










annual
report
2019

UNIVERSIDADE
NOVA
DE LISBOA
knowledge for life



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ABOUT ITQB NOVA

Instituto de Tecnologia Química e Biológica António Xavier (ITQB NOVA) is a scientific research and advanced training institute of the Universidade NOVA de Lisboa. The ITQB NOVA is located in the Town of Oeiras, just outside Lisbon.

The mission of ITQB NOVA is to carry out scientific research and postgraduate teaching in chemistry, life sciences, and associated technologies, while serving the community and performing activities for the promotion of science and technology.

Brief account of ITQB NOVA history

The origins of ITQB NOVA go back to 1986 when the concept of a new research centre was developed and took shape through a process led by Professor António V. Xavier (1943-2006), culminating in the launch of CTQB (Centro de Tecnologia Química e Biológica) in 1989. This research centre became Instituto de Tecnologia Química e Biológica in 1993, when it was integrated in Universidade Nova de Lisboa.

Since its foundation, and to the present date, ITQB NOVA works closely with its partner institution IBET (Instituto de Biologia Experimental e Tecnológica) – a private, not-for-profit biotechnology research organization that interfaces academia and industry.

In 1996, ITQB NOVA started to operate at the present site, in the campus of Quinta do Marquês, in Oeiras. The main building hosts most of the research groups and all administrative and support services; a few groups have remained in the previous location at IGC (Instituto Gulbenkian de Ciência) or otherwise use laboratory space from the INIAV (Instituto Nacional de Investigação Agrária e Veterinária).

ITQB NOVA was one of the first research institutions to be awarded the status of LA (Laboratório Associado) by the Minister of Science and Technology, in 2001. Under the LA programme the Institute established a partnership with IGC and IBET, and later with CEDOC (Centro de Estudos de Doenças Crónicas), to maximize its research and development potential.

In 2015, a new funding mechanism determined the organization of ITQB NOVA research activities within research units. In line with its research strategy, ITQB NOVA coordinates two research units (MOSTMICRO and GREEN-IT) and participates in a third one (iNOVA4Health).

In 2016, ITQB NOVA with INIAV and iBET, have founded the AGROTECH CAMPUS, an agrofood, veterinarian and forestry consortium for research and innovation. In 2016, ITQB adopted the designation ITQB NOVA to better reflect the University affiliation.

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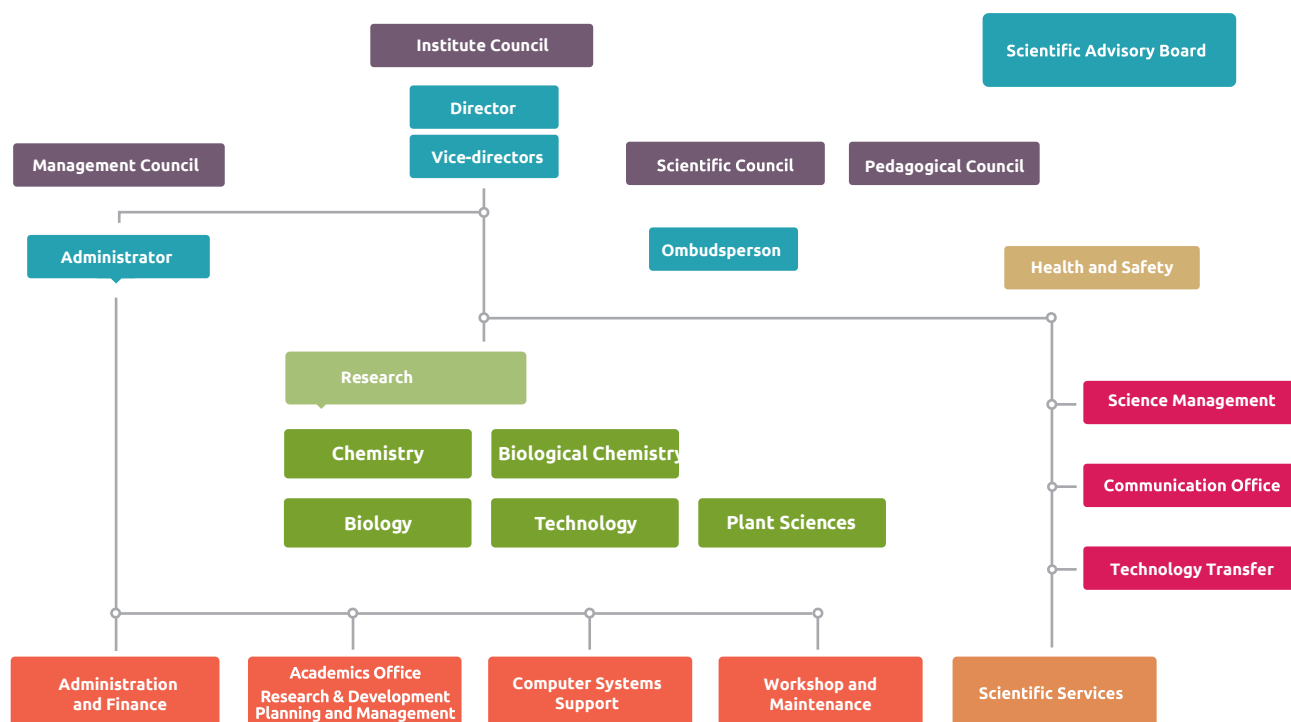
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Cláudia Almeida

UniMS

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Bioimaging Unit

Adriano O. Henriques

Library

Isabel Murta

Teaching Laboratory

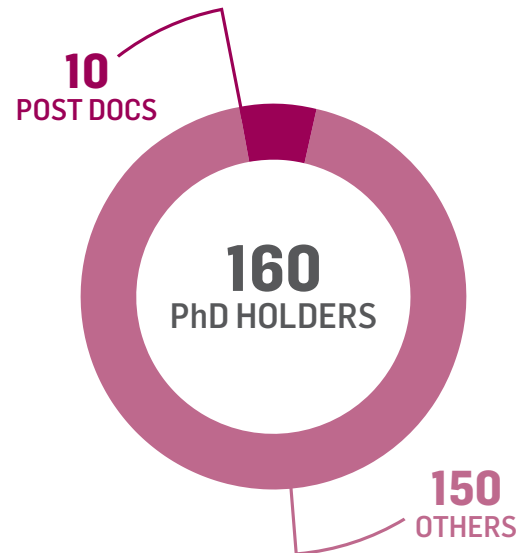
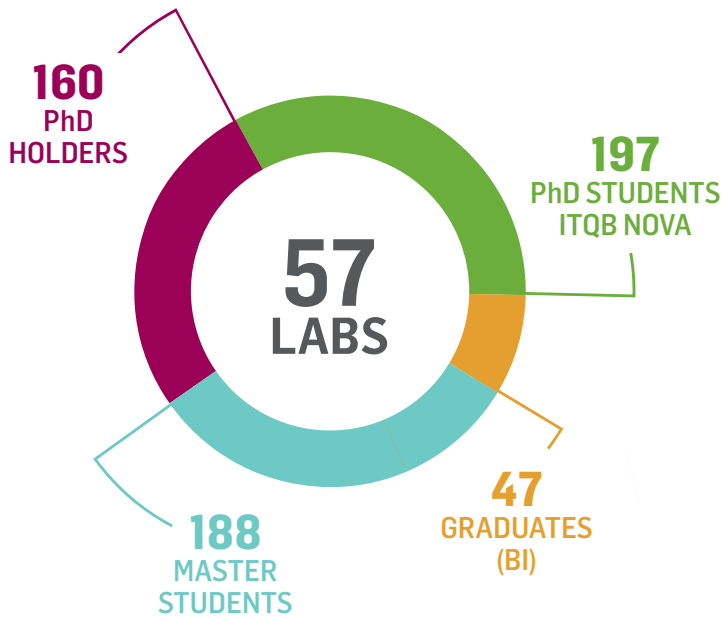
Teresa Baptista da Silva

CTQB ADMINISTRATION

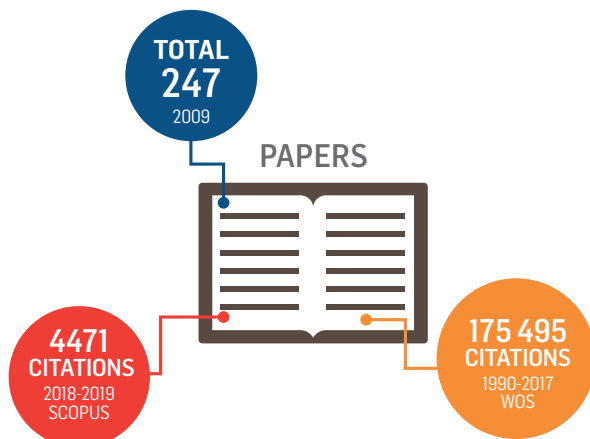
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PEOPLE

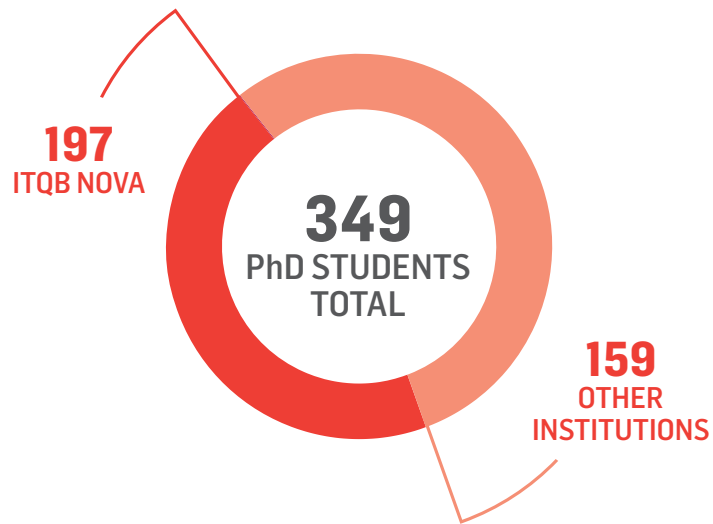


RESEARCH

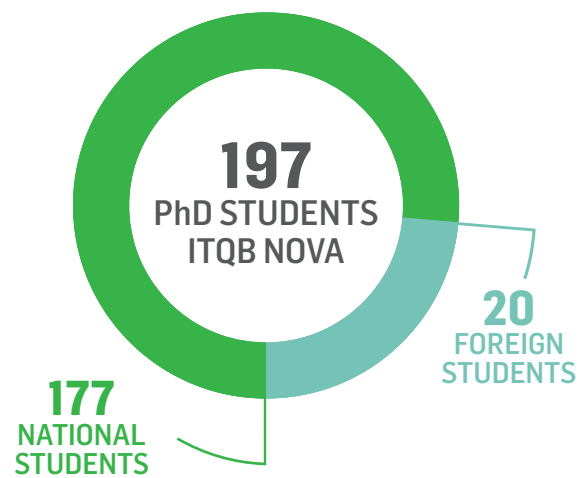
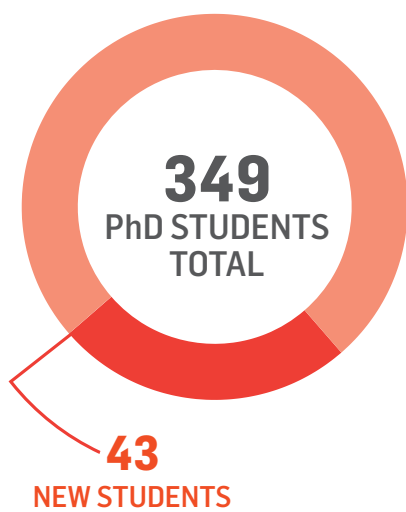




EDUCATION

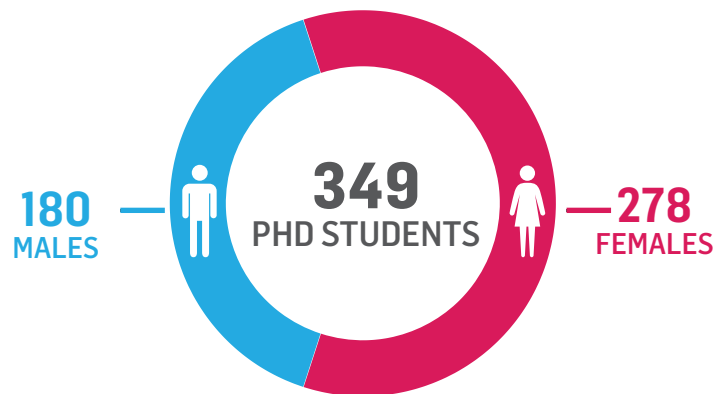


51
Phd
degrees
awarded

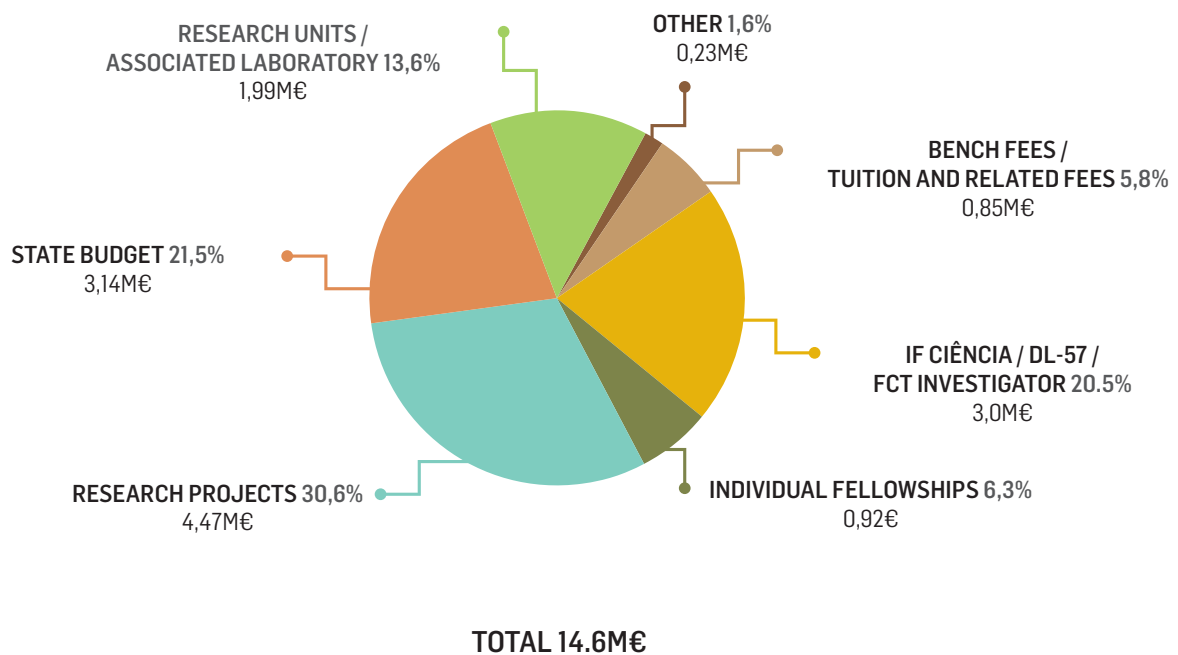




EDUCATION



FUNDING

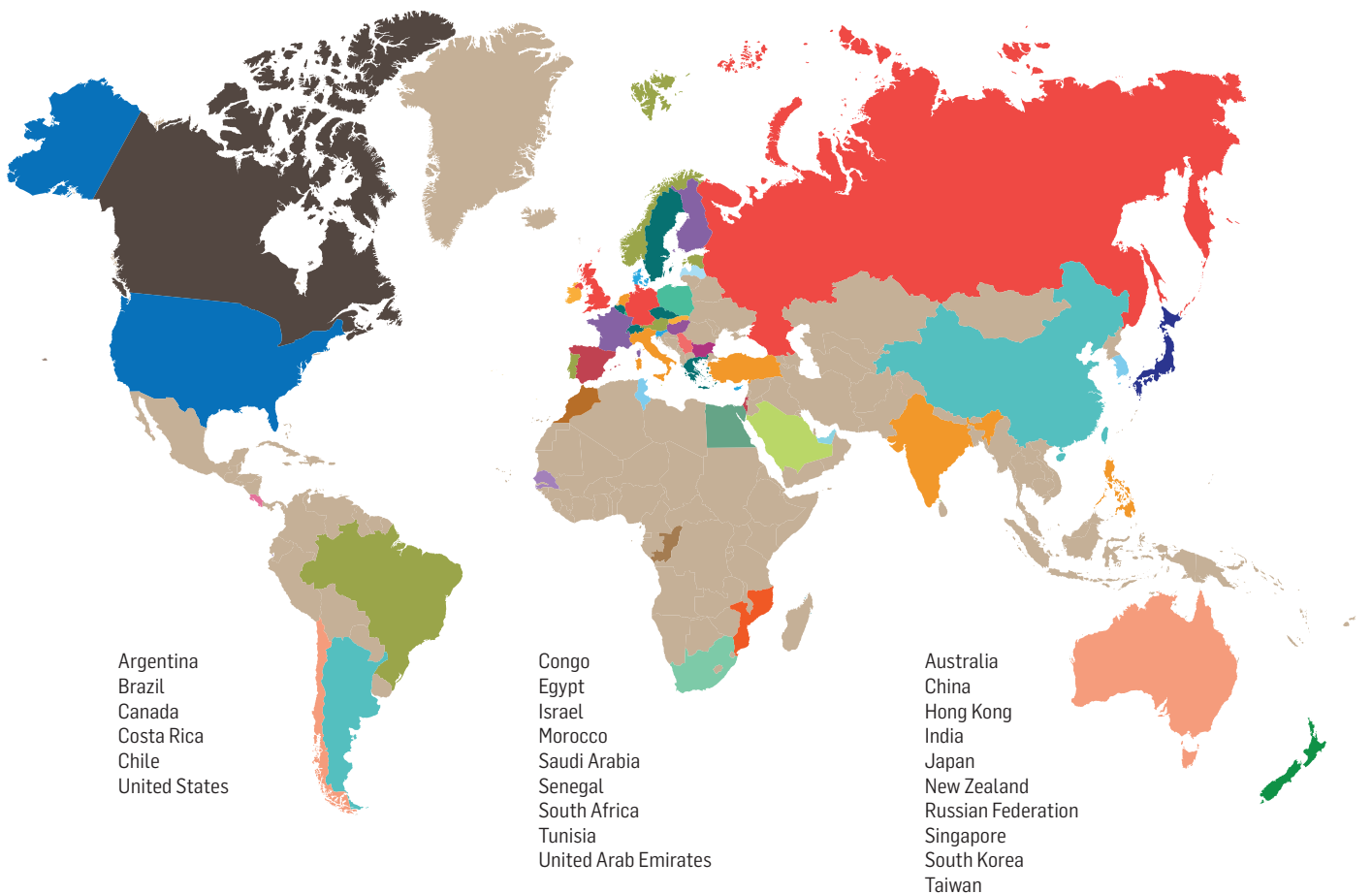




INTERNATIONALIZATION

Countries with projects in collaboration with ITQB NOVA.

Austria
Belgium
Bulgaria
Czech Republic
Denmark
Finland
France
Germany
Greece
Ireland
Italy
Latvia
Luxembourg
Netherlands
Norway
Poland
Slovakia
Slovenia
Spain
Sweden
Switzerland
Turkey
United Kingdom



A YEAR IN REVIEW

**FEB 1**

Making biology crystal clear - 4 million euros to European project in advanced Structural Biology

FEB 7

10 years of the highest field NMR spectrometer in Portugal - CERMAX, ITQB NOVA NMR facility

FEB 9

Visit of Delegação Brasileira da Universidade de Ceará

FEB 22

Call for applications at the Doctoral Programme in Nuclear Magnetic Resonance Applied to Chemistry, Materials and Biosciences

APR 5

Biotechnology and sustainable agriculture debated at ITQB NOVA

APR 6

Call for applications at the Master in Biotechnology for Sustainability

APR 18

Call for applications at the Master in Biochemistry for Health

APR 21

Call for proposals at the António Xavier Prize 2017

APR 26

Call for applications at the Master in Science Communication

JANUARY**FEBRUARY****MARCH****APRIL****JAN 5**

PhD MolBioS Opening Day 2017
Opening of the academic year

JAN 9 TO 10

Annual meeting MOSTMICRO research unit

JAN 20

Visit of Dr. Paulo André Fernandes,
Director interino do Programa de Prevenção
e Controlo de Infecções e de Resistências aos
Antimicrobianos (PPCIRA)

JAN 27

Visit of Prof. Gustavo Goldman,
Universidade de São Paulo

MAR 3

Workshop ITQB NOVA Innovation Series – How to Assess a New Business
Marta MB Ribeiro, Knowledge and Tech Transfer Officer ITQB NOVA

Visit of Bruno Castro, Revista Nature

MAR 6

PhD Program - Plants for Life Opening Day 2017

ITQB NOVA welcomes graduates to apply to FCT call for PhD scholarships

MAR 6 TO 8

5th Cost CARISMA Meeting 2017 at Lisbon
Organization: Beatriz Royo

MAR 17

40 years of science career in a book - Claudina Rodrigues Pousada
autobiography

Applications open for ITQB NOVA Summer School 2017

MAR 27 TO 28

3rd COST EMPHASIS Meeting
Organization: Carla Pinheiro

MAR 30 TO 31

6th Cost ECOSTBio Workshop
Organization: Ricardo Louro



MAY 3 TO 4

Visit of Institute of Life Sciences,
Scuola Superiore Sant'Anna

MAY 18

Fascinated by Plants Worldwide - 700 events
in 52 countries, Portugal on top 3 worldwide in
events

MAY 19

Visit of Prof. Andreas Busch,
Head of Global Drug Discovery at Bayer
HealthCare AG

MAY 27

ITQB NOVA opens the doors - A day to get to know
researchers and their work

MAY 31

Paula M. Alves nominated Chairwoman of
European Society of Animal Cell Technology

JULY 3

Science Merit Award to Manuela Chaves by Minister of Science

JULY 4 TO 7

10th CERMAX practical course on NMR spectroscopy

JULY 7

ITQB NOVA Day 2017 - Celebrating 24 years of ITQB NOVA in Universidade
Nova de Lisboa
António Xavier Prize 2017 - Lifetime Award attributed to Professor
Carlos Geraldes
Best ITQB NOVA PhD Thesis 2016 - Awarded to Luís Carlos Santos Filipe

JULY 11

New European Research Infrastructure Consortium approved

JULY 11 TO 25

Summer school in Science Communication at Lisbon

JULY 24 TO 28

Summer Science @ITQB NOVA

MAY

JUNE

JULY

AUG

JUN 1

ONEIDA Kick off Meeting

JUN 8

Registrations open at the 10th CERMAX practical
course on NMR spectroscopy

JUN 14

Call for applications at the Master in Medical
Microbiology 2017/19

JUN 21

1st FeSBioNet COST Training School at FCT NOVA
Organization: Smilja Todorovic and
Catarina Pimentel

JUN 22 TO 23

Visit of Roberto Lins e Isabelle Viana,
Instituto Aggeu Magalhães

JUN 26 TO 30

Workshop on legume transformation
Old and new genetic engineering techniques to scope
with environmental challenges
Organization: Pedro Fevereiro



OCT 3 TO 6

ISMET 6 General Meeting of the International Society for Microbial Electrochemistry and Technology at NOVA Rectory
Organization: Ricardo Louro

OCT 23

Call for applications at the PhD Fellowships Plants for Life 2018

OCT 25

Call for applications at the MolBioS PhD Program 2018

André Santos was awarded SPB Young Investigator Award

OCT 29

Visit of Filippo Mancia,
Columbia University, New York

**DEC 11**

Last lesson of Professor Hermínia de Lencastre -
Academic jubilation ceremony

SEPTEMBER**OCTOBER****NOVEMBER****DECEMBER****SEP 12**

Call for applications at the PhD Fellowships
Plants for Life 2018

SEP13 TO 15

Plant Apoplastic Diffusion Barriers PADiBa
Symposium

SEP 17

International Microorganism Day at
Pavilhão do Conhecimento, Lisboa

SEP 20 TO 22

3rd general Meeting GREEN-IT Research
Unit

SEP 27 TO 17 OCT

Art & Science Exhibition | Sketching Science
at ITQB NOVA

SEP 29

European Researchers Night at Pavilhão do
Conhecimento, Lisboa

NOV 7 TO 8

Provas de Agregação Doutora Inês Antunes Cardoso Pereira

NOV12

Summer Science @ITQB NOVA João Zagalo project selected for Microbiotech17

NOV 15 TO 17

8th ITQB NOVA PhD Students Meeting

NOV 17 TO 21

EMBO Workshop on Proteostasis at Ericeira

NOV 20 TO 24

ITQB NOVA celebrates science and technology week

NOV 21

One year of Portuguese science on the radio - "90 segundos de ciência"

NOV 22

Call for applications at the Biology at the Host Microbe Interface

Visit of Nuno Fontes, Executive Director of Process Science, Boehringer-Ingelheim,
Fremont, California, USA

NOV 22 TO 24

Symposium and Job Fair - Career Opportunities for PostDoctoral Researchers in Life
Sciences at Cascais

NOV 28

Mariana Gomes de Pinho is new ERC Awardee

NOV 30

Mini-Symposium - Looking for new ways to fight tuberculosis
Hosted by Helena Santos and Margarida Archer



RESEARCH

RESEARCH AREAS

ITQB NOVA has a strong expertise in **Molecular Biosciences**, covered by four broad scientific disciplines: Cellular and Molecular Biology, Molecular and Structural Biology, Biotechnology and Systems Biology, and Chemical Biology. These scientific disciplines drive ITQB NOVA research, contributing to strategic Societal Challenges focused on the well-being of human societies (Molecular Basis of Health and Disease) and on the environment (Biological Resources and Sustainable Development).

Molecular basis of health and disease is directed to the well-being of humans and animals. ITQB NOVA aims to understand **the biological questions at the molecular and cellular scale** exploiting complementary expertise within the Institute. Epidemiology, molecular basis of infection, and antimicrobials and resistance are areas where research is being pursued towards this goal. Our molecular expertise allows us to unveil the mechanisms of disease and drug action, while opening the way for the design of new drugs, including biopharmaceuticals and ATPMs. In summary, ITQB NOVA addresses, at several levels of depth (from the atomic level, to organism biology), **the molecular mechanisms that sustain life**.

Biological resources and sustainable development deals mainly with the environment at large. The expertise of ITQB NOVA in Plant Sciences has a strong molecular edge and obvious impact on agriculture and the environment, placing the Institute on a very competitive position to make a difference at national and international level. Additionally, ITQB NOVA contributes substantially to the topics of food safety and security, which are strategic in our over-crowded planet.

Furthermore, ITQB NOVA expertise in clean production of useful products through (bio)catalysis (including bioenergy production), and microbiotechnology, can pave the way to a more sustainable development, while maintaining and improving the quality of life of advanced societies.

Research activities are currently integrated in **Research Units**, which involve researchers from other institutions. ITQB NOVA coordinates two Research Units – **MOSTMICRO** and **GREEN-IT** - and is further involved in a third one – **iNOVA4Health**. MOSTMICRO and iNOVA4Health operate in the area of Health and GREEN-IT operates in the area of Sustainability.

MOSTMICRO

Molecular, Structural and Cellular Microbiology

The **Molecular, Structural and Cellular Microbiology Unit** (MOSTMICRO) aims to advance the fundamental knowledge of living organisms, with emphasis on important bacterial pathogens, towards improving human health.

Research is focused on selected micro-organisms from all the three life domains, Bacteria, Archaea and Eukarya, for the study of basic biological questions, to improve our understanding of pathogens, and to contribute to the identification and design of novel systems/proteins/compounds with therapeutic potential.

The unit is coordinated by ITQB NOVA.

Green-it

Bioresources4Sustainability

The mission of the **BioResources 4 Sustainability Unit** (GREEN-IT) is to develop or design more sustainable biological and synthetic systems with application in food, feed, energy and the environment through the study of biological resources, ranging from complex systems like plants, bacteria and fungi, down to the level of proteins and molecules

GREEN-IT explores biological resources, using chemical and biological strategies, to address key societal challenges in agriculture, forestry and energy, ensuring environmental protection and supporting a bio-based economy.

The unit is coordinated by ITQB NOVA and also involves research groups from iBET and IGC.

iNOVA4Health

iNOVA4Health is a translational medicine programme organizing the efforts of biomedical researchers involved in biological understanding of disease, lead compounds and biopharmaceuticals "pre-discovery", technological scientists involved in "preclinical development", and clinicians involved in "early clinical and first in man clinical trials" from institutions within NOVA University of Lisbon. The programme has a strong emphasis on developing therapies to promote healthy ageing and in targeting chronic diseases that are responsible for two thirds of deaths worldwide and a major burden on healthcare systems for the future.

The unit is managed by iBET and also includes ITQB NOVA, CEDOC and the IPOLFG, Portuguese Oncology Institute.



MOSTMICRO

METALLOPROTEINS AND BIOENERGETICS

Manuela M. Pereira - Biological Energy Transduction

The Biological Energy Transduction Group addresses a fundamental process for all living organisms: energy conservation. A wide range of biochemical and biophysical techniques is used to investigate the mechanisms of energy transduction by membrane respiratory chains

Miguel Teixeira - Functional Biochemistry of Metalloenzymes

The main research themes of the Laboratory are the study at the molecular level of the structure and functional mechanisms of soluble metalloenzymes, namely those involved in oxygen and nitric oxide metabolisms.

Ricardo Louro - Inorganic Biochemistry and NMR

The Inorganic Biochemistry and NMR Laboratory is devoted to the structural and functional characterization of redox proteins that participate in the anaerobic bioenergetic metabolism of microorganisms, using biophysical methods.*

*This lab also participates in the GREEN-IT Research Unit.

Smilja Todorovic - Raman BioSpectroscopy

The Laboratory is interested in fundamental questions and biotechnological applications of metalloproteins that carry out catalysis, detoxification, signaling, electron transfer and DNA repair. The lab studies their mechanistic properties and immobilizes them on tailored plasmonic metal hybrids to probe molecular processes at interfaces or construct biosensing devices. Advanced vibrational spectroscopy, electrochemistry and spectroelectrochemistry are the main tools in the Lab's research.

MOLECULAR MODELING AND SIMULATION

António Baptista - Molecular Simulation

The Molecular Simulation Laboratory uses theoretical and computational methods to study the atomic-level determinants of the properties of (bio)chemical molecules. The methods are based on physical principles and intend to derive/simulate molecular behavior from those principles.

Cláudio Soares - Protein Modeling

The Protein Modelling Laboratory works on molecular modeling of proteins using computational biophysical methods. Redox proteins, ABC transporters, viral membrane fusion proteins and enzyme engineering are some examples of the work developed

Isabel Rocha - Systems and Synthetic Biology

The Systems and Synthetic Biology Lab pursues the development of efficient microbial cell factories for the production of relevant target products with industrial applications by implementing computationally-driven metabolic engineering strategies.

Manuel Nuno Melo - Multiscale Modeling

The Multiscale Modeling Lab employs computational molecular simulation models at different resolution scales to tackle a wide range of biological questions.

PHARMACEUTICAL AND SMALL BIOACTIVE MOLECULES

Ana Petronilho - Bioorganometallic Chemistry

Research in the group is centred in the synthesis and applications of biologically relevant N-heterocyclic carbenes.

Carlos Romão - Organometallic Chemistry

The Laboratory of Organometallic Chemistry is presently studying new metal carbonyl complexes to be used as Carbon Monoxide Releasing Molecules (CORM) a new class of drugs based on the therapeutic activity of CO.

Chris Maycock - Organic Synthesis

Natural product syntheses are a great challenge since the product gross structure and stereochemistry are rigorously defined. Any synthesis is a test of the viability of the strategy and of the compatibility of the reagents. The organic synthesis group is dedicated to the synthesis of compounds which have a relatively complex three dimensional structure and which may not necessarily be related to the gross structure.

Rita Delgado - Coordination and Supramolecular Chemistry

The Coordination and Supramolecular Chemistry group designs, synthesizes and evaluates the properties of new molecules for the selective uptake of anions, neutral molecules or metal ions for environmental and medical applications.

Rita Ventura - Bioorganic Chemistry

Bioorganic Chemistry is the interface of organic chemistry and biology. The Lab's research uses the principles and techniques of organic chemistry in attempting to solve problems of relevance to biology. The Lab can design synthetic derivatives of natural products, that improve on nature.

STRUCTURE AND FUNCTION OF BIOMOLECULES

Carlos Frazão - Structural Biology

The Structural Biology Laboratory works on the 3D structural determination of biological macromolecules aiming to understand biological processes at atomic and molecular level.

Inês Cardoso Pereira - Bacterial Energy Metabolism

The Lab investigates metabolic pathways and enzymes used for energy production in anaerobic microorganisms that are relevant to health and the environment, and explores their biotechnological applications.*

*This lab also participates in the GREEN-IT Research Unit.

Pedro Matias - Industry and Medicine Applied Crystallography

The broad goal of the Lab's research is the structural characterization of biomolecules with potential impact in industry and/or medicine towards the understanding of their mode of action, with the aim of designing variants with enhanced properties for industrial applications or contribute to drug discovery and development pipelines targeting proteins with human health implications. The team focuses on X-ray crystallography and has developed several internal and external collaborations to complement



the structural studies with biochemical and biophysical assays. The team is also beginning the first steps towards using Cryo-Electron Microscopy in their research.

DYNAMICS OF MACROMOLECULAR COMPLEXES

Alvaro Crevenna - Biomolecular Self-Organization

We believe that life can be recreated using purified components and that by doing so we uncover fundamental principles. The Lab's aim is to understand the organization and dynamics of macro-molecular complexes and how these give rise to cellular structure and function. The Lab's main tools are single molecule fluorescence microscopy, reconstituted in vitro systems and quantitative cell imaging.

Federico Herrera – Cell Structure and Dynamics

The overall aim of the Cell Structure and Dynamics laboratory is to lay the groundwork for the application of regenerative medicine in central nervous system (CNS) disorders involving neuronal loss, such as neurodegenerative disorders, spinal cord injury or stroke.

Tiago N. Cordeiro - Dynamic Structural Biology

The Dynamic Structural Biology Lab illuminates biological phenomena related to health and biotechnology with structural and dynamic detail. Major research areas: Signalling and Host-Pathogen interactions; Dynamics in Enzyme catalysis and evolution; Disordered proteins. Technical expertise: NMR, SAXS & modeling.

GENE EXPRESSION AND STRESS SURVIVAL

Cecília Arraiano - Control of Gene Expression

The Lab's studies focus on the control of gene expression. The lab has studied RNA degradation and characterized enzymes that mediate decay. Other interests are stress and microbial growth. This work has many applications in Biotechnology and Health.

Claudina Pousada - Genomics and Stress

The genomics and stress laboratory works in the mechanisms involved in homeostasis control when yeast cells are exposed to different environmental cues. The function of Yap transcription factors in stress response is investigated.

Lígia M. Saraiva - Molecular Mechanisms of Pathogen Resistance

The Molecular Mechanisms of Pathogen Resistance Group addresses the survival's mechanisms of human pathogens focus on their resistance to antimicrobials produced by the innate immune system and elucidation of bacterial haem biosynthetic pathways. Development of new antimicrobial drugs based on Carbon Monoxide (COMs) is another research area of the group.

Pedro Domingos - Cell Signaling in Drosophila

The Lab uses Drosophila as a model system to study the molecular and cellular signaling mechanisms involved in the degeneration of the photoreceptors, the cells that sense light in the visual system.

METABOLOMICS PROTEOMICS AND BIOACTIVITY

Ana V. Coelho - Proteomics of Non-Model Organisms

Biodiversity includes an immensity of species handling recognized unique biological processes that deserve to be thoroughly investigated, also aiming at defining new potential biomimetic targets. Proteomics integrated with other omics approaches and supported by de novo peptide sequencing and proteogenomics, is being used as a high-throughput strategy to fulfil this goal.

Helena Santos - Cell Physiology and NMR

Research at the Cell Physiology & NMR Lab is focused primarily on beneficial microorganisms that are sources of metabolites and enzymes with potential application in Biotechnology. Additionally, the lab studies phospholipid biosynthesis in mycobacteria to identify novel anti-tuberculosis drug targets.

BACTERIAL CELL BIOLOGY AND PATHOGENESIS

Adriano O. Henriques - Microbial Development

Bacterial spores are encased in a protein coat that confers resistance against chemicals, lysis and predation, and is a key sensor of the environment. The Lab is studying the molecular mechanisms that drive the sporulation process with model organisms, to also understand pathogenicity in dangerous strains, and to look for biotechnological and medical applications of spores.

Mariana G. Pinho - Bacterial Cell Biology

The Bacterial Cell Biology laboratory uses the Gram positive pathogen *Staphylococcus aureus* to study the mechanisms of cell division and of antibiotic resistance to cell wall targeting antibiotics.

Sérgio Filipe - Bacterial Cell Surfaces and Pathogenesis

The Lab studies how bacteria synthesize a major component of their cell surface, the peptidoglycan, while simultaneously preventing the infected host from detecting this inflammatory macromolecule that can trigger an innate immune response.

Zach Hensel - Single Molecule Microbiology

The Single Molecule Microbiology lab uses high-resolution fluorescence microscopy techniques to detect and track individual DNA, RNA and protein molecules in living cells in order to study gene regulation and other problems in molecular cell biology.

MICROBIOLOGY OF HUMAN PATHOGENS

Hermínia de Lencastre - Molecular Genetics

The long-range interest of the laboratory has been in the epidemiology, genetics, evolutionary and biochemical mechanisms of antibiotic resistant pathogens, specifically, staphylococci, enterococci and *Streptococcus pneumoniae*.

Maria Miragaia - Bacterial Evolution and Molecular Epidemiology

The Laboratory of Bacterial Evolution and Molecular Epidemiology aims to understand the molecular basis of bacterial evolution



with focus on the pathogenicity and evolution of antimicrobial resistance determinants and antimicrobial resistant clones in opportunistic bacteria.

Raquel Sá-Leão - Molecular Microbiology of Human Pathogens

The Lab is studying how human interventions, such as the use of vaccines and antibiotics, impact on the nasopharyngeal ecosystem, a rich niche frequently inhabited by potentially pathogenic bacteria such as *Streptococcus pneumoniae*.

GREEN-IT

PLANT DEVELOPMENT AND STRESS BIOLOGY

Margarida Oliveira - Plant Functional Genomics

The GPlantS lab studies the effect of environmental factors on the regulation of gene expression and plant development, with special focus on salt, drought and temperature stresses, using a number of different genomics approaches.

Nelson Saibo - Plant Gene Regulation

The Plant Gene Regulation Laboratory uses model and crop plants to study gene regulatory mechanisms underlying plant growth and plant responses to adverse environmental conditions.

PLANT METABOLIC REGULATION

Carla António - Plant Metabolomics

The Plant Metabolomics Laboratory uses Analytical Chemistry and Mass Spectrometry-based technologies to study the metabolic mechanisms underlying plant responses to adverse environmental conditions.

Isabel Abreu - Proteome Regulation in Plants

The Proteome Regulation in Plants Laboratory studies the effects of post-translational modifications on protein function. The working hypothesis is that the plant proteome can be induced to rapidly and efficiently deal with environmental changes, by manipulating its global regulation by post-translational modifications.

FOREST GENOMICS AND BIOTECHNOLOGY

Cândido Pinto Ricardo - Plant Biochemistry

The Plant Biochemistry Laboratory has applied transcriptomics, proteomics and metabolomics to study plant development and stress responses. Making use of the information thus gathered and of the recently available genomics data, genes related to proteins shown to be of high relevance to plant development and survival are now being investigated. Another area of interest of the Plant Biochemistry Laboratory concerns science communication to society, activity that is developed in association with the relevant ITQB initiatives.

Célia Miguel - Forest Biotech

The Forest Biotech Lab is studying aspects of forest tree biology which are important to understand and improve characteristic features such as wood and cork formation, or resilience to specific stresses. The Lab is also developing genomic resources and tools to support forest tree research and potential applications.

PLANT PRECISION BREEDING AND BIOTECHNOLOGY

Carlota Vaz Patto - Genetics and Genomics of Plant Complex Traits (PlantX)

The PlantX Lab unveils the genetic and genomic basis of plant Complex traits, such as nutritional or organoleptic quality or biotic/abiotic stress resistance, using different statistical genetic and genomic approaches.

Manuela Chaves - Plant Molecular Ecophysiology

The Lab's general interests concern the understanding of physiological and molecular mechanisms underlying plant responses to environmental stresses as well as the differences among genotypes in the capacity to utilize external resources.

Pedro Fevereço - Plant Cell Biotechnology

The Lab's aim is to develop molecular strategies to support plant selection and breeding programs, to apply biotechnology to the development of company's strategies and to train researchers in plant biotechnology and plant molecular biology.

MOLECULAR AND INDUSTRIAL BIOTECHNOLOGY

Beatriz Royo - Organometallic Catalysis

The Organometallic Catalysis Group works on the synthesis of organometallic compounds with specific properties for their use in catalytic and biological applications. The Group develops new synthetic strategies based on catalytic methods for the functionalization of organic molecules. The Lab is also interested in developing new metal-based drugs for the treatment of human diseases, such as cancer and microbial infections.

Cristina Silva Pereira - Applied and Environmental Mycology

The Applied and Environmental Mycology group aims to enlarge filamentous fungi biotechnological potential. Research ranges from fundamental studies on fungal biology to applications in bioremediation and biocatalysis, also highlighting ionic liquids higher interest.

Inês Cardoso Pereira - Bacterial Energy Metabolism

The Lab investigates metabolic pathways and enzymes used for energy production in anaerobic microorganisms that are relevant to health and the environment, and explores their biotechnological applications.*

*This lab also participates in the MOSTMICRO Research Unit.



Lígia O. Martins - Microbial & Enzyme Technology

The Lab's research activities are in the field of Molecular Biotechnology at the interface of protein science and protein technology, and involve the selection, structure-function characterization, and engineering of promising enzymes for environmental and industrial applications.

Ricardo Louro - Inorganic Biochemistry and NMR

The Inorganic Biochemistry and NMR Laboratory is devoted to the structural and functional characterization of redox proteins that participate in the anaerobic bioenergetic metabolism of microorganisms, using biophysical methods.*

*This lab also participates in the MOSTMICRO Research Unit.

Rita Abranches - Plant Cell Biology

The Plant Cell Biology Laboratory works on several aspects of the biology of the plant cell, with a main focus on the processes that regulate the successful expression of transgenes and synthesis of recombinant proteins in plant cell cultures.

INOVA4HEALTH

Abel Oliva - Biomolecular Diagnostics

This multidisciplinary research team is committed to develop new biomolecular tools, such as nanoparticles (CdSe@ZnS quantum dots) and biosensors, for practical applications like disease diagnostic and bioprocess monitoring.

Ana Luísa Simplicio - Pharmacokinetics and Biopharmaceutical Analysis

The PABA group develops in vitro models to study pharmacokinetics and metabolism. Those models are applied to dietary supplements or prospective drugs.

Ana Sofia Coroadinha - Cell Line Development and Molecular Biotechnology

The primary research activity is centered in development and improvement of virus biopharmaceuticals, recombinant virus for vaccines or gene therapy, and the animal cell lines for their manufacturing.

Catarina Brito - Advanced Cell Models

The Lab's research is mostly translational and focused on the study of cellular microenvironment in disease progression and therapeutic response. To address these questions the lab develops and employs advanced cell-based disease models, using stem cells and other patient-derived cell and exploring three-dimensional culture strategies, along with cell biology and biochemistry approaches. The Lab's projects address several neurological pathologies and cancer.

Colin McVey - Structural Virology

The Lab is studying the mechanisms involved in the establishment and modulation of herpesviral chromatin. Chromatin modulation is a key process that governs the infectious or persistent cycle of herpesviruses. The long-term goal is to understand how these processes contribute to virus tumourigenesis.

Julia Costa – Glycobiology

The Lab is studying structures and functions of glycosylation, which is an important post-translational modification of proteins in human cells, with implications in biomarker discovery.

Manuel Carrondo - Engineering Cellular Applications

The Lab's research is centered on integrative development of bioprocesses for complex biopharmaceuticals namely vaccines, recombinant proteins, viral vectors for gene therapy and cells/stem cells for cell therapy applications.

Margarida Archer - Membrane Protein Crystallography

The Membrane Protein Crystallography Laboratory determines the three-dimensional structure of biological macromolecules. The laboratory is integrated in the Macromolecular Crystallography Unit.

Maria Arménia Carrondo - Structural Genomics

The Structural Genomics Laboratory studies proteins involved in diverse biological processes, such as DNA repair and protection, oxidative stress resistance and hydrogen sulfide metabolism, by a structural genomics approach. The lab combines structural biology methodologies like X-ray crystallography and Small Angle X-ray Scattering (SAXS), with X-ray imaging, biochemical, biophysical and spectroscopic analysis. Moreover, the lab is also building their knowledge on Cryo-Electron Microscopy through the Twinning Project Horizon 2020 IMpACT.*

*This Laboratory is composed of three research teams which are integrated in the MOSTMICRO and iNOVA4Health Research Units.

Maria Rosário Bronze - Food Functionality and Bioactives

The Lab's research is focused on Analytical Chemistry applied to the study of foods namely with respect to their characterization, quality, safety and authenticity.

Paula Alves - Cell Bioprocesses

The Lab's research is centered on the development of bioprocesses for complex biopharmaceuticals namely vaccines, recombinant proteins and viral vectors for gene therapy. Current efforts include also the development of tools and methodologies for cell therapy applications and pre-clinical research (novel 3D in vitro models for liver, cardiac- and neuro-toxicology, through the use of human stem cells and primary cultures of human hepatocytes).

Teresa Crespo - Microbiology of Man-made Environments

The group focus is the study of microorganisms (bacteria, viruses and fungi) present in food and water matrices and their pathogenic potential and impact on the environment and human health. The group has a long track record in characterizing microbial populations thriving in food and water matrices using a multidisciplinary approach and applying the most recent technology.



SCIENTIFIC SERVICES

Researchers at ITQB NOVA can profit from the excellent research facilities and support services. A list of the major services available on site is provided in this section.

NMR Facility CERMAX

Centro de Ressonância Magnética Nuclear António Xavier

Available to ITQB NOVA and outside researchers

ITQB NOVA hosts the largest Portuguese NMR facility - Centro de Ressonância Magnética António Xavier (CERMAX), that is part of the National NMR Facility.

CERMAX has several NMR spectrometers all from Bruker (300MHz multiprobe, 400 MHz with automatic sampler, 500 MHz multiprobe, 500 MHz cold probe and 800 MHz thermostated automatic sampler and Cryoprobe). The 800 MHz is the highest field NMR spectrometer in Portugal, and one of only three in the Iberian Peninsula. These instruments support a wide range applications, including the determination of the structures and function of proteins, structure and reactivity of small molecules and catalysts, metabolomic studies, materials' sciences and in vivo NMR, among others. CERMAX organizes annually a practical course on NMR techniques for the Portuguese community, contributes actively with access time and expertise to the training of researchers and students of the masters and PhD programs run by ITQB-NOVA, and to the scientific output of the institute.

Contacts: Dr. Ricardo O. Louro (cermax.direction@itqb.unl.pt)

Mass Spectrometry Facility UniMS

Available to ITQB NOVA and outside researchers

UniMS provides state-of-the-art Mass Spectrometry services to the scientific community and Industry, guaranteed by the continuing increase in Mass Spectrometry know-how and infrastructures. This unit is administrated by a joint commission ITQB NOVA and iBET, and is a node partner of the Portuguese Mass Spectrometry Network RNEM.

Contacts: unims.direction@itqb.unl.pt | unims.direction@ibet.pt

Microbial Cell Production

Available to ITQB NOVA researchers

This facility provides technical support to research groups in bacteria/yeast cultivation and associated molecular biology techniques as well as establishing and maintaining collections of expression vectors and host cells for prokaryotic expression systems.

Contacts: João Carita (carita@itqb.unl.pt) and Teresa Baptista da Silva (teresas@itqb.unl.pt)

Protein Purification & Characterization

Available to ITQB NOVA researchers

This facility provides assistance and expertise in protein purification using fast pressure liquid chromatography systems and biochemical characterization of proteins.

Contacts: Cristina Timóteo (cristina.timoteo@itqb.unl.pt), Teresa Baptista da Silva (teresas@itqb.unl.pt).

Bacterial Bioimaging Cluster

Available to ITQB NOVA and outside researchers

The Bacterial Imaging Cluster (BIC) is housed in a biosafety level II facility and houses: 1) two custom build Single Molecule Localization Microscopy (SMLM) systems (Super-Resolution, TIRF, Live and Fixed-cell imaging); 2) Zeiss Airyscan Confocal system (Confocal diffraction limited and super-resolution imaging, fluorescence resonance after photobleaching (FRAP), fluorescence resonance energy transfer (or FRET) imaging, Live and Fixed-cell imaging); 3) one Leica Widefield system (equipped with a laser micropoint system coupled to a high-end camera, which allows FRAP experiments to be implemented, and specific filter sets for FRET applications); 4) one Zeiss Axio Zoom.V16 (morphology analysis) 5) one Biorad S3e cell sorter (Flow Cytometry Analysis and Fluorescence-Activated Cell Sorting (FACS)).

All BIC equipment is optimized for microbiology and host-pathogen interaction centred biological questions. BIC congregates highly specialized researchers with expertise in advanced imaging and image analysis solutions for microbiology and host-pathogen interaction. Since its onset in 2017 BIC has been a cornerstone of the microscopy work developed at ITQB NOVA, which is highlighted by several publications. BIC is ITQB NOVA's node of Plataforma Portuguesa de BioImage PPBI.

Further information can be found in the BIC website <http://www.itqb.unl.pt/bic>

Contacts: BIC scientific Head Adriano O. Henriques, Microbial Development Group (aoh@itqb.unl.pt), BIC Vice-head Mónica Serrano, Microbial Development Group (serrano@itqb.unl.pt), BIC Vice-head Pedro Matos Pereira (pmatos@itqb.unl.pt), Bacterial Cell Biology Group, and Mariana Ferreira, BIC expert technician (mariana.g.ferreira@itqb.unl.pt).

N-terminal Sequencing

Available to ITQB NOVA and outside researchers

This facility offers expertise and assistance in protein and peptide N-terminal sequencing (Edman degradation method). Equipped with ABI Procise Protein Sequencer.

Contacts: Paula Chicau (chicau@itqb.unl.pt).

Biophysical Resources

Available to ITQB NOVA and outside researchers

This facility provides technical support to research groups in several precision instruments for characterization of macromolecules and their interactions. Equipped with TGA Q50, TA; CD Spectrometer J-815, Jasco; Cary Eclipse Fluorescence Spectrophotometer, Varian; DLS Zetasizer Nano ZS, Malvern; DSC Q200, TA; Microcal iTC-200, GE and VP-DSC, Microcal.

Contacts: Paula Chicau (chicau@itqb.unl.pt)



Small Molecule Analysis

Available to ITQB NOVA researchers

The goal of this facility is to provide assistance and technical advice in analytical and semi-preparative HPLC and Elemental Analysis. Equipped with HPLC, Elite LaChrom (PDA Detector), HPLC, Waters semi-preparative (UV/ Vis Detector), HPLC, Waters Alliance Sys. (PDA and Fluorescence Detector), HPLC, Waters Alliance Sys. (UV/Vis, Fluorescence and IR Detector), UPLC Waters (PDA and Fluorescence Detector), Leco TruSpec Micro Elemental Analyzer.

Contacts: Cristina Leitão (mleitao@itqb.unl.pt)

Elemental Analysis

Available to ITQB NOVA and outside researchers

Elemental analysis facility provides an accurate determination of carbon, hydrogen, nitrogen and sulfur composition using a Leco TruSpec Micro Elemental Analyzer.

Contacts: Conceição Almeida (salmeida@itqb.unl.pt)

Greenhouses & Plant Chambers

Available to ITQB NOVA researchers

The aim of this facility is to provide technical and logistic assistance to plant growth, propagation and protection under controlled environment conditions.

Contact: Hugo Matias (hugo.silva@itqb.unl.pt)

Lab manager

Available to ITQB NOVA researchers

Coordinates the purchase and maintenance of scientific equipment for the institute, establishing an efficient and professional purchase procedures. Supervises common scientific equipment and supports researchers who need to acquire laboratory instruments.

Contact: Paula Chicau (itqb.labmanager@itqb.unl.pt)

Teaching Laboratory

Available to ITQB NOVA and outside researchers

Designed and equipped to support the teaching activities of the Institute in areas ranging from Biochemistry to Genetics. Can be rented for teaching and other activities.

Contact: Teresa Baptista da Silva (le@itqb.unl.pt)

Washing rooms

Available to ITQB NOVA researchers

The washing room's team provides support to all research groups in decontamination, washing, preparation and sterilization of laboratory equipment.

Contact: João Carita (carita@itqb.unl.pt)

Library

Available to ITQB NOVA and outside researchers

Physical and online library specialized in chemistry, biology and microbiology. Resources available and useful to all users at ITQB NOVA and outside researchers upon request. Also provides a quiet area for students and faculty to study and do research.

Contact: Isabel Murta (isamurta@itqb.unl.pt)

Health and Safety

Available to ITQB NOVA researchers.

Health and Safety at ITQB NOVA comprises the Safety Committee and Floor Coordination (SFCC) and the Healthcare. The main objective of SFCC is the promotion of safe and healthy working conditions throughout ITQB NOVA; to provide counselling and/or training on demanded subjects and assure that all research activities are compliant with legal obligations concerning to Health and Safety at Work, Environmental Protection and Emergency awareness. ITQB NOVA Healthcare department includes Occupational Medicine and General Practice.

Contact: Helena Matias (itqb.safety@itqb.unl.pt)



RESEARCH FUNDING

The ITQB NOVA Science Funding Office supports the institution and researchers in the preparation of competitive funding applications by disseminating opportunities, engaging with funders, planning, advising and supporting grant preparation and submission. The overarching goal is to contribute to an ample and balanced funding portfolio at ITQB NOVA.

In 2019, the Science Funding Office registered 155 proposals submitted to national (88) and international (67) funding agencies, which secured € 3,4 million for the ITQB NOVA for the incoming years. Moreover, the institute displayed a well-balanced list of potential funders, with researchers applying to 45 different funders (12 national and 33 international), of which 12 were private.

Substantial effort was dedicated into supporting specific calls, namely the calls for Marie S. Curie Individual Fellowships (2 approved applications), Horizon 2020 Twinning (1 approved application), La Caixa Junior Leader (1 approved application) the FCT Scientific Employment Stimulus Call (2 approved applications). An information session about the FCT Individual Scientific Employment call was held on the 31st of January 2019. The ITQB NOVA Science Funding Office also provides training for researchers. The first edition of the two day intensive course on Grant Writing for ITQB NOVA postdocs and early PIs was delivered, hosted by the Postdoc Association of ITQB NOVA. Under the umbrella of the TRANSPER project in which the office staff participates, two training workshops were organized focused on skills for wider employability of researchers. The first workshop was held at the University of Karlstad, Sweden, and the other at NOVA Rectorate in Lisbon; and selected ITQB NOVA researchers were trained. TRANSPER is funded by the ERASMUS Plus Strategic Partnerships and coordinated by Karlstad University (total grant: 386 260 €; 51 850 € for ITQB NOVA).

In 2019, the project ITQB++, coordinated by M. Trindade and funded by FEDER (Portugal 2020) continued to support researchers in the preparation of European grants (total grant: 152 010 €; incentive 60 804€).

INNOVATION OFFICE

2019 has seen a positive change at ITQB NOVA regarding innovation and intellectual property support, which has increased with the setup in September of a new Innovation Office, in partnership with Gulbenkian Institute of Science. This office set up and supported within the framework of Oeiras' Municipality Strategy for Science and Technology. The Innovation Office is dedicated to supporting scientists from the point of view of innovation and translational research. It aims at the identification, protection and adequate exploitation of ideas with added value that will boost relations with the industry and businesses and contribute to increase the impact of research developed at ITQB NOVA. This new structure is based on two ideas: the creation of an Innovation Office for the Life Sciences and the creation of a proof of concept funding program. The unit will increase the impact of science for society, as well as its visibility and international reputation.

In 2019 the office has provided support to 67 projects, resulting in the signature of 32 innovation contracts, 12 of which with companies. It has contributed to secure over 385k euros in industrial funds. In addition, it has also provided support in reviewing 6 consortium agreements with multiple partners from public and private organizations. As part of the effort to communicate the activities of the office and the advantages of innovation and IP protection, 3 seminars were organized.



EDUCATION

PHD PROGRAMS

A PhD student at ITQB NOVA is part of the research staff. Integrated in research groups, PhD students develop an original research thesis supervised by the lab's PI and closely monitored by the PhD Thesis Committee. PhD Programs at ITQB NOVA also include a limited period of classes (organized in doctoral training programmes), where students from different labs work together and learn about different scientific topics and research lines, develop technical and transversal skills, and discuss their current and future paths.

ITQB NOVA coordinates two main doctoral programs, Molecular Biosciences and Plants for Life and further participates in the Sustainable Chemistry and Bioengineering doctoral programs. ITQB NOVA is the academic institution responsible for the Doctoral Program in Integrative Biology and Biomedicine in partnership with the Gulbenkian Institute of Science, and for the International Program in Neurosciences in partnership with the Champalimaud Foundation. In addition, ITQB NOVA also coordinates the specialized doctoral training course funded by FCT, Biology at the Host Microbe Interface and further participates in other FCT funded doctoral training courses.

A3ES accredited PhD Programs at ITQB NOVA:

The **PhD Program in Molecular Biosciences** is a flexible state-of-the-art research oriented program in life sciences. The Program provides advanced training in molecular approaches needed to understand the mechanisms of life.

The International **PhD Program Plants for Life** provides advanced training in plant sciences to address key biological questions related to plant growth and development, plant responses to environmental stress, and improvement of crop varieties and plant products.

The **PhD in Sustainable Chemistry** is a multidisciplinary program in the central/ broad area of chemistry, which will provide new focus on sustainable research strategies towards the development of new chemical, processes and products in line with current needs of the Chemical Industry and the demands of society. (coordinated by FCT NOVA)

The **PhD in Bioengineering** is designed to train students towards academia, hospitals and industry, able to produce cutting-edge developments on Bioengineering, translated into clinical applications, and to promote new business ventures, improving human health and economic growth. (coordinated by FCT NOVA)

The **IGC PhD Program in Integrative Biology and Biomedicine** is hosted by the Instituto Gulbenkian de Ciência and trains students in a wide spectrum of different topics in the biological sciences.

The **Champalimaud International Neurosciences PhD Program** is hosted at the Champalimaud Centre for the Unknown and aims to provide students with a foundation to perform innovative and interdisciplinary work in basic or applied neuroscience.

Advanced Doctoral Training Programs at ITQB NOVA:

The **Biology at the Host Microbe Interface** program trains students on understanding the general principles guiding host-microbe interactions towards novel therapeutic intervention against infectious as well as non-communicable diseases.

The **Program on Catalysis and Sustainability (CATSUS)** trains students in modern Catalysis, promoting a synergic cooperation of the different types of Catalysis, in Chemistry and Chemical Engineering, by gathering teams with complementary expertises in various institutions and favouring their interaction.

The **Program in Advanced Integrated Microsystems** provides advanced training in the design and implementation of miniaturized multifunctional devices and systems, fabricated using top-down and bottom-up micro and nanofabrication techniques, to be applied to bioprocessing, biotechnology, biomedicine, pharmaceutical sciences, biosensing for biomedical, environmental and food safety, and physical sensing.

The **Graduate Program Science for Development** is an innovative advanced training program, aiming to help prepare African and East Timorese students to pursue a scientific career and to train a new generation of University professors. The program is coordinated by IGC and funded by FCT and Fundação Calouste Gulbenkian.

The **Program in Applied and Environmental Microbiology** is an inter-university and inter-research centre program offering multidisciplinary training that includes in-depth understanding of molecular and cellular microbiology and of the contemporary view of genome-based microbiology, microbial diversity and evolution.

The goal of **Nuclear Magnetic Resonance Applied to Chemistry, Materials and Biosciences (PTNMR)** doctoral training program is to foster the development of NMR spectroscopy in Portugal by training students to take the maximum advantage of this powerful technique in a variety of key research areas: Structural Biology, Material Sciences, Small Molecules, Metabolomics and Metabonomics.

NOVA DOCTORAL SCHOOL

ITQB NOVA PhD Students have access to courses within the NOVA Doctoral School, a transdisciplinary structure within Universidade NOVA, which offers a range of complementary and transferable activities that support the personal and professional development of PhD students and supervisors.



MASTER COURSES

At the 2nd cycle level, ITQB NOVA coordinates the Masters in Biotechnology for Sustainability and co-coordinates the Masters in Medical Microbiology, the Masters in Biochemistry for Health, and the Masters in Science Communication, together with other NOVA organic units. ITQB NOVA also hosts students registered at other academic institutions for their thesis research project.

The **Master in Biotechnology for Sustainability** is coordinated by ITQB NOVA, with the collaboration of iBET, IGC, INIAV, INSA, NOVA-SBE and CEBAL. This course aims to endow its students with a transversal and interdisciplinary perspective of green and white biotechnologies, preparing them to deal with the new societal challenges with increased awareness of their responsibilities towards the planet and the future generations.

The **Masters Degree in Medical Microbiology**, is a collaborative Masters Course from Universidade Nova de Lisboa initiated in 2003 and involving ITQB NOVA, the Instituto de Higiene e Medicina Tropical, Faculdade de Ciências Médicas and Faculdade de Ciências e Tecnologia. The course trains specialists in medical microbiology, providing a solid training both for professionals in laboratory and clinical settings, and for those wishing to pursue their studies in research (3rd cycle).

The **Masters Degree in Biochemistry for Health** is a collaborative Masters from Universidade NOVA de Lisboa, involving ITQB NOVA, Faculdade de Ciências Médicas and Faculdade de Ciências e Tecnologia. The course provides a critical and analytical perspective of Human Health from a Biochemical point of view.

The **Masters Course in Science Communication** is a collaborative project of Faculdade de Ciências Sociais e Humanas and ITQB NOVA. With an essentially practical approach, the course covers the application of different communication tools to science communication in three major domains: journalism, institutional communication and education.

Master Projects

Research laboratories at ITQB NOVA welcome Master students registered at other academic institutions to develop their research projects. In this case, the credits are awarded by the institution awarding the Master degree. Available Research Projects are regularly announced at the ITQB NOVA's webpage.

OTHER COURSES

ITQB NOVA also offers non-degree courses on initiation to research and a post-graduation course on entrepreneurship.

The **Post-graduation Start-up Research** is a program collaboratively built by scientists and entrepreneurs from ITQB NOVA and NOVA SBE designed to create awareness in researchers of the value their science can generate. The Program provides Life Sciences researchers with knowledge about Innovation management, soft and entrepreneurship skills.

The **Postgraduate Programme in Research Practice** aims to provide a one-year hands-on training in research, in one of ITQB NOVA research Laboratories at four levels: Basic, Intermediate, Advanced, and Specialized.

The **University Extension Courses in Scientific Training** offer the possibility of short (less than one year) hand-on training in one of ITQB NOVA research laboratories.

The **Summer Science @ ITQB NOVA** provides undergraduate students the opportunity to experience science in a cutting-edge research institute. During one week, students spend approximately 25 hours in a laboratory of their choice and participate in various round tables and workshops. Having the opportunity to participate in social activities to meet and interact with scientists and, most of all, have fun while learning more about science.



SCIENCE & SOCIETY

OUTREACH ACTIVITIES

ITQB NOVA is actively involved in bringing its research and researchers closer to the society. This is done through communicating our scientific breakthroughs through media, website and social media, organizing outreach activities, such as visits from high schools and universities and science displays, and also training ITQB NOVA researchers in communication skills to interact with all types of audiences through media or outreach. Science and society activities are coordinated by ITQB NOVA Science Communication and Image Office.

CIÊNCIA ABERTA A OEIRAS AND OEIRAS EDUCA

The link with the local community has been strengthened through the partnership with the Oeiras City Council and IGC in the "Oeiras Educa" and "Ciência Aberta a Oeiras" programmes. These programmes aim to bring science closer to citizens, with projects ranging from activities for schools to teaching, technology transfer, and research. During 2019, Oeiras Educa programme includes several activities for schools, Job Shadowing periods for high school students, and support for Science Clubs, and participation in commemorative days (such as Microorganism Day, Children's Day or Microscopy Day).

HIGHSCHOOL AND UNIVERSITY VISITS

During 2019, we held ITQB NOVA Open Day entitled "Junta-te ao Elementos!" in celebration of the International Year of Periodic Table. Researchers, lab, and facilities received visitors from Oeiras, Lisboa, Sintra, and Cascais to know more about our work. ITQB NOVA Open days are held regularly since 2005. ITQB NOVA has also organized the Portuguese activities of the Fascination of Plants Day, an international initiative of the European Plant Sciences Organization scheduled for May 18th and organized every two years. ITQB NOVA is one of the associate partners of Pavilhão do Conhecimento Ciência Viva, in Lisbon, and collaborates frequently in science displays and exhibitions they organize. In 2019, ITQB NOVA collaborated to the exhibition "Pum! A vida secreta dos intestinos". Hands-on activities at Microorganism Day were organized by researchers from ITQB NOVA - with the support of Oeiras City Council and the participation of IHMT - NOVA Institute of Hygiene and Tropical Medicine - and IGC - Gulbenkian Institute of Science.

TRAINING SCIENTISTS

Training in Science Communication is mandatory at all PhD programs coordinated by the institute. This training is also available for Sustainable Chemistry PhD Program and Universidade NOVA Doctoral School. Other Science Communication courses coordinated by ITQB NOVA and delivered through NOVA Doctoral School are Communicating Science Visually and Social Media for Scientists. ITQB NOVA also offers a Master in Science Communication and a Summer Course in Science Communication, with FCSH NOVA.

MEDIA AND SOCIAL MEDIA

ITQB NOVA maintains an active communication with the outside world, on our research and researchers achievements. We produce news for the website, press releases that get covered by national and international Media and we maintain active social media accounts on Facebook, Twitter, YouTube, Instagram, and LinkedIn. In 2019, we had 373 mentions in national and international media. The daily radio show "90 Segundos de Ciência", the winner of the Gulbenkian 2019, is a science dissemination radio program broadcast on national Antena 1 station twice daily since 21st November 2016. The show is produced and coordinated by ITQB NOVA and FCSH NOVA, and sponsored by Novartis, and has a dedicated social media on Facebook and Twitter, website www.90segundosciencia.pt.

ITQB in 2019

AWARDS, HONORS AND DISTINCTIONS

Nuno Maulide elected Scientist of the year in Austria

ITQB NOVA-invited professor was distinguished by the Austrian Club of Education and Science Journalists.

Manuela Chaves elected Correspondant Associé of the Académie d'Agriculture de France

Nuno Maulide is the winner of Lieben Award

ITQB NOVA-invited professor was chosen by the Austrian Academy of Sciences

Helena Santos distinguished with Medal of Scientific Merit

Ministry for Science, Technology and Higher Education awarded Helena Santos, a pioneer in the use of Nuclear Magnetic Resonance techniques for the non-invasive study of cellular metabolism. Former director of ITQB NOVA, Manuel Nunes da Ponte, was also honoured.

Catarina Paquete elected to ISMET board

The International Society for Microbial Electrochemistry and Technology links researchers from various areas of science and engineering to study interactions between electroactive organisms and electrodes.

90 Segundos de Ciência awarded with the 2019 Gulbenkian Knowledge prize

The programme is a result of the Master in Science Communication run by ITQB NOVA and NOVA FCSH.

Helena Santos receives the Nicolau Van Uden Prize

MAIN SEMINARS

INVITED SPEAKERS

Seminars by invited speakers at ITQB NOVA

Science policy and research governance: what can researchers do? The example of the EU-LIFE alliance

Marta Agostinho, EU-LIFE Coordinator

Intracellular replication of *Streptococcus pneumoniae* inside splenic macrophages serves as a reservoir for septicemia

Marco Rinaldo Oggioni, University of Leicester

Novel Molecular Mechanisms Improving Fitness in Zn(II)-dependent Carbapenemases: The last frontier of Antibiotic Resistance

Alejandro Vila, Howard Hughes International Scholar, Universidade Nacional de Rosario, Argentina

[Plants for Life Seminar] Towards Understanding the Morphogenesis and Functionality of Phloem

Yrjo Helariutta, Sainsbury Laboratory, University of Cambridge, UK

[Plants for Life Seminar] Harnessing the evolution of photosynthetic efficiency

Steven Kelly, Royal Society University Research Fellow and Associate Professor in the Department of Plant Sciences at the University of Oxford

[Plants for Life Seminar] Coordination of the plant circadian clock at the single cell level

James Locke, Sainsbury Laboratory, University of Cambridge, Cambridge, UK

[Plants for Life Seminar] Mechano-chemical basis of cellular and tissue level architecture in plants

Arun Sampathkumar, Max Planck Institute of Molecular Plant Physiology, Golm, Germany

[Plants for Life Seminar] From fixation to end-product synthesis: following the path of carbon in C3 and C4 plants by dynamic ¹³C02 labelling

Stephanie Arrivault, Max Planck Institute of Molecular Plant Physiology

The complex regulation of the CO₂-fixing enzyme Rubisco

Elizabete Carmo-Silva, University of Lancaster, UK

SUMO conjugation in plants: mechanistic insights and biological implications.

Maria Lois, Center for Research in Agricultural Genomics-CRAG

Water strategic issue for Mediterranean Agriculture – from plant to agronomy

Miguel Costa, Instituto Superior de Agronomia

On the origin of flower self-compatibility in almond and apricot
Ossama Kodad, National School of Agriculture in Morocco and Head of the Department of Pomology

Coleoptile elongation in japonica rice under submergence

Chiara Pucciariello, Associate Professor in Plant Physiology at Istituto di Scienze della Vita - Sant'Anna Scuola Universitaria Superiore Pisa

Multiple Pathogen Recognition by Plant Immune Receptors

Matthew J. Moscou, The Sainsbury Laboratory, Norwich Research Park

[iNOVA4Health Seminar] Challenges of the pharmaceutical industry and its implications for collaborators

Harald Dinter, Independent Consultant (Formerly BAYER AG)

Efficient cell wall synthesis relies on flotillin modulated membrane fluidity

Prof Dirk-Jan Scheffers, University of Groningen, Department of Molecular Microbiology

Molecular dynamics à la carte: from small molecules to drug discovery

Dr. Francesco Colizzi, Institute for Research in Biomedicine, Barcelona, Spain

Vector control, an indispensable approach to combat neglected diseases; the experience of Cape Verde

Lara Gómez, University of Groningen, Department of Molecular

New Frontiers for Vaccinology

Mariagrazia Pizza, GSK Vaccines, Siena, Italy

⁵⁷Fe nuclear resonance vibrational spectroscopy of metalloenzymes

Lars Lauterbach, Technical University of Berlin

Incorporating complex physiological traits into wheat breeding pipelines

Gemma Molero, CIMMYT - International Maize and Wheat Improvement Center

Chemistry talking to biology for Cell Delivery and Bottom up Cytoskeleton Mimics

Javier Montenegro, Ramón y Cajal, CIQUS, USC

Insights from molecular modeling and dynamics into dendrimers as drug delivery carriers

Nuno Martinho, iBB (Instituto Superior Técnico)

Carbon/nitrogen balance: coordination at plant level and response to environmental changes

Rubén Vicente Pérez, Max Planck Institute of Molecular Plant Physiology

Understanding physiology through metabolic flux quantitation

Tiago Alves, Universitätsklinikum Carl Gustav Carus

Interfacing biocatalysts with synthetic materials for semi-artificial photosynthesis

Erwin Reisner, Department of Chemistry, University of Cambridge

Polyphosphorylation, a new post-translational modification of proteins

Cristina Azevedo, University College London

[iNOVA4Health Seminar] Re-Generando: Gene modified dendritic cells and CAR-T cells to rebuild the immune system

Renata Stripecke, Hannover Medical School

Excerpting Advances from Quorum Sensing to Communicate with Electronics

William E. Bentley, Fischell Department of Bioengineering, Department of Chemical and Biomolecular Engineering, Institute for Bioscience and Biotechnology Research, Robert E. Fischell Institute for Biomedical Devices, University of Maryland, College Park, MD

[iNOVA4Health Seminar] Disruptive engineering of viral immunotherapies to create a world free of cancer

José Manuel Otero, Senior Vice President of Technical Operations, Turnstone Biologics

High-resolution cryoEM of membrane protein complexes

Werner Kühlbrandt, Max Planck Institute of Biophysics, Department of Structural Biology, Germany

Proteogenomics and metaproteomics, new horizons in proteomics

Jean Armengaud, Laboratory «Innovative technologies for Detection and Diagnostics» CEA-Marcoule, France

Cryo-EM of fully recombinant human proteasomes – a new approach with new potential applications

Ana Toste Rego, Research Officer at MRC-LMB, Cambridge, UK

AVX SEMINARS

Created in 2008, "António V. Xavier Seminars" bring to ITQB NOVA outstanding Portuguese researchers working in Portugal. Carrying ITQB NOVA founder's name, this seminar series promotes the discussion on a diverse range of topics at ITQB NOVA community. The seminars are held in English and are open to the public.

New water vapor observations and the predictability of atmospheric storms

Pedro Miranda, IDL – Faculdade de Ciências da Universidade de Lisboa

Biorecognition as a Tool for the Functionalization of Cellulose-based Materials with Biomolecules and Nanostructures

Miguel Prazeres, IBB – Instituto Superior Técnico

Sustainability in view of drug delivery

Ana Aguiar Ricardo, Chemistry Department FCT NOVA

The ecosystem of Serra da Estrela: plant biodiversity and bioactive compounds from underexplored natural sources

Ana Paula Duarte, Centro de Investigação de Ciências da Saúde da Universidade da Beira Interior

Theory and Practice in Photodynamic Therapy of Cancer

Luís Arnaut, Dep. de Química da Universidade de Coimbra

Emerging contaminants in a changing world: current perceptions and future perspectives

Fernanda Cássio, Centro de Biologia Molecular e Ambiental da Universidade do Minho

A Synthetic Biology approach for the use of cyanobacteria as cell factories

Paula Tamagnini, Faculdade de Ciências da Universidade do Porto

Applications of nucleic acid mimics in biotechnology

Nuno Filipe Azevedo, LEPABE – Universidade do Porto

Protein aggregation for food formulations: influence of electric fields and the formation of protein-based nanohydrogels

António Vicente, Universidade do Minho

Centrosomes and Cilia in Development and Disease

Mónica Bettencourt Dias, Instituto Gulbenkian Ciência

FRONTIER LEADERS

Seminar series designed to integrate the ITQB NOVA PhD Program bringing to Portugal renowned researchers in biology and chemistry, in particular those awarded with ERC Advanced Grants.

Metal Complexes in Medicinal Chemistry

Gilles Gasser, Chimie Paris Tech, PSL University, France

Taming plastids for biotechnology and synthetic biology

Ralph Bock, NPI of Molecular Plant Physiology, Germany

Metal Complexes in Medicinal Chemistry

Gilles Gasser, Chimie Paris Tech, PSL University, France

Coordination of DNA Replication with Cell Division in *Streptococcus pneumoniae*

Jan-Willem Veening, University of Lausanne, Switzerland

Host-microbes symbiosis in health and disease

Joel Doré, French National Institute for Agricultural Research – Micalis Institute, France

Increasing complexity in simulations of biological membranes

D. Peter Tieleman, University of Calgary, Canada

SCAN SEMINARS

Seminars by inhouse researchers and ITQB NOVA alumni.

Seed biology and technology approaches for developing better and healthier crops

Susana Araújo

Influenza fusion peptide: Dissecting the molecular properties of a key player in the infectious process

Diana Lousa

Mutagenesis studies to assess substrate specificity determinants of multicopper oxidases

Vânia Brissos

Making live-cell super-resolution microscopy easy(er)

Pedro Matos Pereira

Control of heme homeostasis by a link between heme biosynthesis and heme acquisition pathways in *Staphylococcus aureus*

Marco Videira

New 'fragrances' in hydrogen sulfide metabolism in human biochemistry and (patho)physiology

João Vicente

Dye-decolorizing peroxidases, a perspective for H₂O₂ biosensing

Célia Silveira

Regulating the Terminator: Salmonella SraL sRNA protects rho transcript from the action of its own protein

Inês Silva

Exploring membrane respiratory chains

Ana Patrícia Refojo

Transcriptional regulation of Fe-S biogenesis genes: a safeguard against arsenate toxicity

Sofia Silva

New insights into the regulation of iron detoxification in yeast: when one becomes two

Catarina Amaral

Bioethanol production from renewable resources - central role of non-conventional yeasts

Maria José Leandro

Optimizing electroactive bacteria for the practical implementation of bioelectrochemical systems

Catarina Paquete

Post-transcriptional regulation of Xbp1 mRNA by Pumilio under ER stress

Fátima Cairrão

Antibiotic Resistance as a Stress Response

Catarina Milheirinho

Degrading to build: how E3-ubiquitin ligases can help to understand rice stress responses

Tiago Lourenço

Imaging single mRNAs and their encoded proteins in living *Escherichia coli*

Zach Hensel

Unveiling the protective role of food bioactive compounds towards colorectal cancer

Teresa Serra

Unlocking the potential of chickling pea as source of powdery mildew disease resistance for grain legumes: a genomic approach

Carmen Santos

Improving abiotic stress tolerance in *Medicago truncatula* by engineering polyamines metabolic pathway

Sofia Duque

Communicating ITQB NOVA: a joint venture

Renata Ramalho

SOBIR1/EVR prevents precocious initiation of fiber differentiation during wood development

Ana Milhinhos

Ask not what data management can do for you – Ask how you can manage your data

Inês Chaves

The bumpy road to get structures of membrane proteins

Margarida Archer

Staphylococcus aureus in former Portuguese colonies in Africa: missing pieces in the world MRSA puzzle

Teresa Conceição

Peptides, pores, and cool ways to simulate them

Manuel Melo

OTHERS EVENTS

[PhD] INTERFACE Opening Day 2019

Opening of the academic year

[Meeting] Advanced Integrated Microsystems AIM PhD Program Meeting

[Meeting] 2nd Host Microbe Interface PhD Program Meeting

[Meeting] 3rd ONEIDA MEETING

12th International Conference on Hydrogenases

[Meeting] Plants for Life Opening Day

[Seminar] Advancing Biologics Characterization by Mass Spectrometry

[Seminar] Final graduation and pitch session StartUp research course

[Open Workshop] Plant Biotechnology for Sustainability and Global Economy

[Meeting] Cool tools for science - User innovation Workshop

[Seminar] Synthesis of analogs, chemical probes and prodrugs based on the structure of AI-2

[Mini-Symposium] Biological insights into pathogenicity in staphylococci

[Seminar] Plant phenotyping stories: a quest to understand plant development and adaptation to a changing climate

[Meeting] MolBioS Opening Day 2019

[Meeting] IMpaCT Kick-off-Meeting - Public Open Session

[Event] International Microorganism Day

Gardens of the Marquês of Pombal Palace, Oeiras, Activities for students, the senior public or anyone who wants to discover the essential role that microorganisms play in our health, environment and quality of life.

[Seminar Nobel Chemistry Laureate 2002] 25 years of ITQB NOVA Rectorate of Universidade NOVA de Lisboa. ITQB NOVA celebrates 25 years of the institute's integration in Universidade NOVA de Lisboa.

[Internal Event] ITQB/iBET Postdoctoral Day

Exclusive event for ITQB/iBET PostDocs

[Workshop] Metallo proteins and spectroscopy: relevance for human health and

[Event] ITQB NOVA Open Day

[Seminar] Laboratory Biohazard waste management

PURE: Learn to manage your NOVA CV

Green-IT Annual Meeting

[Workshop] Plant Phenotyping-Genotyping Data Management

PURE: Learn to manage your NOVA CV

Tiago Guedes, Universidade NOVA de Lisboa

PHD THESES 2019

Doctoral theses awarded by ITQB NOVA and supervised at the indicated institutions. In addition to these theses, ITQB NOVA researchers are frequently involved in supervising, and co-supervising, thesis awarded by other universities.

ITQB NOVA/IBET

Ana Margarida Trancoso Gomes Rosa, Biology

Unveiling the regulatory mechanisms behind SUMOylation to improve rice abiotic stress response

Supervisor(s): Isabel A. Abreu, Margarida Oliveira

Ana Elisabete da Silva Fernandes, Sustainable Chemistry

Towards cooperative organometallic and enzymatic catalysis to develop new value chains from organic wastes

Supervisor(s): Beatriz Royo, Ligia Martins

Ana Rita Andrade Borba, Biology

Transcriptional regulatory mechanisms controlling key genes involved in C4 photosynthesis in maize

Supervisor(s): Nelson Saibo, Julian Hibbert

Anabela Carvalho Vieira, Biology

A holistic analysis of N₂O emissions from wastewater treatment systems

Supervisor(s): Gilda Carvalho, Adrian Oehmen

Andreia Filipa Campos Tavares, Biology

Determination of cell shape in *Staphylococcus aureus*,

Supervisor: Mariana Gomes de Pinho

Carolina Piçarra Cassona, Biology

Single cell analysis of toxinogenesis by vegetative and sporulating cells in the enteric pathogen *Clostridioides difficile*

Supervisor(s): Adriano O. Henriques, Mónica Serrano

Catarina Isabel Santos Florindo, Technological and Engineering Sciences

A sustainable path towards water purification – an insight based on hydrophobic Deep Eutectic Solvents

Supervisor(s): Dra. Isabel Marrucho, Dr. Luís Branco

Cátia Cláudia Barria da Silva, Biology

Dynamics and Function of Ribonuclease R in *Streptococcus pneumoniae*

Supervisor: Cecília Maria Arraiano

David José Souto Patinha, Technological and Engineering Sciences

Development of new solid phase microextraction phases based on poly(ionic liquids)

Supervisor(s): Isabel Marrucho, Armando Silvestre

Diana Sofia Pereira Espadinha de Oliveira Costa, Biology

Exploring the factors underlying *Staphylococcus epidermidis* pathogenicity

Supervisor(s): Maria Miragaia, Hermínia Lencastre

Filipa Alexandra Gomes Calisto, Biochemistry

A molecular insight into the respiratory Alternative Complex III,

Supervisor(s): Manuela Pereira, Miguel Teixeira

Helena Pires Sapeta, Biology

Jatropha curcas drought response – a morphophysiological, transcriptomic and biochemical study to uncover key protective mechanisms

Supervisor(s): Margarida Oliveira, Ana Paula Santos

Hélio Antunes Tomás, Technological and Engineering Sciences

Development of novel HIV-1 based lentiviral vector producer cells,

Supervisor(s): Ana Sofia Coroadinha, Manuel Carrondo

Mafalda Sofia Gameiro Moleirinho, Bioengineering

Advancing purification of viral targets

Supervisor(s): Cristina Peixoto, Ricardo Silva

Mário Rui Costa Soromenho, Chemistry

Exploring the photochromism of Gemini Diarylethene-based Ionic Liquids as a switch of the physico-chemical properties of solutions

Supervisor(s): José Esperança, Carlos A.M. Afonso

Miguel Ricardo Guerreiro, Technological and Engineering Sciences

Cell-based switch-on sensors for detection and quantification of label-free viruses

Supervisor(s): Ana Sofia Coroadinha

Nicole Sofia Morgado Vieira, Technological and Engineering Sciences

Fluorinated Ionic Liquids for the Development of New Drug Delivery Systems

Supervisor(s): Luís Paulo N. Rebelo, Ana B. Pereira

Nuno Miguel Loureiro Gonçalves, Biology

Insights into the rice response to abiotic stress: The role and regulation of the only DELLA protein of rice

Supervisor(s): Isabel Abreu, Margarida Oliveira

Patrícia Alexandra Teixeira Borges, Biochemistry

Unravelling structural features of flavodiiron proteins: a detailed structural insight for oxygen or nitric oxide reduction

Supervisor(s): Célia Romão, Carlos Frazão

Patrícia Cátia Isidoro Amaral, Biology

Metabolic control of spore development in *Bacillus subtilis*: the role of pyruvate dehydrogenase

Supervisor(s): Adriano O. Henriques, Luis Jaime Mota

Paulo Jorge Gomes de Castro, Biochemistry

Disentangling the function and structural modularity of the membrane arm from respiratory complex I

Supervisor(s): Manuela Pereira

Ricardo Filipe da Cruz Duarte dos Santos, Biology

More than an RNA matchmaker: Expanding the roles of Hfq into ribosome biogenesis

Supervisor(s): Cecília Maria Arraiano, José Andrade

Sofia de Almeida Santos de Castro e Abreu, Biology

Development of cell models for Translation Cancer Research

Supervisor(s): Catarina Brito, Vitor Espírito Santo

Sónia Alexandra dos Santos Zacarias, Molecular Biosciences
Engineering a [NiFeSe] Hydrogenase for an efficient hydrogen production

Supervisor(s): Pedro Matias, Inês C. Pereira

Tiago Filipe Pinto Jorge, Chemistry

Mass spectrometry-based metabolomics approaches to study *Casuarina glauca* responses to a combined salt-heat stress

Supervisor(s): Carla António, Doutor Alisdair Robert Fernie

Vanessa Alexandra Conduto Miranda, Chemistry

Synthesis of new bioactive autoinducer-2 analogues

Supervisor(s): Rita Ventura, Karina Xavier

INSTITUTO GULBENKIAN DE CIÊNCIA

Catarina Antunes Angelico Pinto Nabais, Biology

Dissecting the rules underlying *de novo* centrosome biogenesis

Supervisor(s): Mónica Bettencourt-Dias, Ivo Telley

Cíntia Patrícia Horta Ramos, Biology

Dissecting Non-Canonical Roles of Condensins Complexes

Supervisor(s): Raquel Oliveira

Delphine Pessoa, Biology

One and only one: Regulation of the biosynthesis of a singular structure

Supervisor(s): Jorge Carneiro

Inês Couto Coelho, Biology

Responses to liver damage: Macrophage plasticity in tissue recovery and dysbiotic drifts

Supervisor(s): Carlos Penha Gonçalves, Maria Paula Macedo

Inês Mota Torcato, Biochemistry

Discovery of novel autoinducer-2 receptors

Supervisor(s): Karina Xavier

Ioanna Nikolaos Oikonomidi, Biology

Understanding regulation of shedding: control of TACE by iRhoms

Supervisor(s): Colin Adrain

Irma Varela Lasheras, Biology

Gdf11/Smad2 signaling and Hox gene regulation during patterning of the mouse axial skeleton

Supervisor(s): Moisés Mallo

Jose Guilherme Pereira de Almeida Santos, Biology

Thymic activities in the establishment of tumor immune tolerance

Supervisor(s): Jocelyne Demengeot

Maria Fernanda Niño González, Molecular Biosciences

The Major Facilitator Superfamily (MFS) of membrane transporters: Uncovering novel determinants of plant abiotic stress tolerance

Supervisor(s): Paula Duque

Mário António Fonseca Soares, Integrative Biology and Biomedicine

Transcription factor-dependent regulation of neural stem cell identity throughout mitosis

Supervisor(s): Diogo S. Castro, Raquel A. Oliveira

Mattia Carmelo Adamo, Biology

Regulation of plant energy signaling by components of the abscisic acid pathway

Supervisor(s): Elena Baena-González

Pâmela Cristina Carvalho Borges, Molecular Biology

Role of telomere proteins in replication stress

Supervisor(s): Miguel Godinho Ferreira

Ricardo Nuno Silva Moura Pinho, Biology

Stability, Robustness, and Phenotype Accessibility in Boolean Gene Regulatory Networks

Supervisor(s): Isabel Gordo, Marcus W. Feldman

Sumnima Singh, Biology

The impact of loss of alpha-1,3-galactosyltransferase function on host-microbe interactions with implications for human evolution,

Supervisor(s): Miguel Soares

Yash Girish Pandya, Biology

Innate and vasoregulatory crosstalk at the maternal-fetal interface during placental malaria

Supervisor(s): Carlos Penha Gonçalves

CHAMPALIMAUD FOUNDATION

Andres Laan, Biology

Testing the predictive power of normative theories in social neuroscience

Supervisor(s): Gonzalo de Polavieja, Joe Patton

Antonia Helena Groneberg, Biology

Early life social experiences shape social avoidance kinematics in larval zebrafish

Supervisor(s): Gonzalo de Polavieja, Michael Orger

Catarina Cunha e Silva Soares de Albergaria, Biology

Behavioral state modulating of eyeblink conditioning in mice: Uncovering new circuit mechanisms of cerebellum-dependent associative learning

Supervisor(s): Megan Carey

Dana Marie Darmohray, Biology

Cerebellar contributions to locomotor coordination and learning mice

Supervisor(s): Megan Carey

Elizabeth Maria Rickenbacher, Neurosciences

Mechanisms of Self-Defense Suppression of Mothers Under Threat in the Presence of Offspring

Supervisor(s): Marta Moita

João Rui Alves Andrade Afonso, Biology

Multiplexed Simultaneous Representations of Cognitive and Motor Features, in the Mouse Medial Prefrontal Cortex, During a Memory Guided Behavior

Supervisor(s): Alfonso Renart

Luís Fernando Gomes Moreira, Biology

Mate-choice and social preference in *mus musculus* females,

Supervisor(s): Susana Lima, Marta Moita

Marina Fridman, Neurosciences

Contextual modulation of visual thalamocortical circuits,

Supervisor(s): Leopoldo Petreanu

Nuno Filipe Pires Alves e Calaim, Neurosciences

Learning to represent and store relevant events with efficient coding

Supervisor(s): Christian Machens

Ricardo Andrés Zacarias Silva, Biology

Mechanisms of Defensive Action Selection in Flies

Supervisor(s): Marta Moita, M^a Luísa Vasconcelos

MASTER THESES

Master theses awarded by ITQB NOVA. In addition to these theses, ITQB NOVA researchers are frequently involved in supervising, and co-supervising, thesis awarded by other universities

MASTER IN BIOCHEMISTRY FOR HEALTH

Micael Correia Freitas

Cyclophilin D as a multiple sclerosis and cardiovascular disease drug target

Supervisor: Tiago Bandeiras (ITQB NOVA)

Inês Tomás de Aquino Raposo

Exploring cytochrome-c's biogenesis in eukaryotes

Supervisor: Ricardo Louro (ITQB NOVA)

Mariana de Oliveira Farinha Fidalgo Valério

Structural and dynamic properties of the Dengue fusion peptide in a membrane bilayer: A computational approach

Supervisor: Diana Lousa (ITQB NOVA)

Paulo Alexandre Correia Mamede

Crystallographic studies of serine β -lactamase and serine proteases with novel inhibitors

Supervisor: Margarida Archer Frazão (ITQB NOVA)

Ricardo Alexandre Antunes Barras

SuberSkin - plant defensive polymers in wound healing

Supervisor: Cristina S. Pereira (ITQB NOVA)

Ana Teresa Carrilho Carvalho

The mechanism of the *Legionella* VipA protein in altering actin dynamics during infection

Supervisor: Zach Hensel (ITQB NOVA)

Elisa Thome Cabral

Chimeric lentiviral vectors for gene therapy Improving transduction efficiency

Supervisor: Ana Sofia Coroadinha (iBET)

Filipa Ribeiro da Fonseca

Establishment of bioengineered glucose-responsive nanoparticles for type 2 diabetes mellitus therapy

Supervisor: Bruno Sarmento (UP)

Inês da Conceição Duarte Prazeres

Development of astaxanthin lipid formulations for nutraceutical application: targeting the gastrointestinal epithelium

Supervisor: Ana Matias (iBET)

Patrícia Vanessa da Cunha Lage

Design de plataformas enzimáticas e magnéticas para produção de compostos bioativos em microreator

Supervisor: Maria Henrique Ribeiro (FFUL)

Rodrigo Manuel Ferreira Eduardo

Exploring Tumor-Macrophage Interaction in Anaplastic Thyroid Cancer

Supervisor: Branca Maria Cavaco (IPO)

Susana Isabel Duarte Santos

Characterization of biological and metabolic responses to pH changes in a commensal *Staphylococcus epidermidis* strain

Supervisor: Ana Varela Coelho (ITQB NOVA)

Tatiana Clemente Pires

Exploring malate:quinone oxidoreductases – MQO

Supervisor: Manuela Pereira (ITQB NOVA)

MASTER IN BIOTECHNOLOGY FOR SUSTAINABILITY

Olena Dorosh

Portuguese vine-canex extracts as a source of bioactive compounds for incorporation in cosmetic products

Supervisor: Manuela Moreira (REQUIMTE/LAQV)

Alice Gaspar Martins

The role of SUMO conjugating enzymes on the regulation of SLR1, a major growth regulator

Supervisor: Isabel A. Abreu (ITQB NOVA)

Rita José Quintal Escórcio

In the search of novel bioplastics: Exploiting bio & chemical tools to fine tune the physicochemical properties of plant polyesters,

Supervisor: Cristina S. Pereira (ITQB NOVA)

Rita Sofia Cebola Rebelo Manuel

Influence of Ferredoxin, Iron-Sulfur Carrier and Cobalamin Importer Overexpression on the Production of High-value Products by *Escherichia coli*

Supervisor: Inês Cardoso Pereira (ITQB NOVA)

Ana Margarida Matos Pereira

A Circular Economy and Green Solution for Textile Wastewater Treatment

Supervisor: João Miguel Nunes (CEO)

Joana Castro Pereira Carmona Belo

Osmotic and combined heat and osmotic stresses have distinct effects on suberization of *Quercus* suber roots

Supervisor: Pedro M. Barros (ITQB NOVA)

Maria Miguel Serra Pires

Towards optimal production of secondary metabolites through association of *Boraginaceae* plants with arbuscular mycorrhizal fungi

Supervisor: Margarida Oliveira (ITQB NOVA)

MASTER IN MEDICAL MICROBIOLOGY

Suzilaine Luiz de Sousa Rodrigues

Caracterização molecular de *Staphylococcus aureus* isolados de colonização nasal e do meio ambiente

Supervisor: Teresa Conceição (ITQB NOVA)

MASTER IN SCIENCE COMMUNICATION

Ana Margarida de Almeida Matias

Engaging socially-vulnerable communities in science: exploring Science&Art approaches

Supervisor: Paulo Nuno Gouveia Vicente (FCSH NOVA)

Carolina Lobão de Jesus Figueira

Não Só Ciência: planeamento de um festival de Astronomia com outros elementos culturais

Supervisor: Joana Lobo Antunes (ITQB NOVA)

Inês Rodrigues da Silva Zêzere

Comunicação de Ciência na NOVA Medical School

Supervisor: Joana Lobo Antunes (ITQB NOVA)

João Miguel Pires Ventura

Conversas à volta de uma vela

Supervisor: António Granado (FCSH NOVA)

José Henrique Vieira Fernandes de Aguiar

Poster científico: uma exploração

Supervisor: Paulo Nuno Gouveia Vicente (FCSH NOVA)

Maria Inês Almeida Ramos

Um modelo para uma comunicação de ciência dirigida a séniores - estudo de caso com duas escolas séniores da cidade de Coimbra

Supervisor: Maria Queiroz (FCSH NOVA)

Teresa Freire Mendes

Comunicação de Ciência Revolucionária?

Supervisor: Carlos Catalão (FCSH NOVA)

RESEARCH HIGHLIGHTS

Regulating the terminator

ITQB NOVA researchers unveil a new mechanism for transcription termination, PNAS, February 2019, <https://doi.org/10.1073/pnas.1811589116>

Proteins always find a way

New paper on spore surface protein assembly PLoS Genet, April 2019, <https://doi.org/10.1371/journal.pgen.1007912>

Finding the trigger to apoptosis

New mechanism for cell death through ceramides in mitochondria, Nature Communications, April 2019, <https://doi.org/10.1038/s41467-019-09654-4>

Round and round we go

Mariana Pinho Lab unveiled mechanism for elongation of cocci Nature Microbiology, May 2019 <https://doi.org/10.1038/s41564-019-0437-2>

Catalysis for a sustainable world

Beatriz Royo lab proposes the use of manganese, one of the most abundant metals on Earth, as a catalyst for industrial uses ChemCatChem, May 2019, <https://doi.org/10.1002/cctc.201900662>

Origin and evolution of a bacterial developmental programme

New paper uncovers the origin and evolution of bacterial sporulation Molecular Biology and Evolution, July 2019, <https://doi.org/10.1093/molbev/msz175>

Improving a biological hydrogen machine

Development of hydrogenase variants with improved properties reveals new pathways of oxygen inactivation ACS Catalysis, August 2019, <https://doi.org/10.1021/acscatal.9b02347>

Molecular insights on bioelectrochemical technologies

A new evolutionary vision on cytochromes c obtained from studies using a Gram-positive bacterium mBio, August 2019, <https://doi.org/10.1128/mBio.01210-19>

New approaches to disordered proteins

Small-angle X-ray scattering used to analyse the molecular plasticity of a protein associated with poor prognosis in cancer ACS Chemical Biology, September 2019, <https://doi.org/10.1021/acscchembio.9b00679>

Lost in transition

The impact of exoribonucleases enzymes in the shift between exponential and stationary growth phases Scientific Reports, November 2019, <https://doi.org/10.1038/s41598-019-52453-6>

ITQB NOVA and IGC carry out simulation of a hospital outbreak

On the European Antibiotic Awareness Day, researchers of consortium ONEIDA announce the results of a pilot study completed in record time. The initiative opens new perspectives for the control of bacterial infections in Portuguese hospitals.

FULL LIST OF PUBLISHED PAPERS 2019

Articles indexed in Scopus

- 1 Abecasis, B., Gomes-Alves, P., Rosa, S., Gouveia, P. J., Ferreira, L., Serra, M., & Alves, P. M. (2019). Unveiling the molecular crosstalk in a human induced pluripotent stem cell-derived cardiac model. *Biotechnology and Bioengineering*, 116(5), 1245-1252. doi:10.1002/bit.26929
- 2 Aires-De-Sousa, M., De La Rosa, J. M. O., Gonçalves, M. L., Pereira, A. L., Nordmann, P., & Poirel, L. (2019). Epidemiology of carbapenemase-producing *klebsiella pneumoniae* in a hospital, Portugal. *Emerging Infectious Diseases*, 25(9), 1632-1638. doi:10.3201/eid2509.190656
- 3 Alba-Molina, D., Rodríguez-Padrón, D., Puente-Santiago, A. R., Giner-Casares, J. J., Martín-Romero, M. T., Camacho, L., Martins, L.O., Muñoz-Batista, M.J., Cano, M. & Luque, R.. (2019). Mimicking the bioelectrocatalytic function of recombinant CotA laccase through electrostatically self-assembled bioconjugates. *Nanoscale*, 11(4), 1549-1554. doi:10.1039/c8nr06001k
- 4 Albuquerque-Martins, R., Carvalho, P., Miranda, D., Gonçalves, M. T., & Portugal, A. (2019). Edible ectomycorrhizal fungi and cistaceae. A study on compatibility and fungal ecological strategies. *PLoS ONE*, 14(12) doi:10.1371/journal.pone.0226849
- 5 Alves, M.L., Carbas, B., Gaspar, D., Paulo, M., Brites, C., Mendes-Moreira, P., Brites, C.M., Malosetti, M., Van Eeuwijk, F. & Vaz Patto, M.C. (2019). Genome-wide association study for kernel composition and flour pasting behavior in wholemeal maize flour. *BMC Plant Biology*, 19(1) doi:10.1186/s12870-019-1729-7
- 6 Amaral, J., Correia, B., António, C., Rodrigues, A.M., Gómez-Cadenas, A., Valledor, L., Hancock, R.D., Alves, A. & Pinto, G. (2019). Pinus susceptibility to pitch canker triggers specific physiological responses in symptomatic plants: An integrated approach. *Frontiers in Plant Science*, 10 doi:10.3389/fpls.2019.00509
- 7 Angelino, D., Carregosa, D., Domenech-Coca, C., Savi, M., Figueira, I., Brindani, N., Jang, S., Lakshman, S., Molokin, A., Urban, J.F., Davis, C.D., Brito, M.A., Kim, K.S., Brighenti, F., Curti, C., Bladé, C., Del Bas, J.M., Stilli, D., Solano-Aguilar, G.I., Dos Santos, C.N., Del Rio, D. & Mena, P. (2019). 5-(hydroxyphenyl)- γ -valerolactone-sulfate, a key microbial metabolite of flavan-3-ols, is able to reach the brain: Evidence from different in silico, in vitro and in vivo experimental models. *Nutrients*, 11(11) doi:10.3390/nu11112678
- 8 Apura, P., Domingues, S., Viegas, S. C., & Arraiano, C. M. (2019). Reprogramming bacteria with RNA regulators. *Biochemical Society Transactions*, 47(5), 1279-1289. doi:10.1042/BST20190173
- 9 Araújo, S., Pagano, A., Dondi, D., Lazzaroni, S., Pinela, E., Macovei, A., & Balestrazzi, A. (2019). Metabolic signatures of germination triggered by kinetin in *medicago truncatula*. *Scientific Reports*, 9(1) doi:10.1038/s41598-019-46866-6
- 10 Arez, F., Rebelo, S.P., Fontinha, D., Simão, D., Martins, T.R., MacHado, M., Fischli, C., Ouevray, C., Badolo, L., Carrondo, M.J.T., Rottmann, M., Spangenberg, T., Brito, C., Greco, B., Prudêncio, M. & Alves, P.M. (2019). Flexible 3D cell-based platforms for the discovery and profiling of novel drugs targeting plasmodium hepatic infection. *ACS Infectious Diseases*, 5(11), 1831-1842. doi:10.1021/acscinfdis.9b00144
- 11 Arraiano, C. M. (2019). Stories of the future: Manipulating RNA and Intra/Interkingdom communication. *Microbial Biotechnology*, 12(1), 48-50. doi:10.1111/1751-7915.13344
- 12 Ascenso, O. S., Torcato, I. M., Miguel, A. S., Marques, J. C., Xavier, K. B., Ventura, M. R., & Maycock, C. D. (2019). Synthesis and biological activity of a potent optically pure autoinducer-2 quorum sensing agonist. *Bioorganic Chemistry*, 85, 75-81. doi:10.1016/j.bioorg.2018.12.022
- 13 Assunção, M., Pinheiro, J., Cruz, S., Brazão, J., Queiroz, J., Eiras Dias, J. E., & Canas, S. (2019). Gallic acid, sinapic acid and catechin as potential chemical markers of vitis graft success. *Scientia Horticulturae*, 246, 129-135. doi:10.1016/j.scienta.2018.10.056
- 14 Assunção, M., Santos, C., Brazão, J., Eiras-Dias, J. E., & Fevereiro, P. (2019). Understanding the molecular mechanisms underlying graft success in grapevine. *BMC Plant Biology*, 19(1) doi:10.1186/s12870-019-1967-8
- 15 Barreto, H. G., Ságo, S. A., Chalfun-Júnior, A., Fevereiro, P., & Benedito, V. A. (2019). Transcriptional profiling of the AFL subfamily of B3-type transcription factors during the in vitro induction of somatic embryogenesis in the model legume *medicago truncatula*. *Plant Cell, Tissue and Organ Culture*, 139(2), 327-337. doi:10.1007/s11240-019-01687-3
- 16 Bárria, C., Domingues, S., & Arraiano, C. M. (2019). Pneumococcal RNase R globally impacts protein synthesis by regulating the amount of actively translating ribosomes. *RNA Biology*, 16(2), 211-219. doi:10.1080/15476286.2018.1564616
- 17 Bento-Silva, A., Gonçalves, L., Mecha, E., Pereira, F., Patto, M. C. V., & Bronze, M. D. R. (2019). An improved HILIC HPLC-MS/MS method for the determination of β -ODAP and its α isomer in *lathyrus sativus*. *Molecules*, 24(17) doi:10.3390/molecules24173043
- 18 Bermúdez-García, E., Peña-Montes, C., Martins, I., Pais, J., Pereira, C. S., Sánchez, S., & Farrés, A. (2019). Regulation of the cutinases expressed by *aspergillus nidulans* and evaluation of their role in cutin degradation. *Applied Microbiology and Biotechnology*, doi:10.1007/s00253-019-09712-3
- 19 Blánquez, A., Rodríguez, J., Brissos, V., Mendes, S., Martins, L.O., Ball, A.S., Arias, M.E. & Hernández, M. (2019). Decolorization and detoxification of textile dyes using a versatile *streptomyces* laccase-natural mediator system. *Saudi Journal of Biological Sciences*, 26(5), 913-920. doi:10.1016/j.sjbs.2018.05.020
- 20 Borges, P. T., Romão, C. V., Saraiva, L. M., Gonçalves, V. L., Carrondo, M. A., Teixeira, M., & Frazão, C. (2019). Analysis of a new flavodiiron core structural arrangement in Flv1- Δ FlR protein from *synechocystis* sp. PCC6803. *Journal of Structural Biology*, 205(1), 91-102. doi:10.1016/j.jsb.2018.11.004
- 21 Bodilova, A., Alexandre, B.M., Höppner, A., Luís, I.M., Alvarez, C.E., Bickel, D., Gohlke, H., Decker, C., Nagel-Steger, L., Alseekh, S., Fernie, A.R., Drincovich, M.F., Abreu, I.A. & Maurino, V.G. (2019). Posttranslational modification of the NADP-malic enzyme involved in C4 photosynthesis modulates the enzymatic activity during the day. *Plant Cell*, 31(10), 2525-2539. doi:10.1105/tpc.19.00406
- 22 Brodkorb, A., Egger, L., Alming, M., Alvito, P., Assunção, R., Ballance, S., Bohn, T., Bourliou-Lacanal, C., Boutrou, R., Carrière, F., Clemente, A., Corredig, M., Dupont, D., Dufour, C., Edwards, C., Golding, M., Karakaya, S., Kirkhus, B., Le Feunteun, S., Lesmes, U., Macierzanka, A., Mackie, A.R., Martins, C., Marze, S., McClements, D.J., Ménard, O., Minekus, M., Portmann, R., Santos, C.N., Souchon, I., Singh, R.P., Vegarud, G.E., Wickham, M.S.J., Weitschies, W. & Recio, I. (2019). INFOGEST static in vitro simulation of gastrointestinal food digestion. *Nature Protocols*, 14(4), 991-1014. doi:10.1038/s41596-018-0119-1

- 23 Bruno, S. M., Valente, A. A., Pillinger, M., Amelse, J., Romão, C. C., & Gonçalves, I. S. (2019). Efficient isomerization of α -pinene oxide to campholenic aldehyde promoted by a mixed-ring analogue of molybdenocene. *ACS Sustainable Chemistry and Engineering*, 7(16), 13639-13645. doi:10.1021/acssuschemeng.9b03087
- 24 Cabral, C., Wollenweber, B., António, C., & Ravnskov, S. (2019). Activity in the arbuscular mycorrhizal hyphosphere warning neighbouring plants. *Frontiers in Plant Science*, 10 doi:10.3389/fpls.2019.00511
- 25 Cabral, C. S. D., Miguel, S. P., de Melo-Diogo, D., Louro, R. O., & Correia, I. J. (2019). In situ green reduced graphene oxide functionalized 3D printed scaffolds for bone tissue regeneration. *Carbon*, 146, 513-523. doi:10.1016/j.carbon.2019.01.100
- 26 Carbas, B., Salinas, M. V., Serrano, C., Passarinho, J. A., Puppo, M. C., Ricardo, C. P., & Brites, C. (2019). Chemical composition and antioxidant activity of commercial flours from *ceratonia siliqua* and *prosopis spp.* *Journal of Food Measurement and Characterization*, 13(1), 305-311. doi:10.1007/s11694-018-9945-7
- 27 Carregosa, D., Carecho, R., Figueira, I., & Santos, C. N. (2019). Low-molecular weight metabolites from polyphenols as effectors for attenuating neuroinflammation. *Journal of Agricultural and Food Chemistry*, doi:10.1021/acs.jafc.9b02155
- 28 Carvalho, H. F., Branco, R. J. F., Leite, F. A. S., Matzapetakis, M., Roque, A. C. A., & Irazo, O. (2019). Hydrolytic zinc metalloproteases using a computational multi-state design approach. *Catalysis Science and Technology*, 9(23), 6723-6736. doi:10.1039/c9cy01364d
- 29 Carvalho, S.B., Silva, R.J.S., Moleirinho, M.G., Cunha, B., Moreira, A.S., Xenopoulos, A., Alves, P.M., Carrondo, M.J.T. & Peixoto, C. (2019). Membrane-based approach for the downstream processing of influenza virus-like particles. *Biotechnology Journal*, 14(8) doi:10.1002/biot.201800570
- 30 Carvalho, S.B., Silva, R.J.S., Moreira, A.S., Cunha, B., Clemente, J.J., Alves, P.M., Carrondo, M.J.T., Xenopoulos, A. & Peixoto, C. (2019). Efficient filtration strategies for the clarification of influenza virus-like particles derived from insect cells. *Separation and Purification Technology*, 218, 81-88. doi:10.1016/j.seppur.2019.02.040
- 31 Carvalho, S. M., Marques, J., Romão, C. C., & Saraiva, L. M. (2019). Metabolomics of *Escherichia coli* treated with the antimicrobial carbon monoxide-releasing molecule CORM-3 reveals tricarboxylic acid cycle as major target. *Antimicrobial Agents and Chemotherapy*, 63(10) doi:10.1128/AAC.00643-19
- 32 Catalão, M. J., Filipe, S. R., & Pimentel, M. (2019). Revisiting anti-tuberculosis therapeutic strategies that target the peptidoglycan structure and synthesis. *Frontiers in Microbiology*, 10(FEB) doi:10.3389/fmicb.2019.00190
- 33 Cereija, T.B., Alarico, S., Lourenço, E.C., Manso, J.A., Ventura, M.R., Empadinhas, N., Macedo-Ribeiro, S. & Pereira, P.J.B. (2019). The structural characterization of a glucosylglycerate hydrolase provides insights into the molecular mechanism of mycobacterial recovery from nitrogen starvation. *IUCrJ*, 6, 572-585. doi:10.1107/S2052252519005372
- 34 Charlton Hume, H. K., Vidigal, J., Carrondo, M. J. T., Middelberg, A. P. J., Roldão, A., & Lua, L. H. L. (2019). Synthetic biology for bioengineering virus-like particle vaccines. *Biotechnology and Bioengineering*, 116(4), 919-935. doi:10.1002/bit.26890
- 35 Conceição, T., de Lencastre, H., & Aires-de-Sousa, M. (2019). Bactericidal activity of octenidine against *Staphylococcus aureus* harbouring genes encoding multidrug resistance efflux pumps. *Journal of Global Antimicrobial Resistance*, 16, 239-241. doi:10.1016/j.jgar.2019.01.033
- 36 Conceição, T., Martins, H., Rodrigues, S., de Lencastre, H., & Aires-de-Sousa, M. (2019). *Staphylococcus aureus* nasal carriage among homeless population in Lisbon, Portugal. *European Journal of Clinical Microbiology and Infectious Diseases*, 38(11), 2037-2044. doi:10.1007/s10096-019-03638-4
- 37 Cordeiro, T.N., Sibille, N., Germain, P., Barthe, P., Boulahtouf, A., Allemand, F., Bailly, R., Vivat, V., Ebel, C., Barducci, A., Bourguet, W., le Maire, A. & Bernadó, P. (2019). Interplay of protein disorder in retinoic acid receptor heterodimer and its corepressor regulates gene expression. *Structure*, 27(8), 1270-1285.e6. doi:10.1016/j.str.2019.05.001
- 38 Correia, D.M., Sargo, C.R., Silva, A.J., Santos, S.T., Giordano, R.C., Ferreira, E.C., Zangirolami, T.C., Ribeiro, M.P.A. & Rocha, I. (2019). Mapping *Salmonella typhimurium* pathways using ¹³C metabolic flux analysis. *Metabolic Engineering*, 52, 303-314. doi:10.1016/j.ymben.2018.11.011
- 39 Correia, S., Alinho, A. T., Casimiro, B., Miguel, C. M., Oliveira, M., Veríssimo, P., & Canhoto, J. (2019). NEP-TC a rRNA methyltransferase involved on somatic embryogenesis of tamarillo (*Solanum betaceum* Cav.). *Frontiers in Plant Science*, 10 doi:10.3389/fpls.2019.00438
- 40 Costa, J., Streich, L., Pinto, S., Pronto-Laborinho, A., Nimtz, M., Conradt, H. S., & de Carvalho, M. (2019). Exploring cerebrospinal fluid IgG N-glycosylation as potential biomarker for amyotrophic lateral sclerosis. *Molecular Neurobiology*, 56(8), 5729-5739. doi:10.1007/s12035-019-1482-9
- 41 Costa, J. M., Egipto, R., Sánchez-Virosta, A., Lopes, C. M., & Chaves, M. M. (2019). Canopy and soil thermal patterns to support water and heat stress management in vineyards. *Agricultural Water Management*, 216, 484-496. doi:10.1016/j.agwat.2018.06.001
- 42 Costa, J.M., Marques da Silva, J., Pinheiro, C., Barón, M., Mylona, P., Centritto, M., Haworth, M., Loreto, F., Uzilday, B., Turkan, I. & Oliveira, M.M. (2019). Opportunities and limitations of crop phenotyping in southern European countries. *Frontiers in Plant Science*, 10 doi:10.3389/fpls.2019.01125
- 43 Costa, N.L., Hermann, B., Fourmond, V., Faustino, M.M., Teixeira, M., Einsle, O., Paquete, C.M. & Louro, R.O. (2019). How thermophilic gram-positive organisms perform extracellular electron transfer: Characterization of the cell surface terminal reductase OcwA. *MBio*, 10(4) doi:10.1128/mBio.01210-19
- 44 Cristóvão, M.B., Torrejais, J., Janssens, R., Luis, P., Van der Bruggen, B., Dubey, K.K., Mandal, M.K., Bronze, M.R., Crespo, J.G. & Pereira, V.J. (2019). Treatment of anticancer drugs in hospital and wastewater effluents using nanofiltration. *Separation and Purification Technology*, 224, 273-280. doi:10.1016/j.seppur.2019.05.016
- 45 Cruz, F., Lagoa, D., Mendes, J., Rocha, I., Ferreira, E. C., Rocha, M., & Dias, O. (2019). SamPler - a novel method for selecting parameters for gene functional annotation routines. *BMC Bioinformatics*, 20(1), 454. doi:10.1186/s12859-019-3038-4

- 46 Cruz, T.F.C., Shimizu, K., Esperança, J.M.S.S., André, V., Duarte, M.T., Rebelo, L.P.N., Gomes, P.T. & Canongia Lopes, J.N. (2019). Ionic liquids in wonderland: From electrostatics to coordination chemistry. *Journal of Physical Chemistry C*, 123(9), 5804-5811. doi:10.1021/acs.jpcc.9b00987
- 47 Cunha, L. M., Fonseca, S. C., Lima, R. C., Loureiro, J., Pinto, A. S., Vaz Patto, M. C., & Brites, C. (2019). Consumer-driven improvement of maize bread formulations with legume fortification. *Foods*, 8(7) doi:10.3390/foods8070235
- 48 da Costa, P.J., Menezes, J., Saramago, M., García-Moreno, J.F., Santos, H.A., Gama-Carvalho, M., Arraiano, C.M., Viegas, S.C. & Romão, L. (2019). A role for DIS3L2 over natural nonsense-mediated mRNA decay targets in human cells. *Biochemical and Biophysical Research Communications*, 518(4), 664-671. doi:10.1016/j.bbrc.2019.08.105
- 49 Dadsena, S., Bockelmann, S., Mina, J.G.M., Hassan, D.G., Korneev, S., Razzera, G., Jahn, H., Niekamp, P., Müller, D., Schneider, M., Tafesse, F.G., Marrink, S.J., Melo, M.N. & Holthuis, J.C.M. (2019). Ceramides bind VDAC2 to trigger mitochondrial apoptosis. *Nature Communications*, 10(1) doi:10.1038/s41467-019-09654-4
- 50 De Bruyne, T., Steenput, B., Roth, L., De Meyer, G.R.Y., Dos Santos, C.N., Valentová, K., Dambrova, M. & Hermans, N. (2019). Dietary polyphenols targeting arterial stiffness: Interplay of contributing mechanisms and gut microbiome-related metabolism. *Nutrients*, 11(3) doi:10.3390/nu11030578
- 51 De Ferro, A. M., Reis, P. M., Freitas, A. A., Canongia Lopes, J. N., Rebelo, L. P. N., Shimizu, K., & Esperança, J. M. S. S. (2019). Evidences for a null molar volume contribution by hydroxyl groups in ammonium bistriflimide-based ionic liquids. *Journal of Chemical and Engineering Data*, 64(11), 4932-4945. doi:10.1021/acs.jced.9b00442
- 52 De La Gandara, M.P., Diaz, L., Euler, C.W., Chung, M., Gonzalez, A., Cheleuitt, C., Freiwald, W., Tomasz, A., Fischetti, V.A. & De Lencastre, H. (2019). *Staphylococcus aureus* infecting and colonizing experimental animals, macaques, in a research animal facility. *Microbial Drug Resistance*, 25(1), 54-62. doi:10.1089/mdr.2018.0232
53. Delgado, V. P., Paquete, C. M., Sturm, G., & Gescher, J. (2019). Improvement of the electron transfer rate in *Shewanella oneidensis* MR-1 using a tailored periplasmic protein composition. *Bioelectrochemistry*, 129, 18-25. doi:10.1016/j.bioelechem.2019.04.022
- 54 Dias, O., Saraiva, J., Faria, C., Ramirez, M., Pinto, F., & Rocha, I. (2019). IDS372, a phenotypically reconciled model for the metabolism of *Streptococcus pneumoniae* strain R6. *Frontiers in Microbiology*, 10(JUN) doi:10.3389/fmicb.2019.01283
- 55 Dias-Pedroso, D., Guerra, J., Gomes, A., Oudot, C., Brenner, C., Santos, C. N., & Vieira, H. L. A. (2019). Phenolic metabolites modulate cardiomyocyte beating in response to isoproterenol. *Cardiovascular Toxicology*, 19(2), 156-167. doi:10.1007/s12012-018-9485-8
- 56 Direito, R., Reis, C., Roque, L., Gonçalves, M., Sanches-Silva, A., Gaspar, M.M., Pinto, R., Rocha, J., Sepodes, B., Bronze, M.R. & Figueira, M.E. (2019). Phytosomes with persimmon (diospyros kaki L.) extract: Preparation and preliminary demonstration of in vivo tolerability. *Pharmaceutics*, 11(6) doi:10.3390/pharmaceutics11060296
- 57 Direito, R., Rocha, J., Serra, A., Fernandes, A., Freitas, M., Fernandes, E., Pinto, R., Bronze, R., Sepodes, B. & Figueira, M. (2019). Anti-inflammatory effects of persimmon (diospyros kaki L.) in experimental rodent rheumatoid arthritis. *Journal of Dietary Supplements*, doi:10.1080/19390211.2019.1645256
- 58 Domingos, P. M., Jenny, A., Combie, K. F., del Alamo, D., Mlodzik, M., Steller, H., & Mollereau, B. (2019). Regulation of numb during planar cell polarity establishment in the drosophila eye. *Mechanisms of Development*, 160 doi:10.1016/j.mod.2019.103583
- 59 Doria, E., Pagano, A., Ferreri, C., Larocca, A. V., Macovei, A., Araújo, S. D. S., & Balestrazzi, A. (2019). How does the seed pre-germinative metabolism fight against imbibition damage? emerging roles of fatty acid cohort and antioxidant defence. *Frontiers in Plant Science*, 10 doi:10.3389/fpls.2019.01505
- 60 dos Santos, R. F., Arraiano, C. M., & Andrade, J. M. (2019). New molecular interactions broaden the functions of the RNA chaperone hfq. *Current Genetics*, 65(6), 1313-1319. doi:10.1007/s00294-019-00990-y
- 61 Escandell, J.M., Carvalho, E.S.M., Gallo-Fernandez, M., Reis, C.C., Matmati, S., Luís, I.M., Abreu, I.A., Coulon, S. & Ferreira, M.G. (2019). Ssu72 phosphatase is a conserved telomere replication terminator. *EMBO Journal*, 38(7) doi:10.15252/emboj.2018100476
- 62 Espadinha, D., Sobral, R.G., Mendes, C.I., Méric, G., Sheppard, S.K., Carriço, J.A., Lencastre, H. & Miragaia, M. (2019). Distinct phenotypic and genomic signatures underlie contrasting pathogenic potential of *Staphylococcus epidermidis* clonal lineages. *Frontiers in Microbiology*, 10(AUG) doi:10.3389/fmicb.2019.01971
- 63 Esteves, A. M., Graça, G., Peyriga, L., Torcato, I. M., Borges, N., Portais, J. -, & Santos, H. (2019). Combined transcriptomics-metabolomics profiling of the heat shock response in the hyperthermophilic archaeon *pyrococcus furiosus*. *Extremophiles*, 23(1), 101-118. doi:10.1007/s00792-018-1065-0
- 64 Esteves, C.V., Costa, J., Esteban-Gómez, D., Lamosa, P., Bernard, H., Platas-Iglesias, C., Tripier, R. & Delgado, R. (2019). Phosphate and polyphosphate anion recognition by a dinuclear copper(ii) complex of an unsymmetrical squaramide. *Dalton Transactions*, 48(27), 10104-10115. doi:10.1039/c9dt01434a
- 65 Fanna, D. J., Lima, L. M. P., Craze, A. R., Trinch, A., Wei, G., Reynolds, J. K., & Li, F. (2019). Determination of Cu²⁺ in drinking water using a hydroxyjulolidine-dihydroperimidine colorimetric sensor. *Journal of Inclusion Phenomena and Macrocyclic Chemistry*, 94(3-4), 141-154. doi:10.1007/s10847-018-0862-5
- 66 Fernandes, C.G., Martins, D., Hernandez, G., Sousa, A.L., Freitas, C., Tranfield, E.M., Cordeiro, T.N., Serrano, M., Moran, C.P. & Henriques, A.O. (2019). Temporal and spatial regulation of protein cross-linking by the pre-assembled substrates of a *bacillus subtilis* spore coat transglutaminase. *PLoS Genetics*, 15(4) doi:10.1371/journal.pgen.1007912
- 67 Fernandes, T., Vaz-Moreira, I., & Manaia, C. M. (2019). Neighbor urban wastewater treatment plants display distinct profiles of bacterial community and antibiotic resistance genes. *Environmental Science and Pollution Research*, 26(11), 11269-11278. doi:10.1007/s11356-019-04546-y

- 68 Fernandes, T. M., Morgado, L., Salgueiro, C. A., & Turner, D. L. (2019). Determination of the magnetic properties and orientation of the heme axial ligands of PpcA from *Geobacter metallireducens* by paramagnetic NMR. *Journal of Inorganic Biochemistry*, 198 doi:10.1016/j.jinorgbio.2019.110718
- 69 Ferreira, C., Couceiro, J., Família, C., Jardim, C., Antas, P., Santos, C.N., Outeiro, T.F., Tenreiro, S. & Quintas, A. (2019). The synthetic cannabinoid JWH-018 modulates *Saccharomyces cerevisiae* energetic metabolism. *FEMS Yeast Research*, 19(5) doi:10.1093/femsyr/foz042
- 70 Ferreira, S., Pereira, R., Liu, F., Vilaça, P., & Rocha, I. (2019). Discovery and implementation of a novel pathway for n-butanol production via 2-oxoglutarate. *Biotechnology for Biofuels*, 12(1) doi:10.1186/s13068-019-1565-x
- 71 Figueira, I., Tavares, L., Jardim, C., Costa, I., Terrasso, A.P., Almeida, A.F., Govers, C., Mes, J.J., Gardner, R., Becker, J.D., McDougall, G.J., Stewart, D., Filipe, A., Kim, K.S., Brites, D., Brito, C., Brito, M.A. & Santos, C.N. (2019). Blood-brain barrier transport and neuroprotective potential of blackberry-digested polyphenols: An in vitro study. *European Journal of Nutrition*, 58(1), 113-130. doi:10.1007/s00394-017-1576-y
- 72 Figueiredo-Pereira, C., Menezes, R., Ferreira, S., Santos, C. N., & Vieira, H. L. A. (2019). Carbon monoxide released by CORM-A1 prevents yeast cell death via autophagy stimulation. *FEMS Yeast Research*, 19(5) doi:10.1093/femsyr/foz051
- 73 Florentino, A. P., Pereira, I. A. C., Boeren, S., van den Born, M., Stams, A. J. M., & Sánchez-Andrea, I. (2019). Insight into the sulfur metabolism of *Desulfurella amilii* by differential proteomics. *Environmental Microbiology*, 21(1), 209-225. doi:10.1111/1462-2920.14442
- 74 Florindo, C., Branco, L. C., & Marrucho, I. M. (2019). Quest for green-solvent design: From hydrophilic to hydrophobic (deep) eutectic solvents. *ChemSusChem*, 12(8), 1549-1559. doi:10.1002/cssc.201900147
- 75 Florindo, C., Lima, F., Branco, L. C., & Marrucho, I. M. (2019). Hydrophobic deep eutectic solvents: A circular approach to purify water contaminated with ciprofloxacin. *ACS Sustainable Chemistry and Engineering*, 7(17), 14739-14746. doi:10.1021/acssuschemeng.9b02658
- 76 Florindo, C., Lima, F., Ribeiro, B. D., & Marrucho, I. M. (2019). Deep eutectic solvents: Overcoming 21st century challenges. *Current Opinion in Green and Sustainable Chemistry*, 18, 31-36. doi:10.1016/j.cogsc.2018.12.003
- 77 Fraga, M. C., Huertas, R. M., Crespo, J. G., & Pereira, V. J. (2019). Novel submerged photocatalytic membrane reactor for treatment of olive mill wastewaters. *Catalysts*, 9(9) doi:10.3390/catal9090769
- 78 Freitas, A., Barros, S., Brites, C., Barbosa, J., & Silva, A. S. (2019). Validation of a biochip chemiluminescent immunoassay for multi-mycotoxins screening in maize (*zea mays* L.). *Food Analytical Methods*, 12(12), 2675-2684. doi:10.1007/s12161-019-01625-1
- 79 Gano, L., Pinheiro, T., Matos, A.P., Tortosa, F., Jorge, T.F., Gonçalves, M.S., Martins, M., Morais, T.S., Valente, A., Tomaz, A.I., Garcia, M.H. & Marques, F. (2019). Antitumour and toxicity evaluation of a Ru(II)-cyclopentadienyl complex in a prostate cancer model by imaging tools. *Anti-Cancer Agents in Medicinal Chemistry*, 19(10), 1262-1275. doi:10.2174/1871520619666190318152726
- 80 Garriss, G., Nannapaneni, P., Simões, A.S., Browall, S., Subramanian, K., Sá-Leão, R., Goossens, H., de Lencastre, H. & Henriques-Normark, B. (2019). Genomic characterization of the emerging pathogen *Streptococcus pseudopneumoniae*. *MBio*, 10(3) doi:10.1128/mBio.01286-19
- 81 Gomes, A., Oudot, C., Macià, A., Foito, A., Carregosa, D., Stewart, D., Van de Wiele, T., Berry, D., Motilva, M., Brenner, C. & Dos Santos, C.N. (2019). Berry-enriched diet in salt-sensitive hypertensive rats: Metabolic fate of (poly)phenols and the role of gut microbiota. *Nutrients*, 11(11) doi:10.3390/nu11112634
- 82 Gomes, R. A., Almeida, C., Correia, C., Guerreiro, A., Simplício, A. L., Abreu, I. A., & Alves, P. G. (2019). Exploring the analytical power of the QTOF MS platform to assess monoclonal antibodies quality attributes. *PLoS ONE*, 14(7) doi:10.1371/journal.pone.0219156
- 83 Gonçalves, B.V., Portela, R., Lobo, R., Figueiredo, T.A., Grilo, I.R., Ludovice, A.M., de Lencastre, H., Dias, J.S. & Sobral, R.G. (2019). Role of MurT C-terminal domain in the amidation of *Staphylococcus aureus* peptidoglycan. *Antimicrobial Agents and Chemotherapy*, 63(10) doi:10.1128/AAC.00957-19
- 84 Gonçalves, C., Ferreira, C., Gonçalves, L.G., Turner, D.L., Leandro, M.J., Salema-Oom, M., Santos, H. & Gonçalves, P. (2019). A new pathway for mannitol metabolism in yeasts suggests a link to the evolution of alcoholic fermentation. *Frontiers in Microbiology*, 10 doi:10.3389/fmicb.2019.02510
- 85 González-Magaña, A., De Opakua, A.I., Merino, N., Monteiro, H., Diercks, T., Murciano-Calles, J., Luque, I., Bernadó, P., Cordeiro, T.N., Biasio, A.D. & Blanco, F.J. (2019). Double monoubiquitination modifies the molecular recognition properties of p15PAF promoting binding to the reader module of Dnmt1. *ACS Chemical Biology*, 14(10), 2315-2326. doi:10.1021/acscchembio.9b00679
- 86 Górška, A.M., Gouveia, P., Borba, A.R., Zimmermann, A., Serra, T.S., Lourenço, T.F., Margarida Oliveira, M., Peterhänsel, C. & Saibo, N.J.M. (2019). ZmbHLH80 and ZmbHLH90 transcription factors act antagonistically and contribute to regulate PEPC1 cell-specific gene expression in maize. *Plant Journal*, 99(2), 270-285. doi:10.1111/tpj.14323
- 87 Gouveia, A. S. L., Bernardes, C. E. S., Lozinskaya, E. I., Shaplov, A. S., Canongia Lopes, J. N., & Marrucho, I. M. (2019). Neat ionic liquids: Versus ionic liquid mixtures: A combination of experimental data and molecular simulation. *Physical Chemistry Chemical Physics*, 21(42), 23305-23309. doi:10.1039/c9cp03021b
- 88 Graça-Lopes, G., Graça, G., Barahona, S., Moreira, R. N., Arraiano, C. M., & Gonçalves, L. G. (2019). NMR-metabolomics shows that bola is an important modulator of *Salmonella typhimurium* metabolic processes under virulence conditions. *Metabolites*, 9(11) doi:10.3390/metabo9110243
- 89 Guedes, P., Lopes, V., Couto, N., Mateus, E. P., Pereira, C. S., & Ribeiro, A. B. (2019). Electrokinetic remediation of contaminants of emergent concern in clay soil: Effect of operating parameters. *Environmental Pollution*, 253, 625-635. doi:10.1016/j.envpol.2019.07.040
- 90 Guerfali, M., Ayadi, I., Mohamed, N., Ayadi, W., Belghith, H., Bronze, M.R., Ribeiro, M.H.L. & Gargouri, A. (2019). Triacylglycerols accumulation and glycolipids secretion by the oleaginous yeast *Rhodotorula babjevae* Y-SL7: Structural identification and biotechnological applications. *Bioresource Technology*, 273, 326-334. doi:10.1016/j.biortech.2018.11.036

- 91 Guerreiro, M. R., Freitas, D. F., Alves, P. M., & Coroadinha, A. S. (2019). Detection and quantification of label-free infectious adenovirus using a switch-on cell-based fluorescent biosensor. *ACS Sensors*, 4(6), 1654-1661. doi:10.1021/acssensors.9b00489
- 92 Guillou, A., Lima, L. M. P., Esteban-Gómez, D., Delgado, R., Platas-Iglesias, C., Patinec, V., & Tripier, R. (2019). Endo-versus exo-cyclic coordination in copper complexes with methylthiazolylcarboxylate tacn derivatives. *Dalton Transactions*, 48(24), 8740-8755. doi:10.1039/c9dt01366k
- 93 Guillou, A., Lima, L.M.P., Esteban-Gómez, D., Le Poul, N., Bartholomä, M.D., Platas-Iglesias, C., Delgado, R., Patinec, V. & Tripier, R. (2019). Methylthiazolyl tacn ligands for copper complexation and their bifunctional chelating agent derivatives for bioconjugation and copper-64 radiolabeling: An example with bombesin. *Inorganic Chemistry*, 58(4), 2669-2685. doi:10.1021/acs.inorgchem.8b03280
- 94 Hålldin, E., Eriksen, A.K., Brunius, C., da Silva, A.B., Bronze, M., Hanhineva, K., Aura, A.-& Landberg, R. (2019). Factors explaining interpersonal variation in plasma enterolactone concentrations in humans. *Molecular Nutrition and Food Research*, 63(16) doi:10.1002/mnfr.201801159
- 95 Hartmann, D. O., Piontkivska, D., Moreira, C. J. S., & Pereira, C. S. (2019). Ionic liquids chemical stress triggers sphingoid base accumulation in *aspergillus nidulans*. *Frontiers in Microbiology*, 10(APR) doi:10.3389/fmicb.2019.00864
- 96 Hautier, A., Carvalho, T., Valensin, D., Simaan, A.J., Faure, B., Mateus, P., Delgado, R. & Irazzo, O. (2019). The role of methylation in the copper(II) coordination properties of a his-containing decapeptide. *Dalton Transactions*, 48(5), 1859-1870. doi:10.1039/c8dt05037f
- 97 Hidalgo-Castellanos, J., Duque, A. S., Burgueño, A., Herrera-Cervera, J. A., Fevereiro, P., & López-Gómez, M. (2019). Overexpression of the arginine decarboxylase gene promotes the symbiotic interaction medicago truncatula-sinorhizobium meliloti and induces the accumulation of proline and spermine in nodules under salt stress conditions. *Journal of Plant Physiology*, 241 doi:10.1016/j.jplph.2019.153034
- 98 Hill, M.A., Lam, A.K., Reed, P., Harney, M.C., Wilson, B.A., Moen, E.L., Wright, S.N., Pinho, M.G. & Rice, C.V. (2019). BPEI-induced delocalization of BBP4 potentiates β -lactams against MRSA. *Biochemistry*, 58(36), 3813-3822. doi:10.1021/acs.biochem.9b00523
- 99 Huertas, R. M., Fraga, M. C., Crespo, J. G., & Pereira, V. J. (2019). Solvent-free process for the development of photocatalytic membranes. *Molecules*, 24(24) doi:10.3390/molecules24244481
- 100 Janssens, R., Cristovao, M. B., Bronze, M. R., Crespo, J. G., Pereira, V. J., & Luis, P. (2019). Coupling of nanofiltration and UV, UV/TiO₂ and UV/H₂O₂ processes for the removal of anti-cancer drugs from real secondary wastewater effluent. *Journal of Environmental Chemical Engineering*, 7(5) doi:10.1016/j.jece.2019.103351
- 101 Jensen, C., Bæk, K.T., Gallay, C., Thalsø-Madsen, I., Xu, L., Jouselin, A., Torrubia, F.R., Paulander, W., Pereira, A.R., Veening, J.-., Pinho, M.G. & Frees, D. (2019). The ClpX chaperone controls autolytic splitting of *Staphylococcus aureus* daughter cells, but is bypassed by β -lactam antibiotics or inhibitors of WTA biosynthesis. *PLoS Pathogens*, 15(9) doi:10.1371/journal.ppat.1008044
- 102 Jorge, T.F., Tohge, T., Wendenburg, R., Ramalho, J.C., Lidon, F.C., Ribeiro-Barros, A.I., Fernie, A.R. & António, C. (2019). Salt-stress secondary metabolite signatures involved in the ability of *casuarina glauca* to mitigate oxidative stress. *Environmental and Experimental Botany*, 166 doi:10.1016/j.envexpbot.2019.103808
- 103 Kallscheuer, N., Menezes, R., Foito, A., Da Silva, M.H., Braga, A., Dekker, W., Sevilano, D.M., Rosado-Ramos, R., Jardim, C., Oliveira, J., Ferreira, P., Rocha, I., Silva, A.R., Sousa, M., Allwood, J.W., Bott, M., Faria, N., Stewart, D., Ottens, M., Naesby, M., Dos Santos, C.N. & Marienhagen, J. (2019). Identification and microbial production of the raspberry phenol salidroside that is active against huntington's disease. *Plant Physiology*, 179(3), 969-985. doi:10.1104/pp.18.01074
- 104 Kees, E.D., Pendleton, A.R., Paquete, C.M., Arriola, M.B., Kane, A.L., Kotloski, N.J., Intile, P.J. & Gralnick, J.A. (2019). Secreted flavin cofactors for anaerobic respiration of fumarate and urocanate by *shewanella oneidensis*: Cost and role. *Applied and Environmental Microbiology*, 85(16) doi:10.1128/AEM.00852-19
- 105 Komiazyk, M., Palczewska, M., Sitkiewicz, I., Pikula, S., & Groves, P. (2019). Neutralization of cholera toxin by rosaceae family plant extracts. *BMC Complementary and Alternative Medicine*, 19(1) doi:10.1186/s12906-019-2540-6
- 106 Leandro, M. J., Marques, S., Ribeiro, B., Santos, H., & Fonseca, C. (2019). Integrated process for bioenergy production and water recycling in the dairy industry: Selection of *kluyveromyces* strains for direct conversion of concentrated lactose-rich streams into bioethanol. *Microorganisms*, 7(11) doi:10.3390/microorganisms7110545
- 107 Leavitt, W. D., Venceslau, S. S., Waldbauer, J., Smith, D. A., Cardoso Pereira, I. A., & Bradley, A. S. (2019). Proteomic and isotopic response of *desulfovibrio vulgaris* to DsrC perturbation. *Frontiers in Microbiology*, 10(APR) doi:10.3389/fmicb.2019.00658
- 108 Lebègue, E., Costa, N. L., Fonseca, B. M., Louro, R. O., & Barrière, F. (2019). Electrochemical properties of pH-dependent flavocytochrome c3 from *shewanella putrefaciens* adsorbed onto unmodified and catechol-modified edge plane pyrolytic graphite electrode. *Journal of Electroanalytical Chemistry*, 847 doi:10.1016/j.jelechem.2019.113232
- 109 Leitão, S.T., Ferreira, E., Bicho, M.C., Alves, M.L., Pintado, D., Santos, D., Mendes-Moreira, P., Araújo, S.S., Costa, J.M. & Vaz Pato, M.C. (2019). Maize open-pollinated populations physiological improvement: Validating xtools for drought response participatory selection. *Sustainability (Switzerland)*, 11(21) doi:10.3390/su11216081
- 110 Liguori, N., Campos, S. R. R., Baptista, A. M., & Croce, R. (2019). Molecular anatomy of plant photoprotective switches: The sensitivity of PsbS to the environment, residue by residue. *Journal of Physical Chemistry Letters*, 10(8), 1737-1742. doi:10.1021/acs.jpclett.9b00437
- 111 Lopes, E., Conceição, T., Poirer, L., de Lencastre, H., & Aires-De-Sousa, M. (2019). Epidemiology and antimicrobial resistance of methicillin-resistant *staphylococcus aureus* isolates colonizing pigs with different exposure to antibiotics. *PLoS ONE*, 14(11) doi:10.1371/journal.pone.0225497
- 112 Lucena S, Coelho AV, Anjo SI, Manadas B, Mrljak V, Capela e Silva F, Lamy E. (2019). TvariJonaviciute A Comparative proteomic analysis of saliva from dogs with and without obesity-related metabolic dysfunction. *Journal of Proteomics*, 201, 65-72. doi.org/10.1016/j.jpro.2019.04.010

- 113 Macovei, A., Pagano, A., Cappuccino, M., Gallotti, L., Dondi, D., De Sousa Araujo, S., Fevereiro, P. & Balestrazzi, A. (2019). A snapshot of the trehalose pathway during seed imbibition in *medicago truncatula* reveals temporal- and stress-dependent shifts in gene expression patterns associated with metabolite changes. *Frontiers in Plant Science*, 10 doi:10.3389/fpls.2019.01590
- 114 Malagrinò, F., Zuhra, K., Mascolo, L., Mastronicola, D., Vicente, J. B., Forte, E., & Giuffrè, A. (2019). Hydrogen sulfide oxidation: Adaptive changes in mitochondria of SW480 colorectal cancer cells upon exposure to hypoxia. *Oxidative Medicine and Cellular Longevity*, 2019 doi:10.1155/2019/8102936
- 115 Marchel, M., João, K. G., & Marrucho, I. M. (2019). On the use of ionic liquids as adjuvants in PEG-(NH₄)₂SO₄ aqueous biphasic systems: Phase diagrams behavior and the effect of IL concentration on myoglobin partition. *Separation and Purification Technology*, 210, 710-718. doi:10.1016/j.seppur.2018.08.058
- 116 Marques, A.T., Anjo, S.I., Bhide, M., Varela Coelho, A., Manadas, B., Lecchi, C., Grilli, G. & Cecilian, F. (2019). Changes in the intestinal mucosal proteome of turkeys (*meleagris gallopavo*) infected with haemorrhagic enteritis virus. *Veterinary Immunology and Immunopathology*, 213 doi:10.1016/j.vetimm.2019.06.001
- 117 Martins, M. C., Romão, C. V., Folgosa, F., Borges, P. T., Frazão, C., & Teixeira, M. (2019). How superoxide reductases and flavodiiron proteins combat oxidative stress in anaerobes. *Free Radical Biology and Medicine*, 140, 36-60. doi:10.1016/j.freeradbiomed.2019.01.051
- 118 Martins, R. G., Gonçalves, L. G., Cunha, N., & Bugalho, M. J. (2019). Metabolomic urine profile: Searching for new biomarkers of SDHx-associated pheochromocytomas and paragangliomas. *Journal of Clinical Endocrinology and Metabolism*, 104(11), 5467-5477. doi:10.1210/jc.2019-01101
- 119 Martins, T. M., Martins, C., & Silva Pereira, C. (2019). Multiple degrees of separation in the central pathways of the catabolism of aromatic compounds in fungi belonging to the dikarya sub-kingdom doi:10.1016/bs.ampbs.2019.07.003
- 120 Matos, M.S., Romero-Díez, R., Álvarez, A., Bronze, M.R., Rodríguez-Rojo, S., Mato, R.B., Cocero, M.J. & Matias, A.A. (2019). Polyphenol-rich extracts obtained from winemaking waste streams as natural ingredients with cosmeceutical potential. *Antioxidants*, 8(9) doi:10.3390/antiox8090355
- 121 Mecha, E., Leitão, S.T., Carbas, B., Serra, A.T., Moreira, P.M., Veloso, M.M., Gomes, R., Figueira, M.E., Brites, C., Vaz Pato, M.C. & Bronze, M.R. (2019). Characterization of soaking process' impact in common beans phenolic composition: Contribute from the unexplored portuguese germplasm. *Foods*, 8(8) doi:10.3390/foods8080296
- 122 Milke, L., Ferreira, P., Kallscheuer, N., Braga, A., Vogt, M., Kappelmann, J., Oliveira, J., Silva, A.R., Rocha, I., Bott, M., Noack, S., Faria, N. & Marienhagen, J. (2019). Modulation of the central carbon metabolism of *Corynebacterium glutamicum* improves malonyl-CoA availability and increases plant polyphenol synthesis. *Biotechnology and Bioengineering*, 116(6), 1380-1391. doi:10.1002/bit.26939
- 123 Miller, M., Robinson, W.E., Oliveira, A.R., Heidary, N., Kornienko, N., Warnan, J., Pereira, I.A.C. & Reisner, E. (2019). Interfacing formate dehydrogenase with metal oxides for the reversible electrocatalysis and solar-driven reduction of carbon dioxide. *Angewandte Chemie - International Edition*, 58(14), 4601-4605. doi:10.1002/anie.201814419
- 124 Miranda, J.P., Camões, S.P., Gaspar, M.M., Rodrigues, J.S., Carneiro, M., Bárcia, R.N., Cruz, P., Cruz, H., Simões, S. & Santos, J.M. (2019). The secretome derived from 3D-cultured umbilical cord tissue MSCs counteracts manifestations typifying rheumatoid arthritis. *Frontiers in Immunology*, 10(FEB) doi:10.3389/fimmu.2019.00018
- 125 Miranda, V., Torcato, I. M., Xavier, K. B., & Ventura, M. R. (2019). Synthesis of D-desthiobiotin-AI-2 as a novel chemical probe for autoinducer-2 quorum sensing receptors. *Bioorganic Chemistry*, 92 doi:10.1016/j.bioorg.2019.103200
- 126 Misra, C. S., Santos, M. R., Rafael-Fernandes, M., Martins, N. P., Monteiro, M., & Becker, J. D. (2019). Transcriptomics of arabidopsis sperm cells at single-cell resolution. *Plant Reproduction*, 32(1), 29-38. doi:10.1007/s00497-018-00355-4
- 127 Moleirinho, M. G., Silva, R. J. S., Alves, P. M., Carrondo, M. J. T., & Peixoto, C. (2019). Current challenges in biotherapeutic particles manufacturing. *Expert Opinion on Biological Therapy*, doi:10.1080/14712598.2020.1693541
- 128 Moleirinho, M. G., Silva, R. J. S., Carrondo, M. J. T., Alves, P. M., & Peixoto, C. (2019). Exosome-based therapeutics: Purification using semi-continuous multi-column chromatography. *Separation and Purification Technology*, 224, 515-523. doi:10.1016/j.seppur.2019.04.060
- 129 Monte, J., Sá, M., Parreira, C., Galante, J., Serra, A.R., Galinha, C.F., Costa, L., Pereira, V.J., Brazinha, C. & Crespo, J.G. (2019). Recycling of dunaliella salina cultivation medium by integrated membrane filtration and advanced oxidation. *Algal Research*, 39 doi:10.1016/j.algal.2019.101460
- 130 Monteiro, J. M., Covas, G., Rausch, D., Filipe, S. R., Schneider, T., Sahl, H. -, & Pinho, M. G. (2019). The pentaglycine bridges of staphylococcus aureus peptidoglycan are essential for cell integrity. *Scientific Reports*, 9(1) doi:10.1038/s41598-019-41461-1
- 131 Monteiro, T., Gomes, S., Jubete, E., Añorga, L., Silveira, C. M., & Almeida, M. G. (2019). A quasi-reagentless point-of-care test for nitrite and unaffected by oxygen and cyanide. *Scientific Reports*, 9(1) doi:10.1038/s41598-019-39209-y
- 132 Montet, D., Hazm, J.E., Ouadia, A., Chichi, A., Mbaye, M.S., Diop, M.B., Mobinzo, P., Biloso, A., Diansambu, I., Scher, J., Scippo, M.- & Crespo, M.-B. (2019). Contribution of the methodology of collective expertise to the mitigation of food safety hazards in low- or medium-income countries. *Food Control*, 99, 84-88. doi:10.1016/j.foodcont.2018.12.009
- 133 Moreno, C. J. G., Temporão, A., Torres, T., & Silva, M. S. (2019). Trypanosoma brucei interaction with host: Mechanism of VSG release as target for drug discovery for african trypanosomiasis. *International Journal of Molecular Sciences*, 20(6) doi:10.3390/ijms20061484
- 134 Nabais, A. R., Martins, A. P. S., Alves, V. D., Crespo, J. G., Marrucho, I. M., Tomé, L. C., & Neves, L. A. (2019). Poly(ionic liquid)-based engineered mixed matrix membranes for CO₂/H₂ separation. *Separation and Purification Technology*, 222, 168-176. doi:10.1016/j.seppur.2019.04.018
- 135 Nayak, N., Huertas, R., Crespo, J. G., & Portugal, C. A. M. (2019). Surface modification of alumina monolithic columns with 3-aminopropyltetraethoxysilane (APTES) for protein attachment. *Separation and Purification Technology*, 229 doi:10.1016/j.seppur.2019.115674

- 136 Nellepalli, P., Tomé, L. C., Vijayakrishna, K., & Marrucho, I. M. (2019). Imidazolium-based copoly(ionic liquid) membranes for CO₂/N₂ separation. *Industrial and Engineering Chemistry Research*, 58(5), 2017-2026. doi:10.1021/acs.iecr.8b05093
- 137 Nguyen, P.Y., Silva, A.F., Reis, A.C., Nunes, O.C., Rodrigues, A.M., Rodrigues, J.E., Cardoso, V.V., Benoliel, M.J., Reis, M.A.M., Oehmen, A. & Carvalho, G. (2019). Bioaugmentation of membrane bioreactor with achromobacter denitrificans strain PR1 for enhanced sulfamethoxazole removal in wastewater. *Science of the Total Environment*, 648, 44-55. doi:10.1016/j.scitotenv.2018.08.100
- 138 Niño-González, M., Novo-Uzal, E., Richardson, D. N., Barros, P. M., & Duque, P. (2019). More transporters, more substrates: The *arabidopsis* major facilitator superfamily revisited. *Molecular Plant*, 12(9), 1182-1202. doi:10.1016/j.molp.2019.07.003
- 139 Orellana, L., Thorne, A.H., Lema, R., Gustavsson, J., Parisian, A.D., Hospital, A., Cordeiro, T.N., Bernadó, P., Scott, A.M., Brun-Heath, I., Lindahl, E., Cavenee, W.K., Furnari, F.B. & Orozco, M. (2019). Oncogenic mutations at the EGFR ectodomain structurally converge to remove a steric hindrance on a kinase-coupled cryptic epitope. *Proceedings of the National Academy of Sciences of the United States of America*, 116(20), 10009-10018. doi:10.1073/pnas.1821442116
- 140 Oudot, C., Gomes, A., Nicolas, V., Le Gall, M., Chaffey, P., Brousard, C., Calamita, G., Mastrodonato, M., Gena, P., Perfettini, J.-., Hamelin, J., Lemoine, A., Fischmeister, R., Vieira, H.L.A., Santos, C.N. & Brenner, C. (2019). CSRP3 mediates polyphenols-induced cardioprotection in hypertension. *Journal of Nutritional Biochemistry*, 66, 29-42. doi:10.1016/j.jnutbio.2019.01.001
- 141 Pagano, A., de Sousa Araújo, S., Macovei, A., Dondi, D., Lazzaroni, S., & Balestrazzi, A. (2019). Metabolic and gene expression hallmarks of seed germination uncovered by sodium butyrate in *medicago truncatula*. *Plant Cell and Environment*, 42(1), 259-269. doi:10.1111/pce.13342
- 142 Pais, D. A. M., Portela, R. M. C., Carrondo, M. J. T., Isidro, I. A., & Alves, P. M. (2019). Enabling PAT in insect cell bioprocesses: In situ monitoring of recombinant adeno-associated virus production by fluorescence spectroscopy. *Biotechnology and Bioengineering*, 116(11), 2803-2814. doi:10.1002/bit.27117
- 143 Paquete, C. M., Rusconi, G., Silva, A. V., Soares, R., & Louro, R. O. (2019). A brief survey of the "cytochrome" doi:10.1016/bs.ampbs.2019.07.005
- 144 Pastor, J.M., Borges, N., Pagán, J.P., Castanõ-Cerezo, S., Csonka, L.N., Goodner, B.W., Reynolds, K.A., Goncalves, L.G., Argandoná, M., Nieto, J.J., Vargas, C., Bernal, V. & Cánovas, M. (2019). Fructose metabolism in chromohalobacter salicigens: Interplay between the embden-meyerhof-parnas and entner-doudoroff pathways. *Microbial Cell Factories*, 18(1) doi:10.1186/s12934-019-1178-x
- 145 Patinha, D. J. S., Nellepalli, P., Vijayakrishna, K., Silvestre, A. J. D., & Marrucho, I. M. (2019). Poly(ionic liquid) embedded particles as efficient solid phase microextraction phases of polar and aromatic analytes. *Talanta*, 198, 193-199. doi:10.1016/j.talanta.2019.01.106
- 146 Patinha, D. J. S., Silvestre, A. J. D., & Marrucho, I. M. (2019). Poly(ionic liquids) in solid phase microextraction: Recent advances and perspectives. *Progress in Polymer Science*, 98 doi:10.1016/j.progpolymsci.2019.101148
- 147 Pereira, C.V., Duarte, M., Silva, P., da Silva, A.B., Duarte, C.M.M., Cifuentes, A., García-Cañas, V., Bronze, M.R., Albuquerque, C. & Serra, A.T. (2019). Polymethoxylated flavones target cancer stemness and improve the antiproliferative effect of 5-fluorouracil in a 3D cell model of colorectal cancer. *Nutrients*, 11(2) doi:10.3390/nu11020326
- 148 Pereira, C. V., Silva, J. M., Rodrigues, L., Reis, R. L., Paiva, A., Duarte, A. R. C., & Matias, A. (2019). Unveil the anticancer potential of limonene based therapeutic deep eutectic solvents. *Scientific Reports*, 9(1) doi:10.1038/s41598-019-51472-7
- 149 Pereira, F.C., Nunes, F., Cruz, F., Fernandes, C., Isidro, A.L., Lousa, D., Soares, C.M., Moran, C.P., Henriques, A.O. & Serrano, M. (2019). A LysM domain intervenes in sequential protein-protein and protein-peptidoglycan interactions important for spore coat assembly in *bacillus subtilis*. *Journal of Bacteriology*, 201(4) doi:10.1128/JB.00642-18
- 150 Pereira, P., & Arraiano, C. M. (2019). A precision RNA degradation machinery shapes stem cell development. *Journal of Cell Biology*, 218(8), 2437-2438. doi:10.1083/JCB.201906115
- 151 Pereira, R., Vilaça, P., Maia, P., Nielsen, J., & Rocha, I. (2019). Turnover dependent phenotypic simulation: A quantitative constraint-based simulation method that accommodates all main strain design strategies. *ACS Synthetic Biology*, 8(5), 976-988. doi:10.1021/acssynbio.8b00248
- 152 Piçarra, S., Lopes, E., Almeida, P. L., De Lencastre, H., & Aires-De-Sousa, M. (2019). Novel coating containing molybdenum oxide nanoparticles to reduce *staphylococcus aureus* contamination on inanimate surfaces. *PLoS ONE*, 14(3) doi:10.1371/journal.pone.0213151
- 153 Pimentel, V., Afonso, R., Nunes, M., Vieira, M.L., Bravo-Barriga, D., Frontera, E., Martinez, M., Pereira, A., Maia, C., Paiva-Cardoso, M.D.N., Freitas, F.B., Abecasis, A.B. & Parreira, R. (2019). Geographic dispersal and genetic diversity of tick-borne phleboviruses (*phenuiviridae*, *phlebovirus*) as revealed by the analysis of L segment sequences. *Ticks and Tick-Borne Diseases*, 10(4), 942-948. doi:10.1016/j.ttbdis.2019.05.001
- 154 Pinheiro, C., Dickinson, E., Marriott, A., Ribeiro, I.C., Pintó-Marijuan, M., António, C., Zarrouk, O., Chaves, M.M., Dodd, I.C., Munné-Bosch, S., Thomas-Oates, J. & Wilson, J. (2019). Distinctive phytohormonal and metabolic profiles of *arabidopsis thaliana* and *eutrema salsugineum* under similar soil drying. *Planta*, 249(5), 1417-1433. doi:10.1007/s00425-019-03095-5
- 155 Pinheiro, C., Wienkoop, S., de Almeida, J.F., Brunetti, C., Zarrouk, O., Planchon, S., Gori, A., Tattini, M., Ricardo, C.P., Renaut, J. & Teixeira, R.T. (2019). Phellem cell-wall components are discriminants of cork quality in *quercus suber*. *Frontiers in Plant Science*, 10 doi:10.3389/fpls.2019.00944
- 156 Pinto, C., Silva, G., Ribeiro, A.S., Oliveira, M., Garrido, M., Bandeira, V.S., Nascimento, A., Coroadinha, A.S., Peixoto, C., Barbas, A., Paredes, J., Brito, C. & Alves, P.M. (2019). Evaluation of AAV-mediated delivery of shRNA to target basal-like breast cancer genetic vulnerabilities. *Journal of Biotechnology*, 300, 70-77. doi:10.1016/j.jbiotec.2019.05.016
- 157 Pinto, F., de Barros, D. P. C., Reis, C., & Fonseca, L. P. (2019). Optimization of nanostructured lipid carriers loaded with retinoids by central composite design. *Journal of Molecular Liquids*, 293 doi:10.1016/j.molliq.2019.111468

- 158 Pinto, M. F., Olivares, M., Vivancos, Á., Guisado-Barrios, G., Albrecht, M., & Royo, B. (2019). (Di)triazolylidene manganese complexes in catalytic oxidation of alcohols to ketones and aldehydes. *Catalysis Science and Technology*, 9(10), 2421-2425. doi:10.1039/c9cy00685k
- 159 Pobre, V., Barahona, S., Dobrzanski, T., Steffens, M. B. R., & Arraiano, C. M. (2019). Defining the impact of exoribonucleases in the shift between exponential and stationary phases. *Scientific Reports*, 9(1) doi:10.1038/s41598-019-52453-6
- 160 Puente-Santiago, A.R., Rodríguez-Padrón, D., Quan, X., Muñoz Batista, M.J., Martins, L.O., Verma, S., Varma, R.S., Zhou, J. & Luque, R. (2019). Unprecedented wiring efficiency of sulfonated graphitic carbon nitride materials: Toward high-performance amperometric recombinant CotA laccase biosensors. *ACS Sustainable Chemistry and Engineering*, 7(1), 1474-1484. doi:10.1021/acssuschemeng.8b05107
- 161 Queda, F., Covas, G., Silva, T., Santos, C.A., Bronze, M.R., Cañada, F.J., Corvo, M.C., Filipe, S.R. & Marques, M.M.B. (2019). A top-down chemo-enzymatic approach towards N-acetylglucosamine-N-acetylmuramic oligosaccharides: Chitosan as a reliable template. *Carbohydrate Polymers*, 224 doi:10.1016/j.carbpol.2019.115133
- 162 Quental, M.V., Pedro, A.Q., Pereira, P., Sharma, M., Queiroz, J.A., Coutinho, J.A.P., Sousa, F. & Freire, M.G. (2019). Integrated extraction-preservation strategies for RNA using biobased ionic liquids. *ACS Sustainable Chemistry and Engineering*, 7(10), 9439-9448. doi:10.1021/acssuschemeng.9b00688
- 163 Ramos, I., Lourenço, E. C., Ascenso, O. S., Maycock, C. D., Dasika, M., Dickson, M. L., & Ventura, M. R. (2019). The effect of new compounds in stabilizing downstream monoclonal antibody (mAb) process intermediates. *International Journal of Pharmaceutics*, 565, 162-173. doi:10.1016/j.ijpharm.2019.04.080
- 164 Ramos, P. A. B., Ferro, A. M., Oliveira, M. M., Gonçalves, S., Freire, C. S. R., Silvestre, A. J. D., & Duarte, M. F. (2019). Biosynthesis and bioactivity of cynara cardunculus L. guaianolides and hydroxycinnamic acids: A genomic, biochemical and health-promoting perspective. *Phytochemistry Reviews*, doi:10.1007/s11101-019-09604-4
- 165 Ramos-Silva, P., Serrano, M., & Henriques, A. O. (2019). From root to tips: Sporulation evolution and specialization in bacillus subtilis and the intestinal pathogen *clostridioides difficile*. *Molecular Biology and Evolution*, 36(12), 2714-2736. doi:10.1093/molbev/msz175
- 166 Refojo, P. N., Sena, F. V., Calisto, F., Sousa, F. M., & Pereira, M. M. (2019). The plethora of membrane respiratory chains in the phyla of life doi:10.1016/bs.ampbs.2019.03.002
- 167 Rego, D., Redondo, L. M., Sousa, A. P., Abreu, S., Serra, M., & Santo, V. E. (2019). Valorization of platelets with no therapeutic value with pulsed electric fields. Paper presented at the 6th IEEE Portuguese Meeting on Bioengineering, ENBENG 2019 - Proceedings, doi:10.1109/ENBENG.2019.8692500
- 168 Reichmann, N.T., Tavares, A.C., Saraiva, B.M., Jouselin, A., Reed, P., Pereira, A.R., Monteiro, J.M., Sobral, R.G., VanNieuwenhze, M.S., Fernandes, F. & Pinho, M.G. (2019). SEDS-bBPB pairs direct lateral and septal peptidoglycan synthesis in *staphylococcus aureus*. *Nature Microbiology*, 4(8), 1368-1377. doi:10.1038/s41564-019-0437-2
- 169 Reis, F. P., Bárria, C., Gomez-Puertas, P., Gomes, C. M., & Arraiano, C. M. (2019). Identification of temperature-sensitive mutations and characterization of thermolabile RNase II variants. *FEBS Letters*, 593(3), 352-360. doi:10.1002/1873-3468.13313
- 170 Ribas, D., Soares-Silva, I., Vieira, D., Sousa-Silva, M., Sá-Pessoa, J., Azevedo-Silva, J., Viegas, S.C., Arraiano, C.M., Diallinas, G., Paiva, S., Soares, P. & Casal, M. (2019). The acetate uptake transporter family motif "NPAPLGL(M/S)" is essential for substrate uptake. *Fungal Genetics and Biology*, 122, 1-10. doi:10.1016/j.fgb.2018.10.001
- 171 Ripoll-Rozada, J., Costa, M., Manso, J. A., Maranhã, A., Miranda, V., Sequeira, A., . . . Empadinhas, N. (2019). Biosynthesis of mycobacterial methylmannose polysaccharides requires a unique 1-O-methyltransferase specific for 3-O-methylated mannosides. *Proceedings of the National Academy of Sciences of the United States of America*, 116(3), 835-844. doi:10.1073/pnas.1813450116
- 172 Robin, M., Issa, A.R., Santos, C.C., Napoletano, F., Petitgas, C., Chatelain, G., Ruby, M., Walter, L., Birman, S., Domingos, P.M., Calvi, B.R. & Mollereau, B. (2019). Drosophila p53 integrates the antagonism between autophagy and apoptosis in response to stress. *Autophagy*, 15(5), 771-784. doi:10.1080/15548627.2018.1558001
- 173 Rodrigues, A. M., Miguel, C., Chaves, I., & António, C. (2019). Mass spectrometry-based forest tree metabolomics. *Mass Spectrometry Reviews*, doi:10.1002/mas.21603
- 174 Rodrigues, A. M., Ribeiro-Barros, A. I., & António, C. (2019). Experimental design and sample preparation in forest tree metabolomics. *Metabolites*, 9(12) doi:10.3390/metabo9120285
- 175 Rodrigues, A.S., Chaves, I., Costa, B.V., Lin, Y.-, Lopes, S., Milhinhos, A., Van de Peer, Y. & Miguel, C.M. (2019). Small RNA profiling in pinus pinaster reveals the transcriptome of developing seeds and highlights differences between zygotic and somatic embryos. *Scientific Reports*, 9(1) doi:10.1038/s41598-019-47789-y
- 176 Rodrigues, J., Inzé, D., Nelissen, H., & Saibo, N. J. M. (2019). Source-Sink regulation in crops under water deficit. *Trends in Plant Science*, 24(7), 652-663. doi:10.1016/j.tplants.2019.04.005
- 177 Rodrigues-Pousada, C., Devaux, F., Caetano, S. M., Pimentel, C., da Silva, S., Cordeiro, A. C., & Amaral, C. (2019). Yeast AP-1 like transcription factors (yap) and stress response: A current overview. *Microbial Cell*, 6(6), 267-285. doi:10.15698/mic2019.06.679
- 178 Romero-Díez, R., Matos, M., Rodrigues, L., Bronze, M. R., Rodríguez-Rojo, S., Cocero, M. J., & Matias, A. A. (2019). Microwave and ultrasound pre-treatments to enhance anthocyanins extraction from different wine lees. *Food Chemistry*, 272, 258-266. doi:10.1016/j.foodchem.2018.08.016
- 179 Rosa, M. T., & Abreu, I. A. (2019). Exploring the regulatory levels of SUMOylation to increase crop productivity. *Current Opinion in Plant Biology*, 49, 43-51. doi:10.1016/j.pbi.2019.04.009
- 180 Sales-Dias, J., Silva, G., Lamy, M., Ferreira, A., & Barbas, A. (2019). The notch ligand DLL1 exerts carcinogenic features in human breast cancer cells. *PLoS ONE*, 14(5) doi:10.1371/journal.pone.0217002
- 181 Santos, C. S., Carbas, B., Castanho, A., Vasconcelos, M. W., Vaz Patto, M. C., Domoney, C., & Brites, C. (2019). Variation in pea (*pisum sativum* L.) seed quality traits defined by physicochemical functional properties. *Foods*, 8(11) doi:10.3390/foods8110570

- 182 Santos, F., Leitão, M. I. P. S., & Duarte, A. R. C. (2019). Properties of therapeutic deep eutectic solvents of L-arginine and ethambutol for tuberculosis treatment. *Molecules*, 24(1) doi:10.3390/molecules24010055
- 183 Santos, I., Ramos, C., Mendes, C., Sequeira, C.O., Tomé, C.S., Fernandes, D.G.H., Mota, P., Pires, R.F., Urso, D., Hipólito, A., Antunes, A.M.M., Vicente, J.B., Pereira, S.A., Bonifácio, V.D.B., Nunes, S.C. & Serpa, J. (2019). Targeting glutathione and cystathionine β -synthase in ovarian cancer treatment by selenium-chrysin polyurea dendrimer nanoformulation. *Nutrients*, 11(10) doi:10.3390/nu1102523
- 184 Santos, R. B., Pires, A. S., van der Hoorn, R. A. L., Schiermeyer, A., & Abranches, R. (2019). Generation of transgenic cell suspension cultures of the model legume medicago truncatula: A rapid method for agrobacterium mediated gene transfer. *Plant Cell, Tissue and Organ Culture*, 136(3), 445-450. doi:10.1007/s11240-018-1525-3
- 185 Santos, S.P., Yang, Y., Rosa, M.T.G., Rodrigues, M.A.A., De La Tour, C.B., Sommer, S., Teixeira, M., Carrondo, M.A., Cloetens, P., Abreu, I.A. & Romão, C.V. (2019). The interplay between mn and fe in deinococcus radiodurans triggers cellular protection during paraquat-induced oxidative stress. *Scientific Reports*, 9(1) doi:10.1038/s41598-019-53140-2
- 186 Santos, T., Pereira, P., Campello, M. P. C., Paulo, A., Queiroz, J. A., Cabrita, E., & Cruz, C. (2019). RNA G-quadruplex as supramolecular carrier for cancer-selective delivery. *European Journal of Pharmaceutics and Biopharmaceutics*, 142, 473-479. doi:10.1016/j.ejpb.2019.07.017
- 187 Sarabipour, S., Debat, H. J., Emmott, E., Burgess, S. J., Schwessinger, B., & Hensel, Z. (2019). On the value of preprints: An early career researcher perspective. *PLoS Biology*, 17(2) doi:10.1371/journal.pbio.3000151
- 188 Sarre, A., Stelter, M., Rollo, F., De Bonis, S., Seck, A., Hognon, C., Ravanat, J.-., Monari, A., Dehez, F., Moe, E. & Timmins, J. (2019). The three endonuclease III variants of deinococcus radiodurans possess distinct and complementary DNA repair activities. *DNA Repair*, 78, 45-59. doi:10.1016/j.dnarep.2019.03.014
- 189 Schäper, S., Wendt, H., Bamberger, J., Sieber, V., Schmid, J., & Becker, A. (2019). A bifunctional UDP-sugar 4-epimerase supports biosynthesis of multiple cell surface polysaccharides in sinorhizobium meliloti. *Journal of Bacteriology*, 209(10) doi:10.1128/JB.00801-18
- 190 Schievano, A., Berenguer, R., Goglio, A., Bocchi, S., Marzorati, S., Rago, L., Louro, R.O., Paquete, C.M. & Esteve-Núñez, A. (2019). Electroactive biochar for large-scale environmental applications of microbial electrochemistry. *ACS Sustainable Chemistry and Engineering*, 7(22), 18198-18212. doi:10.1021/acssuschemeng.9b04229
- 191 Sebastião, M. J., Serra, M., Pereira, R., Palacios, I., Gomes-Alves, P., & Alves, P. M. (2019). Human cardiac progenitor cell activation and regeneration mechanisms: Exploring a novel myocardial ischemia/reperfusion in vitro model. *Stem Cell Research and Therapy*, 10(1) doi:10.1186/s13287-019-1174-4
- 192 Serra, A.T., Serra, M., Silva, A.C., Brckalo, T., Seshire, A., Brito, C., Wolf, M. & Alves, P.M. (2019). Scalable culture strategies for the expansion of patient-derived cancer stem cell lines. *Stem Cells International*, 2019 doi:10.1155/2019/8347595
- 193 Silva, H.D., Beldíková, E., Poejo, J., Abrunhosa, L., Serra, A.T., Duarte, C.M.M., Brányik, T., Cerqueira, M.A., Pinheiro, A.C. & Vicente, A.A. (2019). Evaluating the effect of chitosan layer on bioaccessibility and cellular uptake of curcumin nanoemulsions. *Journal of Food Engineering*, 243, 89-100. doi:10.1016/j.jfoodeng.2018.09.007
- 194 Silva, I. J., Barahona, S., Eyraud, A., Lalaouna, D., Figueroa-Bossi, N., Massé, E., & Arraiano, C. M. (2019). SraL sRNA interaction regulates the terminator by preventing premature transcription termination of rho mRNA. *Proceedings of the National Academy of Sciences of the United States of America*, 116(8), 3042-3051. doi:10.1073/pnas.1811589116
- 195 Silva, J.M., Pereira, C.V., Mano, F., Silva, E., Castro, V.I.B., Sá-Nogueira, I., Reis, R.L., Paiva, A., Matias, A.A. & Duarte, A.R.C. (2019). Therapeutic role of deep eutectic solvents based on menthol and saturated fatty acids on wound healing. *ACS Applied Bio Materials*, 2(10), 4346-4355. doi:10.1021/acsabm.9b00598
- 196 Silva, J. P. N., Lopes, S. V., Grilo, D. J., & Hensel, Z. (2019). Plasmids for independently tunable, low-noise expression of two genes. *MSphere*, 4(3) doi:10.1128/mSphere.00340-19
- 197 Soares, H. R., Castro, R., Tomás, H. A., Carrondo, M. J. T., Alves, P. M., & Coroadinha, A. S. (2019). Pseudotyping retrovirus like particles vaccine candidates with hepatitis C virus envelope protein E2 requires the cellular expression of CD81. *AMB Express*, 9(1) doi:10.1186/s13568-019-0741-5
- 198 Soares, H. R., Ferreira-Fernandes, M., Almeida, A. I., Marchel, M., Alves, P. M., & Coroadinha, A. S. (2019). Enhancing hepatitis C virus pseudoparticles infectivity through p7NS2 cellular expression. *Journal of Virological Methods*, 274 doi:10.1016/j.jviromet.2019.113714
- 199 Sokol, K.P., Robinson, W.E., Oliveira, A.R., Zacarias, S., Lee, C.-., Madden, C., Bassegoda, A., Hirst, J., Pereira, I.A.C. & Reisner, E. (2019). Reversible and selective interconversion of hydrogen and carbon dioxide into formate by a semiartificial formate hydrogenlyase mimic. *Journal of the American Chemical Society*, 141(44), 17498-17502. doi:10.1021/jacs.9b09575
- 200 Sousa, A. C., Baptista, S. R., Martins, L. O., & Robalo, M. P. (2019). Synthesis of azobenzene dyes mediated by CotA laccase. *Chemistry - an Asian Journal*, 14(1), 187-193. doi:10.1002/asia.201801450
- 201 Sousa, M., Fenge, C., Rupprecht, J., Tappe, A., Grellier, G., Alves, P., Carrondo, M. & Roldão, A. (2019). Process intensification for peste des petites ruminants virus vaccine production. *Vaccine*, 37(47), 7041-7051. doi:10.1016/j.vaccine.2019.07.009
- 202 Sousa, S. C. A., Carrasco, C. J., Pinto, M. F., & Royo, B. (2019). A manganese N-heterocyclic carbene catalyst for reduction of sulfoxides with silanes. *ChemCatChem*, 11(16), 3839-3843. doi:10.1002/cctc.201900662

- 203 Steinig, E.J., Duchene, S., Robinson, D.A., Monecke, S., Yokoyama, M., Laabei, M., Slickers, P., Andersson, P., Williamson, D., Kearns, A., Goering, R.V., Dickson, E., Ehrlich, R., Ip, M., O'sullivan, M.V.N., Coombs, G.W., Petersen, A., Brennan, G., Shore, A.C., Coleman, D.C., Pantosti, A., Lencastre, H., Westh, H., Kobayashi, N., Heffernan, H., Strommenger, B., Layer, F., Weber, S., Aamot, H.V., Skakni, L., Peacock, S.J., Sarovich, D., Harris, S., Parkhill, J., Massey, R.C., Holden, M.T.G., Bentley, S.D. & Tong, S.Y.C. (2019). Evolution and global transmission of a multidrug-resistant, community-associated methicillin-resistant staphylococcus aureus lineage from the indian subcontinent. *MBio*, 10(6) doi:10.1128/mBio.01105-19
- 204 Suárez-Patiño, S.F., Bernardino, T.C., Núñez, E.G.F., Astray, R.M., Pereira, C.A., Soares, H.R., Coroadinha, A.S. & Jorge, S.A.C. (2019). Semliki forest virus replicon particles production in serum-free medium BHK-21 cell cultures and their use to express different proteins. *Cytotechnology*, 71(5), 949-962. doi:10.1007/s10616-019-00337-y
- 205 Szymczak, P., Rau, M.H., Monteiro, J.M., Pinho, M.G., Filipe, S.R., Vogensen, F.K., Zeidan, A.A. & Janzen, T. (2019). A comparative genomics approach for identifying host-range determinants in *streptococcus thermophilus* bacteriophages. *Scientific Reports*, 9(1) doi:10.1038/s41598-019-44481-z
- 206 Tavares, D. A., Handem, S., Carvalho, R. J., Paulo, A. C., de Lencastre, H., Hinds, J., & Sá-Leão, R. (2019). Identification of *streptococcus pneumoniae* by a real-time PCR assay targeting SP2020. *Scientific Reports*, 9(1) doi:10.1038/s41598-019-39791-1
- 207 Teixeira, D., Carrilho, M., Silva, M., Nunes, M., Vieira, M.L., Novo, M.T., Santos-Reis, M. & Rosalino, L.M. (2019). Mediterranean eucalyptus plantations affect small mammal ectoparasites abundance but not individual body condition. *Ecological Research*, 34(3), 415-427. doi:10.1111/1440-1703.12003
- 208 Teixeira, S., Luís, I. M., Oliveira, M. M., Abreu, I. A., & Batista, R. (2019). Goji berries superfood—contributions for the characterisation of proteome and IgE-binding proteins. *Food and Agricultural Immunology*, 30(1), 262-280. doi:10.1080/09540105.2019.1577364
- 209 Thole, V., Bassard, J.-., Ramírez-González, R., Trick, M., Ghasemi Afshar, B., Breitel, D., Hill, L., Foito, A., Shepherd, L., Freitag, S., Nunes Dos Santos, C., Menezes, R., Banados, P., Naesby, M., Wang, L., Sorokin, A., Tikhonova, O., Shelenga, T., Stewart, D., Vain, P. & Martin, C. (2019). RNA-seq, de novo transcriptome assembly and flavonoid gene analysis in 13 wild and cultivated berry fruit species with high content of phenolics. *BMC Genomics*, 20(1) doi:10.1186/s12864-019-6183-2
- 210 Timmis, K., Cavicchioli, R., Garcia, J.L., Nogales, B., Chavarria, M., Stein, L., McGenity, T.J., Webster, N., Singh, B.K., Handelsman, J., de Lorenzo, V., Pruzzo, C., Timmis, J., Martín, J.L.R., Verstraete, W., Jetten, M., Danchin, A., Huang, W., Gilbert, J., Lal, R., Santos, H., Lee, S.Y., Sessitsch, A., Bonfante, P., Gram, L., Lin, R.T.P., Ron, E., Karahan, Z.C., van der Meer, J.R., Artunkal, S., Jahn, D. & Harper, L. (2019). The urgent need for microbiology literacy in society. *Environmental Microbiology*, 21(5), 1513-1528. doi:10.1111/1462-2920.14611
- 211 Tomás, H. A., Mestre, D. A., Rodrigues, A. F., Guerreiro, M. R., Carrondo, M. J. T., & Coroadinha, A. S. (2019). Improved GaLV-TR glycoproteins to pseudotype lentiviral vectors: Impact of viral protease activity in the production of LV pseudotypes. *Molecular Therapy - Methods and Clinical Development*, 15, 1-8. doi:10.1016/j.omtm.2019.08.001
- 212 Tomé, C.S., Lopes, R.R., Sousa, P.M.F., Amaro, M.P., Leandro, J., Mertens, H.D.T., Leandro, P. & Vicente, J.B. (2019). Structure of full-length wild-type human phenylalanine hydroxylase by small angle X-ray scattering reveals substrate-induced conformational stability. *Scientific Reports*, 9(1) doi:10.1038/s41598-019-49944-x
- 213 Torán, J.L., López, J.A., Gomes-Alves, P., Aguilar, S., Torroja, C., Trevisan-Herraz, M., Moscoso, I., Sebastião, M.J., Serra, M., Brito, C., Cruz, F.M., Sepúlveda, J.C., Abad, J.L., Galán-Arriola, C., Ibanez, B., Martínez, F., Fernández, M.E., Fernández-Aviles, F., Palacios, I., R-Borlado, L., Vázquez, J., Alves, P.M. & Bernad, A. (2019). Definition of a cell surface signature for human cardiac progenitor cells after comprehensive comparative transcriptomic and proteomic characterization. *Scientific Reports*, 9(1) doi:10.1038/s41598-019-39571-x
- 214 Torcato, I. M., Kasal, M. R., Brito, P. H., Miller, S. T., & Xavier, K. B. (2019). Identification of novel autoinducer-2 receptors in clostridia reveals plasticity in the binding site of the LsrB receptor family. *Journal of Biological Chemistry*, 294(12), 4450-4463. doi:10.1074/jbc.RA118.006938
- 215 Trindade, I.B., Silva, J.M., Fonseca, B.M., Catarino, T., Fujita, M., Matias, P.M., Moe, E. & Louro, R.O. (2019). Structure and reactivity of a siderophore-interacting protein from the marine bacterium *shewanella* reveals unanticipated functional versatility. *Journal of Biological Chemistry*, 294(1), 157-167. doi:10.1074/jbc.RA118.005041
- 216 Varanda, C. M. R., Materatski, P., Landum, M., Campos, M. D., & Félix, M. D. R. (2019). Fungal communities associated with peacock and cercospora leaf spots in olive. *Plants*, 8(6) doi:10.3390/plants8060169
- 217 Vaz, F., Kounatidis, I., Covas, G., Parton, R.M., Harkiolaki, M., Davis, I., Filipe, S.R. & Ligoxygakis, P. (2019). Accessibility to peptidoglycan is important for the recognition of gram-positive bacteria in drosophila. *Cell Reports*, 27(8), 2480-2492.e6. doi:10.1016/j.celrep.2019.04.103
- 218 Vieira, A., Galinha, C. F., Oehmen, A., & Carvalho, G. (2019). The link between nitrous oxide emissions, microbial community profile and function from three full-scale WWTPs. *Science of the Total Environment*, 651, 2460-2472. doi:10.1016/j.scitotenv.2018.10.132
- 219 Vieira, A., Marques, R., Galinha, C., Pova, P., Carvalho, G., & Oehmen, A. (2019). Nitrous oxide emissions from a full-scale biological aerated filter (BAF) subject to seawater infiltration. *Environmental Science and Pollution Research*, 26(20), 20939-20948. doi:10.1007/s11356-019-05470-x
- 220 Vieira, A., Marques, R., Raposo, R., Martins, M., Alves, R., Pova, P., Irizar, I., Beltrán, S., Craamer, P., Urchegui, G. & Oehmen, A. (2019). The impact of the art-ICA control technology on the performance, energy consumption and greenhouse gas emissions of full-scale wastewater treatment plants. *Journal of Cleaner Production*, 213, 680-687. doi:10.1016/j.jclepro.2018.12.229
- 221 Vieira, N.S.M., Bastos, J.C., Hermida-Merino, C., Pastoriza-Gallego, M.J., Rebelo, L.P.N., Piñeiro, M.M., Araújo, J.M.M. & Pereiro, A.B. (2019). Aggregation and phase equilibria of fluorinated ionic liquids. *Journal of Molecular Liquids*, 285, 386-396. doi:10.1016/j.molliq.2019.04.086
- 222 Vieira, N.S.M., Bastos, J.C., Rebelo, L. P.N., Matias, A., Araújo, J. M. M., & Pereiro, A. B. (2019). Human cytotoxicity and octanol/water partition coefficients of fluorinated ionic liquids. *Chemosphere*, 216, 576-586. doi:10.1016/j.chemosphere.2018.10.159

- 223 Vieira, N. S. M., Stolte, S., Araújo, J. M. M., Rebelo, L. P. N., Pereira, A. B., & Markiewicz, M. (2019). Acute aquatic toxicity and biodegradability of fluorinated ionic liquids. *ACS Sustainable Chemistry and Engineering*, 7(4), 3733-3741. doi:10.1021/acssuschemeng.8b03653
- 224 Vieira, V., Maia, P., Rocha, M., & Rocha, I. (2019). Comparison of pathway analysis and constraint-based methods for cell factory design. *BMC Bioinformatics*, 20(1) doi:10.1186/s12859-019-2934-y
- 225 Vila-Viçosa, D., Reis, P. B. P. S., Baptista, A. M., Oostenbrink, C., & Machuqueiro, M. (2019). A pH replica exchange scheme in the stochastic titration constant-pH MD method. *Journal of Chemical Theory and Computation*, 15(5), 3108-3116. doi:10.1021/acs.jctc.9b00030
- 226 Vincent-Barbaroux, C., Berveiller, D., Lelarge-Trouverie, C., Maia, R., Máguas, C., Pereira, J., Chaves, M.M. & Damesin, C. (2019). Carbon-use strategies in stem radial growth of two oak species, one temperate deciduous and one mediterranean evergreen: What can be inferred from seasonal variations in the $\delta^{13}C$ of the current year ring? *Tree Physiology*, 39(8), 1329-1341. doi:10.1093/treephys/tpz043
- 227 Wang, S., Gegenfurtner, F.A., Crevenna, A.H., Ziegenhain, C., Kliesmete, Z., Enard, W., Müllner, R., Vollmar, A.M., Schneider, S. & Zahler, S. (2019). Chivosazole A modulates protein-protein interactions of actin. *Journal of Natural Products*, 82(7), 1961-1970. doi:10.1021/acs.jnatprod.9b00335
- 228 Zacarias, S., Temporão, A., Barrio, M. D., Fourmond, V., Léger, C., Matias, P. M., & Pereira, I. A. C. (2019). A hydrophilic channel is involved in oxidative inactivation of a [NiFeSe] hydrogenase. *ACS Catalysis*, 9(9), 8509-8519. doi:10.1021/acscatal.9b02347
- 229 Zhao, F., Wang, P., Ruff, A., Hartmann, V., Zacarias, S., Pereira, I.A.C., Nowaczyk, M.M., Rögner, M., Conzuelo, F. & Schuhmann, W. (2019). A photosystem i monolayer with anisotropic electron flow enables Z-scheme like photosynthetic water splitting. *Energy and Environmental Science*, 12(10), 3133-3143. doi:10.1039/c9ee01901d
- 230 Zuhra, K., Sousa, P.M.F., Paulini, G., Lemos, A.R., Kalme, Z., Bisenieks, I., Bisenieks, E., Vigante, B., Duburs, G., Bandejas, T.M., Saso, L., Giuffrè, A. & Vicente, J.B. (2019). Screening pyridine derivatives against human hydrogen sulfide-synthesizing enzymes by orthogonal methods. *Scientific Reports*, 9(1) doi:10.1038/s41598-018-36994-w
- 231 Zuhra, K., Tomé, C.S., Masi, L., Giardina, G., Paulini, G., Malagrino, F., Forte, E., Vicente, J.B. & Giuffrè, A. (2019). N-acetylcysteine serves as substrate of 3-mercaptopyruvate sulfurtransferase and stimulates sulfide metabolism in colon cancer cells. *Cells*, 8(8) doi:10.3390/cells8080828

Articles not indexed in Scopus:

- 1 Ferreira, L.J.; Donoghue, M.T.A.; Barros, P.; Saibo, N.J.; Santos, A.P.; Oliveira, M.M. (2019) Uncovering Differentially Methylated Regions (DMRs) in a Salt-Tolerant Rice Variety under Stress: One Step towards New Regulatory Regions for Enhanced Salt Tolerance. *Epigenomes* 3, 4. doi: 10.3390/epigenomes3010004
- 2 Fonseca, B. M., Silva, L., Trindade, I. B., Moe, E., Matias, P. M., & Louro, R. O. (2019). Optimizing electroactive organisms: The effect of orthologous proteins. *Frontiers in Energy Research*, 7 doi:10.3389/fenrg.2019.00002
- 3 Herrera F*, Branco-Santos J†, Outeiro TF* (2019). Threonine 3 regulates Serine 13/16 phosphorylation in the huntingtin exon 1. *Sciencematters*, doi: 10.19185/matters.201905000005.

Book Chapter:

- 1 Braga, A., Rocha, I., & Faria, N. (2019). Microbial hosts as a promising platform for polyphenol production. *Natural bio-active compounds: Volume 1: Production and applications* (pp. 71-103) doi:10.1007/978-981-13-7154-7_3
- 2 Brito, J. A., & Archer, M. (2019). Structural biology techniques: X-ray crystallography, cryo-electron microscopy, and small-angle x-ray scattering. *Practical approaches to biological inorganic chemistry* (pp. 375-416) doi:10.1016/B978-0-444-64225-7.00010-9
- 3 Crichton, R. R., & Louro, R. O. (2019). Practical approaches to biological inorganic chemistry. *Practical approaches to biological inorganic chemistry* (pp. 1-494) doi:10.1016/C2017-0-04752-3
- 4 de Sousa Araújo S., dos Santos A.L.W., Duque A.S. (2019) Engineering Polyamine Metabolic Pathways for Abiotic Stress Tolerance in Plants. In: Hossain M., Kumar V., Burritt D., Fujita M., Mäkelä P. (eds) *Osmoprotectant-Mediated Abiotic Stress Tolerance in Plants*. Springer, Cham. doi:10.1007/978-3-030-27423-8_14
- 5 Isidro, I. A., Pais, D. A. M., Alves, P. M., & Carrondo, M. J. T. (2019). Online control strategies. *Comprehensive biotechnology* (pp. 943-951) doi:10.1016/B978-0-444-64046-8.00112-9
- 6 Martins C, Martins I, Martins TM, Varela A, Silva Pereira. (2019) A Learning Journey on Toxico-Proteomics. *Fungal Bioremediation: Fundamentals and Applications*.
- 7 Mecha, E.; Figueira, M. E.; Vaz Pato, M. C.; Bronze, M. R. (2019) Two sides of the same coin: the impact of grain legumes on human health – Common bean (*Phaseolus vulgaris* L.) as a case study. In: *Legume Seed Nutraceutical Research*. (Jimenez-Lopez J & Clemente C, Eds.) Chapter 2. InTechOpen. doi:10.5772/intechopen.78737
- 8 Roldão, A., Silva, A. C., Mellado, M. C. M., Alves, P. M., & Carrondo, M. J. T. (2019). Viruses and virus-like particles in biotechnology: Fundamentals and applications. *Comprehensive biotechnology* (pp. 633-656) doi:10.1016/B978-0-12-809633-8.09046-4
- 9 Royo, B. (2019). Recent advances in catalytic hydrosilylation of carbonyl groups mediated by well-defined first-row late transition metals doi:10.1016/bs.adomc.2019.02.001
- 10 Rubiales, D.; González-Bernal, M. J.; Warkentin, T.; Bueckert, R.; Vaz Pato, M. C.; McPhee, K.; McGee, R.; Smykal, P. (2019) Advances in pea breeding. In: *Achieving sustainable cultivation of vegetables*. (Hochmuth G, Ed.) Chapter 22. Burleigh Dodds Science Publishing. doi:10.19103/AS.2019.0045.28
- 11 Saramago, M., da Costa, P. J., Viegas, S. C., & Arraiano, C. M. (2019). The Implication of mRNA Degradation Disorders on Human Disease: Focus on DIS3 and DIS3-Like Enzymes. *Advances in experimental medicine and biology*, 1157, 85-98. doi: 10.1007/978-3-030-19966-1_4
- 12 Trindade, I. B., & Louro, R. O. (2019). Introduction to biomolecular nuclear magnetic resonance and metals. *Practical approaches to biological inorganic chemistry* (pp. 155-199) doi:10.1016/B978-0-444-64225-7.00005-5
- 13 Vidic, S., Estrada, M.F., Gjerde, K., Santo, V.E., Osswald, A., Barbier, M., Chong, Y.T., Sommergruber, W., de Hoogt, R., Brito, C. & Graeser, R. (2019). PREDECT protocols for complex 2D/3D cultures doi:10.1007/978-1-4939-8891-4_1

ONGOING PROJECTS 2019

PROJECTS FUNDED BY FUNDAÇÃO PARA A CIÊNCIA E A TECNOLOGIA

1.	Biocatalysis for tackling lignin recalcitrance	PTDC/BBB-EBB/0122/2014	Lígia Martins	ITQB NOVA	199 686,00
2.	Structural and functional analysis of the Haa1 transcription factor required for yeast response and resistance to acetic acid	PTDC/BBB-BEP/0385/2014	Carlos Frazão	ITQB NOVA	198 545,00
3.	DNA repair – from bacteria to man: Insights into structural and mechanistic features of Base Excision Repair (BER) initiation	PTDC/BBB-BEP/0561/2014	Elin Moe	ITQB NOVA	157 530,00
4.	Deciphering the grass pea (<i>Lathyrus sativus</i>) quality riddle. How can the omics technologies contribute to a demand-driven improvement in legume quality?	PTDC/AGR-TEC/0992/2014	Carlota Vaz Patto	ITQB NOVA	199 998,00
5.	Determination of the architecture and the RNA degradation strategy of Ribonuclease R: implications for pathogen control	PTDC/BIA-MIC/1399/2014	Cecília Arraiano	ITQB NOVA	199 780,00
6.	Functional characterization of genes required for neurodegeneration caused by endoplasmic reticulum stress	PTDC/NEU-NMC/2459/2014	Pedro Domingos	ITQB NOVA	199 474,00
7.	Designing poly(ionic liquid)-based engineered membranes for hydrogen purification	PTDC/CTM-POL/2676/2014	Liliana Tomé	ITQB NOVA	165 874,00
8.	Reduction of CO ₂ for sustainable biofuel production	PTDC/BBB-EBB/2723/2014	Inês Cardoso Pereira	ITQB NOVA	172 369,00
9.	Engineering a highly active NiFeSe Hydrogenase for electrocatalytic and photocatalytic applications	PTDC/BBB-BEP/2885/2014	Pedro Matias	ITQB NOVA	199 595,00
10.	Diron proteins in the microbial response to oxidative or nitrosative stress	PTDC/BBB-BQB/3135/2014	Miguel Teixeira	ITQB NOVA	187 137,00
11.	Deciphering the role of BoA in persistence and biofilm formation	PTDC/BIA-MIC/4046/2014	Ricardo Moreira	ITQB NOVA	196 143,00
12.	The difference a cell wall makes: optimization of bioelectrochemical systems by exploring the paradigm of extracellular electron transfer in Gram-positive bacteria	PTDC/BBB-BQB/4178/2014	Catarina Paquete	ITQB NOVA	196 926,00
13.	An RNA-based approach to bacterial infection: The function of PNPase and regulatory noncoding RNAs in <i>Listeria</i> virulence	PTDC/IMI-MIC/4463/2014	José Andrade	ITQB NOVA	184 582,00
14.	Biosynthesis of modified tetrapyrroles in <i>Staphylococcus aureus</i>	PTDC/BBB-BQB/5069/2014	Susana Lobo	ITQB NOVA	171 354,00
15.	Targetting inhibition of microbial sulfidogenesis: Biochemical and structural characterization of DsrD	PTDC/BIA-MIC/6512/2014	Sofia Venceslau	ITQB NOVA	133 496,00
16.	Discovery and training of microbial biocatalysts for biomass conversion using moving bed technology (MBT)	ERA-MBT/0003/2014	Elin Moe	ITQB NOVA	124 956,00
17.	Powdery Mildew susceptibility in grapevine: phenotype-genotype linkage in the Portuguese germplasm	PTDC/AGR-PRO/4261/2014	Pedro Fevereiro	INIAV	187 638,00
18.	Natural Deep Eutectic Solvents: A platform to Boost <i>Eucalyptus globulus</i> and <i>Quercus suber</i> cork integrated Biorefineries	PTDC/AGR-TEC/1191/2014	Cristina Silva Pereira	Univ. Aveiro	186 354,00
19.	Structure and Function of a Dodecameric Molecular Machine: the human RuvBL1/RuvBL2 Complex and its Role in Disease	PTDC/BBB-BEP/1463/2014	Pedro Matias	IBET	174 144,00
20.	The way forward: optimization of respiratory electron transfer chains toward sustainable microbial electricity production	PTDC/BBB-BQB/3554/2014	Catarina Paquete	NOVA.ID.FCT	166 862,00
21.	An integrated systems approach to uncover the key players in complex protein N-glycosylation in <i>Trypanosoma brucei</i>	PTDC/BBB-BSS/0827/2014	Rita Ventura	IMM	149 450,00

22.	EvoMod- Origin and Evolutionary establishment of a transcriptional module controlling flower asymmetry	PTDC/BIA-PLA/1402/2014	Célia Romão	Univ. Minho	196 716,00
23.	Nonsense-mediated mRNA decay in genetic diseases and cancer: key players, mechanisms, and a novel approach for suppression therapy	PTDC/BIM-MEC/3749/2014	Sandra Viegas	FFC/FC/UNL	199 662,00
24.	Nanoheaters and nanothermometers playing together: towards applications in Brownian motion and hyperthermia	PTDC/CTM-NAN/4647/2014	Federico Herrera	Univ. Aveiro	183 945,00
25.	Molybdenum nanoparticle coating to reduce MRSA contamination of public and healthcare environments	PTDC/DTP-EPI/0842/2014	Hermínia de Lencastre	Cruz Vermelha Portuguesa	190 000,00
26.	Microfluidics Liquid Crystal Based Bifunctional Bacterial Infection Sensor	PTDC/FIS-NAN/0117/2014	Maria Miragaia	NOVA.ID.FCT	159 912,00
27.	Small-molecule inhibitors of human proteasome: a step forward in anticancer drug discovery	PTDC/QEQ-MED/7042/2014	Margarida Archer	FARM-ID	195 672,00
28.	Diversity and complexity of microbial multidomain oxygen and/or nitric oxide reductases flavodiiron enzymes from Clostridiales	PTDC/BIA-BQM/27959/2017	Miguel Teixeira	ITQB NOVA	225 473,06
29.	Chemical Synthesis Using Earth-Abundant Metal Catalysts	PTDC/QUI-QIN/28151/2017	Beatriz Royo	ITQB NOVA	188 523,06
	Using computational and experimental methods to provide a global characterization of viral fusion peptides	PTDC/CCI-BIO/28200/2017	Diana Lousa	ITQB NOVA	239 648,06
30.	Ribonucleases as tools to combat the foodborne pathogen <i>Campylobacter jejuni</i>	PTDC/BIA-BQM/28479/2017	Rute Matos	ITQB NOVA	233 116,03
31.	Role of bacterial haem biosynthesis in host-pathogen interaction	PTDC/BIA-BQM/28642/2017	Lígia Saraiva	ITQB NOVA	239 273,06
32.	Metabolic Odyssey in <i>Staphylococcus aureus</i>	PTDC/BIA-BQM/28827/2017	Manuela Pereira	ITQB NOVA	233 254,12
33.	Unravelling <i>Geobacter sulfurreducens</i> metabolism for bioelectricity production	PTDC/BIA-BQM/29118/2017	Américo Duarte	ITQB NOVA	232 877,67
34.	Find targets for <i>Clostridium difficile</i> infection control	PTDC/BIA-MIC/29293/2017	Mónica Serrano	ITQB NOVA	238 612,12
35.	Exploring the Antimicrobial Potential of Carbon Monoxide-Releasing Molecules	PTDC/SAU-INF/29313/2017	Carlos Romão	ITQB NOVA	239 998,06
36.	Modelling pH effects on beta-lactoglobulin using state-of-the-art constant-pH molecular dynamics	PTDC/QUI-OUT/29441/2017	Sara Campos	ITQB NOVA	191 902,67
37.	Surface enhanced Raman at-line detection of adeno-associated virus vectors for production optimization	PTDC/BTM-SAL/29507/2017	Smilja Todorovic	ITQB NOVA	218 823,06
38.	Identification of the missing links in antibiotic resistance dissemination in the food production chain - from farm-to-fork	PTDC/CVT-CVT/29510/2017	Maria Miragaia	ITQB NOVA	235 310,41
39.	Deciphering the mechanisms of interspecies bacterial communication towards the manipulation of the mammalian gut microbiota	PTDC/BIA-BQM/29668/2017	Rita Ventura	ITQB NOVA	239 802,67
40.	Determination of the molecular mechanisms of biogenesis of c-type cytochromes	PTDC/BIA-BQM/30176/2017	Ricardo Louro	ITQB NOVA	220 673,06
41.	Unravelling the structure of membrane proteins involved in mycobacteria cell wall biosynthesis to develop novel anti-tuberculosis drugs and better understand resistance mechanisms	PTDC/BIA-BQM/30421/2017	Margarida Archer	ITQB NOVA	225 094,95
42.	Aspartic Proteases from <i>Cynara cardunculus</i> L.: study of gene expression and establishment of alternative production platforms	PTDC/BAA-AGR/30477/2017	Rita Abranches	ITQB NOVA	234 015,26
43.	Unraveling structure and function determinants in Alternative Complex III (ACIII)	PTDC/BIA-BQM/30528/2017	Ana Patrícia Refojo	ITQB NOVA	203 654,32

44.	STOPneumo - Targeted approaches to contain pneumococcal disease	PTDC/BIA-MIC/30703/2017	Raquel Sá-Leão	ITQB NOVA	239 261,42
45.	Oxidoreductase-based electrochemical biosensors and bioreactors: rational design guided by biophysical characterization	PTDC/BIA-BFS/31026/2017	Célia Silveira	ITQB NOVA	231 323,06
46.	How do Phytochrome Interacting Factors mediate the cross-talk between light and temperature signalling in rice?	PTDC/BIA-FBT/31070/2017	Nelson Saibo	ITQB NOVA	239 965,17
47.	Detection and Characterisation of Nanoparticles Using Solid-State Nanopores: A Single Molecule Approach	PTDC/NAN-MAT/31100/2017	James Yates	ITQB NOVA	206 215,22
48.	Metals in the radiation resistance bacterium <i>Deinococcus radiodurans</i> , its role in protection up to future applications	PTDC/BIA-BQM/31317/2017	Célia Romão	ITQB NOVA	237 299,70
49.	Mechanistic and optogenetic control of astroglia for neural repair	PTDC/MED-NEU/31417/2017	Federico Herrera	ITQB NOVA	239 898,06
50.	<i>Staphylococcus epidermidis</i> adaptation to nitric oxide produced by the innate immune system	PTDC/BIA-MIC/31566/2017	Sandra Carvalho	ITQB NOVA	236 523,06
51.	The RNA-binding protein Hfq interactome in the human pathogen <i>Listeria monocytogenes</i> : piecing together the elusive role of a virulence regulator	PTDC/BIA-MIC/32525/2017	José Andrade	ITQB NOVA	238 073,06
52.	Molecular and cell biology of imipenem resistance in the human enteric pathogen <i>Clostridium difficile</i>	PTDC/BIA-MIC/32542/2017	Adriano O. Henriques	ITQB NOVA	239 862,12
53.	Iterative Laboratory-Computational Evolution of Bacterial Ligninolytic Enzymes	PTDC/BII-BBF/29564/2017	Lígia Martins	ITQB NOVA	239 857,38
54.	Cork formation and suberin deposition: the role of water and heat stress	PTDC/BIA-FBT/29704/2017	Margarida Oliveira	ITQB NOVA	232 357,43
55.	The emerging role of miRNAs in <i>Vitis</i> rootstock drought response	31907	Ana Fortunato	ITQB NOVA	232 890,50
56.	Building new regulatory networks governing plant growth under stress	PTDC/BIA-FBT/31211/2017	Isabel Abreu	ITQB NOVA	239 062,42
57.	Unravelling the biosynthesis of inositol-phospholipids in <i>M. tuberculosis</i> as a crucial step towards the development of novel anti-tuberculosis drugs	PTDC/BIA-BQM/31031/2017	Carla Jorge	ITQB NOVA	238 487,68
58.	Development of molecular markers for resistance to pine wilt disease in <i>Pinus pinaster</i>	28379	Célia Miguel	FCIÊNCIAS.ID	239 613,60
59.	RESISCAT - Molecular breeding of chestnut for resistance to <i>Phytophthora cinnamomi</i> , the causal agent of root rot	28760	Pedro Fevereiro	INIAV	236 296,65
60.	FructYEAST - Exploring unique metabolic traits of biotechnological interest in fructophilic yeasts	29529	Helena Santos	NOVA.ID:FCT	228 347,05
61.	A systems approach to understand the impact of climate changes in <i>Coffea</i> spp	PTDC/ASP-AGR/31257/2017	Carla António	ISA	239 981,77
62.	Fostering High Throughput Plant Phenotyping by an Interdisciplinary Approach	PTDC/ASP-PLA/28726/2017	Nelson Saibo	FCIÊNCIAS.ID	236 953,97
63.	PRIME - Molecular mechanisms of melanin internalisation and processing by keratinocytes	PTDC/BIA-CEL/29765/2017	Abel Oliva	NOVA MS	225 118,87
64.	Identification of novel quorum sensing signals in the mammalian gut microbiota	PTFC/BIA-MIC/30487/2017	Rita Ventura	FCG	239 848,75
65.	Pruned_Wall - Role of the peptidoglycan hydrolases in the interaction with <i>Streptococcus pneumoniae</i> with an infected host	PTDC/BIA-MIC/30746/2017	Mariana Pinho	NOVA.ID:FCT	239 792,17
66.	StaphOUT - Fighting <i>Staphylococcus aureus</i> - Peptidoglycan amidation as a new target	31645	Hermínia de Lencastre	NOVA.ID:FCT	239 900,00

67.	Doçuras ou travessuras? Glico-conjugados organometálicos de ruténio(II) como agentes anticancerígenos selectivos	PTDC/MED-QUI/31468/2017	Margarida Archer	FARM.ID	236 719,62
68.	Resistance characterization to downy mildew in wild rocket crop	28963	Carla António	INIAV	216 755,50
69.	IF - Exploratory Project	IF/01023/2013/CP1173/CT0003	Colin McVey	ITQB NOVA	50 000,00
70.	IF - Exploratory Project	IF/00109/2014/CP1244/CT0007	Ana Petronilho	ITQB NOVA	50 000,00
71.	IF - Exploratory Project	IF/00961/2014/CP1244/CT0012	José Andrade	ITQB NOVA	50 000,00
72.	IF - Exploratory Project	IF/01004/2014/CP1244/CT0011	João Vicente	ITQB NOVA	50 000,00
73.	IF - Exploratory Project	IF/00124/2015	Catarina Pimentel	ITQB NOVA	50 000,00
74.	IF - Exploratory Project	IF/00217/2015	Sandra Viegas	ITQB NOVA	50 000,00

PROJECTS FUNDED BY PORTUGAL 2020

75.	Plataforma Ómica para Prevenção e Controlo de Infecções e de Resistência aos Antimicrobianos	016419	Raquel Sá Leão	ITQB NOVA	2 469 635,88
76.	Establishing protocols to assess occupational exposure to microbiota in clinical settings	023222	Maria Miragaia Ryder	IPLisboa	148 105,01
77.	Portal Agro-Tech	035472	Cláudio M. Soares	INIAV	923 167,50
78.	ITQB ++	022053	Margarida Trindade	ITQB NOVA	
		39831	Isabel Rocha/ Cláudio Soares	Silicolife	681 648,44

PROJECTS FUNDED BY IFAP (PDR 2020)

79.	PINUS RESINA		Cristina Silva Pereira	ITQB NOVA	71 632,06
80.	Programa de Conservação e Melhoramento Genético Vegetal em Feijão		Carlota Vaz Patto	ITQB NOVA	154 685,25
81.	Programa de Conservação e Melhoramento Genético Vegetal em Oliveira		Pedro Fevereiro	ITQB NOVA	105 524,00
82.	Programa de Conservação e Melhoramento Genético Vegetal em Forrageiras e Pratenses		Pedro Fevereiro	ITQB NOVA	128 038,00
83.	Plataforma Portuguesa de Bioimagem (PPBI)	022122	Adriano O. Henriques	IBMC	5 152 587,12
84.	Rede Nacional de Espectrometria de Massa (RNEM)	022125	Isabel Abreu	FC/UL	2 915 650,00
85.	Infraestrutura Portuguesa de Dados Biológicos (BIODATA)	022231	Nelson Saibo	IGC	2 243 427,58
86.	Rede Nacional de Ressonância Magnética Nuclear (RMN)	022161	Ricardo Louro	FCT/UNL	4 829 609,00

PROJECTS FUNDED BY PFIZER

87.	Effect of universal use of the 13-valent pneumococcal conjugate vaccine on pneumococcal colonization: a study following several years of use of PCVs in the private market in Portugal	WI230921	Raquel Sá Leão	ITQB NOVA	240 024,00
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PROJECTS FUNDED BY NOVARTIS

88.	90 Segundos de Ciência	Joana Lobo Antunes	ITQB NOVA
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PROJECTS FUNDED UNDER ERASMUS + PROGRAMME

89.	TRANSPER: A transnational skills programme to enhance the employability of researchers.		Margarida Trindade	Karlstad University	386 260,00
90.	ERASMUS+ Strategic Partnerships	2017-1-PT01-KA201-035823	Ana Sofia Fortunato	Agrup. Escolas Matilde Rosa Araújo /Agência Nacional Erasmus	154 865,00

PROJECT FUNDED BY LA CAIXA BANKING FOUNDATION

91.	Organismal role of th ER membrane complex: a conserved machinery required for membrane protein biogenesis.		Pedro Domingos		960 769,00
92.	Projects funded by European Comission:				
93.	Embedding crop diversity and networking for local high quality food systems	633571	Carlota Vaz Patto	INRA	3 429 908,75
94.	Exploiting native endowments by re-factoring, re-programming and implementing novel control loops in <i>Pseudomonas putida</i> for bespoke biocatalysis	635536	Cecília Arraiano	Wageningen University	6 021 083,00
95.	Infrastructure for NMR, EM and X-ray crystallography for translational research	653706	Margarida Archer	Universiteit Utrecht	9 999 534,25
96.	Flow Induced Phase Transitions, a new low energy paradigm for polymer processing	713475	Cristina S. Pereira	The University of Sheffield	3 741 870,25
97.	Releasing the full potential of Instruct to expand and consolidate infrastructure services for integrated structural life science research	731005	M ^a Arménia Carrondo/Margarida Archer	Instruct Academic Services Limited	3 950 000,00
98.	Designing InnoVative plant teams for Ecosystem				
99.	Resilience and agricultural Sustainability	727284	Carlota Vaz Patto	The James Hutton Institute	4 999 363,50
100.	Implementation of The Discoveries Centre for Regenerative and Precision Medicine, a new Centre of Excellence in Portugal -	739572	Paula Alves	Universidade do Minho	14 996 606,25
101.	Twin to Illuminate Metals in Biology and Biocatalysis through Biospectroscopy	810856	Miguel Teixeira (+ Ricardo Louro + Smilja Todorovic)	ITQB NOVA	994 367,50
102.	Bacterial Enzymes and Bioprocesses for Lignin Valorisation	824017	Lígia Martins	ITQB NOVA	970 600,00
103.	Membrane protein integrated technologies development for drug design	823780	Margarida Archer	Universita degli Studi di Roma La Sapienza	464 600,00
104.	Modular cell factories for the production of 100 compounds from the shikimate pathway	814408	Isabel Rocha	SILICOLIFE Lda	7 995 343,75
105.	Selective Modifications of AROMatics through Biocatalytic Oxidations	837890	Lígia Martins	BIO BASE Europe Pilot Plant VZW	3 924 163,00
106.	Imaging life from Molecules to cells - building knowledge on Cryo-electron microscopy methodologies	857203	Pedro Matias	ITQB NOVA	800 000,00

PROJECTS FUNDED BY EUROPEAN COMISSION, EUROPEAN RESEARCH COUNCIL

107.	Development of biomaterials through mimesis of plant defensive interfaces to fight wound infections	647928	Cristina Silva Pereira	ITQB NOVA	1 795 967,50
108.	Exploring the bacterial cell cycle to re-sensitize antibiotic-resistant bacteria	771709	Mariana Pinho	ITQB NOVA	2 533 500,00

PROJECTS FUNDED BY EUROPEAN COMISSION, INDIVIDUAL FELLOWSHIPS

109.	Turning BacTERia into factories of BIOdegradable PLASTICS	867437	Cecília Arraiano	ITQB NOVA	147 815,00
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