterial membrane sensory proteins for future drug discovery
Mary K. Phillips-Jones University of Leeds, United Kingdom

How cells adapt to Fe deficiency through targeted messenger RNA degradation
Dennis Thiele Duke University Medical Center

Improving photosynthetic efficiency of plants - a genetic approach
Baishnab Tripathy, Jawaharlal Nehru University, India

Electron tunneling and coupled proton transfer reactions in respiratory enzymes
Alexei A. Stuchebrukhov University of California, USA

The importance of peeing earnest: urine derived cells as model systems in biology and biomedicine
Regina Grillari University of Natural Resources and Life Sciences Vienna, Austria

From cellular ageing to recombinant protein production Spotlight on small RNA
Johannes Grillari BOKU-University of Natural Resources and Life Sciences Vienna, Austria

Role of formate in syntrophic methanogenic communities
Alfons Stams, Wageningen University

Genome assessments of cis-elements in the promoter regions of related genes
António Costa de Oliveira, *Universidade Federal de Pelotas*, Rio Grande do Sul, Brazil

Bioprocess development activities at Institut Pasteur of Tunis
Héla Kallel Head, Bioprocess Development Unit Institut Pasteur of Tunis, Tūnis

Cervarix: first human vaccine manufactured with baculovirus expression system
Isabelle Knott Director, Head of Cell Culture Development GlaxoSmithKline Biologicals S.A.

Health benefits of dietary polyphenols: new ideas linking bioavailability and efficacy
Gary Williamson University of Leeds, United Kingdom

Vascularized multi-organ systems – the next level of engineering human biology in vitro
Uwe Marx & Mark Rosowski Technische Universität Berlin, Institute of Biotechnology

CcmI protein acts as an apocytochrome _c_ chaperone during cytochrome
Andreia F. Verissimo Department of Biology, University of Pennsylvania, Philadelphia (Andreia Verissimo is a former ITQB PhD student).

High resolution gel-based proteomics for the analysis of molecular mechanisms
Jens R. Coorssen University of Western Sydney, Australia

Challenges and Opportunities in Structure Determination of Membrane Proteins.
Isabel de Moraes Imperial College London and Diamond Light Source (honorary)

Cysteine-containing peptides and pseudopeptides as efficient Cu(I) chelators
Pascale Delangle CEA Grenoble Institut Nanosciences et Cryogénie

Insights into initial stages of bacterial cell division: Looking at dynamic FTSZ polymers on surfaces at the nanoscale
Marisela Vélez, Instituto de Catálisis y Petroleoquímica CSIC, Madrid, Spain

2-D DIGE:Best Practice in 2-D Electrophoresis
Bruno Bacher GE Healthcare Europe GmbH

Marrying Qual and Qual Aspects in - Omics World
Michaela Scigelova, Thermo Fisher Scientific, Bremen, Germany

Emerging techniques for mass spectrometry
Robert Tongue, Waters, Manchester, United Kingdom

Recepta Biopharma and its Innovation Model
José Fernando Perez, Recepta Biopharma, Brazil

Some Perspectives on Vaccines, Biologicals, and the Pharmaceutical Industry
John G. Aunins Merck Sharp & Dohme, West Point, New Jersey, USA

Fields of Application – Research and Development at the Fraunhofer IGB
Kai Sohn -Fraunhofer Institute for Interfacial Engineering and Biotechnology Stuttgart, Germany

Bacterial cytochrome bd and nitrosative stress
Alessandro Giuffrè -CNR Institute of Molecular Biology and Pathology; Sapienza University of Rome; ITQB Invited Professor

Programa COHiTEC
Sessão de Apresentação

Evolution of pneumococcal serotypes in invasive diseases in Italy in the conjugate vaccine era
Annalisa Pantosti, National Health Institute, Rome, Italy

Using deep sequencing to discover new modes of gene regulation
Gordon Carmichael University of Connecticut Health Center Farmington, USA

Understanding the adaptation of L. lactis by Integrative biology
Muriel Cocaign-Bousquet LISBP, Toulouse, France

Deciphering the role of the microRNA-200c in breast cancer metastasis
Ricardo Perdigão Henriques PhD Student at Engineering Cellular Applications Laboratory

Growth and regeneration in an ever changing ocean
Sam T Dupont, The Sven Lovén Centre for Marine Sciences, Sweden

Transporting Folded Proteins Across Membranes
Ben Berks, University of Oxford, United Kingdom

Science and Society

School Visits

20 visits | 620 students

Schools
EB2,3/S de Celorico de Basto
Escola Profissional Amar Terra Verde
Escola Sec. Alvide
Escola Secundária Augusto Cabrita (Barreiro),
Escola Secundária de S.João do Estoril
Escola Secundária Fernando Lopes-Graça - Parede
Escola Secundária José Cardoso Pires.
Escola Secundária Sebastião e Silva
Escola Secundária/3 Padre Alberto Neto (3 visitas)
Secundária de S. Lourenço - Portalegre
Vila Pouca de Aguiar

Labs
Analytical Chemistry
Analytical Services
Animal Cell Technology Unit
Applied and Environmental Mycology
Bacterial Cell Surfaces and Pathogenesis (2x)
Biological Energy Transduction
Biomolecular Diagnostic
Biomolecular NMR
Cell Bioprocesses Laboratory (2x)
Cell Physiology & NMR
Cell Signaling in Drosophila
Control of Gene Expression
Disease and Stress Biology
Forest Biotech
Genomics and Stress
Genomics of Plant Stress
Glycobiology
Industry and Medicine Applied Crystallography
Infection Biology
Inorganic Biochemistry and NMR
Lactic Acid Bacteria & In Vivo NMR
Membrane Protein Cristalography
Microbial & Enzyme Technology
Microbial Development
Microbiology of Man-made Environments (3x)
Molecular Genetics
Molecular Genetics of Microbial Resistance
Molecular Thermodynamics
Nutraceuticals and Delivery
Pharmaceutical and Biopharmaceutical Analysis and Pharmacokinetics
Plant Cell Biology (2x)
Plant Cell Biotechnology (2x)
Plant Molecular Ecophysiology
Protein Biochemistry Folding & Stability
Systems Biodynamics

Open Day

Organizing Committie
Ana Luísa Simplício
Ana Sanchez
Carlos Romão
Collin Mcvey
Helena Vieira
Lisete Galego
Mannolis Matzapetakis
Miguel Costa
Pedro Domingos
Sérgio Filipe
Yann Astier

Summer Training

Genes e Proteínas Que Não Estão de Férias
Lígia M. Saraiva

Introdução ao meio laboratorial
Célia Romão

Síntese de novas moléculas
Beatriz Royo

Science and Technology Week

Researchers
Ana Oliveira
Catarina Brito
Inês Cardoso Pereira
José Brito
José Esperança
Pedro Fevereiro
Pedro Matias
Rita Abranches
Vanessa Pereira

Schools
E.B. 2,3 Carlos Lopes - Amadora
AMRT-Associação de Melhoramentos e Recreativo do Talude
Dr. Joaquim de Barros - Paço de Arcos
Escola EB 2,3 Piscinas - Lisboa
Escola sec. Quinta do marquês
Escola Secundária de Ferreira Dias - Cacém
Escola Secundaria Padre Alberto Neto - Queluz
Secundária Sebastião e Silva- Oeiras

Open Letter

By occasion of the internal fundraising "Chillers" campaign, November 2011

Dear All,

We have officially concluded our internal fundraising campaign. Throughout November, we received almost 350 donations, collecting circa 70,000 Euros. These are extraordinary numbers by all accounts; they will cover a significant part of the expenses to replace the so-called chillers as well as those to renew the building's energy control system. I would like to publicly thank all of those who have anonymously contributed to this cause. I am also taking this opportunity to appraise this unprecedented initiative in a public Portuguese institution.

We are living, we all know that, very harsh times, severe times for each and every one of us, unkind for institutions that are facing a growing number of financial and human difficulties.

In this atmosphere of adversity, I was constantly surprised by the generosity of those who approached me with ideas of solidarity campaigns to overcome specific obstacles, such as purchasing new scientific equipment or supporting human resources. At the same time, I was struggling with the eminent failure of several infrastructural devices, which had only outlived their lifetime due to the dedication and competence of our maintenance services. I knew how difficult it had been to include this expense in our annual budget over the years. I also knew of the good will of our funding institutions; however, I was also aware of their own financial constraints at this point.

And this is when two ideas became one. The replacement of these apparatus would benefit all; rather than focusing on particular research area equipment, this was something so fundamental that it could indeed unite us all in a common effort. So, our internal fundraising campaign was born: a challenge to all – researchers, staff, students and alumni contributing anonymously and voluntarily with as much as they could to help replacing the building's energy control system.

Knowing for so long the special character of the people in this institution, I believed in the success of this campaign from the start. But, as often happens, reality surpassed the best expectations. Not only in regards to numbers, which are truly exceptional, but by the number of ideas and initiatives that have flourished during the past month at ITQB, a demonstration of the distinctive spirit of this institution. I doubt any other director has ever felt as proud of its institution as I do right now.

I wish to heartedly thank you for all your support and I assure you that this initiative will never be forgotten. An annual award will be created to celebrate our esprit de corps.
As you know, replacing the chillers will also impact our energy savings. This money will be converted to science, as it should be. So the benefit is doubled; not only have you assured that ITQB continues to function at its best but you are also contributing to our future success.

Meanwhile, we have extended this campaign to those outside. Our internal commitment has convinced others to contribute as well. We believe we have set a new standard for companies and institutions, and, who knows, for individuals, to support research at ITQB. There will be other, more important measures needed in order to solve our financial hurdles – some of those are already under study – but encouraging external donations is a project we should nurture.

I wish to finish by thanking Professor Manuela Chaves for the way she has led and monitored the whole process and for the immense dedication and professionalism of Ana Freire in managing all the donations.

With my sincere gratitude to you all
Luís Paulo

Installation of the "chillers", March 2012

Research groups 63

% Female PhD students 73

Invited speakers 66

% Female PhD holders 64

52 % articles with international teams

21 % Foreign PhD holders

3,5 M€ in Research Projects

2011 Curiosities

INSTITUTO
DE TECNOLOGIA
QUÍMICA E BIOLÓGICA
/UNL

Knowledge Creation

ITQB | Av. da República | EAN | 2780-157 Oeiras | Portugal
+351 214 469 350 | info@itqb.unl.pt | www.itqb.unl.pt