Annual Report

2023

imed
Research Institute
for Medicines

No Breakthrough
is too small.

2022
— 2023

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Contents

Foreword

message from the coordinator

JOÃO GONÇALVES
Coordinator, imed

Based at the Pharmacy Faculty of the Universidade de Lisboa but on a world-wide mission to spur medicine innovation, we're a group of scientists and students that believe that by overcoming micro challenges we may advance health sciences for the benefit of our community. Therefore, welcome to the Research Institute for Medicines, a research unit funded by Fundação para a Ciência e Tecnologia, *where no breakthrough is too small*.

In 2023, the Research Institute for Medicines solidified its efforts to seamlessly integrate science, technology, and translational research to advance health sciences. Over the year, 173 scientists, 123 PhD students, and 260 master's students collaborated across 30 research laboratories specializing in chemistry, biology, and pharmaceutical sciences. Their work centered on creating innovative tools and methods to prevent, diagnose, and treat complex human diseases.

Acknowledging the power of collaboration, the institute launched an internal funding initiative with a budget of 75,000 euros to support one-year collaborative projects among IMED laboratories. This initiative, called IEDA, was highly successful, funding 16 projects designed to explore novel research ideas.

Despite the challenges posed by limited national funding, IMED scientists demonstrated impressive fundraising achievements. The institute's budget grew by 11% compared to 2022, reaching 4.1 million euros. This increase largely stemmed from the institute's success in securing

funding through highly competitive international grants. The dissemination of research findings continued primarily through scientific publications, with 229 articles published over the year, 61% of which appeared in first-quartile journals. The distribution of these publications spanned across the Scientific Hub (57%), Technologic Hub (35%), and the Translational Hub (8%).

While 2023 presented numerous challenges, it also marked a new beginning for the institute, filled with opportunities for groundbreaking discoveries that hold the potential to make a meaningful impact on society.

Looking forward, we are determined to continue strengthening our research networks, enhancing collaboration, and promoting a culture of innovation and excellence. In 2024, we aim to further diversify our research funding, engage in impactful partnerships, and continue the vital work of translating scientific discovery into societal benefit. To all our partners, supporters, and collaborators, thank you for your continued trust and belief in our mission. Together, we are pushing the boundaries of health sciences and making a difference, one breakthrough at a time.

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1. imed Organization

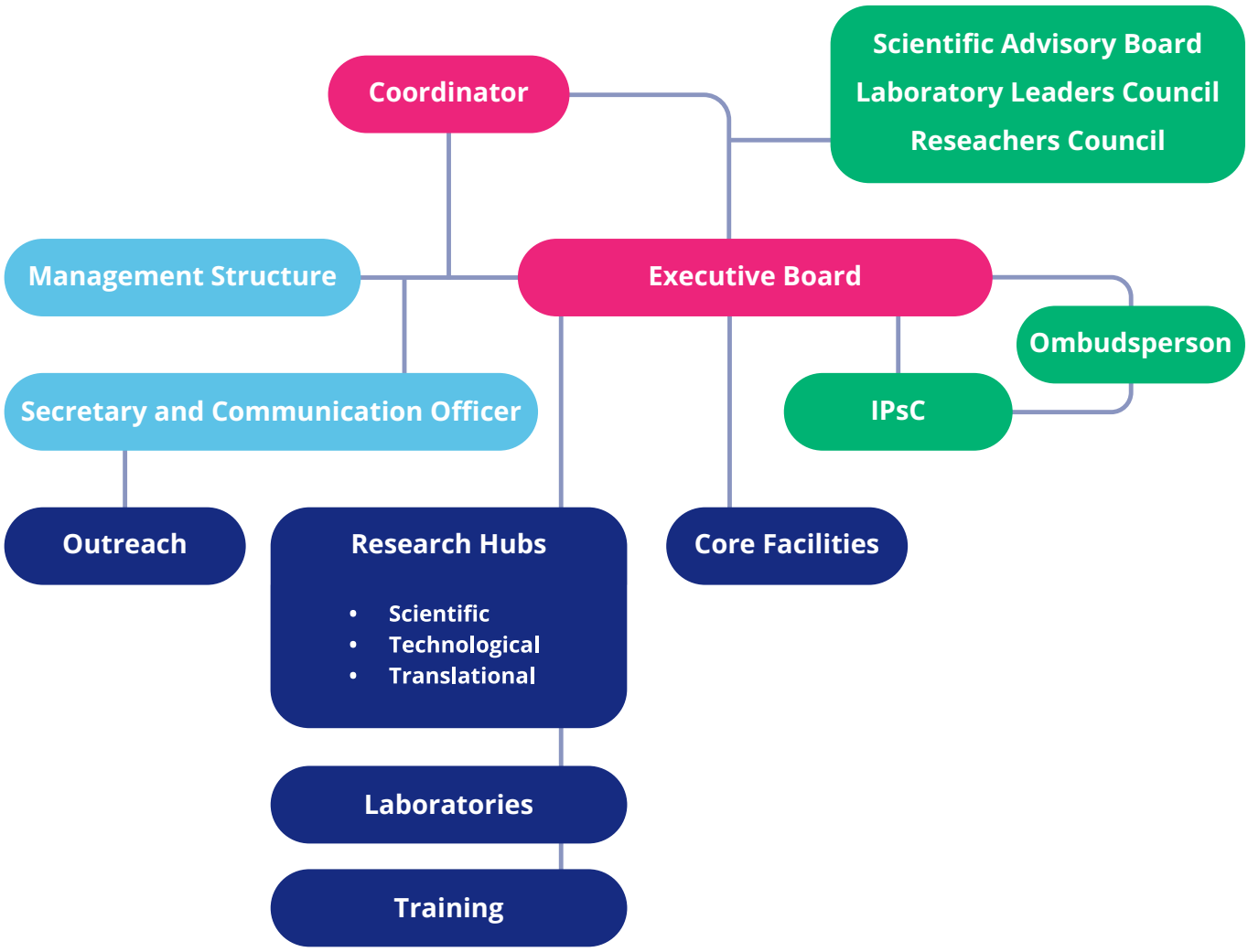
imed structure

Scientific Advisory Board

imed structure

Our multidisciplinary research unit has 194 researchers that maintain 30 research laboratories covering the fields of chemistry, biology, and pharmaceutical sciences. The laboratory leaders, nominated by the laboratory doctors, are responsible for electing the institute coordinator and for supervising the executive board activities.

The executive board (EB) has a critical role in setting the culture and values of the institute. The EB is responsible for overseeing the daily activities of imed and for ensuring the execution of the initiatives proposed in the strategic plan. The EB is coordinated by João Gonçalves that is the main contact point between imed researchers, our host institution (FFUL) and Fundação para a Ciência e Tecnologia. The coordinator is assisted by Adelaide Fernandes, Helena Florindo, Rui Castro and Pedro Góis that are responsible for coordinating the different research hub activities, for the articulation with imed's post-graduate students commission (ipSC) and for assuring the institute training, communication and outreach activities.



Scientific Advisory Board

imed executive board is constituted by eminent international scientists to ensure that our strategic direction is in the best interest of science and society.

PROF. RONIT SATCHI-FAINARO

Head, Cancer Research and Nanomedicine Laboratory

The Hermann and Kurt Lion Chair in Nanosciences and Nanotechnologies,

Director, Cancer Biology Research Center

Department of Physiology and Pharmacology

Sackler Faculty of Medicine, Sagol School of Neuroscience, Tel Aviv University, Israel

PROF. NUNO MAULIDE

Full Professor of Organic Synthesis at the University of Vienna and adjunct PI at CeMM

DR. PAULO FONTOURA

Global Head and SVP Neuroscience, Immunology, Ophthalmology, Infectious and Rare Diseases at Roche

PROF. NADIM BOU-HABIB

Lecturer at the Nova School of Business and Economics

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2. Scientific Structure

Research Hubs & Laboratories

imed Laboratories

Research Hubs & Laboratories

imed research model is supported by 30 laboratories who bring the perspectives and tools of disciplines across the fields of chemistry, biology and pharmaceutical sciences to tackle key scientific questions in health sciences. The focus of our team is on discovering molecules, molecular mechanisms and technologies that can be translated into breakthrough healthcare solutions.

Our laboratories have diverse interests and are flexible workspaces that shared knowledge and instrumentation to foster interaction and innovation. Therefore, our capacities cover a wide range of research activities that support our **Scientific, Technological and Translational Hubs.**

Scientific Hub

- Oncology
- Neurodegenerative disorders
- Metabolic diseases
- Infectious diseases

Technological Hub

- Emerging technologies
- Bioorganic and natural products chemistry
- Medicinal and chemical biology
- Pharmaceutical and biotechnology tools and applications

Translational Hub

- Evidence-based interventions
- Regulatory sciences
- Health care sector
- Pharma industry

Scientific Hub

Within the Scientific Hub, we aim at integrating chemistry, biology and pharmaceutical sciences to develop pioneering tools and techniques to prevent, detect and treat cancer, neurodegenerative, metabolic and infectious diseases.

Oncology

In the field of oncology, we work to provide innovative solutions to cancer patients through disruptive advances in fundamental scientific discoveries, guided by a deeper understanding of the molecular basis of this disease. This advanced knowledge drives imed drug discovery program towards the identification of druggable targets that fuel cancer progression. imed cancer research program integrates biochemistry, molecular/cell biology and immunology with chemistry, nanotechnology and biotechnology to translate this fundamental knowledge into novel tools for cancer diagnosis, prevention and therapy.

Leading Laboratories:

- Drug Delivery & Immunoengineering
- Neurovascular
- Natural Products Chemistry
- Medicinal Organic Chemistry
- Computational Medicinal Chemistry

Neurodegenerative disorders

In the field of neurodegenerative disorders, we are studying diseases like Alzheimer, Parkinson, Amyotrophic Lateral Sclerosis or Multiple Sclerosis that are characterized by the progressive degeneration of the structure and function of the central nervous system. Although neurodegenerative diseases are typically defined by specific protein accumulations, regional vulnerability and parenchyma atrophy, these disorders share many fundamental processes associated with inflammation, glial reactivity, neuroimmune interactions and progressive neuronal dysfunction. Therefore, we seek to understand the molecular basis of central nervous system pathogenesis, guiding the rational development of innovative therapeutic approaches for these diseases. Our strategy brings together neuroscientists, biophysicists and chemists to identify novel mechanisms driving disease onset and progression and envision new treatments. Our long-term vision encompasses the identification of novel, early biomarkers for pre-symptomatic disease diagnosis; the discovery of new targets for pharmacological intervention; as well as innovative strategies to prevent disease occurrence.

Leading Laboratories:

- Central Nervous System, Blood and Peripheral Inflammation
- Neuroinflammation, Signalling and Neurodegeneration
- Stem Cell Bioenergetics and Neurodegeneration
- Toxicology, Biomarkers & Risk Assessment

Metabolic diseases

In the field of metabolic diseases, we recognize the role of metabolism in many different human diseases by affecting the ability of cells to perform critical biochemical reactions that involve the processing or transport of proteins, carbohydrates, or lipids. Therefore, we are studying non-endoplasmic reticulum associated rare inherited diseases and probing novel molecular targets involved in cell function to develop innovative therapeutics for metabolic disorders underlying diabetes, cancer and liver diseases. We perform biochemical and biophysical characterization of enzymes, transporters and channels involved in metabolic pathways, and employ innovative molecular biology techniques on cellular and animal models of metabolic diseases to identify novel mechanisms of disease pathogenesis that can translate into druggable biological targets. Benefiting from our ties with the pharma industry, we further synthesize and screen putative drugs for identified targets, while working towards the development of novel medical devices with the same goal.

Leading Laboratories:

- Cell Function and Therapeutic Targeting
- Membrane Transporters in Health & Disease
- Metabolism, Genetics and Proteins in Health & Disease
- Liver Disease Diagnostics and Therapeutics

Infectious diseases

In the field of infectious diseases, we work to gain insights into the mechanisms of infection associated to existing and emerging threats, aiming at the development of multipronged approaches capable of targeting host-infectious agent interaction, while controlling disease progression. We aim to develop effective vaccines and treatments to combat the spread of infectious diseases and to improve clinical care. Our coordinated efforts are directed towards the prevention, early detection, and intervention against public health threats, including malaria, HIV and Covid19, as well as tuberculosis, fungal and parasitic diseases.

Leading Laboratories:

- Phage Biology Research and Infection Control
- Host-Pathogen Interactions
- Pathogen Genome Bioinformatics and Computational Biology
- Bacterial Pathogenomics and Drug Resistance
- HIV evolution, epidemiology, and prevention

Technological Hub

Within the **Technological Hub**, we are highly engaged in translating our advanced scientific knowledge and technologies into breakthrough healthcare solutions that empower societies to live better and healthier.

A vibrant network based on strong partnerships between our scientific community, distinct players within pharmaceutical and biotechnology companies and the Healthcare sector transforms innovative research & technologies into useful everyday products and life-saving medicines.

Emerging technologies

In the field of emerging technologies, recent advances in biology offer a deeper understanding of the molecular basis of complex diseases and unique opportunities to accelerate basic research into healthcare. At imed we are developing emerging technologies based on chemistry, biology and pharmaceutical sciences to facilitate the translation of these findings into new therapeutic options to detect and treat cancer, neurodegenerative, metabolic and infectious diseases.

Leading Laboratories:

- Advanced Technologies for Drug Delivery
- Bioorganic Chemistry
- Advanced Cell Models for Predictive Toxicology & Cell-based Therapies
- Molecular Microbiology and Biotechnology
- Pharmaceutical Bioengineering, Biotechnology & Bioproducts
- Chemical Biology
- Medicinal Chemistry

Translational Hub

Within the **Translational Hub** we are deeply committed to advance pharmacotherapy innovation and access to it by people living with illness by developing disruptive translational research to benefit human health, by converging our fundamental science discoveries into applied research. This is driven by the joint efforts of our institute with multiple players within the Healthcare sector, including policy-makers, clinicians and allied healthcare professionals and people living with illness and their representative organizations and associations.

Leading Laboratories:

- Systems Integration Pharmacology, Clinical & Regulatory Science
- Pharmacy Practice & Health Communication

Health Care Sector

The provision of healthcare to patients in the form of new drugs, devices or services is invaluable to support a healthier society. imed scientists strive to empower the healthcare sector with knowledge in the areas of health promotion, disease prevention and medicines optimization.

Leading Laboratories:

- Pharmaceutical Care and Clinical Pharmacy
- Pharmaceutical Development

Pharma Industry

The pharmaceutical industry plays a decisive role in unravelling innovative therapeutic options to prevent diseases and cure or alleviate patients. imed researchers have established strong collaborations with national and international pharma industry to advance innovative research & technologies into the market, aiming to improve patient's health and reducing the social burden of human diseases.

Leading Laboratories:

- Pharmaceutical Engineering and Manufacturing

In line with this program, actions will be intensified to promote interaction between the different areas of knowledge and the intramural collaborations, ensuring that all the PIs and groups can participate in each research line within the new Scientific Strategic Project.

imed Laboratories

Advanced Cell Models for Predictive Toxicology & Cell-based Therapies

We are a multidisciplinary research team, with expertise in cell/tissue engineering, regenerative medicine, toxicology and cancer pharmacology, focused on the use of advanced (3D) in vitro models as tools for developing new cell-based therapeutics and studying drug metabolism and mechanisms of diseases (ex.: liver diseases, skin pathologies, lung cancer).

In 2023 **our group developed health and disease in vitro models for evaluating the efficacy and safety of new therapeutics. We showed that the manipulation of glucose homeostasis and glucocorticoid signalling improved the function and metabolism of hepatocyte-like cells (HLCs), important for implementing relevant human hepatic models. Moreover, the redox-active manganese(III) porphyrin, MnTnBuOE-2-PyP5+, impaired the migration and invasion of NSCLC cells, either alone or combined with cisplatin.**

Leader: Joana Miranda

Advanced Technologies for Drug Delivery

Our major challenge is to deliver bioactive entities at cellular and intracellular target sites using advanced technologies, thus developing new delivery systems for clinically relevant situations, based on conventional and innovative materials, exploring invasive and non-invasive administration routes.

In 2023 **we developed new metal-based complexes formulated in liposomes with high therapeutic potential against melanoma and colon cancer. We also successfully tested a novel method developed for the biogenic synthesis of silver nanoparticles in wound healing models, in vitro, ex vivo and in vivo. Finally, we design a mucosal nanovaccine against P. gingivalis to break the link between periodontitis and Alzheimer's disease.**

Leader: António Almeida

Bacterial Pathogenomics and Drug Resistance

Our research is focused on the molecular epidemiology, clinical impact of strain diversity and laboratory diagnosis of infectious diseases caused by bacterial pathogens, namely, mycobacteria and Gram-negative pathogens. Moreover, we also focus on the translation of genomic diversity and in-depth knowledge of resistance mechanisms towards development of novel products and computational tools.

In 2023 **our laboratory has led a genomic investigation on the emergence of a unusual carbapenemase producing clone of *Klebsiella pneumoniae*, demonstrating its emergence in Portugal and its dissemination to other European countries. Moreover, the laboratory is now leading a large-scale global genome-wide analysis envisioning the expansion of *Mycobacterium tuberculosis* target space.**

Leader: Isabel Portugal

Bioorganic Chemistry

The Bioorganic Chemistry laboratory is focused on the interface of organic chemistry and biology, aiming at the discovery and process intensification of new more sustainable synthetic methodologies that, in collaboration with biomedical laboratories, can be further explored to tackle important biological problems related with infectious diseases, oncology and inflammation.

In 2023 **we developed two distinct total synthesis of the highly bioactive natural marine compound (±)- and (-)-Agelastatin A that requires flow conditions as key steps. In addition, new synthetic routes were developed to highly functionalized structures from Achmatowicz derivatives and bio-based nitrogen-rich furanic platforms as biomass synthons.**

Leader: Carlos Afonso

Cell Function and Therapeutic Targeting

We investigate novel mechanism-based molecular targets to inform drug discovery and biomarker development in inflammation, degenerative and oncogenic diseases. We specifically address cell signalling and the crosstalk with metabolism and interorgan communication, integrating cellular and molecular technologies with multiple preclinical and patient-derived models and samples to facilitate the translation from bench to bedside.

In 2023 **we discovered that Ripk3 deficiency rescues mitochondrial impairment, alters lipid droplet dynamics, and is associated with less severe MASLD, suggesting that RIPK3 inhibition holds therapeutic promise. NPC1 and PGC-1α isoforms were identified as potential therapeutic targets in Parkinson's, while CYP46A1 AAV-mediated gene therapy improves major hallmarks of Niemann-Pick type C disease.**

Leader: Cecília Rodrigues

Central Nervous System, Blood and Peripheral Inflammation

The laboratory focuses on the role of inflammation in the emergence or progression of neurodevelopmental and neurodegenerative disorders. We are particularly interested in the interplay between the Central Nervous System (CNS)-centered neuroinflammation and the inflammatory response derived from the periphery.

In 2023 **we detailed age-associated changes in the murine model of Multiple Sclerosis, the EAE, namely at neuropathology, immune response and gut microbiota; showed that obesity aggravates disease phenotype in the EAE model; and begun to explore the impact of microglia-T cell interplay in Multiple Sclerosis-associated cognitive impairment.**

Leader: Adelaide Fernandes

Chemical Biology

Chemical biology offers unique possibilities to rationally manipulate biological processes and will most certainly play a major role in unravelling solutions for current unmet medical needs. Broadly our laboratory is focusing on discovering innovative chemical technologies that permit the construction of functional molecules, and on applying these technologies to the construction of therapeutic bioconjugates and small molecule probes.

In 2023 **we have developed various technologies to address cancer. In detail, we expanded the architectures of our fluorescent BASHY platform and found that these platforms serve as excellent photosensitizers for photodynamic therapy, displaying very high photo indexes. In the field of bioconjugation, we introduced (2-cyanamidophenyl)boronic acids and O-salicylaldehyde esters as new reagents for the construction of bioconjugates, selectively at N-terminal residues.**

Leader: Pedro Gois

Computational Medicinal Chemistry

We design and apply protocols and computational algorithms to gain insight into biological and chemical systems with pharmacological importance and use this knowledge to rationally design and repurpose new potential therapeutic agents that can contribute to the treatment of human diseases. We use a vast range of methods, such as virtual screening, docking, homology and pharmacophore modeling, molecular dynamics, quantum chemistry, cheminformatics and machine learning.

In 2023 **we released an in silico, open-source tool for large-scale screening of the human proteome to find pharmaceutical ligands. This is the first tool enabling high-accuracy, large-scale, fully automated screening tasks. We co-proposed a novel approach that integrates structural data from AlphaFold 2 to predict protein-molecule interactions. We have also identified anticancer molecules computationally.**

Leader: Rita Guedes

Drug Delivery & Immunoengineering

Our research is focused on the characterization of the mechanisms of cellular dynamics, cross-talk and networks, to identify new targets that will guide the engineering of translational nanotechnology-based systems for drug delivery, imaging and immunotherapy in specific clinically relevant situations (cancer, inflammation, infectious and genetic diseases).

In 2023 **our research group disclosed the synergy between our rationally designed cancer nanovaccine and immune modulatory and checkpoint therapies (αCSF-1R and αPD-1) within the immunosuppressive tumor microenvironment, which resulted in prolonged survival and remission in mouse models of colorectal cancer.**

We also developed an innovative methodology to study lipid droplet (LD) properties in live cells, which further revealed the existence of multiple LD populations with distinctive biophysical features. This is important as LD has been emerging as being involved in the severity of several diseases, including neurodegenerative conditions.

As a result of our continuous effort to increase the interactions with pharmaceutical industries, our lab developed a new formulation containing sunscreen for ophthalmology use. This formulation is novel and innovative and therefore a patent was submitted.

Leader: Helena Florindo

HIV evolution, epidemiology, and prevention

Our main areas of activity are: a) Epidemiology, drug resistance and evolution of HIV, HCV and HBV; b) HIV-2 infection (diagnosis, pathogenesis, natural history, neutralizing antibody response); c) Design and pre-clinical evaluation HIV vaccines and microbicides; d) Design and pre-clinical evaluation of antiviral drugs.

In 2023 **we have developed a novel aptamer-based siRNA delivery system for HIV therapy. Apsi510 was obtained by chemical conjugation of an anti-HIV integrase aptamer and an siRNA sequence targeting the HIV-1 TAR/poly A regions to a dendron. Apsi510 activity against HIV-1NL4.3 was evaluated in two experimental systems using HeLa CD4+ and TZM-bl cells. Apsi510 activity was dose-dependent and inhibited >95% of viral replication at 50 nM. Apsi510 is a promising drug candidate for the treatment and prevention of HIV.**

We hypothesised that a chimeric envelope gp120 containing the C2, V3 and C3 regions of HIV-2 and the remaining parts of HIV-1 would elicit a neutralising response against HIV-1 and HIV-2. This chimeric envelope was synthesised and expressed in vaccinia virus. Balb/c mice primed with the recombinant vaccinia virus and boosted with an HIV-2 C2V3C3 polypeptide or monomeric gp120 from a CRF01_AG HIV-1 isolate produced antibodies that neutralised >60% (serum dilution 1:40) of a primary HIV-2 isolate. Four out of nine mice also produced

antibodies that neutralised at least one HIV-1 isolate. Neutralising antibodies targeted the three major neutralising epitopes in the HIV-1 envelope gp120. These results provide proof of concept for chimeric HIV-1/HIV-2 envelope glycoproteins as vaccine immunogens that can direct the antibody response against neutralising epitopes in the HIV-1 and HIV-2 surface glycoproteins

Leader: Nuno Taveira

Host-Pathogen Interactions

Microbial pathogens have evolved unique ways to interact with their hosts. It is therefore not surprising that pathogens have developed a large and diverse array of virulence factors well suited to interfere with or stimulate a variety of host-cell responses in order to invade, survive and replicate within their hosts. The understanding of how pathogens interact with their hosts is providing the basis for the development of novel therapeutic approaches as well as a number of very sophisticated tools for probing basic aspects of cellular physiology and immunology. As a result, we are beginning to define not only the molecular details of the host pathogen interactions but also potential targets to be manipulated from the host and the pathogen sides. Mycobacterium tuberculosis and other mycobacteria, HIV, Influenza virus, SARS-CoV-2 and other emerging viruses are target pathogens. The group offers expertise to assess the anti-microbial activity of new compounds targeting all these pathogens.

In 2023 **we develop a drug delivery system to manipulate protease inhibitors of cathepsins for control tuberculosis. We implemented a CRISPRi-system in mycobacteria to assert PG role in beta-lactams susceptibility and host-responses. Furthermore, several microRNAs were identified to be involved in the regulation of HIV infection and dissemination within CNS. We performed conservation and drugability studies to map interaction hot spots as promising targets for antivirals development against COVID-19 and Influenza.**

Leader: Elsa Anes

Liver Disease Diagnostics and Therapeutics

The Liver Disease Diagnostics and Therapeutics laboratory aims to unravel the role of microRNAs (miRNAs/miRs) - and other modulators of gene expression - in liver disease pathogenesis, so that they can be used in disease diagnosis, treatment, monitoring and prevention.

In 2023 **we characterized miR-21 as a key promoter of metabolic-associated steatohepatitis (MASH)-related hepatocarcinogenesis (Rodrigues PM et al., Liver International). In particular, mir21 knock-out (KO) mice on a MASH|liver cancer-inducing diet exhibited peroxisome-proliferator-activated receptor α (PPARα) activation, augmented mitochondrial activity, reduced liver injury and liver pathohistological findings below the threshold for MASH diagnosis. Furthermore, mir21-KO mice also displayed reduced number of pre-neoplastic nodules, hepatocyte proliferation and activation of oncogenic signalling, being protected from MASH-associated carcinogenesis. The miR-21/PPARα pathway was similarly deregulated in patients with hepatocellular carcinoma (HCC) - or MASH-related HCC, correlating with HCC markers and worse prognosis.**

We also collaborated in showing that targeting miR-873-5p, a repressor of glycine N-methyltransferase (GNMT) enzyme, represents a novel and attractive approach to treat alcohol-related liver disease (ALD), a pathology with no therapeutic options. In particular, administration of anti-miR-873-5p exerted hepatoprotective effects against ALD by rescuing SIRT1 activity, restoring bile acid homeostasis and attenuating the overall inflammatory response (Rodríguez-Agudo R et al., JHEP Reports). Altogether, the study of miRNAs in liver diseases exemplifies the trend in modern medicine towards precision diagnostics and personalized therapies, with the manipulation of miRNAs showcasing the transformative potential of biomolecules in shaping the future of healthcare.

Last but not least, prompted by the COVID-19 pandemics, we shifted part of the lab's funds and resources towards the study of SARS-COV-2 vaccination in chronic liver disease patients. We created and coordinated the HEPCOVIVAc consortium, involving 6 European countries and over 350 patients. Results showed that liver cirrhosis is associated with a lower immune response to COVID-19 vaccines but not with reduced vaccine efficacy (Simão AL et al., JHEP Reports).

Leader: Rui Castro

Medicinal Chemistry

Our laboratory focuses on designing molecules technologies to cure human diseases and accelerate drug discovery. Our research programme uses chemistry-centric approaches to interrogate biological systems and to modulate target-ligand interactions that underlie infection, cancer, and neurodegenerative disorders.

In 2023 **we have developed of novel early lead compounds based on core structures related to natural products. Using multicomponent chemistry, we rapidly generated structurally diverse indoles endowed with antimalarial activity and in vivo exposure by oral administration. In the field of artificial intelligence, we set up evaluation guidelines/standards for machine learning tools in the chemical sciences (published in Nature Reviews Chemistry).**

Leader: Rui Moreira

Medicinal Organic Chemistry

Our research is focused on the design and synthesis of small molecules for relevant therapeutic targets. To achieve these goals, novel chemical methodologies are developed and applied to library synthesis, while focusing on structure-activity relationships, metabolic stability studies and identification of the possible metabolites for the most promising leads.

In 2023 **we identify two potent G4 binders and DHX36 helicase inhibitors; discover of a hybrid molecule that incorporated in liposomes can markedly reduce lung metastasis in a murine metastatic melanoma model. Finally, we develop a new small molecule that led to an increase in the p53 melting temperature (Tm) of 10.39 °C, suggesting an effective binding to wild-type p53 core domain.**

Leader: Maria M. M. Santos

Metabolism, Genetics and Proteins in Health & Disease

MetGenPro Group research lies at the interface of cell metabolism and gene expression. We focus on molecular genetics and alterations in metabolic pathways or enzyme structure/function in response to drugs, gene variants and disease states. Our studies range from basic biomedical research to translational areas addressing personalized medicine for better diagnosis, prognosis and therapies.

In 2023 **we genotyped a specific cohort of IEM patients which allowed to establish a genotype-phenotype correlations and infer disease severity. We also develop a high-throughput screening approach that allowed overcoming time-consuming case-by-case assays for identification of protein freeze-drying additives. Furthermore, we targeted metabolomics using mass spectrometry-based techniques were implemented for assessing mitochondrial function.**

Leader: Paula Leandro

Membrane Transporters in Health & Disease

Our group investigates membrane transport proteins in living organisms and their potential as new biomarkers and drug targets. We identify mechanisms of regulation and dysfunction leading to disease and discover chemical compounds as modulators, characterizing kinetics and pharmacological potential for therapeutics of metabolic disorders, inflammation and cancer.

In 2023 **we developed a new cell-based platform to screen inhibitors of human aquaporins, we identified a natural compound as a new aquaporin inhibitor and investigated the role of aquaporins in breast cancer, pancreatic cancer, and melanoma, their impact on cell biomechanical properties and on cellular oxidative stress and energy homeostasis.**

Leader: Graça Soveral

Molecular Microbiology and Biotechnology

The Molecular Microbiology and Biotechnology laboratory aims to develop new strategies of antibody engineering and synthetic biology for the advance of new biopharmaceuticals by interrogating the immune humoral and cellular responses in infectious diseases and biologic therapies.

In 2023 **we developed a fast, highly sensitive, point-of-care multiplex RT-LAMP and CRISPR/Cas12a assay to detect SARS-CoV-2. We identify that patients with CLD and cirrhosis exhibit lower immune responses to COVID-19 vaccination, irrespective of disease aetiology. Finally, we validated a platform to develop a novel class of ADCs that combines the benefits of rabbit VL-sdAb scaffolds.**

Leader: João Gonçalves

Natural Products Chemistry

The Natural Products Chemistry group is focused on the identification and development of novel hit/lead-drug candidates from natural sources though both isolation and molecular derivatization of novel bioactive chemical scaffolds from plants.

In 2023 **we discovered that several Amaryllidaceae-type alkaloid derivatives showed significant multidrug resistance reversal activity in cancer. Similarly, a N-alkylated indole alkaloid derivative inhibited P-gp efflux activity, decreased P-gp overexpression and increased apoptosis.**

An indole alkaloid derivative showed promising in vitro and in vivo antitumor activity. It represents a starting point for the development of anticancer agents against hard-to-treat cancers.

Leader: Maria José Umbelino Ferreira

Neuroinflammation, Signaling and Neuroregeneration

Neuro in focus on neurodevelopmental disabilities, genetic susceptibilities, neuroinflammation and ageing causing homeostatic imbalance and predisposing to neurodegeneration. We investigate how glial phenotypes, neuro-immune deregulation, and paracrine distress lead to disease onset/progression. We aim to identify early biomarkers for non-invasive diagnosis, generate patient-specific stratification tools for disease modelling, and improve healthcare.

In 2023 **we optimized the large-scale production of exosomes from human NPCs in bioreactors and their miRNA-loading, which were validated in mixed-models of Alzheimer's disease and Amyotrophic Lateral Sclerosis (from in-vivo/ex-vivo to microfluidic triculture platforms). We mapped neuroimmune dysregulated phenotypes and identified small molecule regulators.**

Leader: Dora Brites

Neurovascular

The Neurovascular Lab focuses on the blood-brain barrier in Neuropathology as a source of peripheral biomarkers reflecting brain dysfunction, a target for

modulation to prevent disease onset and progression, and an obstacle to overcome to achieve therapeutic concentrations in the brain for treatment of brain disorders.

In 2023 **we used a blood-brain barrier (BBB) in vitro model to establish the BBB-permeation and BBB-tightness properties of beneficial natural compounds. We identified MEF2C and miR-194-5p as new players in triple negative breast cancer and found BBB-permeant EGFR and PI3K dual inhibitors as drug candidates to tackle the malignant cells. We implemented and characterized a challenging mouse model of brain metastases.**

Leader: Maria Alexandra Brito

Pathogen Genome Bioinformatics and Computational Biology

Our lab is focused on genomic studies based on genome sequencing and application of computational and bioinformatics approaches, as well as computation-driven experimental approaches, to comprehend the evolution, epidemiology, virulence, population level genomic variation and phylogeography of pathogens.

In 2023 **the lab clinched an Advanced Computing Project Grant for pioneering research on Helicobacter pylori's pangenome. We successfully concluded the Prophage Genomics task in the International Helicobacter pylori Genome Project and were honored with an invited oral communication at the European Helicobacter and Microbiota Study Group, solidifying their impactful contributions.**

Leader: Filipa Vale

Phage Biology Research and Infection Control

The PhaBRIC lab addresses key biologic questions concerning the interaction of phages with their bacterial hosts. As a major research topic, the lab seeks to understand the action of phage proteins that disrupt the bacterial cell envelope, and to explore this knowledge to develop innovative strategies to fight antibiotic-resistant bacteria.

In 2023 **the PhaBRIC lab was involved in studies aiming at better understanding cellular factors affecting bacterial susceptibility to antimicrobial agents, which included conventional antibiotics and phage-derived enzybiotics. Under the iDEA collaborative projects of imed, we have studied the potential of hydrogels as vehicles for the topical application of therapeutic bacteriophages.**

Leader: Carlos São-José

Pharmacy Practice & Health Communication

The PhP& HC Lab aims to deliver scientific evidence and knowledge on the real-life use of medicines and health technologies, from the societal and population levels to the individual perspectives. In particular, it is meant to evaluate pharmacists' and pharmacy services' contribution to the rational use of medicines, including information and communication fluxes.

In 2023 **we have engaged in significant work related to hospital pharmacists' practice, shedding light on their crucial role in patient care. Another notable achievement was the comprehensive retrospective cohort study examining the medication usage and care of older individuals in long-term care facilities. Additionally, the exploration of ethical principles among practicing community pharmacists in Portugal raised awareness and potential concerns, contributing to the ongoing discourse on professional conduct in pharmacy practice.**

Leader: Afonso Cavaco

Pharmaceutical Care and Clinical Pharmacy

Our laboratory focuses on education, research, and on the implementation of advanced pharmaceutical care, encompassing health promotion, disease prevention and medicines optimization. Specific topics include medication adherence and medication review, early identification of suspects of non-communicable diseases (NCDs), health promotion through pharmacy-based interventions, and development of services to manage inappropriate use of medication.

In 2023 **we studied the cardio and cerebrovascular risk of major adverse events following exposure to potentially inappropriate medications and the real-world effectiveness of Innovative therapies for the most prevalent cancers in Portugal. In addition to these studies, we have also addressed the decision making for the use of conditionally authorised medicines.**

Leader: Filipa Alves da Costa

Pharmaceutical Development

The activities of this specialized group are divided into three main research topics: a) Development of innovative and sustainable drug delivery systems (DDS) and technologies, to be used in the prevention of diseases and optimization of treatments (cosmetics, medical devices and medicines); b) Characterization of the target quality product; c) Safe and efficacy studies – from lab to society.

In 2023 **our research group expanded collaborations with SMEs, startups, hospitals, and pharmacies to drive innovation aligned with market demands and to respond to business and societal challenges. Our group also secured two PRRs dedicated to developing novel, accessible, sustainable, and easy to use systems for delivering medicines, healthcare products, and phytopharmaceuticals. Concurrently, we continued to focus on advancing 3D printing technology to create personalized drug delivery platforms tailored in shape and size to individual patient needs.**

Leader: Joana Marto

Pharmaceutical Engineering and Manufacturing

The PhEMLab is focused on the underpinning sciences related with the design, optimization and manufacturing of bulk pharmaceutical dosage forms. The PhEmLab is oriented for pharmaceutical materials characterization (solid-state), particle engineering, drug products manufacturing process development (including continuous and 3D printing), modelling and advanced real-time high-throughput monitoring. The PhEMLab operates in strong collaboration with the pharmaceutical industry.

In 2023 **we reinforced its role in linking academic research with industry by strengthening existing collaborations with industry and establishing new protocols for research activities. PhEMLab runs R&D projects, also involving PhD students, with Merck (GE), Hovione (PT), Medinfar (PT), Labatech (PT), RCPE (AT), Generis (PT), LEF (PT), Hikma (PT), Teva (PT), SHL Portugal (PT). In 2023 João Almeida Lopes as PI of the imed.ULisboa team started a new funded project from La Caixa Foundation (PharmaStar) where a pharmaceutical formulation targeting diabetes type II is going to be produced from bioactive compounds from the Serra da Estrela Natural Park (PNSE) endemic flora. The Lab PI organized one international and one national event at the FFUL.**

Leader: João Almeida Lopes

Pharmaceutical Bioengineering, Biotechnology & Bioproducts

PharmaBB aims at developing innovative research, exploring bioengineering & biotechnology, to disease prevention, health promotion and well-being. Our Group brings together different areas of expertise, contributing to achieve a higher knowledge based on the manufacturing of bioactive compounds using green technologies, biofabrication of (bio) materials and gene/drug delivery platforms towards (bio)therapeutics (against infectious, cancer or neuroprotection), medical devices, biomedical and food applications.

In 2023 **we developed 3D-printed biosurfactant-chitosan antibacterial coating for the prevention of silicone-based associated infections. Functionalized magnetic hydrogel polyvinyl alcohol and chitosan electrospun lysozyme nanofibers were advanced for biomedical applications. Moreover, valuable insights into the regulatory status of the clinical translation of induced pluripotent stem cell-derived cardiomyocytes were developed, to obtain a quality and safe product in compliance with GMP principles and applicable regulatory authorities.**

Leader: Maria H. Ribeiro

Stem Cell Bioenergetics and Neuroregeneration

Our laboratory is interested in understanding and exploiting the contribution of bioenergetics to neural stem cell fate in the adult brain. By bridging areas of stem cell biology and metabolism, we aim to discover checkpoint mechanisms and promising molecules capable of improving the neuroregenerative potential of these cells throughout adulthood.

In 2023 **we further investigated how different systemic cues, including metabolic regulators and insults, influence the regenerative properties of neural stem cell secretome (paper in preparation). The interplay between microglia and deficits of neurogenesis in models of Aniridia was also validated. At last, we started to assess the effect of an obesity-associated microRNA in neural stem cell homeostasis and neural plasticity in adult mice.**

Leader: Susana Solá

Systems Integration Pharmacology, Clinical & Regulatory Science

Our group aims to support integrative **systems pharmacological research focusing in developing innovative pharmacological tools to be used both in a non-clinical and clinical development pipeline, while predicting and modelling preventive or therapeutic clinical effects in a translational approach, profoundly anchored in state-of-the-art principles and guidance of Regulatory Science.**

In 2023 **we published 35 papers on the therapeutic approaches of several diseases, with diverse medicines development strategies (repurposing, new substances, and herbal/food substances, complemented with the PD, PK, pharmacoepidemiology and regulatory science expertise of the lab. We had an oncology collaborative project with the CHLO and a Horizon Europe Research funded international project (MORE-Europa).**

Leader: João Rocha

Toxicology, Biomarkers & Risk Assessment

Our laboratory works on exposure assessment and environmental occurrence of xenobiotics that are considered worldwide concerns to Environment and Public Health. We study the toxicants and drugs' mode of action to identify new biomarkers to support Human and Environmental Risk Assessment processes and develop innovative technologies and therapies.

In 2023 **we focused on the optimization and validation of the micro-FTIR method for the analysis of microplastics in drinking water and on the evaluation of the inflammatory mechanisms triggered by exposure of cells to nanoplastics. Moreover, we pursued the study of mercury effects on redox-selenoproteins and the consequences for health and disease, including the repurposing of thimerosal to control glioblastoma.**

Leader: Cristina Carvalho

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3. imed Training Structure

Undergraduate course

Master program

Doctoral students

Committed with the training of the next generation of scientists working at the interface of chemistry, biology and pharmaceutical sciences, imed researchers provide extensive training activities for undergraduate students but also at the master, doctoral and post-doctoral levels.

Undergraduate course

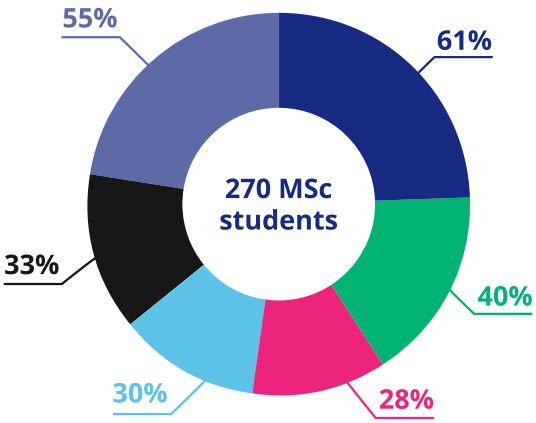
Most of imed researchers participate in the teaching activities of the pharmaceutical sciences and medicines department and the Pharmacy, pharmacology, and health technologies department of the Faculty of Pharmacy at the Universidade de Lisboa. In this context, the teaching activities of imed researchers spread over the many different disciplines of the integrated master of pharmaceutical sciences. Furthermore, most of imed laboratories offer positions for undergraduate students and in 2023, over 30 undergraduate students initiated their scientific careers in imed laboratories.

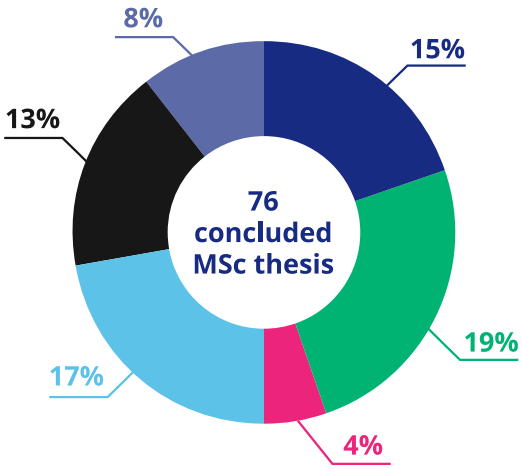
Master program

In addition to this responsibilities, imed scientists are also leading most of the faculty master courses. This involvement encompasses teaching of individual courses but also the supervision of thesis. In 2023, 76 master students concluded their studies under the supervision of imed scientists.

Over this year, imed scientists coordinated the following master courses that were attended by 270 students:

- Clinical Analysis
- Biopharmaceutical Sciences
- Pharmaceutical Engineering
- Food Quality and Health
- Medicinal Chemistry and Biopharmaceuticals
- Regulation and Evaluation of Medicines and Health Products
- Pharmaceutical Chemistry and Therapeutic





Advance Cosmetology

Coordinator: Helena Margarida Ribeiro and Joana Marto

The MCA covers a general view of cosmetics, from regulation aspects to the development, production, control, and counselling for all categories of these products. It is a sector of high economical value and high technical-scientific and regulatory complexity, which involves researchers, manufacturers, users, and regulatory entities, and with an important role in the healthcare. The MCA objective is to prepare students for the skills demanded by the society: teamwork, selection knowledge, relate and summarize information, critical and initiative skills in problem solving. Thus, the learning allows diversifying and adapting strategies, putting the students in cognitive contexts appropriate for the proposed objectives.

Biopharmaceutical Sciences

Coordinator: Cecília Rodrigues

Enlarge the classical concept of biopharmaceutical sciences by providing scientific, multidisciplinary background on the discovery phase of the drug development process. Study molecular mechanisms of disease, targets, biomarkers and advanced therapies. Train graduates to equate and solve problems, while motivating students Prepare creative and independent investigators and knowledgeable professionals, encouraging the debate of recent topics and the use of advanced experimental technologies.

Food Quality and Health

Coordinator: Maria Eduardo Figueira

This course aims to contribute to the acquisition and / or updating of professional and scientific skills in the area, to improve the Quality and Food Safety in Portugal, indispensable in the guarantor of public health, in line with the requirements of the European Community.

Laboratory Medicine

Coordinator: Maria Cristina Marques

To provide a solid and up-to-date training in different scientific domains of the clinical analysis, guaranteeing a comprehensive laboratory component to confer skills for the achievement of laboratory techniques applicable to the prevention, diagnosis and monitoring of the disease, as well as to ensure a professional specialization.

To promote the academic training necessary to follow studies of higher cycle in different scientific areas of the clinical analyses.

Medicinal and Biopharmaceutical Chemistry

Coordinator: Maria José Umbelino

Pharmaceutical Chemistry, a core subject of Pharmaceutical Sciences, is essential for a comprehensive understanding of the drug discovery and development pathway. Named Medicinal Chemistry in the Anglo-Saxon and Northern Europe and Pharmaceutical Chemistry in the countries of southern and central Europe, it is internationally recognized as a transversal subject able to integrate many knowledge areas as Chemistry, Biology or Pharmacology, aiming at the development of new therapeutic agents based on their mechanisms of action and molecular targets.

Pharmaceutical Engineering

Coordinator: António Almeida

To train professionals with competence in the most modern tools for the design and operation of processes for manufacturing, managing and quality control of the product throughout its life cycle (including active substances of chemical or biological origin, drug products and health products) and capable of contributing significantly to technological innovation, improvement of industrial competitiveness and leadership in certain pharmaceutical areas, as well as to the resolution of public health problems in current or emerging therapeutic areas.

Regulation and Evaluation of Medicines and Health Product

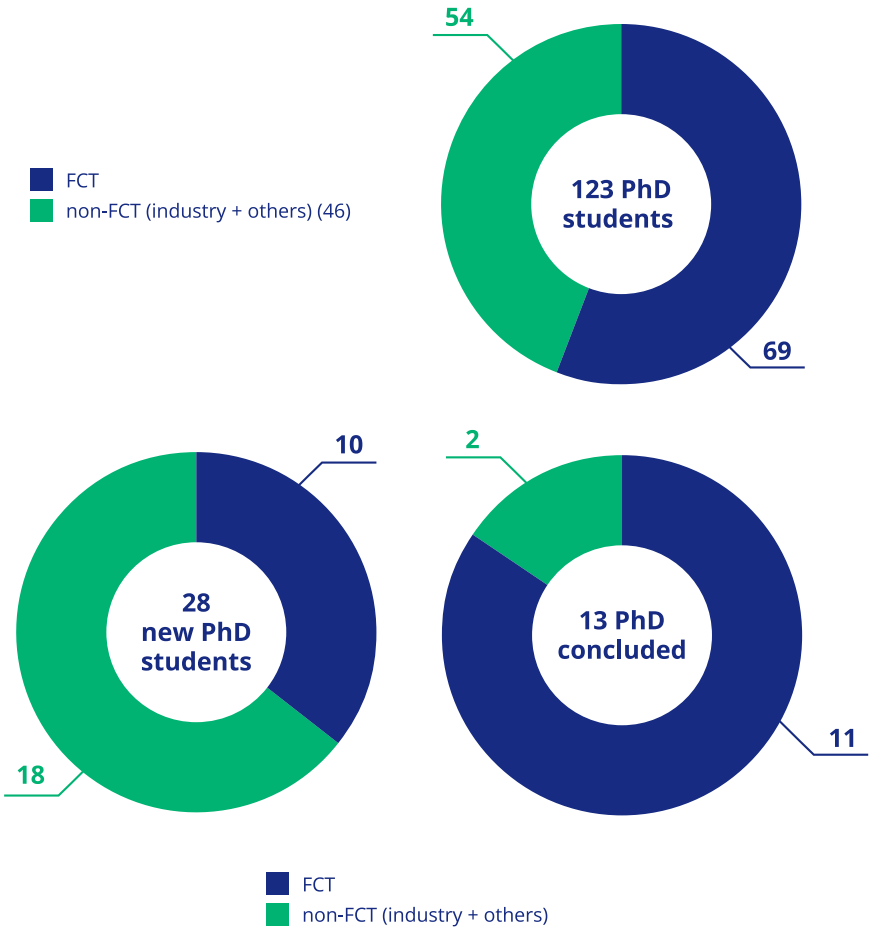
Coordinator: Maria Beatriz da Silva Lima

This course aims to increase de knowledge on all the regulatory aspects, laws and directives, science-based approaches on the Marketing authorisation in European Union for Medicinal Human Medicines and Veterinary Medicines. Furthermore, this course will include legislation in Health Products based on Medicinal Plants, Medical Devices as well as patent laws, price regulation and others.

Doctoral students

imed scientists contribute intensely for the PhD in Pharmacy at the Faculty of Pharmacy, University of Lisbon with the direct supervision of PhD candidates and with the organization of post-graduate courses. In 2023, imed scientist recruited 28 new PhD students and 13 concluded their studies. Currently, 123 students are engaged in the PhD program at the Pharmacy Faculty that are funded by FCT (69) and other schemes that include collaborations with the industry and patient associations (54).

imed scientists are actively involved in training activities at the post-graduate level and offer the following advanced doctoral programs:



Advanced Research Methods in Health and Pharmacy Practice

Coordinator: Afonso Miguel Cavaco; Filipa Alves da Costa

Laboratory: Pharmacy Practice & Health Communication; Public Health & Medicines Use

Pharmacy practice is an area of study within health services research that focuses on the role of pharmacists in promoting the safe and effective use of medicines and medical devices. Therefore, pharmacy practice research studies come to play and can adopt varied formats, resorting to methodologies used initially in epidemiology, including observational and experimental studies, whilst combining these with methods primarily used in the social sciences. These methodologies enable a more person-centred approach to understanding the experience of people living with illness and relying on medication and medical devices to maintain their health and well-being. Gaining in-depth knowledge in health services research is essential for pharmacy doctorates to develop their research projects by selecting the most appropriate methodologies for reviewing state of the art in their areas of interest, selecting suitable study designs, collecting and analysing data emerging and producing high-quality evidence that supports the advancement of this area of practice.

Advanced Topics in Medicinal Chemistry and chemical biology

Coordinator: Rui Moreira

Laboratory: Medicinal Chemistry

The advanced specialization course in Medicinal Chemistry and Chemistry Biology is intended to frame the training of students who have been admitted to the PhD program in Pharmacy. It is a highly flexible programme covering a wide range of courses taught by chemists, pharmacists, biologists and industrial medicinal chemists. It provides a strong foundation in

core chemistry, supplemented by specialist knowledge of medicinal chemistry and chemical biology.

Advanced Drug Delivery

Coordinator: António Almeida; Helena Florindo

Laboratory: Advanced Technologies for Drug Delivery; Drug Delivery & Immunoengineering

Advanced Drug Delivery **is part of the PhD Programme in Pharmacy, trains students in the development of advanced medicinal products, covering crucial aspects that determine the fate of drugs in the human or animal body, from their fundamentals to the advanced strategies to overcome the physiological barriers, including innovative technological and therapeutic applications. The course will be held at the Research Institute for Medicines (imed. ULisboa), Faculdade de Farmácia, Universidade de Lisboa, in Lisbon. The training program is aimed at PhD students but welcomes the participation of external academic and scientific community members. Registration is free but mandatory. The course intends to improve PhD students' knowledge in the discovery of potential biotherapeutics, the improvement of production and monitoring of drugs and the translation of these drugs to the clinics.**

Advanced Analytical Tools: Multiple Applications for Mass Spectrometry

Coordinator: Maria Rosário Bronze; Noélia Duarte

Laboratory: Natural Products Chemistry

Mass Spectrometry (MS) is an advanced analytical technique that has reached an outstanding position due to its unique characteristics: high selectivity, low detection limits, speed and a large diversity of applications. During the last two decades, MS has progressed rapidly through the advances on ionization methods and mass analysers that have led to the advent of new equipment. This progress has allowed the development of new applications mostly oriented towards health promoting areas such as proteomics, lipidomics, metabolomics, foodomics, drug discovery, pollution control and forensic and toxicological sciences. This course aims to give an overview on basic MS fundamentals and instrumentation highlighting several recent applications.

Multidisciplinary Project-based Learning in Pharmacy

Coordinator: André Santos; Isabel Rivera; Maria M.M Santos

Laboratory: Cell Function and Therapeutic Targeting; Bacterial Pathogenomics and Drug Resistance; Medicinal Organic Chemistry

The Multidisciplinary Project-Based Learning in Pharmacy course is part of the Doctor of Pharmacy Program, and trains students to embrace new ways of thinking, outside their comfort zone, to generate a new approach to solving a real-world based problem (e.g., a pandemic disease). To achieve this goal, mixed groups of students (with backgrounds in chemistry, biology, or pharmaceutical sciences) will provide the starting point for productive discussions that will culminate in the development of a project capable of answering the proposed problem. Understanding how to integrate multi- and translational disciplines will facilitate students in strengthening their critical thinking, communication skills, and peer networking. The course is held at the Institute for Medicines Research (iMed.ULisboa), Faculty of Pharmacy, University of Lisbon, in Lisbon, is a key tool to develop a scientific personality, crucial for the next years of their PhD programs.

Molecular Biomarkers and Technologies

Coordinator: Elsa Rodrigues

Laboratory: Cell Function and Therapeutic Targeting

Biomarkers are now an integral part of the drug discovery and development process, acting as indicators of drug mechanism of action, efficacy, safety and disease progression, as well as assisting in disease diagnosis, patient selection and clinical trial design. Biomarkers also offer the potential to inform treatment decisions and bring personalized medicine into clinical practice. Latest advances in clinical and translational biomarkers will be covered, including patient selection and predicting response to therapy, liquid biopsy and cell free DNA, companion diagnostics and personalized medicine, biomarker assay development and validation, and biomarker-based clinical trials. The new frontier of digital health and its impact on drug and diagnostic development will be explored, covering emerging digital biomarkers and their utility in clinical trials, advances in biosensors and wearables as clinical endpoints, integration of mobile health into drug development, and the latest applications in point-of-care testing and remote patient monitoring.

Advances in Neuropharmaceutics

Coordinator: Adelaide Fernandes

Laboratory: Central Nervous System, Blood, and Peripheral Inflammation; Neuroinflammation, Signaling and Neuroregeneration; Neurovascular

Neuropharmaceutics focuses on the identification of therapeutic targets in nervous system diseases, and then translating those discoveries into drug and therapy development. Neurological disorders have a crucial impact on our society accounting for increased health costs, while drug development to central nervous system (CNS) disorders represents the second investment priority of the pharmaceutical industry, following cancer. Thus, advances in neuropharmaceutics are a key area for students of a PhD programme aiming to target discovery, drug design, medicine development and usage.

Pathogen Multiomics and Bioinformatics

Coordinator: João Perdigão

Laboratory: Bacterial Pathogenomics and Drug Resistance

The Pathogen Multiomics and Bioinformatics advanced course is structured around six distinct modules that spans the entire spectrum from the introduction to NGS data and quality control to genome-wide association studies applied to different pathogens. While the course comprehends a solid theoretical component that underpins the learning and execution of the different analytical stages in the practical sessions which comprise most of the course. It is intended that the participants apprehend the concepts and fundaments of the analytical procedures that are necessary to translate the large data volumes generated by NGS platforms while systematically consolidating the theoretical basis of this knowledge.

Redox Signaling and Redox Systems in Health and Disease: implications for drug design and development

Coordinator: Vasco Branco

Laboratory: Toxicology, Biomarkers & Risk Assessment

Redox signalling achieved by reactive oxygen species (ROS) is a key aspect of signal transduction in various cellular processes such as cell death, differentiation and inflammation. However, the line separating redox signalling from oxidative stress is a thin one and redox homeostasis is reliant on the action of redox active systems. These systems are complex arrays of enzymes controlling ROS levels but also the oxidation-reduction cycle of critical protein residues (e.g. cysteines) that enable signal transduction. Disruption of redox signalling has been implicated in the aetiology of several pathologies including cancer and neurodegenerative diseases. Moreover, redox enzymes have very reactive residues (cysteines and selenocysteines) and are, therefore, candidate targets for inhibition by electrophilic compounds, creating opportunities for therapeutic strategies. This Advanced Course will approach these aspects in detail which are of widespread interest for many PhD candidates in Pharmacy.

Stem Cell Technologies

Coordinator: Susana Solá

Laboratory: Stem Cell Bioenergetics and Neuroregeneration

Stem cell-based therapies are thriving. In fact, pharmaceutical companies are increasingly investing in stem cell technology to develop innovative and potentially valuable new treatments for severe human diseases, including cancer and neurological disorders, such as multiple sclerosis, Alzheimer´s and Parkinson´s disease, mood disorders, brain tumours and even stroke. Moreover, although seminal advances have occurred in understanding stem cell biology, further work is still needed to bridge the current gap between stem cell technologies and effective treatments in brain-related disorders. Stimulating the scientific interest on the topic will certainly accelerate and improve the successful transfer of stem cell-based discoveries from the bench to the bedside.

Topical and Transdermal Delivery

Coordinator: Sandra Simões

Laboratory: Advanced Technologies for Drug Delivery

Topical and transdermal drug delivery systems are designed to support the development of new and effective therapeutics. The human stratum corneum acting as a barrier for the permeation of active substances has limited the number of molecules commercially available as transcutaneous delivery systems. Several strategies have been employed over the past few decades to optimize drug delivery across the skin of several poorly permeable compounds. However, passive techniques present limited potential to facilitate the delivery of macromolecules. Topical and transdermal delivery is therefore an area of research with many challenging objectives but also with great opportunities to work envisaging the patient compliance as it refers to a convenient painless non-invasive drug administration route.

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4. Resources

Facilities

New equipment

imed research ecosystem is supported by 30 laboratories across the fields of chemistry, biology and pharmaceutical sciences. All research groups benefit from laboratory facilities and shared scientific platforms that include:

Facilities

imed state-of-the-art facilities and world-class services provide an ideal environment for the discovery and development of new medical treatments and for generating breakthroughs in health sciences. Our facilities are equipped with the latest equipments and state-of-the-art technologies, allowing us to conduct research and provide services that are at the forefront of modern science. In parallel, we offer a wide range of services, including research and development of new drugs and therapies, and advanced imaging and flow cytometry. We are committed to advancing healthcare through innovation, research, and collaboration, and our facilities are open to the scientific and health community, as well as the pharma and industry sector.

Animal Facility

Head: Maria Manuela Gaspar

Laboratory: Advanced Technologies for Drug Delivery

The Animal Facility supports the discovery and development of innovative medicines for the benefit of humans and animals. This Facility consists of several rooms for animal maintenance with housing capacity of around 500 small rodents (rats and mice) and rooms for experimental procedures (small surgeries and dissections). Metabolic cages are also available. Support rooms are used for cleaning, washing and sterilization of cages and other equipment, food, and bedding. Several rodent models are established and typically available, including models of infection, acute and chronic inflammation, xenograft or metastatic tumours, non-alcoholic fatty liver disease, neurodegenerative diseases as well as biodistribution and toxicity studies. Upon request and contract, these or other animal models may be provided to external entities. The Animal Facility provides technical and scientific support to investigators on protocol development, refinement of experimental procedures, small surgery techniques, and services of husbandry and routine daily care (feeding, watering, and cage changing).

The Animal Facility is licensed by "Direção Geral de Alimentação e Veterinária" (DGAV), the competent national authority responsible for implementing the legislation for the protection of animals for scientific purposes All animal experiments conducted in the Animal Facility are subject to rigorous review and must be previously submitted to the Animal Welfare Board (ORBEA – Orgão de Bem-Estar Animal) at the Faculty of Pharmacy, University of Lisbon (Regulamento 806/2016), and then approved by DGAV. Together, they ensure that research animals are used only when necessary and under humane conditions. Personnel and users are certified researchers for conducting animal experimentation. All procedures are performed according to the EU Directive (2010/63/UE) and Portuguese laws (DR 113/2013, 2880/2015, Portaria 260/2016 and 1/2019).

imed is committed to following the 3Rs, Replacement, Reduction and Refinement, and carrying out research of the highest quality and providing animals used in research with the best care available. Alternatives to animal use, which include computer modeling, cell culture and bacterial systems, are available and used whenever possible.

Biosafety Level 3

Head: Quirina Santos Costa

Laboratory: Host-Pathogen Interactions

The Biosafety Level 3 Facility is specifically dedicated to research involving biological pathogens of level 3 security. It was designed to minimize the risk of personnel and environmental exposure to potentially hazardous agents according to European and Portuguese legislation. All users must undergo specific biosafety level 3 training and must follow strict rules and guidelines while working in the facility.

Consists of an anteroom for material and personnel preparation, and a main procedure room equipped with tree vertical laminar flow chambers (type A2 and type B2), three CO2 incubators (Hera Cell), one regular incubator, two benchtop centrifuges (Eppendorff), a benchtop ultracentrifuge (Beckman), an aerosol-tight microfuge (Eppendorff), a Tecan infinite 200 multimode microplate reader, water baths, freezers, refrigerators, optical and inverted phase-contrast microscopes (Leica), and a dedicated double door pass-through autoclave (Matachana).

Cell Culture

Head: Joana Amaral; Rui Silva

Laboratory: Cell Function and Therapeutic Targeting; Neuroinflammation, Signalling and Neuroregeneration

The Cell Culture Facility comprises dedicated cell culture rooms equipped with the required environment and equipment for a wide range of cell and tissue culture procedures, from maintenance and manipulation of cell lines and tissue samples to cell observation and data analysis. In addition, the facility provides routine mycoplasma detection testing for mammalian cell lines. Consists of laminar flow hoods (Esco, Class II Type A2), CO2 incubators (Hera Cell), inverted microscopes (Zeiss) coupled to an imaging system (Leica), and support equipment (automated cell counter, centrifuges, water baths, refrigerators, freezers). Fluorescence and bright-field microscopes (Zeiss) with dedicated cameras (Leica) and imaging and acquisition systems are available, including an Invitrogen EVOS™ FL Auto 2 fully automated, inverted, multi-channel fluorescence and transmitted light imaging system.

Additional dedicated equipment provides cell analysis high-throughput capabilities with Multidrop Combi Reagent Dispenser (Thermo Scientific) for 6 to 1536-well plates; GloMax®-Multi+Microplate Multimode Reader (Promega), accepting 6 to 384-well plates, and accommodating luminometer, fluorescence, and visible/UV absorbance modules and dual injector system for 6 to 96-well plate formats; and xCELLigence RTCA SP (ACEA Biosciences) for real-time label free impedance-based cell analysis in 96-well format.

The facility provides biological evaluation of cell function, routinely determining the role of transgenes and the cytotoxic and cytoprotective activities of synthetic and natural compounds in multiple cell models, including immortalized cells (human, monkey, rat, mouse), embryonic stem cells (rat and mouse), primary cultures (rat and mouse liver, brain), and organotypic cultures.

Confocal Microscopy

Head: Liana Silva

Laboratory: Drug Delivery & Immunoengineering

The confocal microscopy facility supports the highest level of research at **imed** by providing confocal imaging training, services and bioimage analysis. Activities are divided among three key areas: sample preparation, confocal microscope image acquisition and data analysis with Aivia, a powerful artificial intelligence-guided image analysis software.

The Leica TCS SP8 laser scanning confocal microscope is a fully motorized high-resolution inverted confocal microscope for fluorescence imaging. The DMi8 fluorescence microscope is equipped with a fully motorized stage, fast z movement (Leica Super Z Galvo stage), 4 solid state lasers (405, 488, 552, 638 nm), four detectors (one HyD high-sensitivity and three PMT), a transmitted light detector with CCD camera, three dry objectives (5x, 10x and 20x) and two oil immersion objectives (40x and 63x). The advantage over conventional widefield light microscopy is that the optics of this confocal microscope remove scattered light and light originating from outside the focal plane of interest, thus generating a high contrast “optical section”. Moreover, this microscope allows several types of image acquisition, such as 2D, z-stack, multi-positions, tile scanning/ image stitching of large samples and time-lapse.

Computer Assisted Drug Design

Head: Rita Guedes

Laboratory: Computational Medicinal Chemistry

The Computer Assisted Drug Design Facility consists of a Linux-based high-performance computer cluster with 424 CPU cores, 4 to 8GB per CPU/GPU and 2 TB per node with a specific implementation of state-of-the-art software for molecular modelling, molecular dynamics, virtual screening, and de novo design. Provides technical support ranging from advice in experimental design to data analysis.

Flow Cytometry

Head: Catarina Godinho Santos

Staff: Miguel Cardoso

Laboratory: Molecular Microbiology and Biotechnology

The cytometry system at imed consists of the Cytek® Aurora full spectrum flow cytometer and a computer workstation running SpectroFlo® software for sample acquisition and data analysis. This spectral flow cytometry system allows unique fluorochrome combinations in comparison to conventional flow cytometry and enables analysis of cells with high autofluorescence.

The cytometer is an air-cooled, compact benchtop instrument. It is equipped with 4 lasers (Violet, Blue, Yellow-Green and Red), 48 detection channels for fluorescence, and three channels for scatter (blue laser FSC, blue laser SSC, and violet laser SSC). High-throughput sample loaders are available to automate sample delivery and acquisition and currently are compatible with 96-well plates.

An independent workstation for analysis of flow cytometry data is available upon booking, where SpectroFlo® and FCS ExpressTM 7 software can be used.

Technical support in panel design, experimental planning, sample preparation, sample acquisition and data analysis can be requested.

Gene and Protein Expression

Head: Rui Castro

Laboratory: Liver Disease Diagnostics and Therapeutics

The Gene and Protein Expression Facility at **imed** is equipped with cutting-edge technologies that allow for high-throughput, accurate and sensitive measurements of gene and protein expression levels, enabling researchers to gain a deeper understanding of the molecular mechanisms underlying biological processes.

Consists of equipment for sample quality monitoring and quantification, including a Qubit 4 fluorometer and a NanoDrop 2000c spectrophotometer (ThermoFisher Scientific); and microplate readers, including a Multiskan FC and a Varioskan LUX multimode reader (ThermoFisher Scientific), equipped with a flexible range of measurement technologies including Absorbance, Fluorescence Intensity, Luminescence, AlphaScreen, and Time-Resolved Fluorescence.

Protein Electrophoresis & Western Blotting equipment includes standard and mini-gel electrophoresis systems (Bio-Rad and ThermoFisher Scientific); Trans-Blot Turbo (Bio-Rad) and iBlot 2 (ThermoFisher Scientific) transfer systems; and the Chemidoc MP (Bio-Rad), iBright CL750 and iBright FL1500 (ThermoFisher Scientific) Imaging Systems, supporting imaging applications of fluorescent, chemiluminescent, and colorimetric western blots, in addition to fluorescent stained nucleic acid gels, fluorescent stained protein gels, colorimetric stained protein gels, and colorimetric membrane stains.

Gene expression equipment encompasses end-point thermocyclers (Bio-Rad and ThermoFisher Scientific) and real time PCR systems, including the Applied Biosystems 7300 and state-of-the-art QuantStudio 7 Flex Real-Time PCR Systems. The latter enables high-throughput, quantitative gene expression, combining 384-well microfluidic gene expression, predesigned or customed card arrays, with multiplexing (21 filter combinations), and fast real-time capabilities.

The facility provides personalized guidance and training to researchers in designing and conducting experiments, data analysis and interpretation; and provides a wide range of services, including protein and RNA isolation, quantification and quality control, protein and gene expression profiling, and data analysis.

Mass Spectrometry

Head: Maria do Rosário Bronze and Fábio Santos

Laboratory: Chemical Biology

The Mass Spectrometry Facility is part of the National Mass Spectrometry Network.

Consists of a Triple Quadruple mass spectrometer (Micromass Quattro Micro API, Waters) with electrospray ionization (ESI) atmospheric pressure chemical ionization (APCI) ion sources. This facility is also equipped with an Ion-Trap (LCQ-Fleet, Thermo) mass spectrometer dedicated to the characterization of proteins and biological conjugates.

Provides identification and quantification of small molecules in complex matrices, such as biological fluids, and extracts of natural products. Services are available for users on a "do-it-yourself" basis or self-service, for long-term studies, upon initial training requirements. A technician is also available for full service.

Molecular BioScreening

Head: Vanda Marques and Cecília Rodrigues

Laboratory: Cell Function and Therapeutic Targeting

The Molecular BioScreening facility at **imed** offers an innovative and integrated approach of cell-based medium- to high-throughput assays for screening small molecules (natural or synthetic) and biologics. It provides cell-based assays, including untargeted phenotypic assay approaches, using human and non-human cell lines, primary cells, stem cells and organoids that recapitulate human biology.

Primary screens are designed and optimized to deliver solutions that help achieve specific experimental goals; and are available for adherent and 3D cell cultures, optimized for 96-well and/or 384-well formats, include IC50 and EC50 determination, drug interaction evaluation, or cell death arrays (apoptosis, necroptosis and ferroptosis).

The facility is equipped with instrumentation, automation, and software for running medium- to high-throughput screens using a variety of assay technologies, including an automatic liquid handling platform for 6 to 1536-well plates (Thermo Scientific); multi-label plate readers; and real-time label free impedance-based cell analysis (xCELLigence RTCA SP – ACEA Biosciences)

The Molecular BioScreening unit is available to both internal and external researchers. Inquiries regarding other specific assays are welcome from academia, biotechnology and pharmaceutical industries seeking solutions in bioscreening.

The facility is core for many researchers at **imed**, as it combines the power of relevant cell models, phenotypic screens, and live cell functional assays to ultimately lead to the discovery of new therapeutic agents.

Nuclear Magnetic Spectroscopy

Head: Noélia Duarte

Laboratory: Natural Products Chemistry

Nuclear magnetic resonance (NMR) spectroscopy is an advanced analytical technique that has reached an outstanding position in several scientific areas, including chemistry, biochemistry, medicine, physics, material sciences and geology. At **imed**, the NMR facility is equipped with a Bruker® - Biospin Fourier 300 MHz (7.1 T) spectrometer, with a 1H & 13C (5 mm) probe and autosampler SampleXpress Lite. The equipment is used to support R&D projects and advanced training activities. 1D and 2D-NMR experiments are routinely carried out to elucidate the structure of small molecules obtained both from synthesis or natural sources; and kinetic studies to elucidate reaction mechanisms. Additional applications include metabolic studies (for instance, metabolite identification), and compound quantification in drug development studies. Basic training of users (students or researchers) for in-house data collection and processing, as well as external services for academia and pharmaceutical industries are also provided.

New equipment

In 2023, we strength our capacity to study complex mixtures and biologics with the acquisition of a Thermo Scientific Orbitrap Exploris mass spectrometry. This is a quantitative high-resolution, accurate-mass (HRAM) liquid chromatography mass spectrometry (LC-MS) with record-setting performance. We expect that this new equipment will deliver precision data on exact masses and the possibility to start exploring proteomics as a tool to unravel druggable targets and new medicines.

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5. Scientific Development

Human resources

Research funding

Research outputs & actions

Internationalization

Human resources

In December 2023, more than 550 people were working at imed: 173 principal investigators, 26 researchers (including postdoctoral and CEEC), 123 PhD students, 270 MSc students.

Recruitment policy

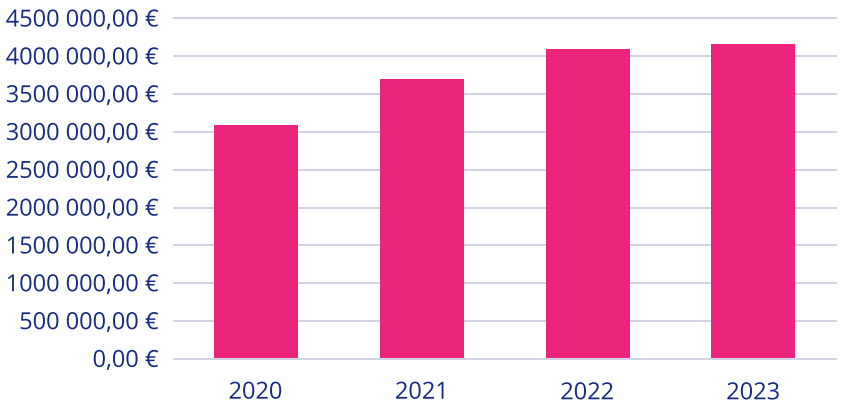
At imed we aim to establish an organic environment that leads to breakthroughs in health sciences for the benefit of all. This can only be achieved with the best researchers working together. Therefore, as a research centre of the Pharmacy Faculty of the Universidade de Lisboa, imed recruiting strategy is aligned with the host institution policy, which during this year, was able to recruit new researchers that are now fully integrated in imed.

Research funding

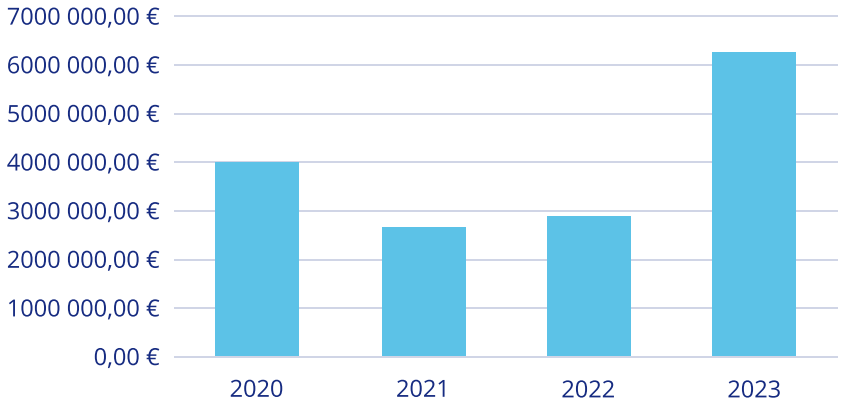
imed scientist have been quite successful in securing competitive funds despite the difficult financial circumstances experienced in 2023. The institute funds reached a global available value of 4.2 MEuros in 2023. These positive numbers were possible because our scientists were particularly successful in securing funds both through national (2.9 MEuros) and international competitive calls (920 kEuros), as well as from projects with industry and contracted research services (280 KEuros) following our commitment to strengthen our knowledge transfer capacity.

Globally our figures as at 31st of December 2023, show 33 (coordinator)+ 19 (partner) active national projects, 8 (coordinator)+ 9 (partner) international projects, and 3 funded contracts with the private sector. The overall budget of imed also considers Fundação para a Ciência e Tecnologia support in the form of: R&D Unit Pluriannual funding; contracts of researchers with PhD or PhD student scholarships under funded projects.

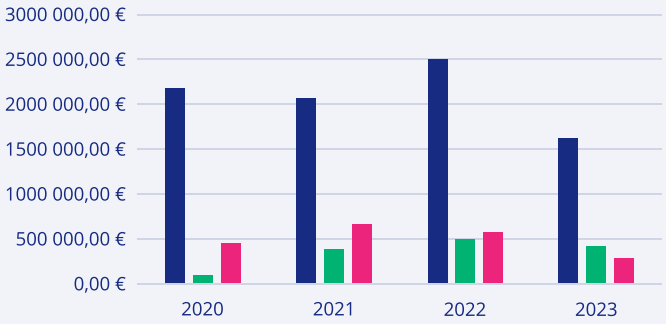
Total available funding



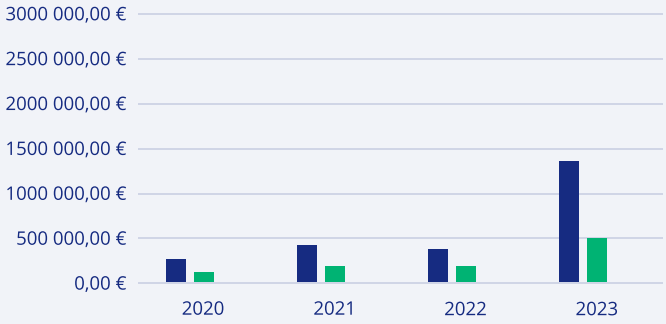
Total awarded funding



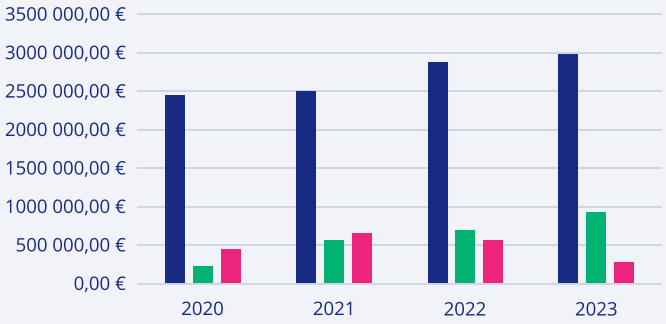
Coordinator



Partner



Total available funding



List of projects starting in 2023

National projects - Coordinator

Ultra-Alta Pressão como uma ferramenta sustentável para quimo-selectividade ajustável

Foundation for Science and Technology (2022.08851.PTDC)

PI: Carlos Afonso

Conjugados de Fármacos Ativaveis por Ião Ferroso: alvejar o Metabolismo do Ferro na Era da Oncologia de Precisão

Foundation for Science and Technology (2022.07857.PTDC)

PI: Rui Moreira

O papel dos microRNAs na resposta imunitária e celular à vacinação COVID-19 em doentes

Foundation for Science and Technology (2022.08837.PTDC)

PI: André Simão

Exploração de padrões químicos e biológicos partilhados entre compostos antimicrobianos para construir melhores modelos computationais para a descoberta de novos antibióticos

Foundation for Science and Technology (2022.03752.PTDC)

PI: Natália Aniceto

Derivados de alcaloides indólicos para reverter a resistência em tumores BRCA-deficientes. Investigação computacional dos modos de ligação

Foundation for Science and Technology (2022.05718.PTDC)

PI: Maria José Umbelino

Imunoterapia dirigida à aquaporina-9 como estratégia inovadora para o tratamento da inflamação

Foundation for Science and Technology (2022.06601.PTDC)

PI: Inês Vieira da Silva

Nano-imunoterapia para regular o perfil imunológico e o microbioma no cancro pancreático

Foundation for Science and Technology (2022.04506.PTDC)

PI: Liane Moura

Células CAR T switchable para eliminar reservatórios de VIH-1 em células T foliculares

Foundation for Science and Technology (2022.07042.PTDC)

PI: Catarina Godinho Santos

Interrogando a capacidade de drogar com pequenas moléculas as interações DNAG4-helicase

Foundation for Science and Technology (2022.06099.PTDC)

PI: Alexandra Paulo

Combinando síntese fotoquímica e assimátrica para produzir novos aminociclopentitóis quirais

Foundation for Science and Technology (2022.08559.PTDC)

PI: Filipa Siopa

Toxicidade de Nanoplásticos: da inflamação intestinal a efeitos sistémicos

Foundation for Science and Technology (2022.04884.PTDC)

PI: Vasco Branco

Estimulação da resposta inata e memória celular para aumentar a eficácia das células CAR-T

Foundation for Science and Technology (2022.07746.PTDC)

PI: João Gonçalves

Role of ZBP1 in regulating cell death and inflammation in non-alcoholic fatty liver disease

2023.01783.RESTART

PI: Joana Amaral

Spiro-B-lactams as broad-spectrum host-directed drugs for RNA respiratory viruses

Gilead Génese 2022

PI: Inês Bártolo

"Caracterização de formulações tópicas"

Laboratório MEDINFAR – Produtos Farmacêuticos, S.A.

PI: Helena Ribeiro

International projects - Coordinator

Focused Ion Technology for Nanotechnology

Cost Actions (COST 094/21)

PI: Catarina Reis

Medicinal Chemistry and Chemical Biology Strategies for Drug Discovery

EU-OPENSCREEN (ERIC Training)

PI: Rui Moreira

Dana-FENS Brain Awareness week grants 2023

FENS DANA BAE 2023

PI: Joana Amaral

National - Partner

Ciência Viva no Laboratório – Ocupação Científica de Jovens nas Férias, Edição de 2023

Ciência Viva no Laboratório 2023

PI: Adelaide Fernandes

Hypervalent iodine to expand the chemical space and access synthetic N-containing molecules

Foundation for Science and Technology (Hi2E-Synth)

PI: Pedro Góis

Nanosistemas inovadores com reposicionamento de fármacos para o tratamento de doenças periodontais

Foundation for Science and Technology (2022.06464.PTDC)

PI: Ana Francisca Bettencourt

TAT-TrkB, a novel neuroprotective compound to fight Alzheimer's disease

Prémios Santa Casa Neurociências - Mantero Belard (MB-35-2021)

PI: Paulo Paixão

Nova abordagem na terapêutica da doença de Parkinson a partir de macroalgas

Foundation for Science and Technology (2022.09196.PTDC)

PI: Filipa Siopa

International - Partner

Targeting Circadian Clock Dysfunction in Alzheimer's Disease (TClock4AD)

Horizon Europe

PI: Rita Guedes

From fragments to high affinity binders interfacing integrated structural biology, medicinal chemistry and artificial intelligence (Fragment-Screen)

Horizon Europe

PI: Tiago Rodrigues

More Effectively Using Registries to suppOrt PAtient-centered Regulatory and HTA decision-making

Horizon Europe (More-EUROPA)

PI: Bruno Sepodes

Next Generation Vaccines against Gastrointestinal Mucosal Pathogens, using Helicobacter pylori as Model Pathogen

Horizon Europe (Vax2Muc)

PI: António Almeida

Accelerating drug repurposing for rare neurological, neurometabolic and neuromuscular disorders by exploiting SIMilarities in clinical and molecular PATHology

Horizon Europe (SIMPATHIC)

PI: Sofia de Oliveira Martins

FUnctional Nucleic Acids as Versatile SMart BUilding BLocks in Non-ConventIonal SolvenTs

Horizon Europe (FUNAMBULIST)

PI: Carlos Afonso

National R&D, Production, Marketing and Distribution Platform for Innovative Biopharmaceuticals (Bio-Hub)

PRR - Plano de Recuperação e Resiliência (28)

PI: João Gonçalves

Plataforma de Valorização, Industrialização e Inovação Comercial para o AgroAlimentar (VIIAFOOD)

PRR - Plano de Recuperação e Resiliência (37)

PI: Helena Ribeiro

TEC4GREEN

PRR - Plano de Recuperação e Resiliência (13)

PI: Helena Ribeiro

Research outputs & actions

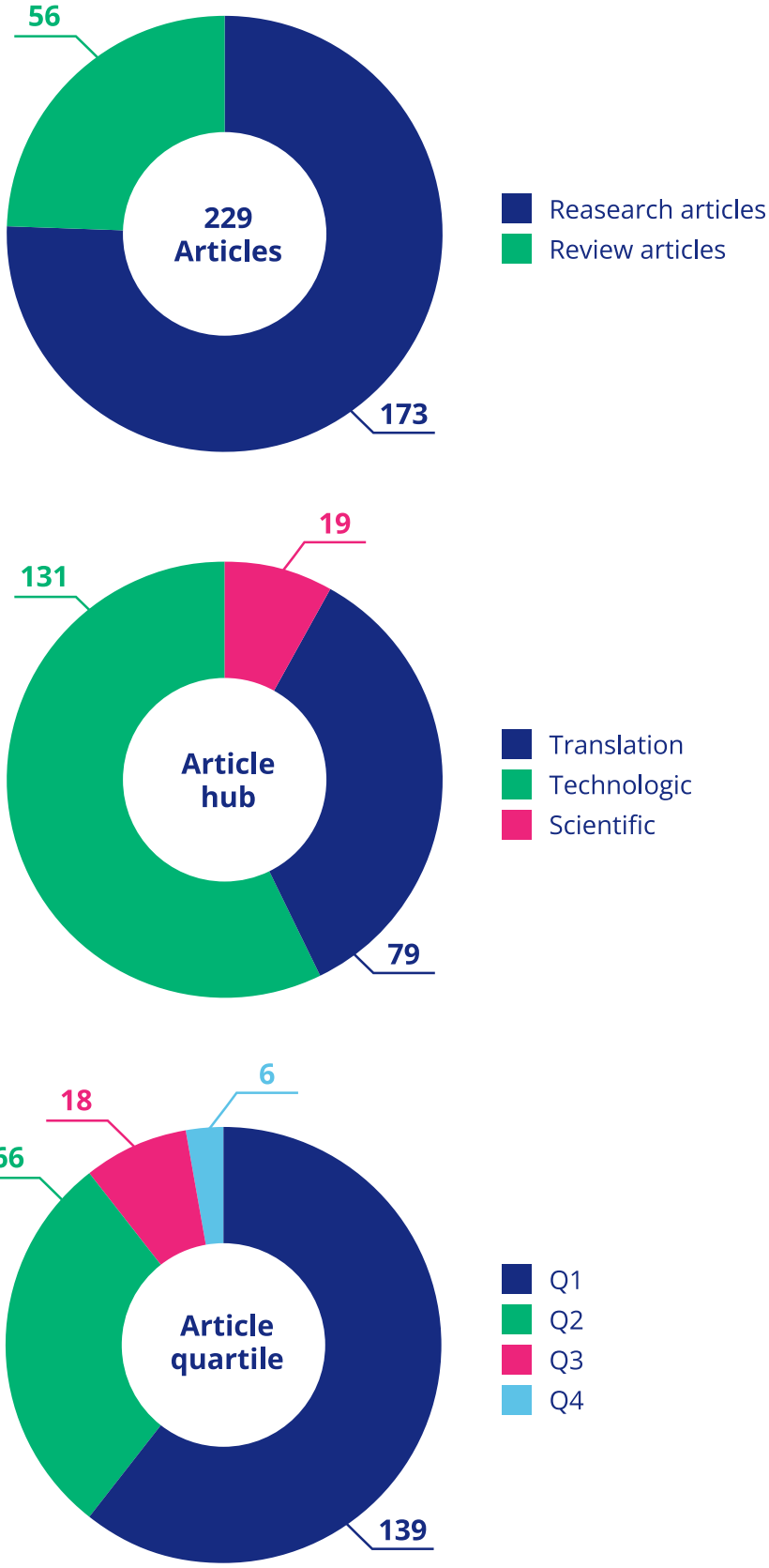
Collaborative projects

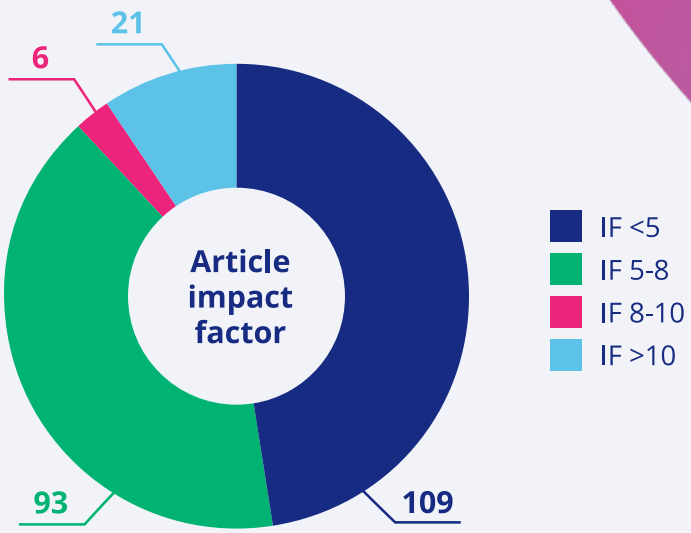
Continuing our mission to strengthen multidisciplinary and collaborative science, in 2023 we launched once again the IDEA's action, an internal call with a budget of 75Keuros for 1-year collaborative projects between IMED laboratories. This action was quite successful and test new ideas within the institute.

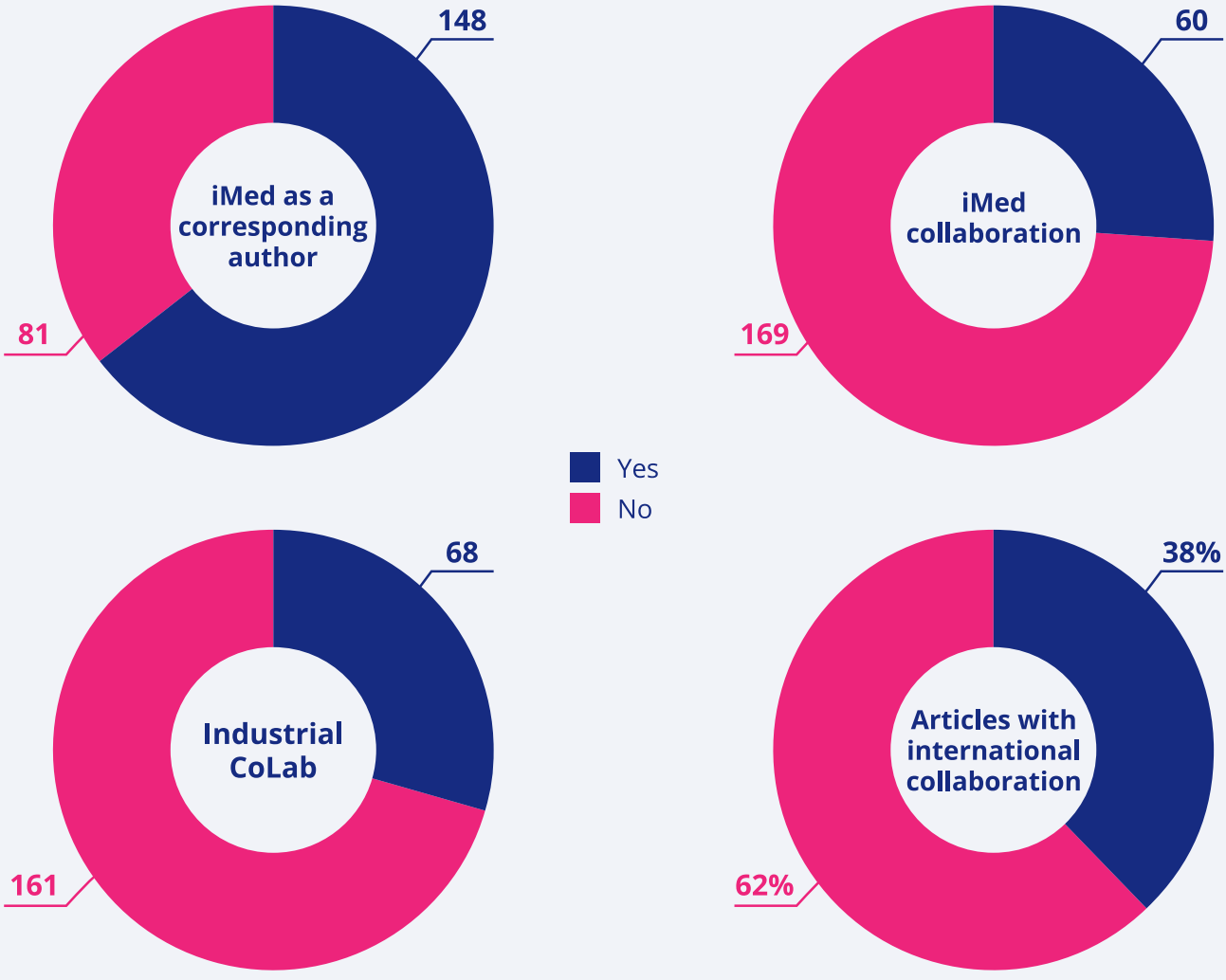
Scientific publications and actions

In 2023 imed maintained a good record of scientific contributions, with 229 articles published in Journal Citation Reports (JCR) referenced Journals. These 173 research papers and 56 reviews are a main output of the institute recently created research Hubs. 57% of these articles are a contribute from the Scientific Hub, 35% from the Technologic Hub and 8% from the translational Hub. 61% of imed JCR articles were published in journals indexed in the first quartile (Q1). 65% of all articles have imed scientists as corresponding authors and 26% result from collaborative efforts of imed laboratories.

Furthermore, imed researchers achieved a sharp increase in the number of publications in top-ranked journals namely 18 papers with IF>10. It is very important to note that many of the publications in top journals are the result of research lead by imed researchers, which demonstrates that imed PIs can themselves be highly competitive.




21
6
Article impact factor
93
109
IF <5
IF 5-8
IF 8-10
IF >10


148
iMed as a corresponding author
81
60
iMed collaboration
169
Yes
No
68
Industrial CoLab
161
38%
Articles with international collaboration
62%

Research highlights

imed's research program aims at discovering molecules, mechanisms and technologies that can be translated into breakthrough healthcare solutions. Our research methodology combines the expertise of disciplines across the fields of chemistry, biology, and pharmaceutical sciences to tackle key scientific questions in health sciences. The institute capacities cover a wide range of research activities that support our **Scientific, Technological and Translational Hubs.**

Scientific Hub

Within the Scientific Hub, we integrate chemistry, biology, and pharmaceutical sciences to develop new tools and techniques to prevent, detect and treat cancer, neurodegenerative, metabolic and infectious diseases.

Selected publications from the Scientific Hub

RIPK3 dampens mitochondrial bioenergetics and lipid droplet dynamics in metabolic liver disease

https://doi.org/10.1002/hep.32756

Cirrhosis is associated with lower serological responses to COVID-19 vaccines in patients with chronic liver disease

https://www.jhep-reports.eu/article/S2589-5559(23)00028-9/fulltext

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miR-21-5p promotes NASH-related hepatocarcinogenesis

https://doi.org/10.1111/liv.15682

Technological Hub

Within the Technological Hub, we are highly engaged in advancing our scientific knowledge into innovative chemical, biotechnological and pharmaceutical technologies that may lead to breakthrough healthcare solutions.

Selected publications from the Technological Hub

Unlocking the Potential of Bio-Based Nitrogen-Rich Furanic Platforms as Biomass Synthons

https://doi.org/10.1002/anie.202304449

Polyoxazoline-Based Nanovaccine Synergizes with Tumor-Associated Macrophage Targeting and Anti-PD-1 Immunotherapy against Solid Tumors

https://doi.org/10.1039/d2gc00253a

Ru-Catalyzed Isomerization of Achmatowicz Derivatives: A Sustainable Route to Biorenewables and Bioactive Lactones

https://doi.org/10.1021/acscatal.2c04867

Translational Hub

Within the **Translational Hub** we are deeply committed to advance pharmacotherapy innovation and access to it by people living with illness by developing disruptive translational research to benefit human health, by converging our fundamental science discoveries into applied research. This is driven by the joint efforts of our institute with multiple players within the Healthcare sector, including policymakers, clinicians and allied healthcare professionals and people living with illness and their representative organizations and associations.

Selected publications from the Translational Hub

The Helicobacter pylori Genome Project: insights into H. pylori population structure from analysis of a worldwide collection of complete genomes

https://doi.org/10.1038/s41467-023-43562-y

Repeated out-of-Africa expansions of Helicobacter pylori driven by replacement of deleterious mutations

https://doi.org/10.1038/s41467-022-34475-3

Large-scale genomic analysis of global Klebsiella pneumoniae plasmids reveals multiple simultaneous clusters of carbapenem-resistant hypervirulent strains

https://doi.org/10.1186/s13073-023-01153-y

Imed scientists contributed in with 55 reviews and perspectives articles on the most advanced areas of research across the different imed hubs. The following list highlights some of these contributions.

Criteria for preclinical models of cholangiocarcinoma: scientific and medical relevance

https://doi.org/10.1038/s41575-022-00739-y

Spatial metabolomics and its application in the liver

https://doi.org/10.1097/HEP.0000000000000341

Human liver organoids: From generation to applications

https://doi.org/10.1097/HEP.0000000000000343

Intellectual property

Intellectual property protection as patents is critical to fostering innovation and to build a strong alliance with the private sector. At imed we aim at translating our findings commercially valuable technologies and/or products. Therefore, in 2023 we submitted 7 national and 12 international patent requests.

National

PT118234- Benzoic acid derivatives methods and uses thereof. Luís Filipe Vicente Constantino, João Pedro Almeida Pais, Tiago Alexandre Duarte Delgado, Olha Antoniuk, Elsa Maria Ribeiro dos Santos Anes, David Alexandre Rodrigues Pires

PT118236- Nitrobenzamide compounds, methods and uses thereof. Luís Filipe Vicente Constantino, João Pedro Almeida Pais, Tiago Alexandre Duarte Delgado, Olha Antoniuk, Raquel Martins da Silva, Elsa Maria Ribeiro dos Santos Anes, David Alexandre Rodrigues Pires

PT118464- Compostos tioesteres, métodos de obtenção e seu uso. Luís Filipe Vicente Constantino, João Pedro Almeida Pais, Olha Antoniuk, Duarte Manuel Moura da Silva Figueiredo Antunes, Tiago Alexandre Duarte Delgado, Elsa Maria Ribeiro dos Santos Anes, David Alexandre Rodrigues Pires

PT118237- A biomaterial with enhanced antimicrobial properties, its preparation method and use in a medical device or prosthesis for in vivo medical applications. Ana Bettencourt and coworkers

PT117765- Fluvoxamine for treatment of psoriasis. Martins AMTBS, Ribeiro HMOM, Marto JM, Gonçalves LMD, Simões SID

PT118152- One-pot method for the synthesis of 3-acetamido-furfural from N-acetylglucosamine. Bruno M.F. Gonçalves, Rafael F.T.A. Gomes, Carlos A.M. Afonso

PCT/PT2023/050002- Fluvoxamine for treatment of psoriasis. Martins AMTBS, Ribeiro HMOM, Marto JM, Gonçalves LMD, Simões SID

International

PCT/IB2021/057430- Air quality enhancement system based on fluid mechanics and integrated UV emission. dos Santos Almeida Nunes João Miguel, Duarte Jorge da Silva Gabriela Conceição; Braga Franco Sandra Maria; Maciel Linhares João Manuel; Azevedo Pereira José Miguel; Pinto dos Santos Costa Quirina Alexandra; Ribeiro dos Santos Anes Elsa Maria; Rodrigues Pires David Alexandre

WO/2023/034530- Air quality enhancement system based on fluid mechanics and integrated UV emission. dos Santos Almeida Nunes João Miguel, Duarte Jorge da Silva Gabriela Conceição; Braga Franco Sandra Maria; Maciel Linhares João Manuel; Azevedo Pereira José Miguel; Pinto dos Santos Costa Quirina Alexandra; Ribeiro dos Santos Anes Elsa Maria; Rodrigues Pires David Alexandre

EP22199251- Benzoic acid derivatives methods and uses thereof. Luís Filipe Vicente Constantino, João Pedro Almeida Pais, Tiago Alexandre Duarte Delgado, Olha Antoniuk, Elsa Maria Ribeiro dos Santos Anes, David Alexandre Rodrigues Pires

EP22199255- Nitrobenzamide compounds, methods and uses thereof. Luís Filipe Vicente Constantino, João Pedro Almeida Pais, Tiago Alexandre Duarte Delgado, Olha Antoniuk, Raquel Martins da Silva, Elsa Maria Ribeiro dos Santos Anes, David Alexandre Rodrigues Pires

WO2022053998 (A1)- New pharmaceutical compounds, methods and uses thereof. Ataíde Saraiva Lucília Helena, Umbelino Ferreira Maria José, Mulhovo Silva Fabião, da Silva Borges Costa José Luís, Gomes Raimundo Liliana Sofia, Paterna Ângela, Meixedo Calheiros Juliana

EP4069305- Nanostructured drug delivery system as a multifunctional platform for therapy. Vitorino CS, Pais AACC, Sousa JJ, Ferreira AC, Fortuna AC, Cova, TF, Nunes SC, Torres JD, Almeida AJ, Mendes MM, Gonçalves LMD

US20230387620- Nanostructured drug delivery system as a multifunctional platform for therapy. Vitorino CS, Pais AACC, Sousa JJ, Ferreira AC, Fortuna AC, Cova, TF, Nunes SC, Torres JD, Almeida AJ, Mendes MM, Gonçalves LMD

EP4069305 - Nanostructured drug delivery system as a multifunctional platform for therapy. Vitorino CS, Pais AACC, Sousa JJ, Ferreira AC, Fortuna AC, Cova, TF, Nunes SC, Torres JD, Almeida AJ, Mendes MM, Gonçalves LMD.

PCT/IB2023/057408- One-pot method for the synthesis of 3-acetamido-furfural from N-acetylglucosamine. Bruno M.F. Gonçalves, Rafael F.T.A. Gomes, Carlos A.M. Afonso

PCT/IB2023/06210- Drug delivery systems based on endoperoxides useful in diagnosis and therapy.

Diogo Silva and co-workers

PCT/IL/2023/050366 - Nanovaccines for treatment of viral diseases. Patent Application: US Provisional Patent Application No. 63/172,144. Satchi-Fainaro R, Florindo HF.

WO/2023/175955 (PCT/IL2023/050195) - Modulators of pd-l1/pd-1 interaction and uses thereof. Patent Application: US Provisional Patent Application No. 63/150,643. Filed on February 18, 2021. Satchi-Fainaro R, Florindo HF, Guedes R, Acúrcio R.

Book chapters

Book chapters are an important tool to organize and disclosed scientific information for a broad audience. Therefore, imed scientists participated in these efforts and in 2023 contributed with 14 book chapters in a wide range of important topics for the development of innovative medicines.

Cavaco, A.M., Quitério, C.F., Félix, I.B., Guerreiro, M.P. (2023). Communication and Person-Centred Behaviour Change. In: Guerreiro, M.P., Brito Félix, I., Moreira Marques, M. (eds) A Practical Guide on Behaviour Change Support for Self-Managing Chronic Disease. Springer, Cham. https://doi.org/10.1007/978-3-031-20010-6_5

R. Garcia, M. A. Brito "Breast cancer cells extravasation across blood-brain barrier: from basic to translational research" in Interdisciplinary Cancer Research, Ed. N. Rezaei, pp 1-34, Springer, Cham 2023 [ISSN: 2731-4561; ISSN: 2731-457X].

A. M. Martins, A. Ascenso, A. Costa, S. Simões, H.M. Ribeiro, J. Marto. "Topical dosage forms: bioequivalence at a glance", in Time-proof perspectives on bioequivalence, Ed. C. Vitorino, J.J. Sousa, A.J. Almeida, M. Miranda, Nova Science Publishers, Inc. 2023. ISBN: 979-8-88697-604-5.

M.N. Amaral, J O. Pinho, M.M. Gaspar, C.P. Reis. "Challenges for delivering plant actives", in Phytopharmaceuticals and herbal drugs, Ed. D. Singh e M.R. Singh, Elsevier, 2023,pp. 35-103, https://doi.org/10.1016/B978-0-323-99125-4.00008-1

AM Martins, A Ascenso, A Costa, S Simoes, HM Ribeiro, J Marto (2023) '4 Topical dosage forms bioequivalence at a glance. In: C Vitorino, M Miranda, A Almeida, J Sousa (ed) Time-proof perspectives on bioequivalence, Nova Science Publishers, ISBN: 979-8-88697-604-5

Rodrigues JS, Camões SP, Serras AS, JP Miranda. 2023. Metodologias avançadas in vitro para avaliação da toxicidade alimentar. In Toxicologia alimentar. eds. Nuno G. Oliveira, Ricardo Dinis Oliveira & Félix Dias Carvalho. Lidel. Cap. 23

Vicente-Saez, R., Windeck, J., Ribeiro, M. H. L., Rousi, A., Rovira Fernandez, A., Legrand, A., Rodrigues, C., Halverson, K., & Cappelluti, F. (2023). Unite! handbook of best practices for effective mainstreaming of open science and innovation at Universities. Unite! Alliance Publications. https://doi.org/10.5281/zenodo.10262984

M. H. Ribeiro, A.C. Severo "Advances on Resources, Biosynthesis Pathway, Bioavailability, Bioactivity, and Pharmacology of Hesperetin". In Handbook of Dietary Flavonoids. Ed. J. Xiao, Springer, Cham 2023. Online ISBN978-3-030-94753-8. Print ISBN978-3-030-94753-8

M.H. Ribeiro, P. Lage (2023). Naringin: Advances on Resources, Biosynthesis Pathway, Bioavailability, Bioactivity, and Pharmacology. In Handbook of Dietary Flavonoids. Ed. J. Xiao, Springer, Cham. 2023. Online ISBN978-3-030-94753-8. Print ISBN978-3-030-94753-8

V. Lopes de Andrade. Biomarkers of Toxic Metals. 1st Ed. CRC Press Taylor & Francis Editors. 2023 302 pg. ISBN: 1000954331.

José Brito, Nuno Taveira, Ana Isabel Fernandes (Editors). 2023. The 6th International Congress of CiiEM—Immediate and Future Challenges to Foster One Health. Medical sciences Forum. MDPI Books. ISBN: 978-3-0365-9174-2; DOI: 10.3390/books978-3-0365-9175-9

José Brito, Nuno Taveira and Ana I. Fernandes. Preface of the 6th Congress of the Egas Moniz Centre for Interdisciplinary Research—Immediate and Future Challenges to Foster One Health. In: José Brito, Nuno Taveira, Ana Isabel Fernandes (Editors). 2023. In: The 6th International Congress of CiiEM—Immediate and Future Challenges to Foster One Health. Medical sciences Forum. MDPI Books, P. 1-3. ISBN: 978-3-0365-9174-2; DOI: 10.3390/books978-3-0365-9175-9 (Book) (Reprinted from: Med. Sci. Forum 2023, 22, 22, doi:10.3390/msf2023022022.)

Inês Moranguinho, Pedro Borrego, João Lavrado, Rui Moreira and Nuno Taveira. New Compound Combining an Integrase-Targeting Aptamer and a Small Interfering RNA Targeting the Trans-Activation Response/Poly A Region of HIV-1 Potently Suppresses HIV-1 Replication, In: José Brito, Nuno Taveira, Ana Isabel Fernandes (Editors). 2023. In: The 6th International Congress of CiiEM—Immediate and Future Challenges to Foster One Health. Medical sciences Forum. MDPI Books. P. 55-61. ISBN: 978-3-0365-9174-2; DOI: 10.3390/books978-3-0365-9175-9 (Book) (Reprinted from: Med. Sci. Forum 2023, 22, 23, doi:10.3390/msf2023022023.)

Natalia Aniceto, Alex Freitas, Taravat Ghafourian. Modelling ADME/TOX for Drug Discovery in the Age of Data, Springer Handbook of Chem- and Bioinformatics.

Internationalization

Addressing current health problems requires a multidisciplinary approach which often implies the constitution of highly collaborative international teams. imed researchers have demonstrated their commitment with internationalization, both in funding and publications.

International collaborations

Over the year imed researchers have established a strong network of collaborations with prestigious international institutions. The following list highlights some of the international institutions that had active collaboration with imed scientist throughout 2023.

University of Newcastle Upon Tyne

Universiteit Antwerpen

Universidad Complutense de Madrid

Alma Mater Studiorum- Universita di Bologna

INSTRUCT-ERIC

Academisch Ziekenhuis Groningen

Technische Universitaet Muenchen

Stichting Radboud Universitair Medisch Centrum

Universidad del Pais Vasco/ euskal Herriko Unibertsitatea

LXBIO-Pharmaceuticals SA

MC Shared Services, SA

Ascenza Agro SA

Institute of Organic chemistry with Centre for Phytochemistry – Bulgarian Academy of Sciences (IOCPP-BAS)

University of Jyväskylä (JYU)

Tampere University (TUNI)

Biodonostia- Health Research Institute

Centre for Cooperative Research on Biomaterials (CIC biomaGUNE)

INSERM, University of Toulouse

Université de Lausanne (UNIL)

Tel Aviv University (TAU)

University of Eastern Finland (UEF)

University of California, San Francisco

University of Bari Aldo Moro- Department of Biosciences, Biotechnology and Biopharmaceuticals

Technical University Munich- Chemistry Department

Centro de Investigacion Principe Felipe

Institut National de la Santé et de la Recherche Medicale (INSERM)- Unit 1259 MAVIVH

Sorbonne Université Institut Pariesien de Chimie Meléculaire

Karolinska Institutet- Department of Medical Biochemistry and Biophysics

Faculty of Veterinary, University of Santiago of Compostela

Department of Pharmaceutical and Medicinal Chemistry, Eberhard-Karls-Universität Tübingen

Participation in international projects (ongoing in 2023)

Dana-FENS Brain Awareness week grants 2023

FENS DANA BAE 2023

PI: Joana Amaral

Rifabutin liposomes: a novel nanotechnological strategy for effective treatment of systemic methicilin-resistant staphylococus aureus infections

PI: Manuela Gaspar

RIPK3 biology and targeting in metabolic liver disease

CaixaResearch Health Call 2021

PI: Cecília Rodrigues

Targeting TDP-43 with protein kinase inhibitors: a effective and measurable therapy for ALS

CaixaResearch Health Call 2021

PI: Dora Brites

Protecting the brain from metastatic breast cancer

CaixaResearch Health Call 2021

PI: João Gonçalves

Multifunctional nano-immunotherapy against breast brain metastases

CaixaResearch Health Call 2022

PI: Helena Florindo

Valorização sustentável das plantas endógenas do Parque Natural da Serra da Estrela para aplicações na indústria farmacêutica

Programa Promove 2022

PI: João Lopes

Unraveling the role of glial cells in AESACS Rationale

Ataxia Charlevoix-Saguenay Foundation

PI: Adelaide Fernandes

Biotransformação de resina proveniente de Pinus para a produção de biofixadores de pigmentos naturais com aplicação têxtil

PT2020- CENTRO 2020 2 POR Lisboa 2020

PI: Carlos Afonso

Proof of concept for biological activity of cannabinoids and terpenes - cosmeceutical applications

PT2020 – POR Lisboa 2021

PI: Catarina Pinto Reis

Liver Investigation: Testing Marker Utility in steatohepatitis

LITMUS (777377)

PI: Cecília Rodrigues

Straightening training, research and innovation capacities in the valorisation of bio-renewable resource

Biomass4Synthons (H2020-Widespread-2018-2020 (GA 951996))

PI: Carlos Afonso

Protease-guided tumour targeting tools to revolutionize cancer diagnosis and treatment

OncoProTools (HORIZON-MSCA-2021-DN-01 (GA 101073231))

PI: Rui Moreira

Discovering chronic inflammation biomarkers that define key stages in the Healthy-to-NASH (non-alcoholic steatohepatitis) transition to inform early prevention and treatment strategies

halt-RONIN (HORIZON-HLTH-2022-STAYHLTH-02 (GA 101095679))

PI: Joana Miranda

Targeting Circadian Clock Dysfunction in Alzheimer's Disease

TClock4AD (HORIZON-MSCA-2021-DN-01 (GA 101072895))

PI: Rita Guedes

From fragments to high affinity binders interfacing integrated structural biology, medicinal chemistry and artificial intelligence

Fragment-Screen (HORIZON-INFRA-2022-TECH-01 (GA 101094131))

PI: Tiago Rodrigues

More Effectively Using Registries to suppOrt PAtient-centered Regulatory and HTA decision-making

More-EUROPA (HORIZON-HLTH-2022-TOOL-11 (GA 101095479))

PI: Bruno Sepodes

Next Generation Vaccines against Gastrointestinal Mucosal Pathogens, using Helicobacter pylori as Model Pathogen

Vax2Muc (HORIZON-HLTH-2022-DISEASE-06-wo-stage (GA 101080486))

PI: António Almeida

Accelerating drug repurposing for rare neurological, neurometabolic and neuromuscular disorders by exploiting SIMilarities in clinical and molecular PATHology

SIMPATHIC (HORIZON-HLTH-2022-DISEASE-06-two-stage (GA 101080249))

PI: Sofia de Oliveira Martins

FUnctional Nucleic Acids as Versatile SMart BUilding BLocks in Non-ConventIonal SolvenTs

FUNAMBULIST (HORIZON-EIC-2022-PATHFINDEROPEN-01 (GA 101099652))

PI: Carlos Afonso

Biofriendly decontamination of Chemical Warfare Agents

EnzIL (SPS G713- NATO)

PI: Carlos Afonso

National R&D, Production, Marketing and Distribution Platform for Innovative

Bio-Hub (PRR 28)

PI: João Gonçalves

Plataforma de Valorização, Industrialização e Inovação Comercial para o AgroAlimentar

VIIAFOOD (PRR 37)

PI: Helena Ribeiro

TEC4GREEN

BTEC4GREEN (PRR 13)

PI: Helena Ribeiro

Iron-triggered technologies as a novel targeted therapy for cancer

Ravine (Fundação la Caixa CI22-00103)

PI: Diogo Magalhães e Silva

Participation in national and international networks

imed scientists participate in an extensive number of international networks that strength transnational collaboration with the objective of addressing important scientific problems. The following list highlights some of the networks that include imed scientists in 2023.

EU-OPENSCREEN

In 2023, imed became a partner site of the EU-openscreen, which is the most extensive European high-performance screening network. This network collaboratively develops novel molecular tool compounds and early therapeutic candidate molecules together with external users from various disciplines of the life sciences.

VectorB2B

imed became a founding member of VectorB2B that aims provide services to drug development programs via CDMO/CRO integrated services. This is a non-profit association that resulted from the shared initiative of seven entities: iMed.Lisboa - Faculty of Pharmacy, University of Lisbon, Faculty of Medicine, University of Lisbon, Faculty of Veterinary Medicine, University of Lisbon, University of Coimbra, Medinfar, BeVaG and TechnoPhage. These shareholders are a strong and complementary set of academic partners and biotech companies renowned in the health sector in Portugal. Together, they form a robust asset of knowledge and innovation, particularly in the domain of biological therapeutics, across the whole chain of development with focus on drug discovery, toxicology, chemistry manufacturing and controls (CMC) and CRO.

Marie Skłodowska-Curie Innovative Training Networks (MSCA ITN)

H2020 MSCA-ITN-ETN - OncoProTools 2022-26

imed: Maria Santos and Rui Moreira

Innovative Medicines Initiative - Research and Innovation Action (IMI-RIA)

H2020 IMI-RIA 2017-22 - Litmus - Liver investigation: Testing marker utility in steatohepatitis

imed: Cecilia Rodrigues

Marie Skłodowska-Curie Innovative Training Networks (MSCA ITN)

HORIZON-MSCA-2021-DN-01 — MSCA Doctoral Networks 2021. Targeting Circadian Clock Dysfunction for Alzheimer's Disease (TClock4AD) (2022-2027). 101072895

PI: Laura Bolognesi, Bologna; Team Member: Rita Guedes

Horizon Europe

Vax2Muc – Next generation vaccines against gastrointestinal mucosal pathogens, using Helicobacter pylori as model

imed: António Almeida https://www.vax2muc.eu

SIMPATHIC Consortium – Horizon Europe program funded project comprises 22 partners, including research teams from academic centres in Europe and Canada, European patient and training organizations, companies, and collaborating with pan-European research infrastructure platforms for medicines repurposing

EATRIS, REMEDi4ALL, REPO4EU

HORIZON-WIDERA-2023-ACCESS-03-01 - Raise excellence in Research & Science & Innovation in HEI for widening countries (2023-2028)

imed: Maria H. Ribeiro

European Cooperation in Science and Technology (COST)

Action CA20121

Bench to bedside transition for pharmacological regulation of NRF2 in non-communicable diseases 2021-2025

imed: Andreia Neves Carvalho, Margarida Castro-Caldas

Action CA22125

Precision medicine in biliary tract cancer (Precision-BTC-Network) 2023-2027

imed: Marta Afonso | Awarding coordinator; National management committee member

Action CA19124

Rethinking Packaging for Circular and Sustainable Food supply chains of the Future (CIRCUL-A-BILITY) 2021-2025

imed: Ana Bettencourt

Action CA21108

European Network for Skin Engineering and Modelling (NETSKINMODELS), 2021-2025, Portuguese Management Committee

imed: Sandra Simões; Manuela Carvalheiro

Action CA19140

Focused Ion Technology for Nanomaterials (FIT4NANO)

imed: Catarina Reis

Action 18125

Advanced Engineering and Research of aeroGels for Environment and Life Sciences (AERoGELS)

imed: Catarina Reis

Action CA17140

Nano2Clinic Cancer Nanomedicine - from the bench to the bedside, 2018-2023

imed: Manuela Gaspar; Catarina Reis

Action CA15216

European Network of Bioadhesion Expertise: Fundamental Knowledge to Inspire Advanced Bonding Technologies (ENBA)

imed: Catarina Reis

Action CA21154 - Translational control in Cancer European Network (TRANSLACORE)

imed: Graça Soveral

Action CA17104 - New diagnostic and therapeutic tools against multidrug resistant tumours (STRATAGEM - PANDORA)

imed: Graça Soveral

Action CA20121 - Bench to bedside transition for pharmacological regulation of NRF2 in noncommunicable diseases (BenBedPhar)

imed: Inês V. da Silva

Action CA 21147 - ENOTTA - European Network on Optimising Treatment with Therapeutic Antibodies in chronic inflammatory diseases

imed: Paulo Paixão

CA19144 - Venon: European Venom Network - 2020-2024

imed: Joana Miranda

CA17112 - Prospective European Drug-Induced Liver Injury Network (PRO-EURO-DILI-NET) – 2018-2023

imed: Joana Miranda, Ana Serras and Joana Rodrigues

CA17112 - Prospective European Drug-Induced Liver Injury Network (PRO-EURO-DILI-NET) – 2018-2023

imed: Joana Miranda, Ana Serras and Joana Rodrigues

CA17112 - Prospective European Drug-Induced Liver Injury Network (PRO-EURO-DILI-NET) – 2018-2023

imed: Joana Miranda, Ana Serras and Joana Rodrigues

CA20121 - Bench to bedside transition for pharmacological regulation of NRF2 in noncommunicable diseases (BenBedPhar) – 2021-2025

imed: Joana Miranda, Nuno Oliveira and Joana Rodrigues

CA20140 - CorEuStem: The European Network for Stem Cell Core Facilities (CorEuStem) – 2021-2025

imed: Joana Miranda and Catarina Trigo

CA21149 - Reducing acrylamide exposure of consumers by a cereals supply-chain approach targeting asparagine (ACRYRED) – 2022-2026

imed: Nuno Oliveira

CA21145 - European Network for diagnosis and treatment of antibiotic-resistant bacterial infections (EURESTOP)

imed: Maria Santos

CA18117 - European network for Gynaecological Rare Cancer research: From Concept to Cure

imed: Maria Santos

CA18127 - International Nucleome Consortium

imed: Alexandra Paulo

CA17112 - Prospective European Drug-Induced Liver Injury Network (PRO-EURO-DILI-NET) (2018-2023)

CA18133 - European Research Network on Signal Transduction (2019-2023)

CA18122 - European Cholangiocarcinoma Network EURO-CHOLANGIO-NET (2019-2023)

CA18116 - Aniridia: networking to address an unmet medical, scientific, and societal challenge. Management Committee member and Working member

Susana Solá

Fundação la Caixa

Fundação "la Caixa" – Fundación Luzón – DRUGS4ALS - Targeting TDP-43 with protein kinase inhibitors: an effective and measurable therapy for ALS (FFUL/iMed.ULisboa: Dora Brites, 2021-2023)

EU4Health 2021 Work Program (ongoing)

Delivering Unified Research Alliance of Biomedical and Public Health Laboratories Against Epidemics (DURABLE)

imed: Helena Rebelo de Andrade

Plano de Recuperação e Resiliência

PRR - Bio-Hub - National R&D Platform for Production, Commercialization and Distribution of Innovative Biopharmaceuticals

UNITE! University Network for Innovation, technology and Engineering

Research and Innovation Framework Programme: CSA-LSP-101017408 H2020 - Planning the Future of Research & Innovation in the European University Alliance UNITE! - Open Science and Innovation 2020-23

imed: Maria H. Ribeiro

European Universities Erasmus-Intensification of prior deep institutional transnational cooperation: ERASMUS-EDU-2022-EUR-UNIV-1: Unite! University Network for Innovation, Technology and Engineering - 2022-2026

imed: Maria H. Ribeiro

Bilateral action

Portuguese coordinator of the bilateral actional Portugal-Hungary - Design and synthesis of hybrid compounds with enhanced anti-tumor potential

imed: Maria Santos

Publication with international teams

37% of imed publications result from ongoing projects involving international collaborators. The following examples, reflect some of the outputs in 2023 of these collaborations.

Hepatitis B and C in Europe: an update from the Global Burden of Disease Study 2019

https://doi.org/10.1016/S2468-2667(23)00149-4

Performance of non-invasive tests and histology for the prediction of clinical outcomes in patients with non-alcoholic fatty liver disease: an individual participant data meta-analysis.

https://doi.org/10.1016/S2468-1253(23)00141-3

ARBM101 (Methanobactin SB2) Drains Excess Liver Copper via Biliary Excretion in Wilson's Disease Rats

https://doi.org/10.1053/j.gastro.2023.03.216

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6. Leadership & Recognition

Participation in national & international institutions

Prizes and recognitions

Participation in national & international institutions

imed scientist have been actively involved in the governing bodies of national and international institutions. The following list highlights some of these activities.

International

Maria Alexandra Brito

Delegate and Secretary of the European Federation of Experimental Morphology

https://efem.eu/council-of-delegates/

Isabel Rivera

Member of the Steering Committee of GalNet (The Galactosemia Network)

https://www.galactosemianetwork.org/

Margarida F.B. Silva

Advisory Board Deputy of ERNDIM (European Research Network for evaluation and improvement of screening, Diagnosis, and treatment of Inherited disorders of Metabolism) created for the Quality Assurance in Laboratory Testing for Inborn Errors of Metabolism

https://www.erndim.org/

Catarina Reis

Vice-president STSMs da COST Action 19140

https://www.cost.eu/actions/CA19140

Ana Bettencourt

Technical Advisor in ISO Technical Committees, ISO/TC 150 SC "Implants for Surgery"; ISO/TC 194, "Biological and clinical evaluation of medical devices" since 2015

https://www.iso.org/technical-committees.html

António J. Almeida

Perito de Qualidade, Agência Europeia do Medicamento (EMA)

https://www.ema.europa.eu/en/homepage

Madalena Pimentel

Research Grant Reviewer for ESCMID, 2023

https://www.escmid.org/

Associate Editor of Frontiers in Microbiology, section Antimicrobials, Resistance and Chemotherapy

https://loop.frontiersin.org/people/623428/overview

Guest Associate Editors of Frontiers in Microbiology, section Virology, under the Research Topic "The Latest Conquests on Viruses of Microbes"

https://www.frontiersin.org/research-topics/43499/the-latest-conquests-on-viruses-of-microbes

Member of the Reviewer Board of Viruses

https://www.mdpi.com/journal/viruses/submission_reviewers

Guest Editor of Viruses, Special Issue: Bacteriophage Lytic Proteins

https://www.mdpi.com/journal/viruses/special_issues/978ECU4P0M

Carlos São-José

Member of the evaluation committee of abstracts submitted to ECCMID 2024 - European Congress of Clinical Microbiology and Infectious Diseases

https://www.eccmid.org/

Review editor for Frontiers in Microbiology (section of Antimicrobials, Resistance and Chemotherapy) and for Frontiers in Molecular Biosciences (section of Molecular Diagnostics and Therapeutics)

https://loop.frontiersin.org/people/294385/overview

Guest Associate Editors of Frontiers in *Microbiology*, section Virology, under the Research Topic "The Latest Conquests on Viruses of Microbes"

https://www.frontiersin.org/research-topics/43499/the-latest-conquests-on-viruses-of-microbes

Member of the Editorial board of the journal Microorganisms (section Molecular Microbiology and Immunology)

https://www.mdpi.com/journal/microorganisms/sectioneditors/molecular_microbiol_immunol?page_no=2

Guest Editor of *Microorganisms*, Special Issue: Bacteriophage-host Cell Interactions: from Biology to the Control of Bacterial Infection

https://www.mdpi.com/journal/microorganisms/special_issues/KS3GAE2P91

Cecília Rodrigues

Editorial Board, Journal of Hepatology

https://aasldpubs.onlinelibrary.wiley.com/hub/journal/15273350/editorial-board/editorial-board

Associate editor, Hepatology

https://aasldpubs.onlinelibrary.wiley.com/hub/journal/15273350/editorial-board/editorial-board

Executive editor, Journal of Physiology and Biochemistry

https://aasldpubs.onlinelibrary.wiley.com/hub/journal/15273350/editorial-board/editorial-board

Marta Afonso

European Association for the Study of the Liver (EASL) young investigator (YI) task force

2020-2023

Maria M. M. Santos

Member of the International Advisory Board of ChemMedChem (Wiley).

https://chemistry-europe.onlinelibrary.wiley.com/journal/18607187

Cristina M. M. Almeida

Member of Drinking Water Directive Working Group (DWD WG) of ECHA (European Chemical Agency)

https://echa.europa.eu/documents/10162/5052411/dwd_cv_almeida_en.pdf/093fed74-0245-c92a-dbb8-14b563d80326?t=1694779489380

Vasco Branco

External Expert of the European Food Safety Authority (EFSA), 2023-2027 - call for Scientific and Technical Support - Various Scientific and Communication Profiles - EOI/EFSA/2022/01

https://drive.google.com/file/d/1YqB2NZQHDyzTae7HRViWKXFiXXhXqCPd/view

Dora Brites

Expert for QS World University Rankings questionnaire of the University of Bologna

https://www.unibo.it/en/university

Member Directory Alzaforum: Networking for a Cure

https://www.alzforum.org/member-directory/dora-brites

Elsa Anes

Evaluation of grants submitted to UKRI – UK Research and Innovation, Medical research council, London. Reference: MR/Y013158/1

Graça Soveral

Chair and Member of the Executive Committee of the Federation of European Biochemical Societies (FEBS)

https://www.febs.org/about/organization-and-governance/febs-executive-committee/

Member of the Council of the IUBMB (International Union of Biochemistry and Molecular Biology)

https://iubmb.org/

Helena F. Florindo

Chair: Controlled Release Society – Focus Group Nanomedicine and Nanoscale delivery

https://www.controlledreleasesociety.org/focus-groups/nanomedicine-and-nanoscale-delivery-nnd

President, Spanish-Portuguese Local Chapter of the Controlled Release Society

https://www.splc-crs.org/about-us/board

Helena Margarida Ribeiro

Technical Committee Chairperson – ISO Cosmetics

Joana Miranda

Chair of the communication subcommittee of the Federation of European Toxicologists and European Societies of Toxicology

https://www.eurotox.com/

João Almeida Lopes

Member of the Council of the European Federation of Pharmaceutical Sciences (EUFEPS)

Portuguese representative on the steering committee of the Chemometrics Study Group of EuChemMS Division of Analytical Chemistry

João Fernandes Pinto

Member of the steering committee of the Pharmaceutical Solid State Research Cluster (PSSRC)

João Rocha

Member of the Committee for Orphan Medicinal Products (COMP)

European Medicines Agency (EMA)

Clinical Pharmacology Expert

European Medicines Agency (EMA)

Bruno Sepodes

Vice-Chair of the Committee or Human Medicinal Products (CHMP)

European Medicines Agency

https://www.ema.europa.eu/en/committees/chmp/members

Member (Portugal) of the Committee or Human Medicinal Products (CHMP)

European Medicines Agency

https://www.ema.europa.eu/en/committees/chmp/members

Member (Portugal) of the Committee of Advanced Therapies (CAT)

European Medicines Agency

https://www.ema.europa.eu/en/committees/cat/members

Co-Chair of the Emergency Task Force (ETF)

European Medicines Agency

https://www.ema.europa.eu/en/documents/other/composition-emergency-task-force-etf-therapeutic-response-covid-19-monkeypox-public-health_en.pdf

Member of the Assembly and Representative of the Assembly at the Management Committee

ICH – International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use

https://www.ich.org/page/members

Henrique Silva

National Representative of the Latin Society for Vascular Research (LIAC)

https://latinoruminvestigatorum.jimdofree.com/

Paulo Paixão

Member of the Methodological Working Party at EMA

https://www.ema.europa.eu/en/committees/working-parties-other-groups/chmp/methodology-working-party

Member of the Expert Working Group of the ICH M13 bioequivalence Guideline

https://www.ich.org/page/multidisciplinary-guidelines

Expert representing the EMA on the development of the International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use (ICH) M13 Guideline on Bioequivalence for Immediate-Release Solid Oral Dosage Forms

Carla Torre

Co-opted Member (Pharmacoepidemiology expert) nominated by the European Commission

Committee or Human Medicinal Products (CHMP)

European Medicines Agency (EMA)

Member of the Methodology Working Party (MWP)

European Medicines Agency

Beatriz Silva Lima

Member of Advisory Board of AICIB - Agency for Clinical Research and Biomedical Innovation

Alexandra Paulo

Member of the Evaluation Panel of Italian Association for Cancer Research Individual Grants

Member of Editorial Board of Scientific Reports

Member of Reviewers Editorial Board of Frontiers in Chemistry

Maria M.M. Santos

Member of the International Advisory Board of ChemMedChem (Wiley-VCH)

Expert for STEP 2/3 evaluations - Full proposals only HORIZON-EIC-2023-ACCELERATOR-01– European Innovation Council (EIC) Accelerator 2023 - €1.13 billion for start-ups and SMEs to develop and scale up high impact innovations with the potential to create new markets or disrupt existing ones

Maria José U. Ferreira

Vice-president of executive committee of the Phytochemical Society of Europe

Nuno Taveira

Cofounder (with Nico Pfeifer from Max Planck Institute for Informatics) and curator of the web tool coreceptor-hiv2.geno2pheno.org

http://coreceptor-hiv2.geno2pheno.org/index.php

Editorial Board Member of section Molecular Microbiology of International Journal of Molecular Sciences (IJMS) journal (MDPI group), Switzerland

https://www.mdpi.com/journal/ijms/sectioneditors/molecular_microbiology

Review Editor for Experimental Pharmacology and Drug Discovery Frontiers in Pharmacology

https://loop.frontiersin.org/people/476379/overview

Associate Editor for Molecular Viral Pathogenesis Frontiers in Cellular and Infection Microbiology

https://loop.frontiersin.org/people/476379/overview

Review Editor for Antivirals and Vaccines Frontiers in Virology (Frontiers group), Switzerland

https://loop.frontiersin.org/people/476379/overview

Editorial Board Member of Diagnostic Microbiology and Infectious Diseases Section of Diagnostics journal (MDPI group), Switzerland

https://www.mdpi.com/journal/diagnostics/sectioneditors/infectious_disease_diagnostic?page_no=2

Member of the Comissão de Garantia da Qualidade para o Ensino (CGQE), Egas Moniz School of Health & Science, Monte de Caparica, Portugal.

Coordinator of the PhD program in Biomedical Sciences at the Instituto Universitário Egas Moniz, Portugal.

Research Associate (collaborator) at Coimbra Chemistry Centre (CQC), Department of Chemistry, University of Coimbra, 3004-535, Coimbra, Portugal

Research Associate (collaborator) at Centro de Investigação Interdisciplinar Egas Moniz (CiiEM), Egas Moniz School of Health & Science, Monte de Caparica, Portugal

Rita Guedes

Coordinator member Paul Ehrlich MedChem Euro-PhD Network

http://www.pehrlichmedchem.eu/

Rui E. Castro

European Association for the Study of the Liver (EASL)

https://easl.eu

- eLearning Advisor (2021-2023)
- Basic Science Taskforce member (2021-2023)
- Scientific Committee member (2023-present)
- Basic Science Taskforce Coordinator (2023-present)

Education Committee member and E-Learning Editor at United European Gastroenterology (UEG)

https://ueg.eu/education

UEG's representative, together with Professor Markus Peck Radosavljevic, at the European Medicines Agency (EMA) Healthcare Professionals' Working Party (HCPWP)

https://www.ema.europa.eu/en/committees/working-parties-other-groups/chmp/healthcare-professionals-working-party

Tiago Rodrigues

Full Member at Acceleration Consortium, Canada

Early Career Board at Journal of Medicinal Chemistry from American Chemical Society.

Mercator Fellow at Molecular Machine Learning Priority Program by Deutsche Forschungsgemeinschaft (DFG, German Research Foundation)

Rui Moreira

President and member of the executive commission of the European Federation for Medicinal Chemistry and Chemical Biology

https://www.efmc.info/

Susana Solá

Member of the Editorial Board of Scientific Reports: Cellular Plasticity Collection

https://www.nature.com/collections/hdaaagbgjc

Member of the Editorial Board of Antioxidants

Member of the Editorial Board of Scientific Reports – Category: Stem Cells and Development

https://www.nature.com/srep/about/editors#medicine_section

Member of the Editorial Board of Antioxidants - Special Issue on: Redox Signaling Regulation in Neurological Disorders

National

Adelaide Fernandes

Member of the board of Portuguese Glial Network

https://redeglial.weebly.com/about.html

Afonso Cavaco

Conselho Nacional para a Cooperação, Ordem dos Farmacêuticos

https://www.ordemfarmaceuticos.pt/pt/a-ordem-dos-farmaceuticos/conselhos-consultivos/conselho-nacional-para-a-cooperacao/

João Rafael Gonçalves

Prática Farmacêutica em CCI, Paliativos e Geriatria, Ordem dos Farmacêuticos

https://www.ordemfarmaceuticos.pt/pt/

Maria Alexandra Brito

Vice-President of the Fiscal Council of the Portuguese Anatomical Society

https://sociedadeanatomica.pt/sap-aap/corpos-sociais/

Isabel Rivera

President of the General Assembly of Sociedade Portuguesa de Doenças Metabólicas

https://www.spdm.org.pt/

Paula Leandro

President of the Supervisory Board of Sociedade Portuguesa de Doenças Metabólicas

https://www.spdm.org.pt/

Margarida F. B. Silva and Paula Leandro

PParticipation in Multidisciplinary Working Groups (medical doctors, biochemists, and nutritionists) focusing in updating patient´s protocols, collaboration in training activities and multicentre scientific production (Margarida Silva– Fatty acid β-oxidation disorders; Paula Leandro - Aminoacidophaties)

António J. Almeida

Member of the steering committee of the National Laboratory for Medicines, representing the Ministry of Science, Technology and Higher Education

https://lm.exercito.pt/

Perito da Comissão de Avaliação de Medicamentos (CAM), INFARMED

https://www.infarmed.pt/web/infarmed

Maria Manuela Gaspar

Presidente da Mesa de Assembleia da Sociedade Portuguesa Ciências em Animais de Laboratório (SPCAL)

https://www.spcal.pt/en/page/8

Membro da Rede Nacional de Órgãos Responsáveis pelo Bem estar dos Animais

https://redeorbea.spcal.pt/page1.html

Sandra Simões

Membro da Rede Nacional de Órgãos Responsáveis pelo Bem estar dos Animais

https://redeorbea.spcal.pt/page1.html

Catarina Reis

Perito da Comissão de Avaliação de Medicamentos (CAM), INFARMED

https://www.infarmed.pt/web/infarmed

Carlos Afonso

Member of the Academy of Sciences of Lisbon

https://www.acad-ciencias.pt/

Madalena Pimentel

Member of the Scientific Committee of the Congress of Microbiology and Biotechnology 2023, held from 07 to 09 December, in Covilhã, Portugal

https://microbiotec23.organideia.com/committees/

Cecília Rodrigues

Universidade de Lisboa Vice-Rector for research, innovation and development

https://www.ulisboa.pt/membro-equipa/cecilia-maria-pereira-rodrigues

Cristina M. M. Almeida

Member of the Technical Committee CT 72, Water Quality, of the Portuguese Environment Agency (APA) in its capacity as Sectoral Standardisation Body (ONS/DGA), in coordination with the Portuguese Institute for Quality (IPQ)

https://storagewebsiteipq.blob.core.windows.net/website/CT-072-3.pdf

Cristina Sampayo

Expert member of the Direção Geral de Alimentação e Veterinária (DGAV) since 2015

https://www.dgav.pt/

José Miguel Azevedo-Pereira

Member of Grupo de Trabalho de Doenças Infecciosas da Rede Temática Transversal da Saúde - rede SAÚDE, from Universidade de Lisboa

Member of direction board of Sociedade Portuguesa de Virologia

Joana Marques Marto

INFARMED
National specialist on the quality assessment of drugs, 2022 - present

Sociedade Portuguesa de Ciências Cosmetológicas
Secretary, 2022 – present

Pedro Contreiras Pinto

INFARMED
National specialist on the PK assessment of drugs, 2002 - present

Joana Miranda

Co-Coordenadora do Registo Português de Toxicologistas (ERT, European Registered Toxicologist), certificado pela Sociedade Europeia de Toxicologia (EUROTOX)

Member of the executive commission of the Portuguese Society for Stem Cells and Cell Therapies

http://spce-tc.org/

President of the fiscal council of the Portuguese Society of Pharmacology

https://spfarmacologia.pt/

Nuno Oliveira

Coordinator of the toxicology section of the Portuguese Society of Pharmacology

https://spfarmacologia.pt/

Ana Catarina Godinho

FLxFlow - The Lisbon Flow Cytometry Network: Ana Catarina Godinho

https://flxflow.pt

Joao Goncalves

Member of the Administration Boad of Vector B2B – Collaborative Laboratory

https://vectorb2b.com

Member of the Administration Boad of Bio-Hub – National R&D Platform

https://www.bio-hub.pt/

João Almeida Lopes

President of the Portuguese Society for Pharmaceutical Sciences (SPCF)

President of the Analytical Chemistry Division of the Portuguese Chemistry Society (SPQ)

João Rocha

Member of Medicines Evaluation Board (CAM)
INFARMED I.P.

Member of the Committee of Pharmacy and Therapeutics (CFT) Regional Health Administration (ARS - Lisboa e Vale do Tejo)

Consultant Member of the Technical Committee of Covid-19 Vaccination (CTVC)
DGS (Directorate-General of Health)

Member of the Supervising Board of the Pharmacovigilance Unit of Lisboa, Setúbal e Santarém

Expert Member of the Veterinary Medicines Evaluation Group (GAMV) Direção-Geral da Alimentação e Veterinária (DGAV)

Expert Member of the Pythopharmaceutical Products and Biocides Evaluation Group (GAPF&B) Direção-Geral da Alimentação e Veterinária (DGAV)

Bruno Sepodes

Member of Medicines Evaluation Board (CAM)
INFARMED I.P.

https://www.infarmed.pt/web/infarmed/institucional/estrutura-e-organizacao/comissoes-tecnicas-especializadas/comissao-de-avaliacao-de-medicamentos

Paulo Paixão

Member of the Medicines evaluation Board at INFARMED

https://www.infarmed.pt/web/infarmed/institucional/estrutura-e-organizacao/comissoes-tecnicas-especializadas/comissao-de-avaliacao-de-medicamentos

Rui Pinto

Member of the Medicines Evaluation Committee
INFARMED - Ministry of Health
Portugal

Expert of Evaluation of Plant Protection Products
DGAV - Ministry of Agriculture
Portugal

Member of the External Advisory Board
Health & Technology Research Center – Lisbon
Member of the Board of the Order of Pharmacists

Carla Torre

Member of Medicines Evaluation Board (CAM)
INFARMED I.P.

Member of the Supervising Board of the Pharmacovigilance Unit of Lisboa, Setúbal e Santarém

Maria H. Ribeiro

College of Food, Farming and Foresty (F3) - Coordinating Council (2021-2024)

College of Chemistry of ULisboa (CQUL) - Executive Committee For Pedagogical Affairs (2021-2024)

Alexandra Paulo

Member of the iMed Committee for the implementation of the Quality Management System

Ana Paulo Francisco

Member of the Committee for Evaluation of Medicines-Infarmed Autoridade Nacional do Medicamento e Produtos de Saúde IP, Portugal

Maria M.M. Santos

Evaluator of PhD fellowship proposals submitted to the Chemistry panel, Fundação para a Ciência e Tecnologia (2023 Call for PhD Scholarships)

Pedro Gois

President of the Medicinal Chemistry and Chemical Biology division of the Portuguese Chemical Society

https://www.spq.pt/associates/divisions

Susana Solá

Member of the Governing Board of the Portuguese Society for Stem Cells and Cell Therapies
Coordinator of the Section: Stem Cell and Science

http://spce-tc.org/about-spce-tc/governing-board/

Member of the Executive Commission of the Mind-Brain College of ULisboa

https://sites.google.com/edu.ulisboa.pt/mind-brain-ulisboa

Prizes & recognitions

imed scientist have been awarded several distinctions for that scientific and social activities. The following list highlights some of these awards

Adelaide Fernandes

Research project 2023, BIOCODEX MICROBIOTA FOUNDATION

https://www.biocodexmicrobiotafoundation.com/national-research-grant/2023-portugal-winner

Maria Alexandra Brito

Delegate and Secretary of the European Federation of Experimental Morphology

https://efem.eu/council-of-delegates/

Vice-President of the Fiscal Council of the Portuguese Anatomical Society

https://sociedadeanatomica.pt/sap-aap/corpos-sociais/

Hana Pavlu-Pereira

Prize for best poster- 19th International Symposium SPDM 2023

"Evaluation of Mitochondrial Function on Pyruvate Dehydrogenase Complex Deficient Patient-derived Cell Lines"

Catarina Madeira

Honourable mention for best poster -19th International Symposium SPDM 2023

"Targeting the stability and activity of medium chain acyl-CoA dehydrogenase p.K329E variant with penta- and hexapeptides"

Ana Bettencourt (co-author)

Prémio Congresso 2023 na Categoria de Investigação da Sociedade Portuguesa de Estomatologia e Medicina Dentária",

Sociedade Portuguesa de Estomatologia e Medicina Dentária, 2023

https://congresso.spemd.pt/

Ana Bettencourt and Lídia Gonçalves

Menção Honrosa, Bolsa de Inovação Secção Regional do Sul e Regiões Autónomas da Ordem dos Farmacêuticos (Binov2023)

Ordem dos Farmacêuticos, 2023

https://www.ordemfarmaceuticos.pt/pt/noticias/bolsa-de-inovacao-para-projetos-do-imed-e-cefar/

António Almeida (co-author)

Prémio APFH-IPSEN

Formulações Orais Pediátricas: Novos Rumos

Portuguese Association of Hospital Pharmacists

António Almeida (co-author)

Bolsa de Inovação da Secção Regional do Sul e Regiões Autónomas da Ordem dos Farmacêuticos (BInov), Vademecum de formulações para impressão 3D de medicamentos

António Almeida

World's Top 2% Scientists list - Updated science-wide author databases of standardized citation indicators", J. Baas, K. Boyack e J. P.A. Ioannidis, University of Stanford, 2023

Lídia Gonçalves (co-autor)

Prémio Professor Miguel Faria

XIX Montenegro International Veterinary Congress, October 13-14, 2023, Santa Maria da Feira, Portugal

Catarina Reis

World's Top 2% Scientists list - Updated science-wide author databases of standardized citation indicators", J. Baas, K. Boyack e J. P.A. Ioannidis, University of Stanford, 2023.

Marine Drugs 2023 Most Popular Preprints Award initiated by Preprints.org.
Most Viewed Papers in 2023 in the Section "Cancer Metastasis", Cancers

Best Oral presentation, "Aerogels for biomedical and environmental applications", 3rd International Conference, Maribor, Slovenia, 5-7t July of 2023

Cecília Rodrigues

World's Top 2% Scientists

Stanford University & Elsevier

Joana Amaral

FENS/Dana Foundation prize

Brain Awareness Week 2023

Cristina M. M. Almeida

Certificate of Excellence, Best Poster Award

"Optimization and Validation of Micro-FTIR Method for the Analysis of Microplastics in Drinking Water"

PTIM, 5th International Caparica Conference on Pollutant Toxic Ions and Molecules

https://www.ptim2023.com/

Dora Brites

Honorable mention – best abstract writing - Matos AT, Martínez A, de Lago E, Vaz AR, Brites D. Terapias emergentes na ELA: explorando o composto IGS-2.7 na preservação da homeostasia celular no ratinho TDP-43. I Seminário Apela(r) para as Doenças Neurodegenerativas, November 17-18, 2023.
Outstanding Author 2021 by the Pediatric Medicine Journal (PM, Pediatr Med, ISSN 2617-5428, Dora Brites)

Mulheres na Ciência, 4ª edição, Ciencia Viva, Dia Internacional da Mulher, March 8, Pavilhão do Conhecimento, Lisboa (Dora Brites Distinction)

Helena Rebelo de Andrade

Louvor da Direcção Geral da Saúde

Emitido pela Directora Geral da Saúde

Louvor nº 187/2023, Diário da República, 2ª série, nº 101, de 25 de maio de 2023

No contexto do trabalho junto da Direcção Geral da Saúde na resposta à pandemia da COVID-19 e na defesa da Saúde Pública

Filipa Cosme Silva e Joana Marques Marto

IPSEN Award – Innovation for Patient Care, Portuguese Association of Hospital Pharmacists

Joana Marques Marto

Bolsa de Inovação da Secção Regional do Sul e Regiões Autónomas da Ordem dos Farmacêuticos (BInov), Vademecum de formulações para impressão 3D de medicamentos

World's Top 2% Scientists list University of Stanford, 2023

Sérgio Camões

Best Poster Award for the work "IFN-γ and TNF-α preconditioning enhances the MSC's immunosuppressive and tissue regenerative abilities".

European Tissue Repair Society (ETRS), 2023

Ana Sofia Serras

Top 4 Abstract for the work "Exosomes derived from mesenchymal stem cells exposed to hepatic injury signals reveal a distinct protein signature associated to pro-regenerative effects"

Molecular Toxicology Speciality Section, European Society of Toxicology (EUROTOX), 2023.

Best Poster Award for the work "Exosomes derived from MSCs primed with APAP injury signals reveal a pro-regenerative signature"

Portuguese Network on Extracellular Vesicles (PNEV), 2023

Joana Rodrigues

Best Poster Award for the work "Development of a stem cell-derived hepatocyte-like cell model to study hepatic insulin resistance"

imed.ULisboa Meeting, 2023

Cardoso S, Gonçalves L, Díaz-Rodríguez P, Landin M, Ribeiro IAC, Bettencourt A.

Prémio "Menção Honrosa, Bolsa de Inovação Secção Regional do Sul e Regiões Autónomas da Ordem dos Farmacêuticos (Binov2023), project "Revolutionizing Implant Infection treatment with 3D-printed Antimicrobial Devices"

Gonçalo Felizardo, Ana Bettencourt, Jaime Portugal, Rodrigo Malheiro, Isabel AC Ribeiro e Cristina Bettencourt

Prémio Congresso 2023 na Categoria de Investigação da Sociedade Portuguesa de Estomatologia e Medicina Dentária, título "Atividade antibiofilme de resina de impressão 3D para prótese com veiculação de fármaco"

Sara Cardoso (PhD student); A Bettencourt; IAC Ribeiro

Best Oral Communication: Category "Research Initiation": Optimizing chitosan-starch hydrogels for 3D printing of customized scaffolds. 14º Congresso das Farmácias, Associação Nacional das Farmácias, Portugal

Margarida Espadinha

EFMC-YSN PhD PRIZE

Rita Emídio/Alexandra Paulo

Best poster Award. "Targeting the c-MYC G4 with indoloisoquinoline derivatives: a computational approach", 3rd Meeting of Young Biophysicists, Porto, Portugal

Inês Bártolo

Prize Génese Program, Gilead, Portugal

José Marcelino

Prize Génese Program, Gilead, Portugal

Pedro Góis

Scientific Award Universidade de Lisboa/Caixa Geral de Depósitos in the field of Chemistry and Chemical Engineer

https://www.ulisboa.pt/noticia/premios-cientificos-universidade-de-lisboacaixa-geral-de-depositos-2023

André Simão

Award for Best Oral Presentation presented at Congresso Português de Hepatologia 2023, for the work entitled "Papel funcional do recetor TGR5 na comunicação entre o tecido adiposo e o fígado no contexto do fígado gordo"

Rui Moreira

Award for the Best Oral Presentation

2nd Meeting of the Portuguese Network on Extracellular Vesicles

NOVA Medical School, Lisbon, Portugal

https://www.nms.unl.pt/en-us/nms/news-and-events/events/detalhe/eventid/8744

Award for the Best Oral Presentation

ETRS & SPCE-TC Joint Meeting 2023

University of Coimbra, Coimbra, Portugal

https://etrs-spce2023.cnc.uc.pt/

ANNUAL REPORT 2023

7. Communication, Dissemination & Outreach

Communication & dissemination of results

Outreach activities

Other selected activities

imed on the news

The European Charter for Researchers clearly states that researchers have the duty to actively engage in the communication of science to the public. imed is deeply committed with this goal and we have actively engaged in different communication, dissemination, and public outreach activities during 2023.

Communication & dissemination of results

Website and social media

imed website (https://imed.ulisboa.pt/) is our primary mechanism of communication with the public. The website is frequently updated with information about research areas, scientific production, research groups, facilities, job offers, training programs and comprehensive information about the institute's activities and research outputs. The institute communication is further complemented with activity on social networks like Facebook, LinkedIn, Twitter.

Conferences

imed communicates with the scientific community mainly by publishing in peer-reviewed journals, though, scientific results are also disseminated through the regular participation in international conferences as well as local scientific meetings.

Imed post-graduate students (ipSC)

The institute post-graduate students are also actively contributing to the institute communication and dissemination of results namely by organizing the 14th iMed.ULisboa Meeting on 26th of June 2023. This event counted with the active participation of over 100 post-graduate students which contributed with oral and poster presentations, and plenary lectures.

Outreach activities

imed aims to connect with the society by sharing the knowledge produced by us researchers with the public and by encouraging the venue of young students and scientific curious citizens to our labs to discover our most recent breakthroughs. In 2023, imed participated in several outreach activities including “Brain awareness week-2023” created by the Dana Foundation, USA, which aims to raise awareness among the general public, particularly students, of the progress and benefit of brain study by lectures at High School and venue of students to imed. Also, in close collaboration with CienciaViva imed participated in “Ciência Viva no Laboratório - Ocupação Científica de Jovens nas Férias”, where imed received 20 high school students in 10 different activities, with the main objective of opening the paths to convergence with the principles of promoting experimental science teaching and attracting scientific careers among secondary school students. Also, with the activity entitled “Era uma vez o medicamento...” during “Semana da Ciência e Tecnologia”, aiming to open Scientific Institutions and Universities to the general public in order to provide the population with opportunities for scientific observation and personal contact with specialists from different areas of knowledge. Furthermore, several imed researchers that are also Professors at the FFULisboa have participated in the annual ULisboa outreach event for the high school students “O dia aberto da FFULisboa” and “Verão na ULisboa”, where the Pharmaceutical Sciences course from the FFULisboa is publicized.

Other selected activities

Participação na "Noite Europeia dos Investigadores", uma iniciativa desenvolvida pela Comissão europeia com o objetivo de promover atividades que aproximem os cientistas do público

http://noitedosinvestigadores.org

Seminar, Intelligent Biomaterials for the Treatment of Autoimmune Diseases and Cancer, Professor Nicholas Peppas, December 15th, Faculty of Pharmacy, University of Lisbon

https://imed.ulisboa.pt/2022/12/02/seminar-intelligent-biomaterials-for-the-treatment-of-autoimmune-diseases-and-cancer/

Helena Florindo

Podcast #36 - Infeciologia: problemas de não haver novos antibióticos da Sociedade Portuguesa de farmacêuticos em Cuidados de saúde

https://www.youtube.com/watch?v=YKOeQcLOmmg

José Miguel Azevedo-Pereira

Ocupação Científica de Jovens nas Férias 2023 – Faculdade de Farmácia da Universidade de Lisboa – iMed, "Queres combater a invasão microbiana no mundo dos dispositivos médicos?", Ciência Viva

Isabel Ribeiro

miRNAs in ALS: Cell-free based therapies for miRNA modulation. Report FFULisboa, Drugs4ALS, Madrid

Dora Brites

Coordination of the Ph.D. Advanced Course in Stem Cell Technologies 2023, integrated into the Ph.D. Programs of both Faculty of Pharmacy, ULisboa and the Champalimaud Foundation

imed on the news

Podcast

“Micotoxinas poderão estar na origem do surto associado à broa de milho”

https://www.publico.pt/2023/08/10/ciencia/noticia/micotoxinas-poderao-estar-origem-surto-associado-broa-milho-2059891

Cristina M.L. Carvalho

Interview in the blog mulheres cidadãs: “Entrevista Joana Miranda, bióloga - Mulheres cidadãs” (radioalma.eu)

https://radioalma.eu/mulheres/2023/10/18/entrevista-joana-miranda-biologaμ/

Joana Miranda

“A fenilcetonúria como modelo para o desenvolvimento de novas abordagens terapêuticas”. Sociedade Portuguesa de Doenças Metabólicas Podcast

Podcast #33 - Vacinas antituberculose. Sociedade Portuguesa de Farmacêuticos em Cuidados de Saúde

https://www.youtube.com/watch?v=FbTC2w7iQAg

Elsa Anes

Podcast #36 - Infeciologia: problemas de não haver novos antibióticos. Sociedade Portuguesa de Farmacêuticos em Cuidados de Saúde

https://www.youtube.com/watch?v=FbTC2w7iQAg

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imed is a FCT funded research centre UIDB/04138/2020; UIDP/04138/2020 but we don't act alone. Every in-house member at imed advances our purpose but we also collaborate with some distinguished external partners.


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