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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 (NOVA4Health).

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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Inês Cardoso Pereira (Vogal)
Julia Costa (Vogal)
PEOPLE

- **160** PhD HOLDERS
- **197** PhD STUDENTS
- **47** GRADUATES (BI)
- **188** MASTER STUDENTS
- **150** OTHERS
- **10** POST DOCS

LABS

- **57** LABS

RESEARCH

- **4471** CITATIONS 2018-2019 SCOPUS
- **175495** CITATIONS 1980-2017 WOS
- **247** TOTAL PAPERS 2009

ONGOING RESEARCH PROJECTS

- **109**
EDUCATION

349 PhD STUDENTS TOTAL

197 ITQB NOVA

159 OTHER INSTITUTIONS

349 PhD STUDENTS TOTAL

197 PhD STUDENTS ITQB NOVA

51 PhD degrees awarded

43 NEW STUDENTS

177 NATIONAL STUDENTS

20 FOREIGN STUDENTS
EDUCATION

- PHD STUDENTS: 349 (180 MALES, 278 FEMALES)

FUNDING

- TOTAL 14.6M€
- RESEARCH PROJECTS 30.6% 4.47M€
- STATE BUDGET 21.5% 3.14M€
- INDIVIDUAL FELLOWSHIPS 6.3% 0.92M€
- IF CIÊNCIA / DL-57 / FCT INVESTIGATOR 20.5% 3.0M€
- BENCH FEES / TUITION AND RELATED FEES 5.8% 0.85M€
- OTHER 1.6% 0.23M€
- RESEARCH UNITS / ASSOCIATED LABORATORY 13.6% 1.99M€
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

Argentina
Brazil
Canada
Costa Rica
Chile
United States

Congo
Egypt
Israel
Morocco
Saudi Arabia
Senegal
South Africa
Tunisia
United Arab Emirates

Australia
China
Hong Kong
India
Japan
New Zealand
Russian Federation
Singapore
South Korea
Taiwan
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

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

FEBRUARY

MAR 3
Workshop ITQB NOVA Innovation Series – How to Assess a New Business
Marta MB Ribeiro, Knowledge and Tech Transfer Officer ITQB NOVA

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

MARCH

MAR 27 TO 28
3rd COST EMPHASIS Meeting
Organization: Carla Pinheiro

APRIL

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

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

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 Luis 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
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

SEP 12
Call for applications at the PhD Fellowships Plants for Life 2018

SEP 13 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

NOV 12
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

DEC 11
Last lesson of Professor Herminia de Lencastre - Academic jubilation ceremony
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 ATMPs. 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.

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.

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 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.

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 carbene.

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.

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.

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 (CORMs) 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.

**METABOLIC 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 fulfill 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 Fevereiro - 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.

**INNOVA4HEALTH**

**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 Luisa 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 modification 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 microbes (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 termostated 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 or 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)

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: Cristina Timóteo (cristina.timoteo@itqb.unl.pt), Teresa Baptista da Silva (teresas@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 bacterial/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 Wildfield 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 Expertize 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 (ah@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 TRANSPEER 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. TRANSPEER 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 expertise 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).

HIGH SCHOOL 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, Universidad 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 13CO2 labelling
Stephanie Arrivault, Max Planck Institute of Molecular Plant Physiology

[Plants for Life Seminar] 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 Pucchiariello, 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 Biology

New Frontiers for Vaccinology
Mariagrazia Pizza, GSK Vaccines, Sienna, Italy

\(^{57}\)Fe 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-Generating: 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
Luis 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
Monica 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 Plan 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 Milheiroço

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

SOBIRI/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 Al-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] 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.

PHD THESSES 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 toxigenogenesis by vegetative and sporulating cells in the enteric pathogen Clostridiodes 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: Célia 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 Iionic Liquids as a switch of the physico-chemical properties of solutions

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

Nuno Miguel Loureiro Gonçalves, Bioengineering
Advancing purification of viral targets

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

Patrícia Alexandra Teixeira Borges, Biochemistry
Unravelling structural features of flavodiron 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): Cecilia Maria Arraiano, Jóses 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 moduling 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

Elisabeth 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, Mª Luísa Vasconcelos

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)

Ricardo 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)

Olena Dorosh
Portuguese vine-canes 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
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

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/10.1038/s41367-019-0437-2

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

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/acschembio.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


2019


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 Haal 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 (Lathyrus sativus) 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 polyionic liquid-based engineered membranes for hydrogen purification
   PTDC/CTM-POL/2676/2014
   Liliana Tomé
   ITQB NOVA
   165 874,00

8. Reduction of CO2 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. Diiron 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 BolA 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 Listeria virulence
    PTDC/IMI-MIC/4463/2014
    José Andrade
    ITQB NOVA
    184 582,00

14. Biosynthesis of modified tetrapyrroles in Staphylococcus aureus
    PTDC/BBB-BQB/5069/2014
    Susana Lobo
    ITQB NOVA
    171 354,00

15. Targeting 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 Eucalyptus globulus and Quercus suber 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 Trypanosoma brucei
    PTDC/BBB-BSS/0827/2014
    Rita Ventura
    IMM
    149 450,00
<table>
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<tr>
<th>Project ID</th>
<th>Title</th>
<th>Principal Investigator</th>
<th>Institution/Host</th>
<th>Funding Amount</th>
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<td>PTDC/BIA-PLA/1402/2014</td>
<td>EvoMod: Origin and Evolutionary establishment of a transcriptional module controlling flower asymmetry</td>
<td>Célia Romão</td>
<td>Univ. Minho</td>
<td>196 716.00</td>
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<tr>
<td>PTDC/BIM-MEC/3749/2014</td>
<td>Nonsense-mediated mRNA decay in genetic diseases and cancer: key players, mechanisms, and a novel approach for suppression therapy</td>
<td>Sandra Viegas</td>
<td>FFC/FC/UNL</td>
<td>199 662.00</td>
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<td>PTDC/CTM-NAN/4647/2014</td>
<td>Nanoheaters and nanothermometers playing together: towards applications in Brownian motion and hyperthermia</td>
<td>Federico Herrera</td>
<td>Univ. Aveiro</td>
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<td>PTDC/OTP-EP/0842/2014</td>
<td>Molybdenum nanoparticle coating to reduce MRSA contamination of public and healthcare environments</td>
<td>Hermínia de Lencastre</td>
<td>Cruz Vermelha Portuguesa</td>
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<td>PTDC/FIS-NAN/0117/2014</td>
<td>Microfluidics Liquid Crystal Based Bifunctional Bacterial Infection Sensor</td>
<td>Maria Miragaia</td>
<td>NOVA.ID.FCT</td>
<td>159 912.00</td>
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<td>PTDC/QEO-MED/7042/2014</td>
<td>Small-molecule inhibitors of human proteasome: a step forward in anticancer drug discovery</td>
<td>Margarida Archer</td>
<td>FARM-ID</td>
<td>195 672.00</td>
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<td>PTDC/BIA-BQM/27959/2017</td>
<td>Diversity and complexity of microbial multidomain oxygen and/or nitric oxide reductases flavodiron enzymes from Clostridiales</td>
<td>Miguel Teixeira</td>
<td>ITQB NOVA</td>
<td>225 473.06</td>
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<tr>
<td>PTDC/QUI-QIN/28151/2017</td>
<td>Chemical Synthesis Using Earth-Abundant Metal Catalysts</td>
<td>Beatriz Royo</td>
<td>ITQB NOVA</td>
<td>188 523.06</td>
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<td>PTDC/CCI-BIO/28200/2017</td>
<td>Using computational and experimental methods to provide a global characterization of viral fusion peptides</td>
<td>Diana Lousa</td>
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<td>PTDC/BIA-BQM/28479/2017</td>
<td>Ribonucleases as tools to combat the foodborne pathogen Campylobacter jejuni</td>
<td>Rute Matos</td>
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<td>PTDC/BIA-BQM/28642/2017</td>
<td>Role of bacterial haem biosynthesis in host-pathogen interaction</td>
<td>Lígia Saraiva</td>
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<td>PTDC/BIA-BQM/28827/2017</td>
<td>Metabolic Odyssey in Staphylococcus aureus</td>
<td>Manuela Pereira</td>
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<td>PTDC/BIA-BQM/29118/2017</td>
<td>Unravelling Geobacter sulfurreducens metabolism for bioelectricity production</td>
<td>Américo Duarte</td>
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<td>PTDC/BIA-MIC/29293/2017</td>
<td>Find targets for Clostridium difficile infection control</td>
<td>Mónica Duarte</td>
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<td>PTDC/SAU-INF/29313/2017</td>
<td>Exploring the Antimicrobial Potential of Carbon Monoxide-Releasing Molecules</td>
<td>Carlos Romão</td>
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<td>PTDC/QUI-OUT/29441/2017</td>
<td>Modelling pH effects on beta-lactoglobulin using state-of-the-art constant-pH molecular dynamics</td>
<td>Sara Campos</td>
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<td>PTDC/BTM-SAL/29507/2017</td>
<td>Surface enhanced Raman at-line detection of adeno-associated virus vectors for production optimization</td>
<td>Smilja Todorovic</td>
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<td>PTDC/CVT-CVT/29510/2017</td>
<td>Identification of the missing links in antibiotic resistance dissemination in the food production chain - from farm-to-fork</td>
<td>Maria Miragaia</td>
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<td>PTDC/BIA-BQM/29668/2017</td>
<td>Deciphering the mechanisms of interspecies bacterial communication towards the manipulation of the mammalian gut microbiota</td>
<td>Rita Ventura</td>
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<td>PTDC/BIA-BQM/30176/2017</td>
<td>Determination of the molecular mechanisms of biogenesis of c-type cytochromes</td>
<td>Ricardo Louro</td>
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<td>PTDC/BIA-BQM/30421/2017</td>
<td>Unravelling the structure of membrane proteins involved in mycobacteria cell wall biosynthesis to develop novel anti-tuberculosis drugs and better understand resistance mechanisms</td>
<td>Margarida Archer</td>
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<td>PTDC/BAA-AGR/30477/2017</td>
<td>Aspartic Proteases from Cynara cardunculus L.: study of gene expression and establishment of alternative production platforms</td>
<td>Rita Abranches</td>
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<td>PTDC/BIA-BQM/30528/2017</td>
<td>Unraveling structure and function determinants in Alternative Complex III (ACIII)</td>
<td>Ana Patricia Refojo</td>
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<td>PTDC/BIA-MIC/30703/2017</td>
<td>STDPneumo - Targeted approaches to contain pneumococcal disease</td>
<td>Raquel Sá-Leão</td>
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<td>PTDC/BIA-BFS/31026/2017</td>
<td>Oxidoreductase-based electrochemical biosensors and bioreactors: rational design guided by biophysical characterization</td>
<td>Célia Silveira</td>
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<td>PTDC/BIA-FBT/31070/2017</td>
<td>How do Phytochrome Interacting Factors mediate the cross-talk between light and temperature signalling in rice?</td>
<td>Nelson Saibo</td>
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<td>PTDC/BIA-BQM/31317/2017</td>
<td>Metals in the radiation resistance bacterium Deinococcus radiodurans, its role in protection up to future applications</td>
<td>Célia Romão</td>
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<td>PTDC/MED-NEU/31417/2017</td>
<td>Mechanistic and optogenetic control of astroglia for neural repair</td>
<td>Federico Herrera</td>
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<td>PTDC/BIA-MIC/31566/2017</td>
<td>Staphylococcus epidermidis adaptation to nitric oxide produced by the innate immune system</td>
<td>Sandra Carvalho</td>
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<td>PTDC/BIA-MIC/32525/2017</td>
<td>The RNA-binding protein Hfq interactome in the human pathogen Listeria monocytogenes: piecing together the elusive role of a virulence regulator</td>
<td>José Andrade</td>
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<td>PTDC/BIA-MIC/32742/2017</td>
<td>Molecular and cell biology of imipenem resistance in the human enteric pathogen Clostridium difficile</td>
<td>Adriano O. Henriques</td>
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<td>PTDC/BII-BBF/29564/2017</td>
<td>Iterative Laboratory-Computational Evolution of Bacterial Ligninolytic Enzymes</td>
<td>Lígia Martins</td>
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<td>PTDC/BIA-FBT/29704/2017</td>
<td>Cork formation and suberin deposition: the role of water and heat stress</td>
<td>Margarida Oliveira</td>
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<td>PTDC/BIA-MIC/32525/2017</td>
<td>The emerging role of miRNAs in Vitis rootstock drought response</td>
<td>Ana Fortunato</td>
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<td>PTDC/BIA-FBT/31211/2017</td>
<td>Building new regulatory networks governing plant growth under stress</td>
<td>Isabel Abreu</td>
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<td>PTDC/BIA-BQM/31031/2017</td>
<td>Unravelling the biosynthesis of inositol-phospholipids in M. tuberculosis as a crucial step towards the development of novel anti-tuberculosis drugs</td>
<td>Carla Jorge</td>
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<td>28379</td>
<td>Development of molecular markers for resistance to pine wilt disease in Pinus pinaster</td>
<td>Célia Miguel</td>
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<td>RESISCAT - Molecular breeding of chestnut for resistance to Phytophthora cinnamomi, the causal agent of root rot</td>
<td>Pedro Fevereiro</td>
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<td>FructYEAST - Exploring unique metabolic traits of biotechnological interest in fructophilic yeasts</td>
<td>Helena Santos</td>
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<td>PTDC/ASP-AGR/31257/2017</td>
<td>A systems approach to understand the impact of climate changes in Coffea spp</td>
<td>Carla António</td>
<td>ISA</td>
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<td>PTDC/ASP-PLA/28726/2017</td>
<td>Fostering High Throughput Plant Phenotyping by an Interdisciplinary Approach</td>
<td>Nelson Saibo</td>
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<td>PTDC/BIA-CEL/29765/2017</td>
<td>PRIME - Molecular mechanisms of melanin internalisation and processing by keratinocytes</td>
<td>Abel Oliva</td>
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<td>PTFC/BIA-MIC/30487/2017</td>
<td>Identification of novel quorum sensing signals in the mammalian gut microbiota</td>
<td>Rita Ventura</td>
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<td>PTDC/BIA-MIC/30746/2017</td>
<td>Pruned_Wall - Role of the peptidoglycan hydrolases in the interaction with Streptococcus pneumoniae with an infected host</td>
<td>Mariana Pinho</td>
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<td>PTDC/BIA-MIC/31645/2017</td>
<td>StaphOUT - Fighting Staphylococcus aureus - Peptidoglycan amidation as a new target</td>
<td>Hermínia de Lancastre</td>
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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 Infeções 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 IPIlsoa 148 105.01

77. Portal Agro-Tech

035472 Cláudio M. Soares INIAV 923 167.50

78. ITQB ++

022053 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 Spectrometria de Massa (RNEM)

022125 Isabel Abreu FC/UL 2 915 650.00

85. Infraestrutura Portuguesa de Dados Biológicos (BIDDATA)

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

W1230921 Raquel Sá Leão ITQB NOVA 240 024.00
PROJECTS FUNDED BY NOVARTIS

88. 90 Segundos de Ciência  
Joana Lobo Antunes  
ITQB NOVA

PROJECTS FUNDED UNDER ERASMUS + PROGRAMME

89. TRANSPEER: 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

Pedro Domingos  
960 769.00

92. Projects funded by European Comission:  

93. Embedding crop diversity and networking for local high quality food systems  
Carlota Vaz Patto  
INRA  
3 429 908.75

94. Exploiting native endowments by re-factoring, re-programming and implementing novel control loops in Pseudomonas putida for bespoke biocatalysis  
Cecília Arraiano  
Wageningen University  
6 021 083.00

95. Infrastructure for NMR, EM and X-ray crystallography for translational research  
Margarida Archer  
Universiteit Utrecht  
9 999 534.25

96. Flow Induced Phase Transitions, a new low energy paradigm for polymer processing  
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  
Mª Arménia Carrondo/Margarida Archer  
Instruct Academic Services Limited  
3 950 000.00

98. Designing innovative plant teams for Ecosystem Resilience and agricultural Sustainability  
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 -  
Paula Alves  
Universidade do Minho  
14 996 606.25

101. Twin to illuminate Metals in Biology and Biocatalysis through Biospectroscopy  
Miguel Teixeira (+ Ricardo Louro + Smilja Todorovic)  
ITQB NOVA  
994 367.50

102. Bacterial Enzymes and Bioprocesses for Lignin Valoirisation  
Ligia Martins  
ITQB NOVA  
970 600.00

103. Membrane protein integrated technologies development for drug design  
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  
Isabel Rocha  
SILICOLIFE Lda  
7 995 343.75

105. Selective Modifications of ARomatics through Biocatalytic Oxidations  
Ligia 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  
Pedro Matias  
ITQB NOVA  
800 000.00
PROJECTS FUNDED BY EUROPEAN COMMISSION, 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 COMMISSION, INDIVIDUAL FELLOWSHIPS

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