



Fundação  
para a Ciência  
e a Tecnologia

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# Atlas of Associate Laboratories

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2022

## **PORTUGUESE ATLAS OF ASSOCIATE LABORATORIES, 2022**

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# Index

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<b>01</b>	Executive Summary	8
<b>02</b>	Foreword Manuel Heitor	12
<b>03</b>	Foreword Helena Pereira	16
<b>04</b>	Introductory Context	22
	4.1 The institutional research landscape in Portugal	23
	4.2 FCT role in R&D funding and evaluation	28
	4.3 Associate Laboratories	30
<b>05</b>	The Associate Laboratories, from 2021 on	36
	5.1 Overall characterization	37
	5.2 List of Associate Laboratories	42
<b>06</b>	Annex	136

## 44 Natural Sciences

- 46 Aquatic Research Infrastructure Network
- 48 Centre for Environmental and Marine Studies
- 50 Global Change and Sustainability Institute
- 52 Centre for Marine and Environmental Research
- 54 Institute for Health and Bioeconomy
- 56 Institute Dom Luiz
- 58 Institute of Molecular Sciences
- 60 Research Network in Biodiversity and Evolutionary Biology
- 62 Institute for Systems and Computer Engineering, Research and Development
- 64 Institute for Plasmas and Nuclear Fusion
- 66 Laboratory of Physics for Materials and Emergent Technologies
- 68 Associated Laboratory for Green Chemistry - Clean Technologies and Processes
- 70 Intelligent Systems Associate Laboratory
- 72 Laboratory for Instrumentation and Experimental Particle Physics
- 74 Life Sciences for a Healthy and Sustainable Future

## 76 Engineering and Technology Sciences

- 78 Associate Laboratory in Chemical Engineering
- 80 Advanced Production and Intelligent Systems
- 82 Aveiro Institute of Materials
- 84 Institute of Nanostructures, Nanomodelling and Nanofabrication
- 86 Associate Laboratory, Life and Health Sciences Research Institute / Biomaterials, Biodegradables and Biomimetics Research Group
- 88 Institute for Systems and Computer Engineering, Technology and Science
- 90 Institute of Telecommunications
- 92 Associate Laboratory on Biotechnology, Bioengineering and microElectro-mechanical Systems
- 94 Associate Laboratory of Energy, Transports and Aerospace
- 96 Laboratory of Robotics and Engineering Systems

## 98 Medical and Health Sciences

- 100 Center for Innovative Biomedicine and Biotechnology - Associate Laboratory
- 102 Institute for Research and Innovation in Health
- 104 Institute of Molecular Medicine João Lobo Antunes
- 106 Laboratory for Integrative and Translational Research in Population Health
- 108 Translation and Innovation towards Global Health
- 110 Health Research Network: From Lab to Community Health

## 112 Agricultural Sciences

- 114 Associate Laboratory for Animal and Veterinary Sciences
- 116 Centre for Biotechnology and Fine Chemistry
- 118 Institute for Innovation, Capacity Building and Sustainability of Agri-Food Production
- 120 Associate Laboratory for Sustainability and Technology in Mountain Regions
- 122 Laboratory for Sustainable Land Use and Ecosystem Services

## 124 Social Sciences

- 126 Centre for Social Studies
- 128 Institute of Social Sciences, University of Lisbon
- 130 Socio Digital Laboratory for Public Policy

## 132 Humanities

- 134 Associate Laboratory for Research and Innovation in Heritage, Arts, Sustainability and Territory

# Executive Summary

## 01

## Associate Laboratories at a Glance

Portugal has seen in the last decades a continuing and consistent development of its research and innovation system with an increase in number of researchers and PhD awards as well as in internationally refereed publications. From 2001 to 2020, R&D expenditure increased from 0.76% to 1.62%, with R&D expenditure in the corporate sector rising from 31.8% to 56.9% of the total of the GDP.

Since its foundation in 1997, 25 years ago, the Fundação para a Ciência e a Tecnologia (FCT), the national agency for the public funding of science, supports the various R&D programmes and has been the main driver for science development in Portugal. In 2021, FCT funding totalled 569 M€, including R&D structures (20% of the total), scientific employment contracts (21%), scholarships (19%), projects (23%), international cooperation (19%) and other transversal activities (5%).

The research performing organizations are the backbone of the national science and knowledge creation. They include R&D units, Associate Laboratories, State Laboratories, Collaborative Laboratories, Scientific Infrastructures as well as interface entities.

Associate Laboratories are one of the institutional building blocks of the national science system, accredited through a selection process led by FCT. They are Research Units or consortia of Research Units that commit themselves to contribute to the design and implementation of public policies in science and technology and receive the Associate Laboratory statute as given by FCT. The concept started in 2000 with 4 Associate Laboratories which increased to 26 Associate Laboratories in 2011. In 2020, FCT launched the first open and competitive call for Associate Laboratories with an external evaluation of the applications. A total of 40 Associate Laboratories statutes were awarded, starting in 2021, integrating 100 Research Units and approximately 9700 researchers

(6400 FTE researchers). The activities specific to the Associate Laboratories were funded with 23, 708 M€ for the period 2021-2025.

The distribution of the Associate Laboratories by scientific domain shows that the highest number is in Natural Sciences (15 Associate Laboratories, 38% of the total) and the lowest in Humanities (one Associate Laboratory, 3%). The average dimension is 242 (160 FTE) researchers per Associate Laboratory, ranging from 192 (114 FTE) researchers in Agricultural Sciences to 462 (227 FTE) researchers in Humanities.

Beyond the importance of an institutional framework for undertaking activities in research, technological development and innovation in all their dimensions of collaboration, interaction with multiple sectors and knowledge valorisation, as well as for providing researchers with structured careers, the Associate Laboratories are at the interface with public administration, government and society to provide science based information for decision making and to foster studies targeted to establish knowledge grounds in the process of public policies design and implementation.

This Atlas of the Associate Laboratories in Portugal presents a summary for each of the 40 Associate Laboratories, organized by scientific domain, and including their strategic aims, description, and activities. It complements the already published Atlas of Research Units that summarises the information on the 312 Research Units that integrate the national science and technology system.

On the year of its 25th, FCT is building up the process of presenting to the society the integrated landscape of the institutional actors that make up the national science ecosystem.



# Foreword

# Manuel Heitor

# 02

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## About the Atlas of Associate Laboratories in Portugal, 2021-2022

**Manuel Heitor**  
Minister for Science,  
Technology and Higher Education

The publication of this **Atlas of Associate Laboratories** by the time of the 25th anniversary of the Portuguese Foundation for Science and Technology, FCT (1997-2022), acknowledges the institutional development of science in Portugal, with the development of large and strong scientific institutions over the last decades.

The **40 Associate Laboratories** described in the Atlas resulted from a peer review process launched in 2019, following the 6th national assessment exercise of R&D units of 2017-18.

Since the creation of the Portuguese Ministry for Science and Technology, in 1995, by José Mariano Gago, national assessment exercises of R&D units occur every four years and are today well established as the founding principle for the institutional landscape of research in Portugal, following the best international practices.

The 40 Associate Laboratories, associating excellent and large R&D units and consortia of R&D units, signed contract programs with FCT for up to 10 years to strengthen pluriannual funding of large scientific institutions and guarantee the continuous development of new scientific questions and stimulate new developments at the frontiers of knowledge. They represent relevant institutions to foster opportunities for young scientists and ensure a sustainable future for the next generation of researchers, giving the institutional framework for a continuing increase of R&D expenditure, to reach an overall R&D investment of 3% of GDP by 2030. Above all, the 40 Associate Laboratories listed in the Atlas have accompanied the evolution of a dynamic institutional landscape that should make us all proud, but also encourage us to continue to do more and better.

Total expenditure on R&D in Portugal has reached a historic value in 2020, representing 1.62% of GDP (while it was

1.2% in 2015, after 1.5% in 2010, but only about 0.3% in the 1980s), being particularly significant in the business sector, which now represents 57% of total R&D expenditure (it was 46% in 2015 and less than 20% in the 1980s). This evolution has been accompanied by reinforcement of tax incentives for R&D activities in companies and by the increase of the national capacity to attract competitive European funds of centralized management (i.e., through the European Framework Programmes for Research and Innovation, including H2020 for 2014-2020 and Horizon Europe since 2021), and decentralized structural funds (namely FEDER and ESF). At the same time, the total number of researchers measured in “Full-Time Equivalent - FTE”, reached 10.2 researchers per thousand active population in 2020 (while it was 7.4 in 2015), surpassing the European average and including about 40% of researchers in business firms.

Beyond these and other statistical information, I argue that the value of this Atlas and the description of the 40 Associate Laboratories, following the release of the Atlas of Research Units bringing together the existing 312 R&D units, fully captures the intrinsic value of the institutional organization of science and technology in Portugal. These two Atlas show a diversified set of institutional arrangements, as well as of skills throughout **all areas of knowledge**, supported by research careers and an institutional setting very much associated with higher education institutions, as well as research infrastructures.

Their critical role at the national level must be understood in the context of an institutional background of an increasingly complex, diversified, and densified institutional landscape for research and innovation. The 40 Associated Laboratories and the 312 R&D units interact with their associated academic and scientific settings and

are complemented by 35 Collaborative Laboratories and about 30 Technology and Innovation centers, as well as an increasingly relevant and diversified network of innovative business firms, including science-driven startups. In addition, seven State Laboratories are pursuing scientific and technological activities in association with thematic public policies under different ministries.

It is in this context that this Atlas clearly calls our attention for seven main critical issues, as follows:

- i) the critical relevance of **periodic research assessment** practices following international peer-reviews, to guarantee the continuous use of best practices worldwide;
- ii) the unique research **opportunity given to students** through their integration in Associate Laboratories and R&D units and in their ongoing research activities, giving them a research environment for their thesis and related academic work;
- iii) the need to move forward with more dynamic and diversified **scientific careers in research and academic institutions**, which are critical to further develop science, advance knowledge and guarantee the capacity to train future generations;
- iv) the critical relevance of **pursuing fundamental research** towards the advancement of knowledge, preferably in close articulation with disruptive science-driven startups to foster innovative solutions;
- v) the recognition of the critical role of the collaboration of Associate Laboratories and R&D units with **institutional intermediaries**, such as Collaborative Laboratories and Technology and Innovation centers, to help diversify research and education and promote institutional collaboration and related risk-sharing mechanisms to foster skilled job creation;
- vi) the importance of **internationalization of our Associate Laboratories and R&D units** and related migratory flows of highly skilled human resources, which call for a collective action for attracting new talents for Portugal, including students and scholars who belong to communities and/or countries at risk in need of humanitarian assistance; and
- vii) the need to better characterize and promote **participatory processes of R&D agenda setting to help engaging civil society** with scientific structures in our national and European contexts.

Overall, I would like to strongly emphasize the role that FCT plays in advancing our knowledge and understanding the foundations of R&D Units towards an “evidence-based science, technology and innovation policy” in the European context.

In this context, we should emphasize that the role of Associate Laboratories is increasingly critical and relevant for the positioning of Portugal in Europe, being clear that:

1. The FCT multi-annual public funding program for R&D institutions was reinforced by more than 80% in the last five years, growing from around 61 million euros annually in 2015 to over 120 million euros in 2021, based on 312 R&D units, 40 Associate Laboratories and also including 35 Collaborative Laboratories.
2. The expansion of Associate Laboratories, from 25 to 40 Laboratories in 2021, following an independent process of institutional peer review, allowed new scientific centralities in the regional context and new scientific areas of intervention, in a broad framework of institutional reinforcement and increased public policy response to scientific, health, social, environmental, and economic challenges.
3. The evolution of the institutional context and, in particular, of the Associate Laboratories is associated with the reinforcement of basic or fundamental R&D activities, including:
  - the promotion of scientific careers for doctorates;
  - the ability to attract talent to Portugal, in particular PhD students and researchers;
  - the European affirmation of Associate Laboratories and their ability to diversify R&D funding sources and increase funding from the European Union or other international entities.

Following the last review of the legal regime for scientific institutions (ie, the Law of Science (Decree-law nr.63/2019, May 16), public policy action has been oriented towards consolidating, strengthening, and expanding the current institutional structure for public and private R&D activities, stimulating their quality, recognizing and valuing their diversity and guaranteeing open access to scientific knowledge (ie, Open Science). The political objective for promoting new horizons of growth and affirmation considers the differentiated and competitive stimulus to the development, promotion, and selective reinforcement of Associate Laboratories towards large international R&D laboratories, effectively integrated into European networks and with attractive scientific careers, together with an active role in the support of public policies in Portugal and Europe.



Minister Manuel Heitor

# Foreword

## Helena Pereira

# 03

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# About the Atlas of Associate Laboratories in Portugal, 2021-2022

**Helena Pereira**

President of Fundação para a Ciência e a Tecnologia

The **Atlas of Associate Laboratories** provides the landscape of one of the institutional building blocks of the national science system. In a context of significant societal challenges, from climate emergency to public health and digital transition, the 40 Associate Laboratories, from all scientific domains, are responsible for supporting national science-based policies on a voluntary basis. These Associate Laboratories are Research Units or consortia of Research Units accredited through a selection process led by FCT.

As the Portuguese Foundation for Science and Technology, FCT, celebrates 25 years of funding and developing science in Portugal, we wish to share the activity of the different actors in R&D, thereby enhancing the overall knowledge of the system and the opening of collaborative synergies. We also aim at consolidating FCT's founding principles – accountability of the public funding in R&D, transparency regarding the science system, information, and dialog with the scientific and academic community and with society. Overcoming the strenuous pressure of a complex administrative and financial framework, FCT has implemented a set of important policies – simplification, regularity and predictability and sound mechanisms for the various funding instruments, – in parallel with the continuous endeavor for higher R&D funding. FCT is now developing the dissemination of structured and comprehensive information on the various institutional partners of the Portuguese science and technology system. The celebration of FCT's 25th anniversary gives a perfect setting for this communication initiative.

This Atlas follows the release, in January 2022, of the **Atlas of Research Units**, with information on each of the 312 Research Units that are R&D performers in Portugal across the different scientific domains, with an analysis of

the overall scenario of R&D in Portugal and of the role of each research unit that obtained a classification of good or above in the last external independent international evaluation carried out in 2017-2018.

In the present **Atlas of Associate Laboratories**, a similar rationale is followed with a characterization of each Associate Laboratory and of the overall system. For obtaining the statute of Associate Laboratory, an evaluation process was opened by FCT to Research Units or consortia of Research Units with a seal of very good or excellent quality obtained in the last evaluation. The proponents undergo an external maturity assessment regarding past performance and strategic plan towards the super arching goal of contributing to public policies.

The seminal idea of Associate Laboratories goes back to the year of 2000 leading to accreditation of the first 15 Associate Laboratories with a contract program with FCT signed in the period 2000-2002. As today, the statute was given to Research Units or consortia of Research Units acknowledged for their R&D strength, excellence and commitment to contribute to public policies. The number of Associate Laboratories increased and 25 Associate Laboratories did undergo an assessment in 2008-2010. In 2011, 26 Associate Laboratories signed 10-year contracts with FCT.

The National Science and Technology System (SNCT, Sistema Nacional de Ciência e Tecnologia) defined by a recent decree law, commonly named as the Law of Science (Decree-law nr.63/2019, May 16) included the Associate Laboratories among other research performing institutions, namely R&D Units and State Laboratories.

Beyond the importance of an institutional framework for undertaking activities in research, technological development and innovation in all their dimensions of collabo-

ration, interaction with multiple sectors and knowledge valorization, as well as for providing researchers with structured careers, the Associate Laboratories are at the interface with public administration, government and society to provide science based information for decision making and to foster studies targeted to establish knowledge grounds in the process of public policies design and implementation.

Associate Laboratories are very diverse reflecting the founding Research Units, institutional integration, organizational approaches and researchers' profile, as well as differentiated by their scientific scope. However, they pursue common goals, grounding their statute, and share similar commitments:

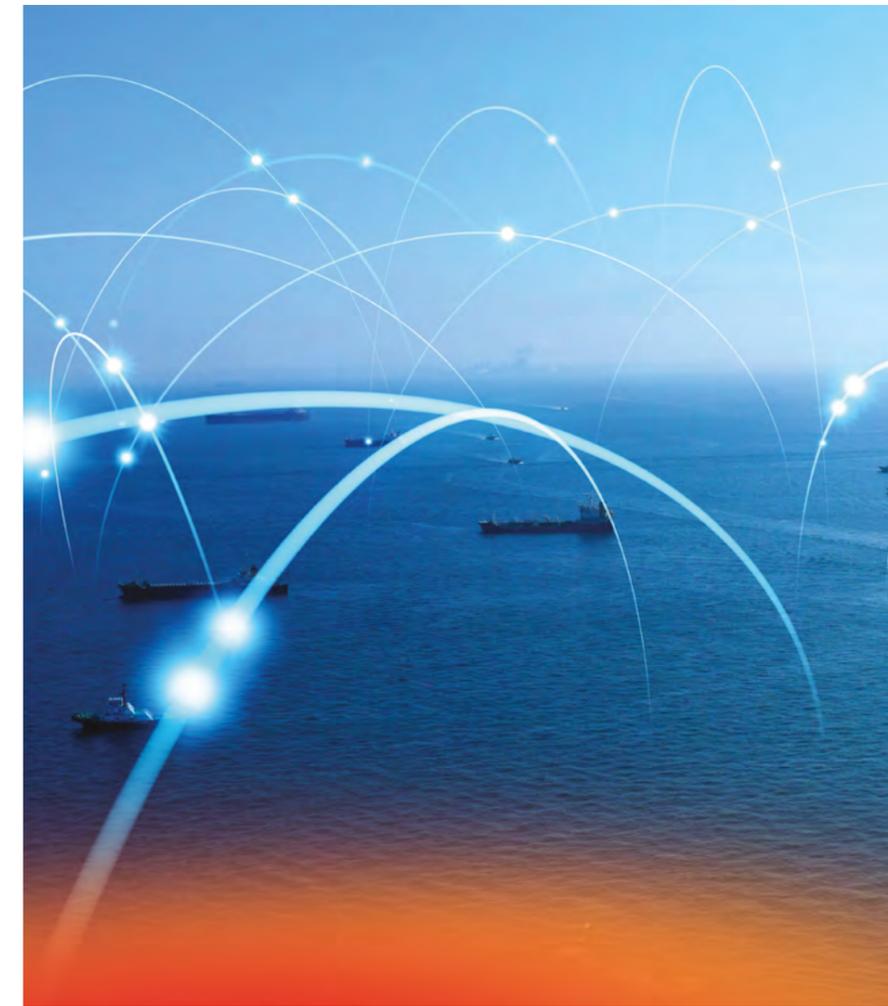
- They recommend public policies of science regarding the inclusion of fundamental science, the fostering of international commitment and the search for fund raising from international sources and private sources;
- They comply to and disseminate national commitments in science practice such as open science, including open access publication and an open data system, as well as an ethical behavior;
- The support of scientific employment is at the core of the Associate Laboratory statute by establishing a structured research career and by permanently contracting researchers;
- An external assessment of each Associate Laboratory will be made after 5 years to assess their fulfillment of the grounding principles;
- After 5 years, each Associate Laboratory must have at least 10% of the FTE number of integrated researchers with a permanent contract with the Associate Laboratory or its associated institutions;
- Associate Laboratories are to be consulted on public policies on science based on their fields of expertise.

This Atlas begins with a brief overview of the science system in Portugal, of the role of FCT in funding and evaluation, and of the overall Associate Laboratories landscape. The 40 Associate Laboratories are then introduced, including their constitutive Research Units and broad scientific domains in Agricultural Sciences, Natural Sciences, Medical and Health Sciences, Engineering and Technology Sciences, Social Sciences and Humanities.

FCT wishes this Atlas to contribute to the knowledge on Portuguese science and on the organizational architecture of the R&D performing institutions, thereby potentiating closer links to Higher Education, public administration and the economic sector.



President Helena Pereira



# Introductory Context



## 4.1 The institutional research landscape in Portugal

The last two decades have been a period of outstanding development for the Portuguese research and innovation system, with a dynamic institutional diversification in all scientific domains. The research and innovation system was legally defined and structured in 2019 by the so-called Law of Science (Decree-law nr.63/2019, May 16). The system encompasses different institutions with specific roles including funders, R&D performers and interface entities, along with scientific culture organizations of both public and private nature. The key principles underlying the system and their institutions are the following: freedom of research, responsibility, integrity, cooperation, scientific capacitation of society, promotion of scientific employment, open science, promotion of science culture, promotion of Portuguese as a science language, internationalization and interaction of knowledge and innovation. A schematic and indicative diagram of the science system is given in [Figure 1](#), showing the participant organizations and entities as well as their links and relationships. The main players in the system are briefly listed and described below.

**Fundação para a Ciência e a Tecnologia (FCT)** is the national funding agency for science supporting most R&D activities, including the research performing entities (R&D Units, Associate Laboratories, Research Infrastructures and Collaborative Laboratories), researchers, PhD scholarships, R&D projects, participation in international organizations (e.g., CERN, ESA, ESO, EMBL among others), communication and advanced computing. FCT is also partner and funder of other agencies, such as Agência Nacional de Inovação - ANI (the National Innovation Agency), Agência de Investigação Clínica e Inovação Biomédica - AICIB (Agency for Clinical Research and Biomedical Innovation), Ciência Viva and Portugal Space, and of international R&D organizations such as Laboratório Internacional de Nanotecnologia - INL (International Iberian Nanotechnology Laboratory) and the AIR Center (Atlantic International Research Center). The funding of FCT to the scientific community is based on competitive calls, always with external and independent evaluations. FCT has a central role in the development of the national science system.

**R&D Units** are the core of the scientific and technological system. They are organized structures of public or private nature that include human resources, equipment and technical infrastructures that are active in R&D, advanced education and science dissemination, working in all scientific domains and spreading over the national territory. Their statute, and funding, is given by FCT after a competitive call and evaluation for a period of 4 years. At present, there are 312 R&D Units integrating approximately 19000 researchers.

**State Laboratories** are public institutions that pursue the State defined objectives of scientific and technological policy by carrying out R&D and technical activities, with responsibilities in the support of the productive sector, also including normalization, certification, metrology and regulation, among others. State Laboratories are consulted by the Government for the definition of programs and instruments for national scientific and technological policies. There are seven State Laboratories: Instituto Hidrográfico - IH (Hydrographic Institute); Instituto Nacional de Investigação Agrária e Veterinária - INIAV (National Institute of Agrarian and Veterinary Research); Instituto Nacional de Medicina Legal e Ciências Forenses - INMLCF (National Institute of Legal Medicine and Forensic Sciences); Instituto Nacional de Saúde Doutor Ricardo Jorge - INSA (National Health Institute Doctor Ricardo Jorge); Instituto Português do Mar e da Atmosfera - IPMA (Portuguese Institute for Sea and Atmosphere); Laboratório Nacional de Energia e Geologia - LNEG (National Laboratory of Energy and Geology); and Laboratório Nacional de Engenharia Civil - LNEC (National Laboratory for Civil Engineering).

**Associate Laboratories** is a title awarded by FCT to R&D Units or consortia of R&D Units committed to contribute to public policies of science and technology and the fostering of scientific employment. The title is granted after a competitive call and external independent evaluation, for a period of 10 years, with a 5-year mid-term evaluation. At present, there are 40 Associate Laboratories in different scientific domains.

**Collaborative Laboratories (CoLAB)** are legal entities formed by a consortium that includes R&D units, interface entities, companies, and other users of knowledge-based results to pursue common agendas for short and medium-term research and innovation targeted to create knowledge based economic and social value as well as qualified employment. The CoLAB title is awarded by FCT for 5 years, after an independent international evaluation. At present, 35 CoLABs are working in different areas and addressing various goals.

**Science and technology infrastructures** are platforms, resources and associated services to be used by R&D institutions and others that were first created in 2014, following a competitive call launched in 2013, and are subject to evaluation and maturity assessment conducted by FCT. They serve the scientific community through large scale or specific equipment and tools, collections, archives and scientific data, computing and software systems, and communication networks targeted to the creation and diffusion of knowledge, including participation in internationally established R&D infrastructures. A total of 56 infrastructures integrate the National Roadmap of Research Infrastructures of Strategic Interest of which 66%

are linked to the European Strategy Forum on Research Infrastructures Roadmap. They pertain to different areas of activity (Energy, Environment, Health and Nutrition, Physical and Engineering Sciences, Social and Cultural Innovation, Digital).

**Technology and Innovation Centres** produce and disseminate knowledge targeted to business enterprises and to creation of economic value in the framework of specialization priorities at national and regional levels. Their main objective is to contribute to increase specialization in the economy and the added value of national supply, and to promote competitiveness of enterprises, namely of SMEs. The statute is given by ANI for a 6-year period after an application process and evaluation (Decree-Law 126-B/2021).

**Networks and Consortia of Science and Technology** are informal or formal organizations joining R&D entities and entities of other nature, with common agendas for research and innovation, including the structured use of scientific and technological infrastructures of common interest and the participation in internationalization processes.

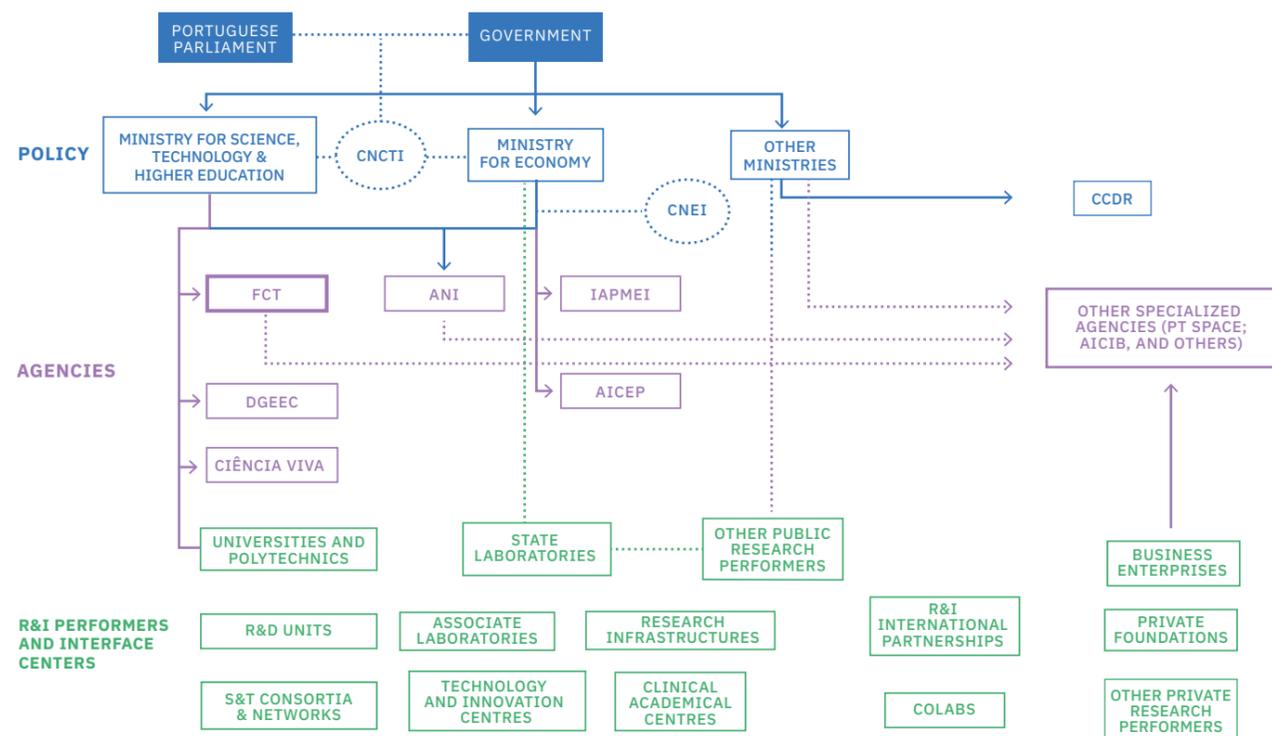


Figure 1. Schematic organizational chart of the National Science and Technology System

The national science and technology system is followed by Direção Geral de Estatísticas da Educação e Ciência - DGEEC (Directorate General for Statistics in Education and Science), responsible for the gathering, analysis and reporting of statistical data on education and science, with delegated competencies from the Instituto Nacional de Estatística - INE (Statistics Portugal). DGEEC promotes the regular survey of the national science and technology system providing the figures for R&D expenditure and number of researchers: Inquérito ao Potencial Científico e Tecnológico Nacional - IPCTN (Survey on the National Scientific and Technological Potential). The IPCTN has been annual since 2007, and biennial before that, with the last survey being held in 2020.

The scientific system has grown significantly in Portugal especially in the last 20 years. This is clearly shown by the total expenditure in R&D that amounted to 1,038 M€ in 2001, 2,758M€ in 2010 and 3,236 M€ in 2020 (Figure 2) and by the number of researchers that totaled 17,725 FTE researchers in 2001, 41,523 FTE researchers in 2010 and 53,174 FTE researchers in 2020 (Figure 3).

A change in the type and nature of the R&D performers also occurred along time. While in 2001 most R&D was performed in public institutions (State Laboratories and

R&D Units integrated in the Higher Education institutions) and in the not-for-profit private R&D Institutions (also included as R&D Units) with less R&D in the corporate sector (corresponding to 31.8% of the total R&D expenditure and 15.4% of the FTE researchers), after 20 years, in 2020, the corporate R&D represented the largest share of R&D expenditure with 56.9% of the total, and also a significant proportion of researchers with 41.3% of the total FTE researchers. The research carried out under the framework of Universities and Polytechnics, integrating the work done by their embedded R&D Units, has an overwhelming relevance for the national science system. In 2001, R&D expenditure and number of researchers classified as pertaining to the Higher Education system were, respectively, 381 M€ and 8,942 FTE researchers, rising to 1,016 M€ and 23,859 FTE researchers in 2010, and to 1,165 M€ and 28,7340 FTE researchers in 2020.

Within the Higher Education system, comprising 39 universities and 77 polytechnic institutes, most R&D is performed by the public institutions, as shown in Figure 4: in 2020, the public sector carried out 93% of the total R&D expenditure of 1,165 M€, mostly through universities with 90%, and included 93% of the total 28.7 thousand FTE researchers, also mostly in universities (Figure 4).

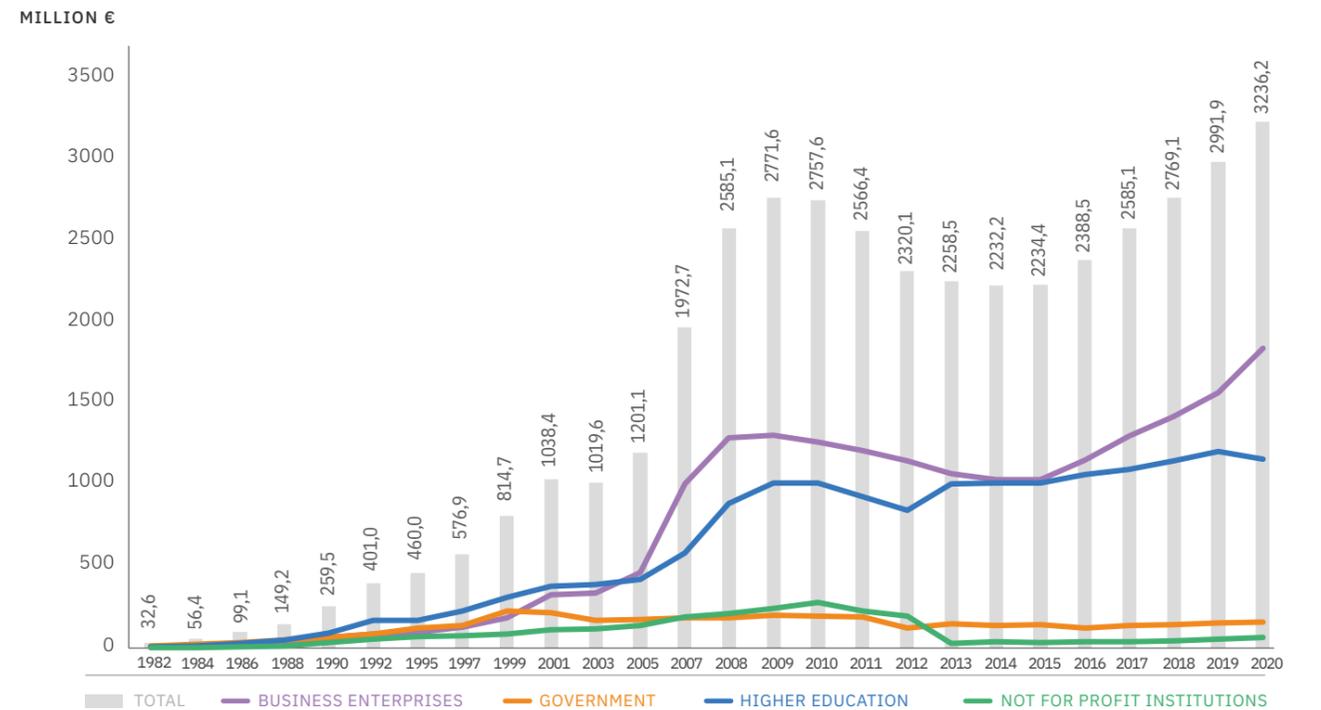


Figure 2. Total R&D expenditure (in M€) by sector of performance, from 1982 to 2020. Source: DGEEC.IPCTN

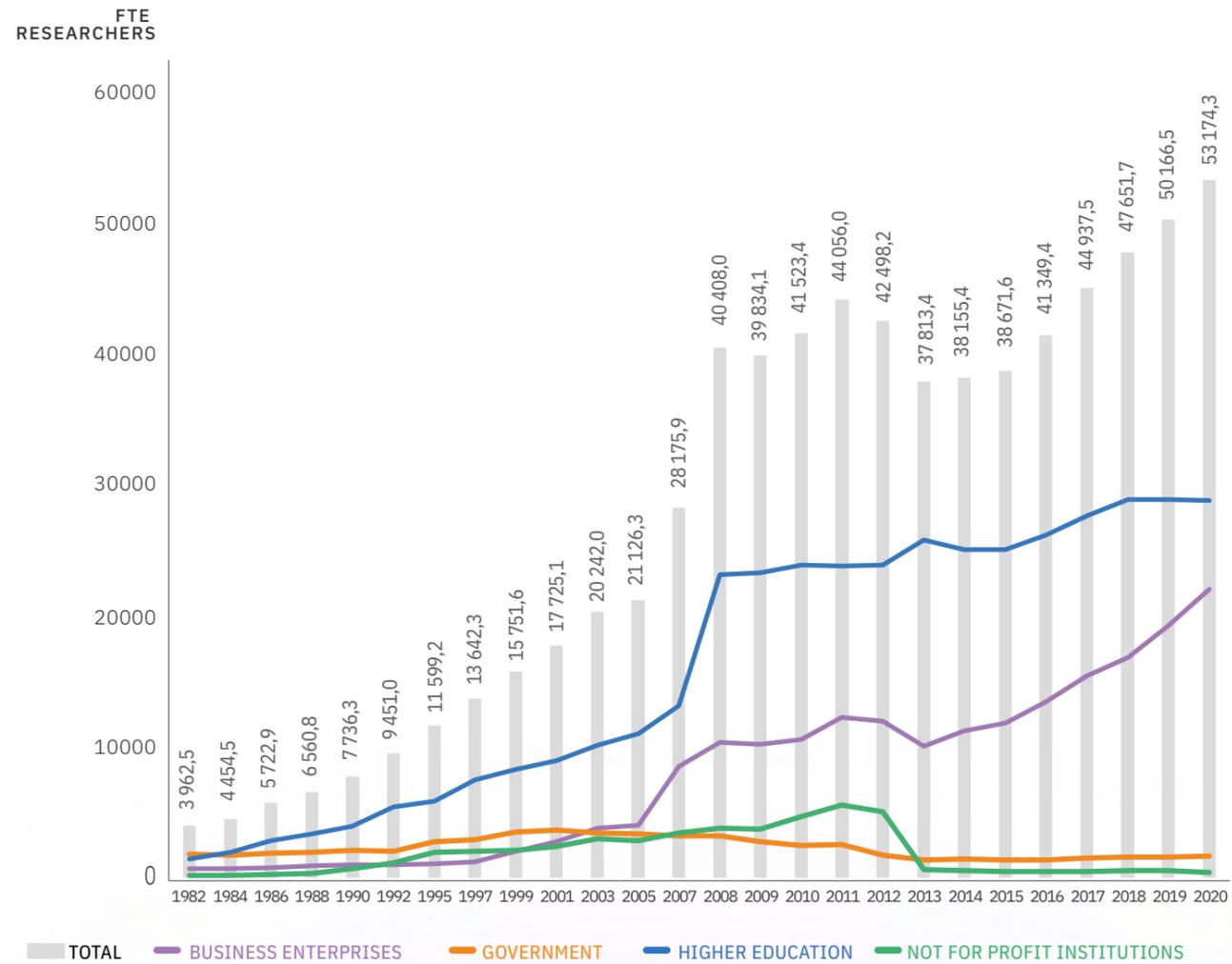
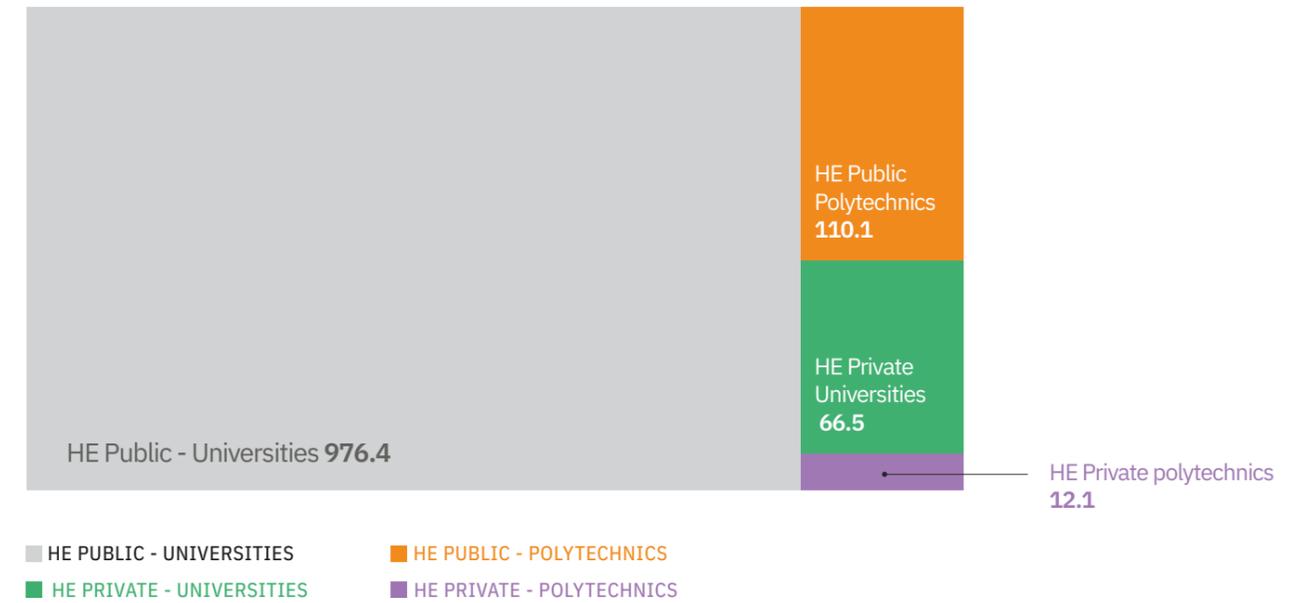


Figure 3. Total Researchers (in FTE) by sector of performance, from 1982 to 2020. Source: DGEEC.IPCTN

R&D EXPENDITURE IN HIGHER EDUCATION - MILLION EUROS



RESEARCHERS IN HIGHER EDUCATION - FTE

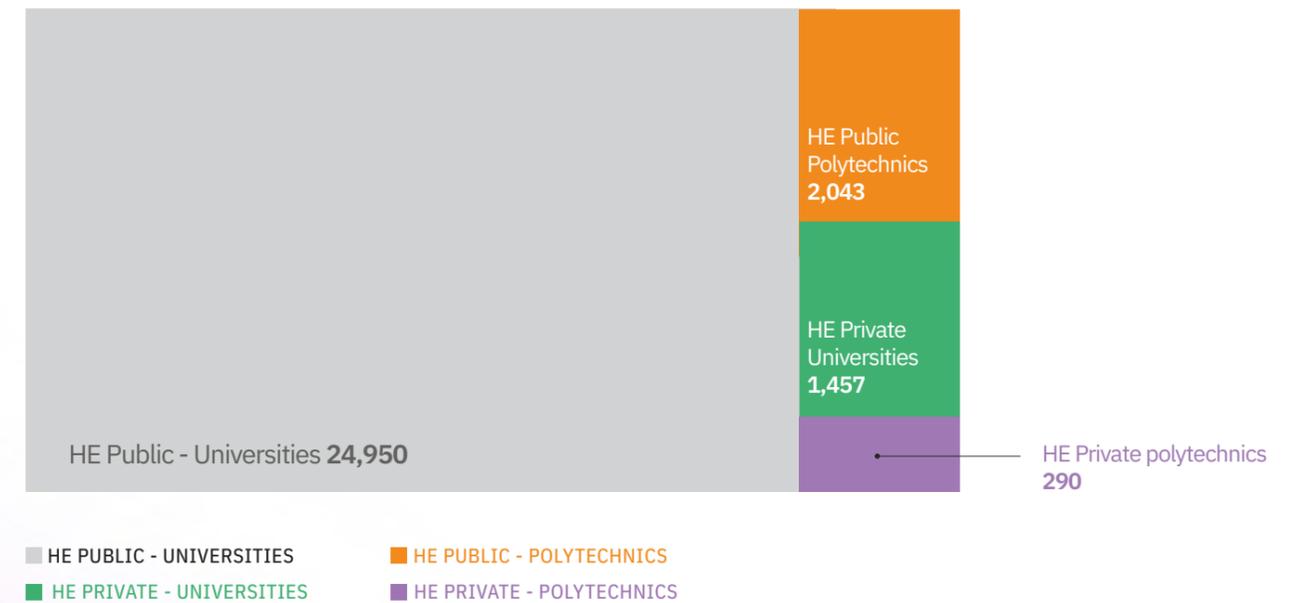


Figure 4. R&D expenditure (in M€) and researchers (in FTE), in Higher Education sector in 2020. Source: DGEEC.IPCTN

# 4.2 FCT role in R&D funding and evaluation

FCT was founded in 1997, following the creation of the Ministry of Science and Technology, in 1995, and succeeding to the former Junta Nacional de Investigação Científica e Tecnológica - JNICT (National Board for Research and Technological Research), a science and technology funding agency operating since 1967 under successive ministries in the areas of culture and science, and planning.

The mission of FCT is to promote, fund and evaluate institutions, networks, infrastructures, equipment, programs and projects, and human resources in all domains of science and technology, also including international cooperation. In 2013, the Fundação para a Computação Científica Nacional - FCCN (Foundation for National Scientific Computation) was integrated in FCT as an organic structure, keeping its functions, competencies and staff to carry the development of national scientific computation and digital communication, among others.

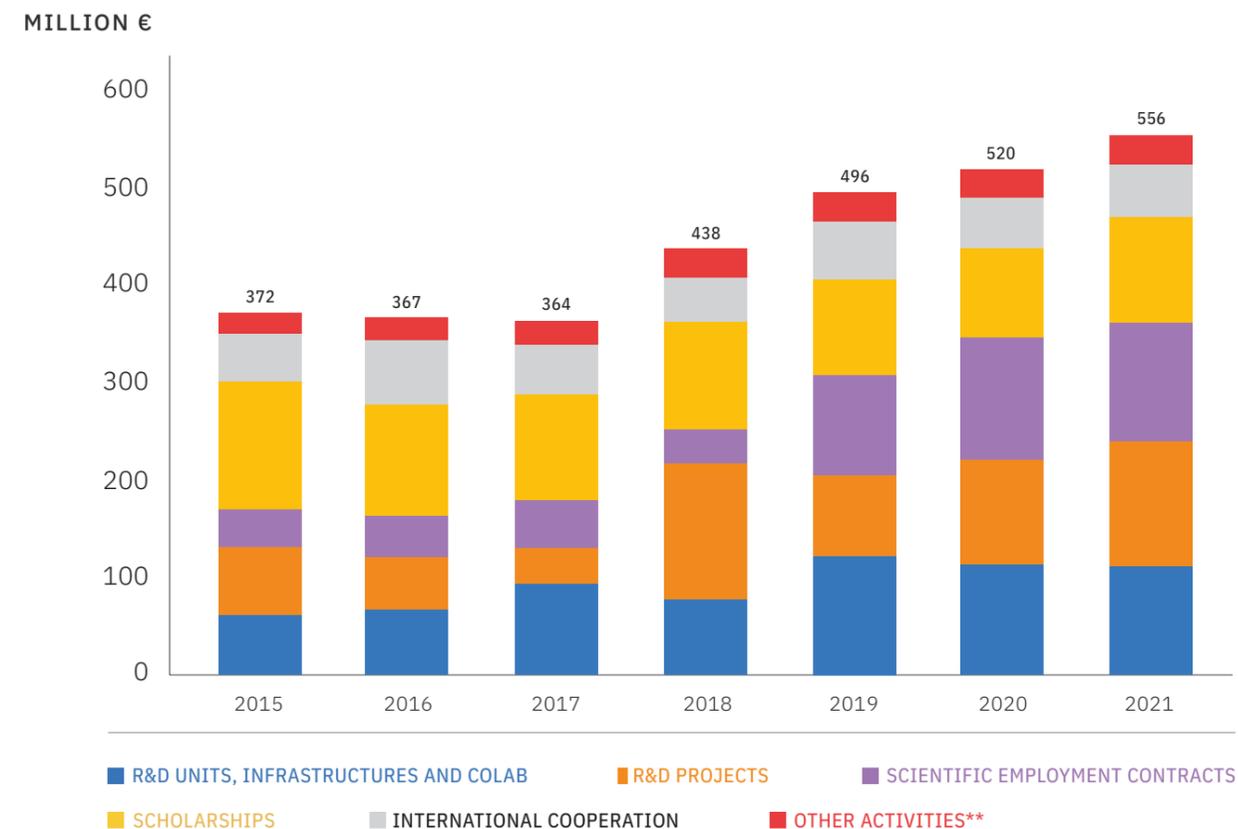
FCT is central to the national system of science and technology, and significantly contributed to its growth, consolidation and complexification along the last two decades, pursuing high quality standards and competitiveness in all scientific domains, stimulating scientific outputs and their valorization by society and the productive sector.

The funding of FCT in science covers the direct support of R&D in structures (R&D Units, Associate Laboratories, Infrastructures and CoLABs), human resources (contracts for researchers and PhD scholarships), ideas (R&D projects), international cooperation (with participation in international organizations) and in cross-cutting support of the scientific community (computing, digital communication, access to scientific information).

FCT funding is granted in the framework of competitive processes following the launch of public calls with clearly defined evaluation criteria and process guidelines.

The evaluation principles are based on peer-review by external independent experts, mostly international, to avoid conflicts of interest, and preserve confidentiality. In some calls with a smaller number of applications, a public presentation is assessed by the panel, as was the case with CoLABs and Associate Laboratories. The assessment results are made public in FCT's website.

In 2021, FCT funding of science totalled 556 M€, a steady increase during the last 5 years period (Figure 5). The funding is distributed by the R&D structures (19.9% of the total), scientific employment contracts (21.9%), scholarships (19.4%), projects (23.2%), international cooperation (9.7%) and cross-cutting and other activities (5.6%). A structural reform in scholarship awards took place as the researcher contracts replaced post-doc scholarships, the main tool to support researchers before 2016. Thereby only the remaining pos-doc scholarships are in execution and since then FCT only awards doctoral targeted scholarships.



\* RCTS – the Science, Technology and Society Network, RCTS100, Advanced Computation, and the subscription of B-On – The Online Knowledge Library

\*\*Other activities: Includes FACC - the Scientific Community Support Fund and Ciência Viva - the National Agency for Scientific and Technological Culture.

Figure 5. FCT Investment (in M€) by areas of activity, from 2015 to 2021. Source: FCT

# 4.3 Associate Laboratories

**Associate Laboratories** were first introduced into the Portuguese science system in 1999 by a decree law (Decree Law nr. 125/1999, April 20) as participating R&D entities, following the State Laboratories and together with R&D units of public or private nature. The national science and technology system further established in 2019 by the Law of Science (Decree Law nr. 63/2019, May 16) strengthened the Associate Laboratories as key entities within the system.

The grounding concept of Associate Laboratories has been maintained since their foundation. They are research units that, individually or in association, commit to the definition of science based public policies. The statute of Associate Laboratory is given for a 10-year period, during which they can also be formally consulted by the government. Associate Laboratories were assessed for their strategic plan and organizational structure, as well as the activities carried out. However, the process for the statute acknowledgement and funding of Associate Laboratories has seen some differences during these last 20 years. The timeline and specific aspects for the Associate Laboratories are detailed here. [Figure 6](#) shows the evolution of Associate Laboratories with milestones regarding their evaluation and application.

The statute started to be awarded in 2000 to 4 Associate Laboratories, increasing gradually to 15 in 2002 and further to 25 Associate Laboratories in 2008. In this period, the decision was taken by the Minister of Science and Technology, José Mariano Gago, after a requirement from the potential Associate Laboratories (until 2014) and then further to a response to an invited targeted call for specific areas (biotechnology, nanotechnology and nanomaterials, systemic risks, transports and energy, and aeronautics and space). The funding was defined in a contract signed

by each Associate Laboratory and FCT. The 2008 external international evaluation, based on the past performance of the existing Associate Laboratories, provided recommendations for statute renewal in 2010, but without any merit classification. This contrasted with the periodic external evaluation of all the Research Units carried out in 2007 and subsequently in 2013. By 2011, the constellation of Associate Laboratories increased to 26 by addition of two new Associate Laboratories while one was terminated.

In 2020, FCT launched an open and competitive call to the statute of Associate Laboratories and to access to an associated complementary funding dependent on targeted objectives. The strategy of open and transparent procedures that is in place in FCT and the maturity of the scientific community, as recognized by the Law of Science, and following the results of the 2017-2018 external international evaluation of Research Units, allowed to open a call for Research Units or consortia of Research Units applying to become Associate Laboratories. High scientific merit (research units classified as excellent or very good) and a suitable critical dimension were required. The applications were evaluated by a high-level panel and an international advisory committee. This was in fact the first full evaluation process of the Associate Laboratories since their introduction in the national science system. 40 Associate Laboratories statutes were awarded, with a 5-year contract with FCT, starting in 2021, renewable after a mid-term positive evaluation for up to 10 years.

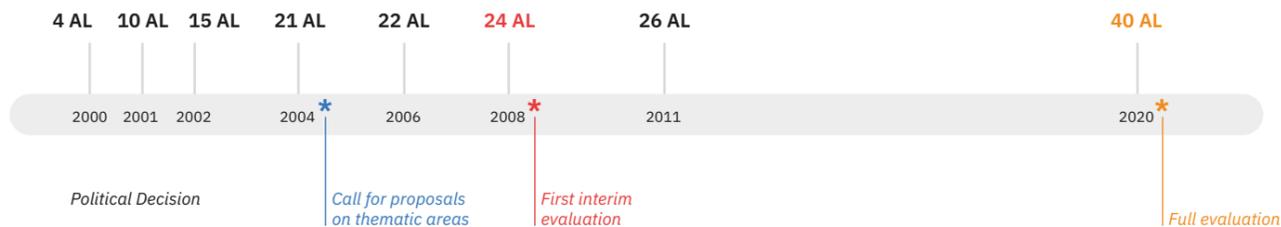
The award of the Associate Laboratory in 2021 followed the grounding principle of contributing to the design and implementation of public policies but already specifying some of the lines that are goals of the national science policy: strengthening of R&D activities of basic or fundamen-

tal nature; promotion of scientific or technical careers for doctors, talent attraction, in particular of PhD students and other researchers; international projection of science and technology activities conducted in Portugal; diversification of public and private funding sources, including European and other international funding. Along these lines, the Associate Laboratories were asked to offer at least 10% permanent positions out of their FTE researchers' pool.

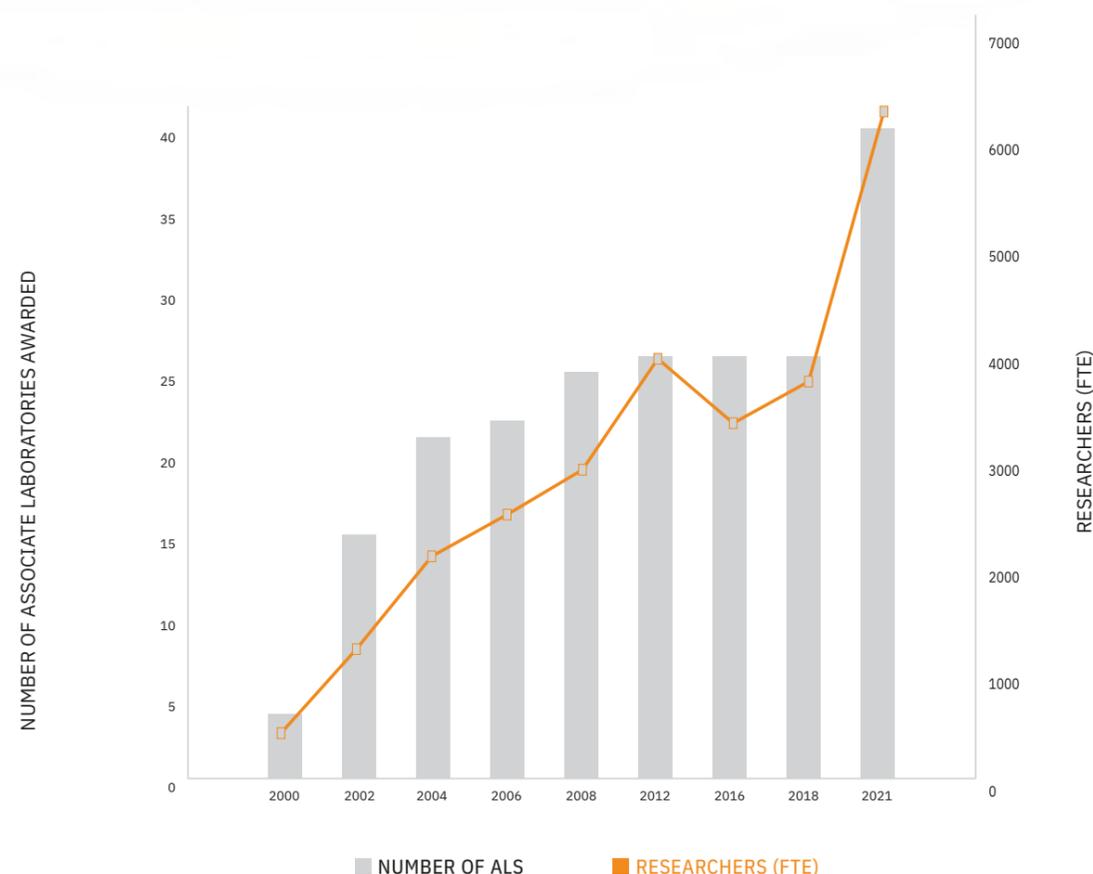
The application process for the Associate Laboratory statute is permanently open following specific procedures. FCT is responsible for the evaluation, contracting, eventual funding and monitoring of the Associate Laboratories. Associate Laboratories are represented by an Associate Laboratories Council (CLA, Conselho dos Laboratórios Associados) as defined in the Law of Science. It is noteworthy that a similar council but from a bottom-up initiative was

already in place in 2003 with reported activity until 2013. The evolution from 2000 to 2021 of Associate Laboratories, their building Research Units and the integrated researchers (full time equivalent, FTE) is shown in [Figure 7](#). There is a steady increase of Associate Laboratories from 2000 to 2008, followed by a stable period, and a sharp increase in 2021. While in 2018, the 27 Associate Laboratories involved 68 Research Units (23.4% of the total), in 2021 the 40 Associate Laboratories involved 100 Research Units (32.1% of the total).

In 2021 new scientific areas were represented by the Associate Laboratories, as Agricultural and Veterinary Sciences as well as Humanities and Arts were included ([Figure 8](#)). The geographic spread of the Associate Laboratories also increased by inclusion of Algarve and Alentejo ([Figure 9](#)).



**Figure 6.** Evolution of Associate Laboratories (AL) and milestones for evaluation and application processes



**Figure 7.** Associate Laboratories and full-time equivalent researchers from 2000 to 2021. Source: FCT

Associate Laboratories are a key component of the Portuguese science and technology system. They complement the structural backbone of the national scientific system currently represented by 312 funded research units. They carry out research, technological development and innovation activities following a 5-year strategic plan and are periodically evaluated by an international peer review process that analyses past performance and the future action programming, giving a merit classification and establishing the basis for FCT's funding.

In a context of rising societal challenges, the Associate Laboratories correspond to an additional and targeted commitment to contribute to the design, development, implementation and monitoring of science based public policies.

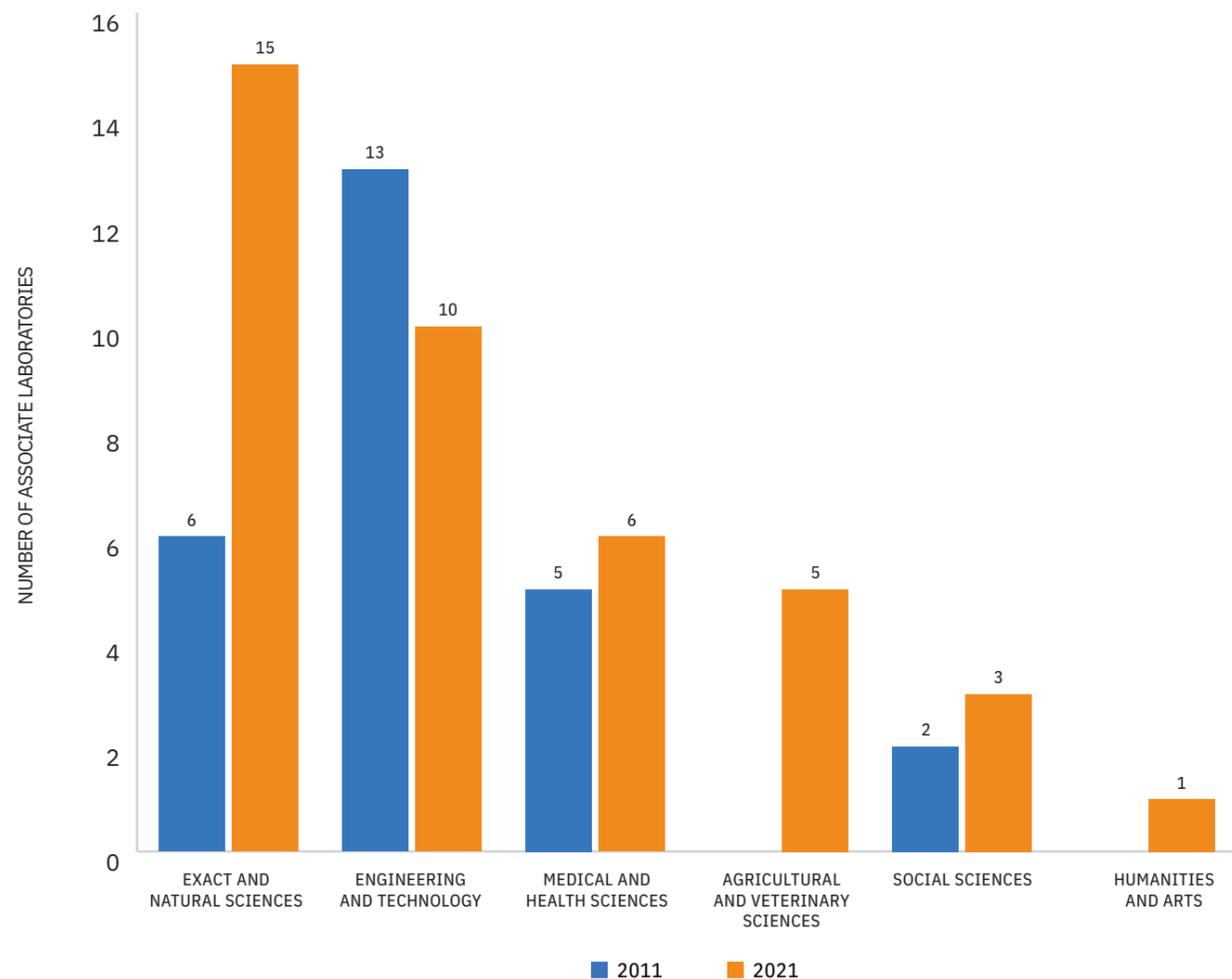


Figure 8. Scientific areas of Associate Laboratories in 2011 and 2021. Source: FCT

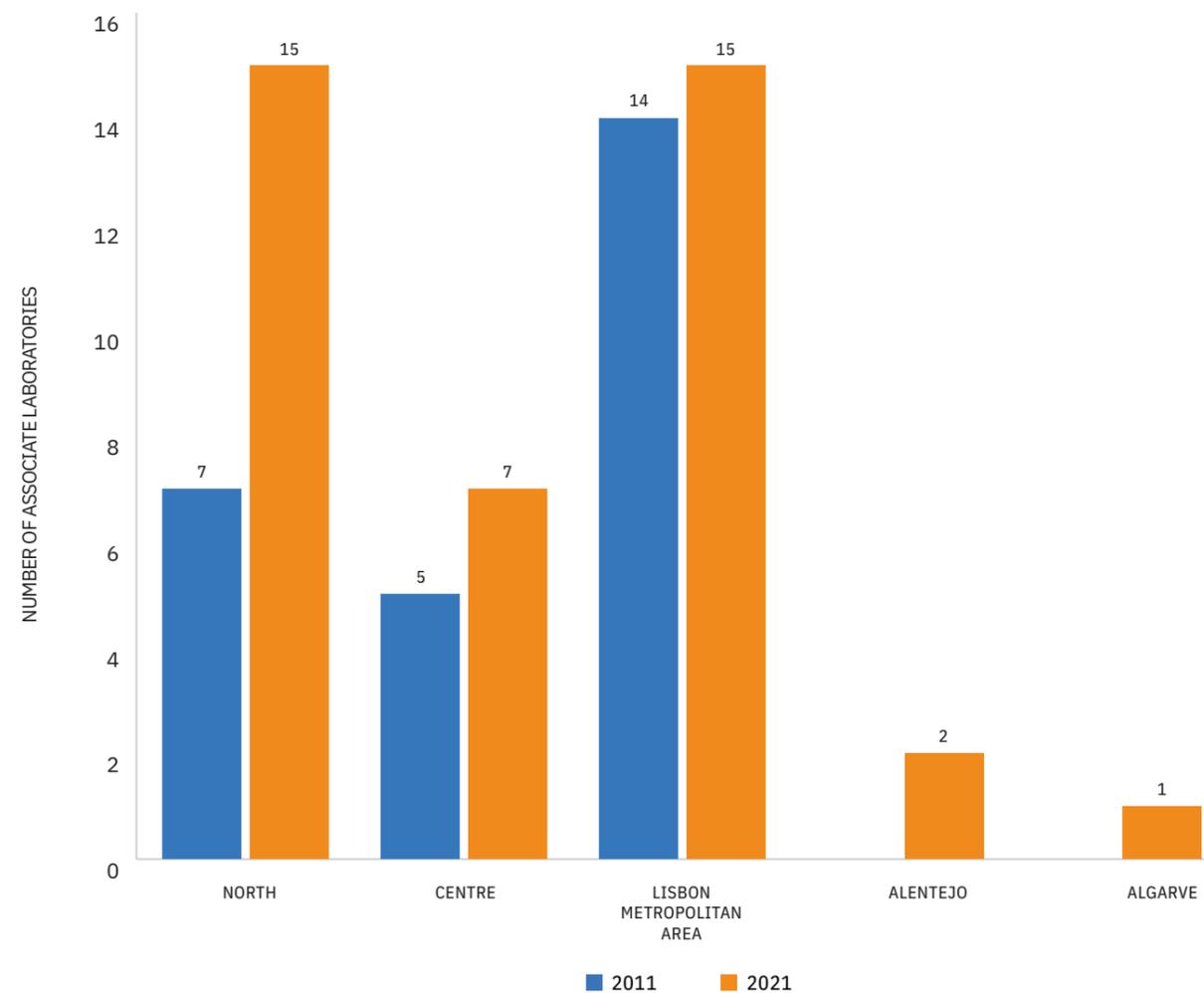
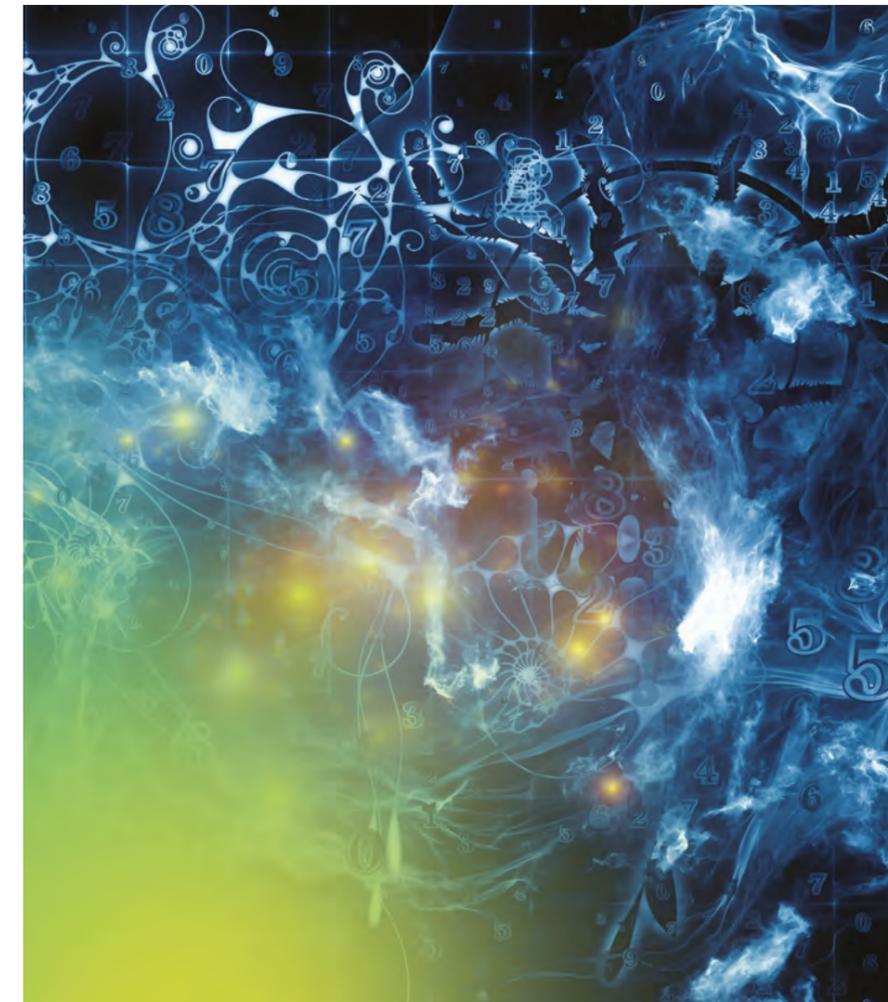


Figure 9. Regional location of Associate Laboratories (as of the proponent institution) in 2011 and 2021



# The Associate Laboratories, from 2021 on

# OS

## 5.1 Overall characterization

**Associate Laboratories** integrate the national science system as entities grouping research units that, individually or in association, commit themselves to contribute to national policies in science and technology. Associate Laboratories were strengthened into the national science system by the Law of Science (Decree law nr. 63/2019) and by the first open and competitive application call launched by FCT in 2020 for Associate Laboratories. The application for obtaining the statute of Associate Laboratory was open to research units with a merit classification of excellent or very good (given by the 2017/18 evaluation) and with a minimum number of 80 integrated researchers. The application included a detailed past and future activity plan for the strategic objectives underlying the goals of Associate Laboratories, namely the contribution to public policies in science and technology, including the fostering of funda-

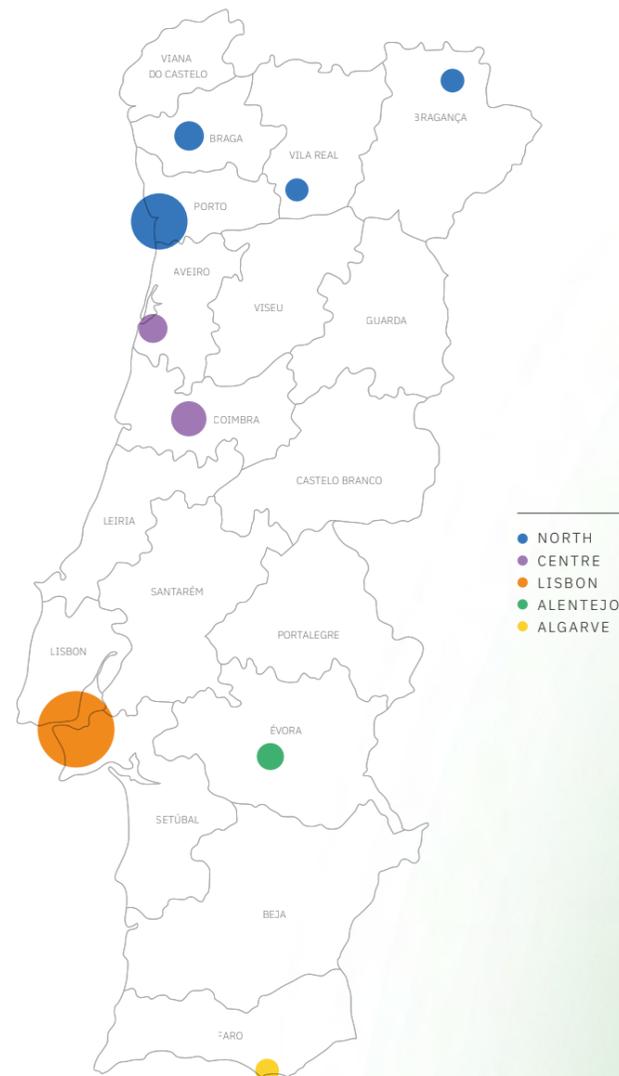
mental research, of careers for doctorates, of international talent attraction and of increase in international funding. The commitment to ensure that permanent contracts of doctorates after 5 years represented 10% of the number of FTE researchers was a requirement for application. An external evaluation by a high-level peer panel and an international committee analyzed the application documents and interacted with the proponents following a public presentation. A total of 40 Associate Laboratories were approved, involving 100 research units and integrating in 2021 6404 researchers (FTE). The contracts were signed for a 5-year period starting in 2021 with a funding of 23,708 M€. The contract renewal will follow an external performance evaluation.

**Table 1.** Number and share of AL, integrated researchers and FCT funding by scientific domains.

SCIENTIFIC DOMAIN	ASSOCIATE LABORATORIES		RESEARCHERS				AL COMPLEMENTARY FUNDING FCT (2021-2025)	
	Number	%	Number	%	Full Time Equivalent (FTE)	%	x1000 Euros	%
Natural sciences	15	38	3 840	40	2 738	43	7 460	31.5
Engineering and Technology sciences	10	25	2 001	21	1 396	22	7 000	29.5
Medical and Health sciences	6	15	1 678	17	1 024	16	7 383	31.1
Agricultural sciences	5	13	961	10	572	9	660	2.8
Social sciences	3	8	734	8	446	7	1 092	4.6
Humanities	1	3	462	5	227	4	113	0.5
<b>Total</b>	<b>40</b>	<b>100</b>	<b>9676</b>	<b>100</b>	<b>6 404</b>	<b>100</b>	<b>23 708</b>	<b>100</b>

The distribution of Associate Laboratories by scientific domain (table 1) shows the highest number in natural sciences (15 AL, 38% of the total) and the lowest in humanities with only one AL (3% of the total). The 9676 researchers reported as integrated in AL are mostly in natural sciences (3840 researchers, 40% of total), followed by engineering and technology sciences (2001 researchers, 21% of total).

In terms of geographic distribution, the north and the Lisbon region concentrate 75% of all units with 15 units each as shown on figure 11. The regions of Alentejo (2 AL) and the Algarve (1 AL) have the lowest numbers.



**Figure 11.** Distribution of the Associate Laboratories across Portugal. Source: FCT



# List of Associate Laboratories

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# S.2

# Natural Sciences

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# 5.2.1

ARNET  
CESAM  
CHANGE  
CIMAR LA  
i4HB  
IDL  
IMS  
InBIO  
INESC-ID  
IPFN  
LaPMET  
LAQV/REQUIMTE  
LASI  
LIP  
LS4FUTURE

# Aquatic Research Infrastructure Network

ARNET



## LEAD R&D UNIT

Marine and Environmental Sciences Centre (MARE)

## PARTICIPANT R&D UNITS

Centre for Marine and Environmental Research (CIMA UALG)  
Centre of Molecular and Environmental Biology (CBMA)

## DESCRIPTION

The Aquatic Research Network (ARNET) is a nationwide multi-institutional network that combines expertise in biologic and environmental sciences, allowing approaching scientifically and technologically all types of aquatic systems, in a context of global and regional changes and cumulative anthropogenic pressures, applying ecosystem- and methodologically-oriented approaches.

ARNET's vision is to be an Associate Laboratory of reference in aquatic sciences based on a holistic and integrated approach from river basins to deep sea ecosystems, contributing to strengthened national and European scientific and technological policy instruments, while establishing itself as a leading driver on the role of Science and Innovation for social and economic development and wealth.

ARNET's mission is to enable science-policy-action exchanges, providing the best available scientific knowledge based in aquatic ecosystems for policy and management decisions with respect to blue and green growth.

ARNET skills and capabilities, international scope, geographic coverage and research themes development makes this Associate Laboratory stand out within the Portuguese scientific system and place itself as a key player within the European context.

ARNET's Strategic Plan is based on an efficient organizational model systematised into eight intervention axes: (1)

Reinforcing RD&I; (2) Supporting public policy; (3) Disseminating research to international institutions; (4) Attracting funding (5) Networking; (6) Mobilizing high quality researchers; (7) Building Capacity of early career scientists and professionals; (8) Promoting public engagement and science communication. Each and all intervention axes support the achievement of the National Scientific and Technological Policy objectives, in particular the response of public policies to scientific, environmental, sanitary (environmental health), economic and social challenges. The scientific contributions are developed under five Thematic Lines (TL) linked to ARNET's objectives and societal challenges. Specifically: Scientific Challenge | TL1-Novel Approaches in Aquatic Exploration and Monitoring; Environmental Challenge | TL2-Environmental Sustainability under Global Change; Sanitary Challenge | TL3-Assessment and Management of Environmental Risks; Economic Challenge | TL4-Biotech- & Nature Based Solutions for Blue Economy; Social Challenge | TL5-Governance, Citizen Science and Ocean Literacy.

## STRATEGICAL OBJECTIVES

ARNET aims at increasing the excellence, impact, and applicability of the scientific production related to marine and freshwater research, driven by five societal challenges: scientific, environmental, sanitary (environmental health),

## WEBSITE

n.a.

## FCT FUNDING FOR AL

210 256 Euros

## INTEGRATED RESEARCHERS

324

## KEYWORDS

- Watersheds, Coastal Systems and Ocean
- Environment
- Natural and Anthropogenic Impacts
- Marine Resources and Biotechnology

economic and social, that set the framework for ARNET's objectives: 1 - Support the development of scientific and technological approaches towards the sustainable use of aquatic ecosystems; 2 - Advance the knowledge on the functioning of aquatic ecosystems; 3 - Promote good ecological status of aquatic realms; 4 - Explore biotechnology and Nature-Based Solutions (NBS) to encourage better stewardship of aquatic resources; 5 - Promote participatory governance models and Ocean literacy.

In addition, two additional cross-cut objectives support ARNET actions: 6 - Drive international cooperation to advance education and training for a Blue Economy; 7- Build upon an international identity strategy based on dissemination, mobilization, funding and networking.

## AREAS OF ACTIVITY

ARNET is committed to strengthen the science-policy interface through actions aligned with global, European, and national scientific and technological policy instruments relevant for aquatic environments. In particular, ARNET actions are aligned with five public policy areas: 1-Sustainability (e.g. UN SDGs, EU Green Deal); 2-Environmental conservation and monitoring (e.g. Biodiversity Strategy for 2030, OSPAR, Convention on Biological Diversity, MSFD, WFD, European IAS Regulation, Strategy for Plastics in a Circular Economy, Food and Nutritional Security Strategy);

3-Blue economy (e.g. Blue Growth Strategy, MSP Directive, Common Fisheries Policy, Farm to Fork Strategy, National Strategy for the Sea), 4-Open Science and Big Data (e.g. Global Ocean Observing System 2030 Strategy, Open Science Agenda), and 5-Research and Innovation (e.g. EU Framework Programme for Research and Innovation, EU Strategy Forum on Research Infrastructures, National Scientific and Technology Policy).

# Centre for Environmental and Marine Studies

CESAM



## LEAD R&D UNIT

Centre for Environmental and Marine Studies (CESAM)

## DESCRIPTION

CESAM is a Research Unit and Associated Laboratory organized in two poles, at the University of Aveiro and at the Faculty of Sciences of the University of Lisbon. CESAM's support to public policies responds to existing and emerging challenges, following a multi-actor and multi-sectoral approach framed on 4 TL: Ecology & Functional Biodiversity, focused on the functional role of biodiversity, structure and processes of ecosystems, and the services they provide; Environment & Health, concerning the growing evidence of the role of the environment as a determinant of human health; Marine Ecosystems & Resources, focused on the complex interrelations between maritime activities, blue growth and marine environment; Integrated Environmental Systems, addressing institutional, behavioral, critical and adaptive economics towards sustainable development, management of natural capital and circular economy, and contributing to innovative products, services, models and processes that benefit the environment.

The CESAM main contributions are: i) Assessment and to the regulations of microplastics in the environment and to the long-term goal of Zero plastic litter generation; ii) Attractiveness of CESAM, Portugal-Centro Region and the country for internationally excellent and mobile highly promising young researchers and researchers with rec-

ognised expertise, namely in the field of socio-ecological sciences; iii) Support policies on wildfire risk assessment and management; measures and good practices for air quality and well-being; action plans for coastal areas vulnerability and risks; iv) Conservation of cetaceans and seabirds supporting the definition of new marine NATURA 2000 sites and enlargements of marine areas of pre-existing NATURA sites contributing to the application of the Habitats Directive and the Birds Directive in Portugal; v) Implementation of the WFD and REACH regulation; help to define a strategy for effect characterization within the pesticide ERA for amphibians; and provide authorities tools for decision-making in what concerns the aquatic ecosystems management and antibiotic prescription policies; vi) To reach the European Green Deal objectives and to contribute to the implementation of the UN 2030 Agenda for Sustainable Development, by fulfilling the 2025 milestones.

## STRATEGICAL OBJECTIVES

CESAM's research covers the biosphere, atmosphere, hydrosphere, lithosphere and anthroposphere. Our mission is to develop leading international research on environmental and marine sciences, following a multi-actor and multisectoral approach, framed into 4 multidisciplinary Thematic Lines, and promoting scientific knowledge and

## WEBSITE

www.cesam-la.pt

## FCT FUNDING FOR AL

409 806 Euros

## INTEGRATED RESEARCHERS

220

## KEYWORDS

- Climate change and strategic planning
- Biodiversity and ecosystem-based management
- Sustainability, blue growth and circular economy
- Social challenges and advanced training

the connection between science and policies: Ecology & Functional Biodiversity; Environment & Health; Marine Ecosystems & Resources; Integrated Environmental Systems. The main objective is to promote a more efficient use of terrestrial and aquatic (from catchment to the deep sea) environmental resources and a more competitive, resilient and sustainable economy. CESAM aims to develop transdisciplinary research and to promote international collaboration among researchers, innovators and students, and to foster the scientific, societal, environmental, economic and advanced training impact of its research.

## AREAS OF ACTIVITY

CESAM is committed to give scientific support to public policies in environmental, health, social, and economic challenges. Namely: i) Social & Scientific: National Strategy for Scientific and technical careers for PhDs; ii) Environment & health: European Strategy for Plastics; EU REACH regulation updates on chemical substances; iii) Climate: National Strategy for Adaptation to Climate Change; FCT Agenda for Climate Change; Portuguese Energy & Climate Plan; European Green Deal, for a sustainable transition towards a Europe climate neutral by 2050; iv) Natural capital: Portuguese sectoral plan for the Natura 2000 network; National Strategy for Nature Conservation & Biodiversity 2030; FCT Agenda Agrofood, Forests and Biodiversity;

National Ocean Strategy; Biodiversity Strategy 2030; UN Decade of Ocean Science for Sustainable Development; and v) Environment & Economics: Portugal-Centro R&I strategy for smart specialisation; EU's 2020 Strategy for smart, sustainable and inclusive growth.

# Global Change and Sustainability Institute

## DESCRIPTION

Global change is affecting the natural environment and people's livelihoods around the world. Ongoing environmental, demographic, and socio-political changes are shaping the 'where' and 'how' people will be able to live in the future. Tackling such increasingly interconnected drivers of change requires a rethink on how R&I, societal and political systems can be integrated to develop public policies and trigger private sector initiatives needed to mitigate and adapt to the effects of ongoing changes. The recently approved "European Green Deal" establishes ambitious goals for turning global change challenges into opportunities, essentially by speeding up the transition into a truly sustainable economy while reducing the EU environmental footprint. Tackling these challenges will require that R&I units streamline the development of policies at national and European levels.

As the first Associate Laboratory fully dedicated to Global Change and Sustainability in Portugal, CHANGE aims to (1) becoming the go-to R&I hub for developing, evaluating and operationalizing policies at regional, national and international level; (2) attracting, training and retaining top-level international and national researchers tackling Global Change and Sustainability; and (3) achieving financial sustainability grounded on diversified funding from national and international sources, including both the pri-

## CHANGE



### LEAD R&D UNIT

Mediterranean Institute for Agriculture, Environment and Development (MED)

### PARTICIPANT R&D UNITS

Center for Environmental and Sustainability Research (CENSE)  
Centre for Ecology, Evolution and Environmental Changes (cE3c)

vate and public sectors. CHANGE is committed to support public policies that (i) safeguard and promote biodiversity and ecosystem services; (ii) ensure sustainable food and biomass systems, from production to consumption; (iii) ensure protection and regeneration of natural resources; (iv) promote a circular and carbon-neutral economy, and (v) strengthen territorial cohesion by reducing regional and social disparities. CHANGE will foster cross-disciplinary linkages, ultimately contributing to resilient environments, healthy people and sustainable economies.

### STRATEGICAL OBJECTIVES

To effectively contribute to pressing global change and sustainability issues, CHANGE will be organized around five strategic science-policy-oriented objectives:

- Support policies for safeguarding and promoting biodiversity and ecosystem services.
- Support policies to ensure sustainable food and biomass systems.
- Support policies to ensure the preservation and regeneration of natural resources.
- Support policies that promote a circular and carbon-neutral economy.
- Support policies that strengthen territorial cohesion.

### WEBSITE

n.a.

### FCT FUNDING FOR AL

217 436 Euros

### INTEGRATED RESEARCHERS

325

### KEYWORDS

- Agro-food and forestry systems
- Sustainability of natural resources
- Circular economy and carbon neutrality
- Governance and territorial cohesion

### AREAS OF ACTIVITY

- Global Change and Sustainability
- Agro-ecological and forestry systems
- Natural resources management
- Biodiversity and ecosystem services
- Circular economy
- Territorial cohesion

# Centre for Marine and Environmental Research

CIMAR LA



## LEAD R&D UNIT

Algarve Centre for Marine Sciences (CCMAR)

## PARTICIPANT R&D UNITS

Interdisciplinary Centre of Marine and Environmental Research (CIIMAR)

## DESCRIPTION

Established in 2002, CIMAR-LA brings together two excellent marine research centers in Portugal, with a combined capacity of over 300 PhD researchers, in view of advancing ocean science that delivers societal benefits and enables sustainable development. CIMAR-LA rests on a governance model designed to foster internal and external collaboration, through five core activity areas that enable relevant outputs for different societal sectors.

The main core activity area is “Scientific Research”, which comprises two thematic lines that address societal and environmental challenges and offer technical solutions and advice to meet the objectives of public policies: “Global change, Ecosystem Services & Conservation” and “Exploration & Exploitation of Marine Resources”. Several activities are in place to push these thematic lines forward, including semestral meetings to align scientific research activities, an annual gathering to promote networking and collaborations and articulation with an external Scientific Advisory Board.

“Scientific Research” feeds the remaining four core areas, each developed by specific working groups (WG). The “Advanced Training” WG supports higher education programmes and prepares scientists to do excellent research, by providing training on soft skills and research techniques. The “Policy and Society” WG delivers science

in support of policy, engages with society to increase science and ocean literacy, and organizes environmental awareness activities to support conservation and promote sustainable behaviour. The “Business & Innovation” WG works closely with industry partners to develop solutions for Circular Economy, Waste Management, Chemical and Plastic Pollution, among others. And the “Collaboration & Internationalization” WG fosters international collaborations and partnerships, implements strategies to attract international talent and funding, promotes open science and access to CIMAR-LA’s high-quality infrastructure.

CIMAR-LA has contributed extensively to supporting Fisheries Policies, ensuring that fishing is environmentally, economically, and socially sustainable (e.g.: Common Fisheries Policy); Biodiversity Conservation Policies, such as the implementation and management of Marine Protected areas; RD&I Policies, in particular Regional Specialization Strategies and European Research Infrastructures; and Climate Change policies, to which CIMAR-LA provides supporting research and scientific advice.

## STRATEGICAL OBJECTIVES

The mission of CIMAR-LA is to understand, protect and sustainably explore the full potential of marine and aquatic ecosystems through multidisciplinary research, innovation and advanced training. For this, CIMAR-LA drives

## WEBSITE

cimar-la.pt

## FCT FUNDING FOR AL

885 375 Euros

## INTEGRATED RESEARCHERS

339

## KEYWORDS

- Biodiversity
- Global change
- Circular economy
- Blue growth

excellence in marine-related research fields in view of enabling a coordinated response in support of public policies at a regional, national and international level. CIMAR-LA has three strategic goals. Firstly, it seeks to put in place strategies to attract and retain top level researchers, this way contributing to the advancement of marine sciences and to scientific employment. Secondly, it aims to promote meaningful knowledge exchange and collaboration in different fields and scales, in view of providing sound scientific advice, innovation and technological solutions to tackle societal challenges and achieving sustainability goals. Thirdly, it intends to leverage international prominence by increasing the capacity of Portuguese marine centres to attract international funding, talents and collaborations.

## AREAS OF ACTIVITY

CIMAR-LA contributes to several UN Sustainable Development Goals for 2030, including goals 13 (Climate Action) and 14 (Life Below Water), and to the UN Decade of Ocean Science for Sustainable Development (2021-2030). At a European level, it actively contributes to the European Green Deal and to reach the targets of four of the five missions set by the European Commission for 2030: “restore our ocean and waters”, “a climate-resilient Europe”, “conquering cancer” and “caring for soil is caring for life”.

CIMAR-LA supports national public policies directed towards a better environment, social equality, research economy and health, including those outlined in national strategies for the sea, adaptation to climate change, education and development, and environmental education. Finally, CIMAR-LA supports regional Research and Innovation Strategies for Smart Specialization, with emphasis on those related to scientific development, blue economy, circular economy, decarbonization and ocean literacy.

# Institute for Health and Bioeconomy

i4HB



## LEAD R&D UNIT

Institute for Bioengineering and Biosciences (IBB)

## PARTICIPANT R&D UNITS

Applied Molecular Biosciences Unit (UCIBIO)

INESC Microsystems and Nanotechnologies (INESC-MN)

## DESCRIPTION

The i4HB mission is to become a leading interdisciplinary Institute, to address societal demands and provide knowledge and sustainable technological solutions to improve the wellbeing of the population.

The TL1, Platforms for Drug Discovery and Development, is implemented to support public policies that reinforce investment in the Health sector. The production of innovative drugs and therapeutic strategies, the increase in the number of patents, the reinforcement of advanced training, and the attraction of international consortia for the development of new clinical solutions have been identified as key objectives to transform Portugal in an international Hub in Health Sciences, a “factory of Europe” according to the Portuguese Economic and Social Recovery Plan (PESRP) for 2020-2030.

The TL2, Advanced Diagnostics and Therapeutics, is aligned with the public policies in the Health sector, within the Portuguese Plan of Recovery and Resilience (PRR), which focuses public investment on the scientific system, namely manufacturing of high value and innovative medical products and devices.

The TL3, Human Health and Environmental Safety, is aligned with the National Investment Programme for Disease Prevention, another key pillar of the PESRP, which focuses on the prevention of highly prevalent diseases

through changes in nutritional and lifestyle-related behaviors, by promoting the consumption of healthier food products, particularly those free of noxious and carcinogenic pesticides and other toxicants.

The TL4, Bioresources Valorization and Bioproducts Production, is aligned with Sustainable Bioeconomy, which has been highlighted as a key pillar for the development of the PESRP. In particular, the plan stresses that public policies and investments should be designed to leverage Portugal’s i) scientific know-how, ii) highly trained pool of human resources and iii) well established research centers in the area, to support the reindustrialization of the country.

To implement the strategic plan, qualified human resources are of utmost importance. To attract and retain talent, three main actions are envisaged: (i) seed money; (ii) career planning, coaching, and training; (iii) incentives to external funding application. A focused effort will be implemented to increase research funds from private and International sources and promote technology transfer and valorization. Cooperation with Industry will be fostered through already-established trustful contacts and key partners. The vision, objectives, and implementation plan of i4HB will put it in the national and international forefront of science.

## STRATEGICAL OBJECTIVES

i4HB mission is aligned with three strategic objectives:

## WEBSITE

i4hb-la.pt

## FCT FUNDING FOR AL

430 430 Euros

## INTEGRATED RESEARCHERS

210

## KEYWORDS

- Innovative Diagnostics, Therapies and Devices
- Tools for Drug Discovery & Development Pipeline
- Human Safety and Antimicrobial Resistance
- Bioprocesses & Circular Economy

(1) promote and secure scientific employment by actively supporting excellence in advanced training of human resources (HRs) and by attracting and retaining talent in Portugal;

(2) prioritize internationalization of R&D and economic exploitation activities through the increase and diversification of international and private funding sources;

(3) reinforce excellence and impact in R&D through strategic and robust collaborations and partnerships with the private sector, public or private institutions, in a continuous support of public policies.

i4HB strategy is implemented around 4 Thematic Lines:

(TL1) Platforms for Drug Development and Discovery;

(TL2) Advanced Diagnostics and Therapies; (TL3) Human Health and Environmental Safety;

(TL4) Bioresources Valorization and Bioproducts Production.

## AREAS OF ACTIVITY

i4HB aims to promote the development of integrated knowledge, research and education to support innovation in Public Policies with an impact in the Health Sector and the Bioeconomy. In particular, the development of innovative treatments, including new drugs and medical products or the development of methodologies to assess xenobiotic toxicity and improve human and environmental health, as well as the development of processes and appli-

cations for the enhancement of bioresources and production of bioproducts.

The strategic plan is supported by 3 Strategic objectives: OBJECTIVE 1 – Promote and SECURE SCIENTIFIC EMPLOYMENT, actively support the ADVANCED TRAINING of human resources with a global impact, attracting TALENT to Portugal

OBJECTIVE 2 – Contribute to the INTERNATIONALIZATION of the scientific operation and increase the DIVERSIFICATION OF FUNDING, in particular from EU R&D programs and other International Entities

OBJECTIVE 3 – REINFORCE EXCELLENCE in R&D in collaboration with the private sector, and public or private institutions to continue to support PUBLIC POLICIES



## LEAD R&D UNIT

Institute Dom Luiz (IDL)

## DESCRIPTION

IDL was established in 1853 as the main Portuguese Observatory in Meteorology and Geophysics and is still responsible for the longest series of climate and geophysics observational data. In 2004, IDL was nominated as an Associate Laboratory of FCT, merging the meteorology and geophysics group with a significant group of geologists and geodesists, and has since evolved into a comprehensive Earth System group, incorporating atmospheric, ocean and solid Earth scientists, together with researchers focused on environmental applications, including renewable energy.

IDL aims to be relevant not only in fundamental Earth System research, but also in applications and technologies that relate science with the main 21st century societal concerns: forecasting and adapting to climate change and to other major natural hazards, and establishing an environmentally sustainable supply of mineral raw materials, water and energy. Based at the University of Lisbon, IDL is also the home of research groups at 5 other Portuguese universities (UCoimbra, UTAD, UBI, ISEL, and UAlgarve), at the Portuguese Institute for the Ocean and Atmosphere (IPMA), at the Hydrographic Institute and at the Madeira Oceanographic Observatory (OOM). IDL operates a number of relevant research infrastructures including a high-performance computing facility, a geomagnetic/pale-

omagnetic laboratory, rock and soil processing and analysis laboratories, advanced analytical laboratories for geochemistry (including electron microprobe, stable isotopes lab, mobile lab), a network of permanent and mobile seismic stations, a pool of mobile ocean bottom seismometers and magnetotelluric observatories, a network of mobile geodetic sensors, field geoelectric and magnetotelluric sounding equipment, and applied physics laboratories for renewable energy applications.

Through IPMA, IH and OOM, IDL researchers have access to the national meteorology, oceanography and geophysics monitoring networks and to national and global remote sensing data. IDL research is strongly rooted on a tradition of Earth and Environment teaching and research at BSc, MSc and PhD levels in Earth System Science and Sustainable Energy Systems.

## STRATEGICAL OBJECTIVES

- (1) Improve the understanding of climate change and other major Earth system hazards;
- (2) Innovate in Earth Observation Systems;
- (3) Optimize the exploration, exploitation and management of Earth resources.
- (4) Accelerate the energy transition;
- (5) Support the sustainable use of marine resources, from the coast to the deep ocean;

## WEBSITE

idl.campus.ciencias.ulisboa.pt

## FCT FUNDING FOR AL

134 016 Euros

## INTEGRATED RESEARCHERS

97

## KEYWORDS

- Climate Change
- Natural Hazards
- Natural resources
- Energetic Transitions

## AREAS OF ACTIVITY

- (1) Prepare for Climate Change. Understanding interannual-to-interdecadal climate variability and extremes for strategic planning.
- (2) Increase society resilience to natural hazards. Improve forecasting, vulnerability and risk assessment.
- (3) Seek sustainable mineral raw materials. Focus on increased synergies between geology, geochemistry and geophysics in the exploration and characterization of mineral resources.
- (4) Build the new Energy Paradigm. Optimize the interaction of geosciences and engineering into sustainable energy solutions.
- (5) Develop the new Ocean frontier. Link geosciences, other marine and environmental sciences, and economy in the understanding of the deep ocean.
- (6) Innovate in advanced training. Post-graduate education, and its quick transference for Society and Economy, is an increasingly important added value activity for European and other Portuguese speaking countries, and key for the development of Portugal itself.



## LEAD R&D UNIT

Centro de Química Estrutural (CQE)

## PARTICIPANT R&D UNITS

Chemistry Research Unit of University of Porto (CIQUP)  
Coimbra Chemistry Center (CQC)

## DESCRIPTION

The multidisciplinary and interdisciplinary character of IMS enables the development of both blue-sky and applied research lines aimed to provide solutions of specific societal challenges that can be confronted using chemistry and molecular-based tools. The different topics contained within each Thematic Line (TL) of the IMS are well embedded in the strategic roadmaps of the 2050 agenda released by the European Commission and also in the UN and EU programmes concerning sustainable development framework

The TLs have the main mission of tackling challenges along a general streamline, initiated with the design, modelling and synthesis of new molecules and materials that can subsequently contribute towards a clean environment, minimization of climate changes, energy sustainability, circular economy and a healthy life. Each TL reflects the vocation and synergies of IMS and its R&D units to develop a novel solution, from an early stage of low technological readiness level (TRL) to its validation in an industrial or technological relevant environment at much higher TRL, and, in some cases, to reach a commercialization stage.

The organization of IMS as three R&D units sharing five TLs is an integrated, multidisciplinary and flexible concept: i) all research groups from the R&D units are encouraged to develop research work contributing to meet the ambitions

of the TLs; ii) thematic lines are not compartmentalized: instead, they overlap in multiple research areas (e.g. a novel nano-structured material (MATsoft) can have its most important applications in pollution control or clean water (H2Oenv)); iii) collaborations between R&D units are expected to solve specific challenges posed by a given TL from different perspectives in a synergistic manner

The TLs' mission is to capitalize the efforts and secure the engagement of different research groups from different R&D units to find innovative solutions relevant to IMS, to promote exchange activities (conferences, workshops, inter-group seminars, joint projects and interdisciplinary training) that reflect its scope and foster its development, to organize teams of researchers from different groups/units that can collaborate in addressing novel challenges, and to raise funding that is pertinent to the TL and that can be secured via the submission of proposals involving members from various groups/units.

## STRATEGICAL OBJECTIVES

In terms of innovation, the primary objective of the Institute of Molecular Sciences (IMS) is to provide our country with the molecular-based instruments that are necessary to solve, in an interdisciplinary way, urgent societal problems in a 5- to 10-year horizon.

Unlike R&D models that are mainly focused on a single

## WEBSITE

n.a.

## FCT FUNDING FOR AL

241 974 Euros

## INTEGRATED RESEARCHERS

312

## KEYWORDS

- Molecular-based Innovation
- Chemical Sciences for Health
- Energy & Environment: a molecular perspective
- Advanced Materials and Chemical Processes

facet or application of the chemical sciences, IMS is involved in many sub-areas ranging from single-molecule processes to functional materials, from environmental concerns to health-related matters, from fundamental to applied research.

The above-mentioned molecular-based instruments can be attained by the mapping of all research conducted at IMS to five overlapping and cooperating thematic lines: MATsoft (Materials, soft matter and nanoscience); MEDlife (Medicinal, biological and biophysical chemistry for health); H2Oenv (Technologies for water, environment and energy); SYNcat (Synthesis, catalysis and chemical processes); and CHEMfocus (Fundamentals and awareness).

## AREAS OF ACTIVITY

The public policies developed at IMS within the context of scientific research include i) innovation, ii) technology transfer, iii) advanced education, iv) scientific careers, v) international cooperation, vi) exploration of natural resources, vii) climate change and neutral energetic transitions, or viii) fundraising and diversification.

Those policies are also encapsulated in the Sustainable Development Goals (SDGs) introduced by the UN 2030 Agenda. Research at IMS includes: new molecules for a new pharma (SDG3: good health); the monitoring of emerging and priority contaminants (SDG6: clean water);

new energy-efficient fluids and materials (SDG7: clean energy); new synthetic and catalytic routes (SDG9 and SDG12: circular economy, green chemistry); CO2 capture and usage, ozone chemistry (SDG13: climate action); biogeochemistry in extreme (arctic) and transitional water systems (SDG14: life below water); (bio)sensing and environment remediation (SDG15: life on land).

# Research Network in Biodiversity and Evolutionary Biology

InBIO



## LEAD R&D UNIT

Research Network in Biodiversity and Evolutionary Biology (InBIO)

## DESCRIPTION

InBIO is an Associated Laboratory (AL) established in 2011, upon formal recognition of its key position to advise the Portuguese State in public policies related to the conservation and management of biodiversity and the environment. It involves a partnership between CIBIO – Research Centre in Biodiversity and Genetic Resources, hosted by the Universities of Porto (headquarters), Azores and Lisbon, and CEA-BN – Centre for Applied Ecology Baeta Neves, hosted by the University of Lisbon. Besides the main hosting institutions, there are integrated researchers from other universities, polytechnic institutes, state laboratories and the public administration.

The vision of InBIO is to firmly establish itself as a strong, competitive, and internationally recognized network of excellence in the fields of evolutionary biology, biodiversity (including agrobiodiversity), and socio-ecological research, integrating all levels of biological organization from genes to ecosystems. Research at InBIO aims to advance knowledge on the origins and maintenance of biodiversity to apply this knowledge to address societal challenges related to climate and land-use changes, environmental degradation, the loss and sustainable use of biodiversity and agrobiodiversity, and the management, restoration and sustainable use of ecosystems and their services. InBIO research is strongly aligned with national and international goals and

is particularly well-positioned to meet the challenges and opportunities created by the European Green Deal and ensuing strategies such as the EU 2030 Biodiversity Strategy and the Farm to Fork Strategy. Research at InBIO is also closely aligned with the 2030 Agenda for Sustainable Development of the United Nations, with strong contributions for a number of its Sustainable Development Goals (SDG), with a particular emphasis on SDG 13 (Climate Action), SDG 14 (Life below Water) and SDG 15 (Life on Land). Research at InBIO has a high level of internationalization, with the institution and its researchers being tightly connected in collaborative networks with tens of top universities and research centres worldwide. Furthermore, research at InBIO has a global scope, involving projects in all continents but Antarctica, though with a strong focus on the Mediterranean Basin, Africa, and Portuguese-speaking countries. This has led to the development of a network of TwinLabs, mainly in Africa, which promotes scientific research and capacity building.

## STRATEGICAL OBJECTIVES

- To accomplish its Vision and Mission, InBIO AL will pursue the following strategic objectives:
- Advance scientific knowledge in the fields of biodiversity and evolutionary biology, with a special emphasis on understanding the processes that lead to present-day patterns of biological diversity and the principles gov-

## WEBSITE

inbio-la.pt

## FCT FUNDING FOR AL

174 530 Euros

## INTEGRATED RESEARCHERS

196

## KEYWORDS

- Biodiversity
- Conservation and Evolutionary Biology
- Genomics
- Landscape Ecology and Planning

erning the spatial partitioning of genotypic and phenotypic variation

- Improve and integrate ecologic, taxonomic and biogeographic knowledge at different scales, focusing in particular on the Iberian and Mediterranean biological heritage
- Apply scientific knowledge to propose conservation priorities and management tools to national and international conservation authorities
- Use scientific data from wild and domestic breeds to improve species management through collaborations with local authorities
- Provide top level education programs in evolutionary and conservation biology
- Foster public awareness, understanding and appreciation of biodiversity, by communicating scientific results and promoting outreach activities

## AREAS OF ACTIVITY

InBIO AL have the following focus areas:

- Research. InBIO is committed to developing high quality research in the areas of biodiversity and evolutionary biology, aiming to become a key player in this field at an international level.
- Advanced training. InBIO fosters an intellectually stimulating learning environment and provides cutting-edge research facilities for training young researchers and professionals.

- Science Communication and Outreach. InBIO is devoted to bridge the gap between science and society, raising awareness on new scientific developments, promoting public scientific culture and responsible research and innovation.

- Services and technology transfer. InBIO conducts continuous efforts to develop and increase effective collaborations and knowledge transfer to relevant partners from the public, private and business sectors.

InBIO currently harbours 34 Research Groups, whose activity is structured upon three main Research Lines, covering the whole research field:

- Evolution, Genetics & Genomics. Understanding biogeographic patterns, the formation of new species and hybridization, adaptation, domestication and co-evolution.
- Biodiversity, Ecology & Conservation. Understanding the mechanisms driving species persistence and diversity from local communities to the global scale, and to inform biodiversity conservation strategies.
- Sustainability, Ecosystems & The Environment. Understanding how human actions interact with natural processes to affect ecosystems and the environment at large, and to find practical solutions to promote the sustainable use of the natural world and natural resources.

# Institute for Systems and Computer Engineering, Research and Development

## DESCRIPTION

INESC-ID, “Instituto de Engenharia de Sistemas e Computadores: Investigação e Desenvolvimento em Lisboa” is a Research and Development and Innovation Organization (R&D+i) in the fields of Computer Science and Electrical and Computer Engineering. INESC-ID boasts more than one hundred PhD researchers and more than two hundred graduate students and fellowship recipients from several universities and polytechnic institutes. In 2013, INESC-ID was identified by FCT as one of the top 10 Portuguese research units attracting projects and funding from the European Union, a recognition that is still valid today.

- Research and development
  - Development of projects, national and international, namely European, in the area of information society, with emphasis on the areas of computation, energy, electronics, telecommunications and information systems;
  - Support to project development by companies and state agencies.
- Human resources training
  - Support to carrying out the work leading to the achievement of academic degrees from the 2nd and 3rd Cycle (Master and Doctorate) and specialization courses, typically at a postgraduate level, for industry and services, from state and private sectors;

INESC-ID



## LEAD R&D UNIT

Institute for Systems and Computer Engineering, Research and Development (INESC-ID)

- Framework for R&D developed by interns including specialized training of employees of companies and public services through their reception at INESC-ID for periods that may range from a few months to a year.
- Services and Consultancy
  - Consultancy in the definition, specification, execution and evaluation of projects by public and private entities;
  - Expertise, analysis and evaluation of project execution reports executed by third parties;
  - Support to calls for tenders from public entities, ranging from the establishment of the bid procedures and specifications to the participation in the evaluation and expert committees;
  - Elaboration of reports on specific matters called upon by government entities, encompassing technical subjects, best practices in a given area, evolution of a certain technology, among others;
  - Support to the elaboration of public documents drawn by governmental entities, on the specification and characterisation of technical aspects of future or established public policies.

## STRATEGICAL OBJECTIVES

- i. Expand the set-up of interdisciplinary projects;
- ii. Reinforce the experimental infrastructures;
- iii. Increase the internationalization, with the participa-

## WEBSITE

inesc-id.pt

## FCT FUNDING FOR AL

164 073 Euros

## INTEGRATED RESEARCHERS

97

## KEYWORDS

- Digital transformation and citizenship
- Life and health technology
- Energy transition
- Security and privacy

tion in research networks and the number of international post-doc and PhD students;

- iv. Increase the technology-transfer activities;
- v. Contribute with qualified people (BSc, MSc, and PhD), in cooperation with universities and schools;
- vi. Improve the number and qualifications of the supporting staff;
- vii. Improve internal quality assessment mechanisms.

## AREAS OF ACTIVITY

- i. Digital Transformation and Citizenship. Innovative and disruptive adoption of digital tools and methods by organizations, to support their core activities, and human resources in order to engage as efficient workers, informed customers and responsible citizens.
- ii. Life and Health Technology. We cover a broad spectrum of applications and methodologies, from artificial intelligence to dynamic systems, through several projects and patents, including three spin-off companies, as well as a long partnership with hospitals and other institutions.
- iii. Energy Transition. Supporting the public entities, industry and the government in the development of public policies for the energy sector, in particular for the power systems necessary transition towards sustainability.
- iv. Security & Privacy. Support the European Commission, government, public entities and national companies in

developing public policies and technological solutions for improving the security and privacy aspects of the Internet.

# Institute for Plasmas and Nuclear Fusion

IPFN



## LEAD R&D UNIT

Institute for Plasmas and Nuclear Fusion (IPFN)

## DESCRIPTION

It is the core of IPFN's mission to:

- Coordinate the Portuguese participation in the Euratom Fusion Programme and in the European Joint Undertaking for ITER and the Development of Fusion Energy (F4E).
- Participate in projects with the European Space Agency (ESA), related to studies of fundamental physics of space and astrophysical plasmas.
- Ensure the Portuguese participation in the European projects on new plasma accelerators.
- Develop the national technology in ultrashort, ultra-intense lasers for multidisciplinary applications.
- Ensure the Portuguese participation in European projects and networks on low-temperature plasma physics and engineering and to develop national competences in plasma-based key-enabling technologies for environmental, biological and energy applications and for novel nanostructured materials.
- Promote the development and research on ion solid interactions and ion beam technologies in multidisciplinary fields.
- Carry out research projects, service rendering, advanced training and outreach activities.
- Collaborate in the graduate and post-graduate teaching in Plasma Physics and Engineering, Intense Lasers and Controlled Nuclear Fusion.

IPFN key highlights are:

- Joining the international endeavour for the energetic transition: IPFN nuclear fusion activities have been strongly focused on the work programme established on the Fusion roadmap for HorizonEurope and ITER construction, resulting on a successful contribution to the EU Fusion Programme.
- Plasma road to solar fuels: IPFN has been leading a research program embodying the theoretical, modelling and experimental investigation of plasma decomposition of CO<sub>2</sub>.
- Territorial cohesion and development of peripheral areas: The national reach was strengthened by the creation of the IPFN Research Node at the University of Madeira in 2017 hosting the High-Pressure Plasmas Group (HPPG) is well-known internationally, in particular, for its work on high-pressure plasma-electrode interaction
- High commitment to Scientific employment: the number of IPFN researchers with PhD has more than doubled from 37 in 2002 to 92 in 2019. IPFN has been truly remarkable in finding different opportunities to provide adequate contractual conditions to its researchers (beyond fellowships) keeping a strong engagement to the creation of scientific employment.
- Innovation society: IPFN follows multiple approaches including the development of experimental facilities in

## WEBSITE

www.ipfn.tecnico.ulisboa.pt

## FCT FUNDING FOR AL

861 565 Euros

## INTEGRATED RESEARCHERS

87

## KEYWORDS

- Plasma Science and Engineering
- Nuclear Fusion
- Intense Lasers
- Photonics

the areas of magnetic and inertial confinement nuclear fusion, intense lasers, environmental plasma engineering and Space exploration, providing a critical home base for the experimental activities carried out in EU larger facilities as well as to enhance cross-cutting activities in plasma physics theory and modelling, taking advantage of our leadership in advanced computing infrastructures.

## STRATEGICAL OBJECTIVES

“Instituto de Plasmas e Fusão Nuclear” (IPFN) is a Research Unit of “Instituto Superior Técnico” (IST) with expertise in Plasma Physics, Controlled Nuclear Fusion, Lasers and Photonics and Advanced Computing. This wide and recognized expertise grants IPFN an important participation in landmark large-scale EU research projects and programmes (e.g. EUROfusion, JET, ITER, IFMIF-DONES, ELI, ESA and FET Open), through collaborations in the scientific and technical activities of these projects, and active presence on their governing boards. IPFN is one of the top Physics laboratories in the country (hosting researchers based at different Portuguese universities). IPFN has critical mass to foster scientific and technological excellence in an international context, providing a unique setting for world-class research, technological transfer and advanced training, with the required multidisciplinary to be competitive in the participation in ambitious large-scale physics projects.

## AREAS OF ACTIVITY

IPFN has two thematic lines designed to support its mission:

- Controlled Nuclear Fusion, focused on the Euratom Fusion roadmap, with the goal to contribute to the ultimate challenge of fusion research which is the realization of electricity generation from magnetic confinement fusion within a reasonable time horizon; and
- Plasma Technologies and Intense Lasers, where we deepen knowledge of plasmas and their interaction with matter and energy, developing technologies with societal impact and exploiting relevant experimental infrastructures (the Plasma Engineering Laboratory, the laboratories of Intense Lasers and VOXEL, and the ESTHER Shock-Tube - the first ESA infrastructure in Portugal).

IPFN mission aims at contributing to major public policies on:

- Energetic transition and decarbonization
- Territorial cohesion and development of peripheral areas
- Scientific employment
- Innovation society
- Advanced training

IPFN active contribution results from the direct engagement and R&D activities of its researchers and the institutional commitment of IPFN with the different stakeholders relevant at the national and the European levels.

# Laboratory of Physics for Materials and Emergent Technologies

LaPMET



## LEAD R&D UNIT

Institute of Physics for Advanced Materials, Nanotechnology and Photonics - University of Porto (IFIMUP)

## PARTICIPANT R&D UNITS

Center of Physics and Engineering of Advanced Materials (CeFEMA)  
Physics Center of Minho and Porto Universities (CF-UM-UP)

## DESCRIPTION

The Laboratory of Physics for Materials and Emergent Technologies (LaPMET) associated laboratory initiative has created new far reaching opportunities and synergies for the involved partners, providing a unique networking environment in our country for a transversal approach in the field of Physics of Materials for Emergent Technologies. LaPMET offers unique expertise in Quantum materials and Quantum Technologies, Advanced materials, processes and technologies for energy, health and environment, as well as new technologies for sensing, grounded in the vast experience of the partners.

The associated Laboratory Mission is, using Physics and Material science insight, to enhance scientific knowledge in the fields of Quantum materials, Quantum communications, photonics, nanoscience and nanotechnology, performing research, advanced training and services to the scientific community and industry. LaPMET VISION stands as an interdisciplinary and multidisciplinary laboratory of excellence with high international impact on research and innovation, maintaining active exchange programs with research centres, universities, industry and other worldwide facilities, creating value for the society, warranting the institution long-term Sustainability, and ensuring own scientific and technical careers for its researchers.

LaPMET structures its intervention in four main thematic

lines which are the driving vectors for excellent scientific research, for which emergent new technologies are foreseen, namely: 1) Quantum Materials and Quantum Technologies; 2) Advanced Materials and Processes for Energy; 3) Advanced Materials and Technologies for Health and Environment and 4) New principles and Technologies for Sensing. These areas were selected as the ones where obvious synergies exist that leverage new far reaching opportunities for international funding.

The Associated Laboratory promotes high quality training programs in Portugal, both educationally and technically-oriented, in its core areas, also directed for their application. In this way, it contributes to the fulfilment of public policies ranging from Science, Technology and Innovation, Sustainable Development, and to Transfer and Valorisation of Knowledge.

## STRATEGICAL OBJECTIVES

The Laboratory of Physics for Materials and Emergent Technologies (LaPMET), binds its action to the following objectives:

1. Assume international leadership in the areas of Quantum materials, Quantum Technologies and advanced materials;
2. Attract funding from European R&D actions and from technology-intense industries, ensuring diversified long-term financing.

## WEBSITE

www.lapmet.org

## FCT FUNDING FOR AL

153 246 Euros

## INTEGRATED RESEARCHERS

148

## KEYWORDS

- Physics of Quantum Materials and Technologies
- Advanced Materials for Energy
- New Materials/Processes for Health and Environment
- Physics and Technology of Sensing

3. Recruit and train the best human resources within the laboratory core areas (Condensed Matter, Material Science, Quantum Materials and Technologies).

4. Lead the national R&D strategy in Material Science and Nanotechnology.

5. Organize regular activities aimed at knowledge dissemination, education and training at different levels (post-graduation, graduation and general public) reinforcing the role of Physics and Materials in society.

6. Be a strong dynamic agent for the private sector by incentivizing joint ventures, promoting joint project calls, startup creation, promoting a pipeline between Science and Technology.

## AREAS OF ACTIVITY

LaPMET promotes activities in the support for the pursuit of Public Policies to Incentive the production and use of renewable energy, advanced training of human resources, public policy to strengthen digital skills and support for national and European initiatives within the scope of respective strategies for quantum materials and technologies.

# Associated Laboratory for Green Chemistry - Clean Technologies and Processes

LAQV/REQUIMTE



## LEAD R&D UNIT

Associated Laboratory for Green Chemistry - Clean Technologies and Processes (REQUIMTE)

## PARTICIPANT R&D UNITS

Glass and Ceramic for the Arts (VICARTE)

## DESCRIPTION

The Laboratório Associado para a Química Verde | Associated Laboratory for Green Chemistry, LAQV, is the Portuguese Research Centre for Sustainable Chemistry, a key component of an imperative World Sustainable Development. As a science-driven institution, it produces high-quality research and participates in international networks and projects; a fundamental aspect is its participation in advanced education and training programs for a large international community of students. LAQV is a valuable partner in national industry and consumer associations, keeping its objectives aligned with political policies and the research agenda established by the Portuguese Government and the strategic agenda of FCT-MCTES. To pursue the objectives established, LAQV is focused in five Thematic Lines: Chemistry Towards a Greener World; Food Science and Technology; Chemical Engineering for Sustainability; Chemistry to Health & Wellbeing; and Cultural Heritage. The strategy of LAQV crosses all policy agendas adopted at the national and international levels.

To tackle such compliance, LAQV working program is focused on different key points: investment in energy transition and sustainability, with a focus on renewable energies and circular economy; investment in the usefulness of marine resources, capitalizing on the broad Exclusive Economic Zone of Portugal, with several purposes, including

for biomedical applications, following biorefining and sustainable sea mining; capitalizing on the impact of chemical and biotechnological discoveries for health by being the translation of conceptual models and research into operative devices and practices that contribute effectively to improve healthy life expectancy and wellbeing; investment in Co-Development R&D projects and Mobilizer Projects, in collaboration with several companies and technological centers; investment on the sustainability of the environment and of the agri-food chain by pursuing the protection and the sustainable exploitation of all ecosystems towards high-efficient resources within a circular economy. LAQV has also a full thematic line dedicated to Science and Culture, which is focused on the identification, preservation, dissemination, and promotion of the scientific and cultural heritage of Portugal. LAQV activities will continue to be focused on public policies, covering their transversal activities of education and training and the Research & Innovation Activities within cutting-edge topics of public interest.

## STRATEGICAL OBJECTIVES

LAQV objectives are aligned with Public Policies Framework. Its activities, namely scientific, academic and technological, are focused on areas of social and economic relevance. As such, LAQV members aim to contribute with their expertise to the definition of public policies, and to

## WEBSITE

laqv.requimte.pt

## FCT FUNDING FOR AL

843 255 Euros

## INTEGRATED RESEARCHERS

349

## KEYWORDS

- Sustainable Chemistry and Clean Processes
- Food Science and Technology
- Chemistry to Health & Wellbeing
- Cultural Heritage

maximize the impact of these policies. With this purpose and with Chemistry as the underlying theme, LAQV set the following objectives:

- Create and develop sustainable procedures and technologies towards a circular and climate-neutral exploitation of natural resources – land and sea.
- Boost a cooperative research strategy towards a valued, healthy, and safe water and food supply.
- Provide processes and methodologies for Energy Transition and Sustainability.
- Converge and integrate top-notch research and expertise towards an effective improvement of healthy life expectancy and wellbeing.
- Use green and innovative processes towards the protection, enhancement, and conservation of Cultural Heritage.

## AREAS OF ACTIVITY

LAQV has a two-way connection with (inter)national public policies: its objectives are established according to public policies, and also participates in management and leadership positions of associations, societies, and professional orders, which articulate with policy makers towards the definition of new public policies, covering the different fields of expertise of LAQV members, namely, Chemistry, Food Science, (Bio)Chemical Engineering, Health and

Preservation of Cultural Heritage. LAQV has already been committed to complying with several strategies proposed by the Government, and its objectives cross several topics of public policies: i) urban science and cities for the future; ii) sea; iii) health and clinical; iv) industry and manufacturing; v) agri-food, forests and biodiversity; vi) science and culture. LAQV also contributes to the following national agenda: climate change, cultural heritage, circular economy, sustainable energy systems, and job qualification in Portugal.

# Intelligent Systems Associate Laboratory

LASI



## LEAD R&D UNIT

ALGORITMI Research Center (ALGORITMI)

## PARTICIPANT R&D UNITS

Applied Artificial Intelligence Laboratory (2Ai)

Artificial Intelligence and Computer Science Laboratory (LIACC)

Centre for Informatics and Systems of the University of Coimbra (CISUC)

Centre for Mechanical Technology and Automation (TEMA)

Centre of Mathematics of the University of Porto (CMUP)

Centre of Technology and Systems (CTS)

Coimbra Institute for Biomedical Imaging and Translational Research (CIBIT)

Institute for Polymers and Composites (IPC)

Institute of Electronics and Informatics Engineering of Aveiro (IEETA)

Research and Development Unit for Mechanical and Industrial Engineering (UNIDEMI)

Research Centre in Real-Time and Embedded Computing Systems (CISTER)

Research Group on Intelligent Engineering and Computing for Advanced Innovation and Development (GECAD)

## DESCRIPTION

LASI sets its mission on tackling relevant societal problems, focusing on a more innovative, sustainable, and inclusive society, where gender and other equality issues assume increased importance. The goal is to consider every single individual as an active and proactive actor of the technological ecosystem, allowing one to push the boundaries of knowledge in domains such as public administration and e-governance, public transportation systems, renewable and green energy, public health and well-being, and go for innovative and more sustainable solutions that, in the end, aim to improve the quality of life of the society as an all and of each individual in particular. All these application areas will be materialized in the following Thematic Lines (TL):

- Innovative and Sustainable Industries - that focuses on advanced manufacturing, decarbonization, factories of future, green AI, Industry 5.0, intelligent materials and

products, and collaborative robotics.

- Smart Cities, Mobility and Energy – that aims to promote sustainable and green cities, focusing on urban computing, intelligent transportation systems, e-Citizenship as well as intelligent environments.
- Health and Well-being - focuses on active ageing, ambient assisted living, and smart intervention with personalized health, biomedical informatics, and medical robotics.
- Infrastructures, and Highly Connected Society - aims to tackle all society specific challenges based on methods and techniques that include cyber security, quantum computing, computational support, internet of things, and virtualization.
- Public Administration and Governance - focuses on E-governance, digital transformation, ethics, data protection and privacy, e-Services, and fair and effective governance.

## WEBSITE

lasi-research.pt

## FCT FUNDING FOR AL

135 742 Euros

## INTEGRATED RESEARCHERS

569

## KEYWORDS

- Computer Science and Artificial Intelligence
- Robotics and Cyber-Physical Systems
- Sustainable Computation
- Intelligent Materials, Manufacturing and Services

## STRATEGICAL OBJECTIVES

The vision of the Intelligent Systems Associate Laboratory (LASI) is to advance edge knowledge in Intelligent Systems to support our society in an innovative, ethical, and sustainable path for the 21st century. The LASI, coordinated by the ALGORITMI Centre, is composed of thirteen R&D units spread over the country. All these R&D units, strongly consolidated in the Portuguese scientific landscape, have a rich relationship with the domains of artificial intelligence and data science, going from the theoretical foundations to its practical application, bringing well-grounded materials, products, and services to our civil society. LASI will promote the generation, dissemination, exploitation and retention of knowledge that is in line with the present and future scientific and technological challenges. We will seek to promote in each member of LASI the competence and passion to work for the benefit of society with creativity, motivation, strict ethical commitment, and respect for human values.

## AREAS OF ACTIVITY

LASI establishes 5 interdisciplinary research Thematic Lines (TL) to give response to social, scientific, health, sanitary, social, economic, and environmental challenges. The goal is to pave the next generation of knowledge and technologies for the development and transformation of the industry and society. Each TL aims to tackle specific societal challenges from United Nations, going from good health (Goal 3), quality education (Goal 4), and gender equality (Goal 5) to renewable and sustainable energy (Goal 7), better jobs and economic growth (Goal 8), innovation and infrastructure (Goal 9), reduced inequalities (Goal 10), smart and sustainable cities (Goal 11), Climate Action (Goal 13), and boost partnerships (Goal 17). Within the Portuguese landscape, the goals are also set to answer societal challenges, including demographic changes and well-being; safe, clean, and efficient energy; intelligent, ecological, and integrated transportation systems; and inclusive, innovative, balanced, and fair societies.

# Laboratory for Instrumentation and Experimental Particle Physics

LIP



## LEAD R&D UNIT

Laboratory for Instrumentation and Experimental Particle Physics

## DESCRIPTION

The Laboratory for Instrumentation and Experimental Particle Physics is the reference institution for particle physics and associated technologies and the reference partner of CERN in Portugal. LIP is an Associate Laboratory since 2001. It has grown increasingly multidisciplinary, and participates in some of the largest computing infrastructures and projects at an European level. LIP brings together about 200 members, including close to 100 PhD researchers, 40 technical and administrative staff, and over 70 graduate students. LIP is nation-wide, with nodes in Lisboa, Coimbra and Braga, in close collaboration with the local universities. The associates of LIP are FCT, the Universities of Lisboa, Coimbra and Minho, IST, FCUL and ANIMÉE.

LIP is engaged to specific objectives that support public policies in several sectors, following a strategic plan in which four thematic lines are considered: 1) Particle and Astroparticle Physics; 2) Instrumentation, Healthcare and Space; 3) Computing and Information Technologies; 4) Science and Society. While the first three lines translate LIP's scientific and technological competence areas into societal contributions, the fourth integrates and boosts the transversal efforts of the other lines, mainly by putting in place a structured framework that allows to push further their knowledge transfer, technology transfer, educa-

tion and outreach actions.

R&D activities at LIP have the support of LIP's Research Infrastructures (computing facilities, detectors and electronics labs, mechanical workshop), which also provide services to external entities, and of LIP's Competence Centres, overarching structures creating a pool of knowledge that eases R&D and fosters knowledge transfer into the non-academic sector. LIP has direct links with Scientific Infrastructures included in the National Roadmap: it is the technical coordinator of the National Distributed Computing Infrastructure (INCD); it is a founding member of ProtoTera; is the main technological partner in several projects of the National Brain Imaging Network (BIN); it works with the Portuguese Space Agency (PT Space), ESA and national and international industrial and academic partners. These links concern research areas that are part of thematic lines 2 and 3 and have the potential to improve both the quality of life (reinforcing the quality of health, education and research networks) and the economy (improving the competitiveness of Portuguese companies).

## STRATEGICAL OBJECTIVES

LIP aims at making impactful contributions by meeting the following objectives:

- Develop excellent fundamental research in particle and astroparticle physics, as the reference laboratory and

## WEBSITE

www.lip.pt

## FCT FUNDING FOR AL

898 141 Euros

## INTEGRATED RESEARCHERS

94

## KEYWORDS

- Particle and astroparticle physics
- Health and space technologies
- Computing and information technologies
- Science and technology for societal challenges

the reference partner of CERN in Portugal.

- Develop excellent research in the areas of application of particle physics' instruments and methods, namely healthcare, space exploration, and data science.
- Develop excellent research in scientific computing and information technologies, (cloud, high performance and high throughput computing, artificial intelligence) remaining a partner in the main Infrastructures and projects at National and European level.
- Engage with society in many different ways: contribute to the development, and qualification of the Portuguese innovation sector, promote digital competences and technology accessibility, focus on science and technology culture and education, inspire the younger generations to pursue careers in science and technology.

## AREAS OF ACTIVITY

LIP is committed to strategic objectives that support public policies in several sectors:

- Science: contributing to advance the boundaries of knowledge and to the excellence and internationalisation of Portuguese science; Meet the goals established in the Portugal-CERN agreements.
- Health: through the application of particle physics technologies to develop more effective and accessible diagnoses and treatments tools and techniques, in particu-

lar for cancer treatment and medical imaging.

- Economy: contributing to strengthen the link between the science and innovation sectors, boosting qualification, internationalisation and productivity.
- Social: promoting science and technology education and digital competences for social inclusion; contributing to eliminate discrimination in education at all levels.
- Environment: directly supporting the use of computing and storage capacity by the national environment and climate research community; as part of ESA's Earth monitoring programme.

# Life Sciences for a Healthy and Sustainable Future

LS4FUTURE



## LEAD R&D UNIT

Molecular, Structural and Cellular Microbiology - Instituto de Tecnologia Química e Biológica António Xavier – MOSTMICRO (ITQB)

## PARTICIPANT R&D UNITS

GREEN-IT “Bioresources for Sustainability” (GREEN-IT)  
iNOVA4Health - Programme in Translational Medicine (iBET, CEDOC/FCM, IPOLFG e ITQB)  
Instituto Gulbenkian de Ciência (IGC)

## DESCRIPTION

The Associate Laboratory Life Sciences for a Healthy and Sustainable Future (LS4FUTURE) is a unique infrastructure in Portugal dedicated to the study of Life Sciences, at different levels of complexity through fundamental, applied, and translational research. The Associate laboratory has its roots in the Laboratório Associado de Oeiras (LAO), created in 2000.

LS4FUTURE subscribes to a One Health concept, working towards environmental and human health to ensure a sustainable future for humankind and our planet. We rely on our distinctive expertise in fundamental, clinical, and applied research and strong complementarity, coupled with strategic partnerships in Health, Industry, Education, Government and Municipalities. Our contribution ranges from topics as diverse as current and emerging diseases, intensification of antimicrobial resistance, food threats, ecosystem degradation, strategies to mitigate climate change, or to contribute to a sustainable economy system.

LS4FUTURE is a national strategic reserve of research in life sciences, working under a unified scientific paradigm to respond to societal challenges. It hosts over 500 PhD holders, including 15 ERC grantees and 13 EMBO members. The AL provides a very strong researcher training program, including 13 Master and 12 PhD programs, as well as training and support to PhD holders at the various levels of their career,

including dedicated programs on innovation.

LS4FUTURE has a very solid international profile, hosting over 200 non-Portuguese students and researchers, due to its strong ability to attract talent and international funding. Participating institutions have an efficient collaboration and communication network, including the sharing of scientific and academic infrastructures, libraries, and administrative support. Together, they provide state-of-the-art facilities and services to support LS4FUTURE researchers and the Portuguese scientific community.

Being composed of diverse actors from complementary sectors, LS4FUTURE goes beyond the impact of its Research Units, tackling problems in a transdisciplinary and comprehensive way, providing effective solutions for current and emerging societal challenges. By combining public and private (not for profit) institutions from the sectors of Higher Education, Research, Industry Interface and Hospitals, LS4FUTURE will have a profound impact on the research and innovation landscape in the area of Life Sciences in Portugal and Europe.

## STRATEGICAL OBJECTIVES

1. Implement a programme to develop scientific and technical careers of PhD holders and an integrated strategy to attract, empower and retain internationally competitive researchers and staff;

## WEBSITE

www.ls4future.pt

## FCT FUNDING FOR AL

1 700 210 Euros

## INTEGRATED RESEARCHERS

473

## KEYWORDS

- Life Sciences
- Precision Medicine
- Biotechnology
- Food Security

2. Perform top quality fundamental and applied research in Life Sciences, embracing the digital transformation, following the scientific programme of its four Research Units;
3. Translate knowledge into healthcare, products, services and processes, directly addressing societal, environmental and economic needs, and aligned with National and European priorities;
4. Achieve a high level of internationalization of teams, projects and activities that can compete with top world performers in R&D;
5. Invest in the professionalization of international fund-raising structures to attract a better share of European and other international funds to Portugal and integrate researchers in international networks;
6. To strengthen our position as a major actor in science communication to the public.

## AREAS OF ACTIVITY

LS4FUTURE is a key player in national science and technology policy in Life Sciences, namely in scientific employment, innovation, and internationalization. Its researchers act as experts to support evidence-based public policy and decision-making, and contribute to high-quality science education and outreach.

LS4FUTURE contributes to the National Health policy, namely in the areas of advanced disease prevention and

understanding of disease mechanisms, and discovery and development of advanced therapeutics; to the National Agro-food policy and the circular economy, namely by contributing to food safety and security, enhancing agriculture productivity and designing solutions towards sustainable ecosystems, grounded in knowledge and biotechnology; and to the Digital Transformation in Life Sciences, creating knowledge capable of handling big data and complex systems.

# Engineering and Technology Sciences

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# S.2.2

ALICE  
ARISE  
CICECO  
i3N  
ICVS/3B's  
INESC TEC  
IT  
LABBELS  
LAETA  
LARSys

# Associate Laboratory in Chemical Engineering

ALiCE



## LEAD R&D UNIT

Laboratory for Process Engineering, Environment, Biotechnology and Energy (LEPABE)

## PARTICIPANT R&D UNITS

Laboratory of Separation and Reaction Engineering -  
Laboratory of Catalysis and Materials (LSRE-LCM)  
Transport Phenomena Research Center (CEFT)

## DESCRIPTION

ALiCE - Associate Laboratory in Chemical Engineering is the result of a consortium of three R&D units based at the Faculty of Engineering of the University of Porto and with a research pole at the Polytechnic Institute of Leiria. Although established in 2021, ALiCE relies on over 20 years of recognized international scientific excellence of its members that synergistically combine their cutting-edge expertise in the fields of Chemical, Biological, Environmental, Materials and Energy Engineering. Over 400 researchers (of which 165 PhDs) offer a unique set of interdisciplinary expertise spanning from fundamental science to technology transfer.

ALiCE is organized into 5 Thematic Lines, two focused on the intensification of industrial chemical processes and bioprocesses, one on innovative materials and products, and the other two on the development of knowledge and applications that enable the sustainability of processes and products, in the fields of energy and environment. The Thematic Lines and the respective sub-activities are: (1) ChE.IND - Chemical Industry: Reaction and separation processes; Fluids, rheology and mixing; Process analytics, modelling and optimization; (2) ChE.BIO - Bioprocesses: Biofilms and biofluids; Marine and food biotechnology; (3) ChE.MAT - Materials: Catalysis, photocatalysis and carbon materials; Polymeric materials and composites; Micro and

nanostructures; (4) ChE.ENE - Energy: Energy from renewable sources; Hydrogen from renewable sources; Energy efficiency and thermal comfort; (5) ChE.ENV - Environment: Monitoring and risk assessment; Advanced water and gas treatments; Wastes and endogenous resources. Five specific objectives are highlighted for the period 2021-2025: (1) to create scientific jobs – 17 permanent researcher positions; (2) to promote advanced training in the relevant topics of the thematic lines and to continue applying to international programs (e.g., Marie Curie) to attract international students – at least 100 doctoral theses; (3) to intensify collaborative research with companies and CoLABs – direct industry funding is expected to increase by 2% of the overall budget; (4) to increase innovation and technology transfer – up to 10 patents applications and 2 spin-offs; and (5) to increase international funding - to foster young researchers to successfully pursue ERC grants and to double the contribution of international funding to the overall budget.

## STRATEGICAL OBJECTIVES

ALiCE is the Associate Laboratory in Chemical Engineering, extending its areas of expertise to Biological, Environmental, Materials and Energy Engineering. ALiCE's mission is to contribute to scientific knowledge and its technological applications for the development of innovative processes

## WEBSITE

www.alice.fe.up.pt

## FCT FUNDING FOR AL

423 568 Euros

## INTEGRATED RESEARCHERS

192

## KEYWORDS

- Chemical Processes
- Bioprocesses
- Environmental Technologies
- Sustainable Energies

and products, in a sustainable and efficient way, and to respond to societal challenges and industry development. The strategic objectives of ALiCE are to maximize the performance in areas of excellence of the consortium's R&D units, emphasize areas that give optimum responses to public policies aimed at responding to societal challenges, and provide the best alignment with the 5 missions of the Horizon Europe. ALiCE's vision is to be the driving force for relevant scientific advances, produce sustainable technological innovation and foster its transfer into industry and society, encourage advanced training, and strengthen the international recognition in interdisciplinary research.

## AREAS OF ACTIVITY

ALiCE aims to stand out as a key partner in the promotion of National and European science-related public policies cooperating with governance bodies, industry partners and stakeholders. Three key public policies are envisaged: (1) to promote scientific employment and career opportunities, offering the best possible conditions to attract talents to develop their research and receive advanced training, and promoting jobs in industry through technology transfer and entrepreneurship. (2) to find technological solutions to respond to societal challenges, including industry decarbonization, processes intensification, digital transition, sustainable bioprocess-

es, food and marine biotechnology, advanced engineered materials, energy from renewable sources, model the impacts of climate changes, combat water scarcity and contaminants of emerging concern.

(3) to increase internationalization, through participation in European and other international networks, projects and infrastructures.

# Advanced Production and Intelligent Systems

ARISE



## LEAD R&D UNIT

Research Center for Systems and Technologies (SYSTEC)

## PARTICIPANT R&D UNITS

Centre for Mechanical Engineering, Materials and Processes (CEMMPRE)

Centre for Rapid and Sustainable Product Development (CDRSP)

Institute for Sustainability and Innovation in Structural Engineering (ISISE)

Institute of Systems and Robotics - ISR – Coimbra (ISR-UC)

## DESCRIPTION

The ARISE AL associates five R&D Units bringing together 190 integrated PhD researchers from fundamental and applied fields in Production Systems, Materials and Components, Computer Science, Robotics, Information Technologies (Cyber-physical Systems), and spanning multiple Engineering fields, notably, Manufacturing, Electrical, Civil, Mechanical, and Materials.

Thus, the ARISE AL is in a unique position to respond and contribute to the enhancement of a wide variety of public policies of the ENEI 2014-20 strategy that transverses a wide swath of the national economy, notably, Manufacturing, Built Environment and Habitat, Energy and Mobility, Information and Communication Systems, as well as Economy of the Sea, Health, Agriculture, and Forestry.

The ARISE AL is organized in following intertwined Thematic Lines:

- New Materials and Components
- Advanced production systems and processes
- Sustainable Energy Systems
- Intelligent Systems and Robotics
- Digital Ecosystem, Sustainability, Risk and Management and its agenda comprises:
  - Fundamental R&D activities of excellence in its intervention areas.
  - Development of new products and services, leading to

reinforcement in intellectual property.

- Public policies addressing social, environmental, and economic challenges for which Production Technologies for Process and Product industries, Habitat, Materials and Components, Information Technologies, Energy, and Health, play a key role with emphasis on the comprehensive Reindustrialization and Decarbonization of the National Economy.
- Active participation in National Economic Recovery Plan aiming at the increase of the value and resilience of the economy.
- Technical and Scientific support to stakeholders, governance, and decision-makers.
- R&D Internationalization of national S&T pivotal to attract talented foreign PhD students and researchers, and increase funding from the EU and other research organizations.
- Promote the access of start-ups and SMEs to advanced technologies, high quality training, and networking.

The success of this program hinges on the deployment of a sound strategy for career development of high qualified researchers, but also on the creation of a dynamic for stability and incentives for future promotions.

The ARISE AL is involved in several COLABs (VG-Colab, HYLAB, +Atlantic, WATER-CoRe), EU and RNIE infrastructures (PAMI, EMSO-PT, SHIFTRAIL, EIT Manufacturing),

## WEBSITE

arise-la.pt

## FCT FUNDING FOR AL

199 871 Euros

## INTEGRATED RESEARCHERS

251

## KEYWORDS

- Sustainable Production and Energy Systems
- Digital Ecosystems, Sustainability, & Management
- Robotic and Intelligent Systems
- New Materials and Components

as well as more than a dozen of mobilizing agendas and pacts in the PRR scope.

## STRATEGICAL OBJECTIVES

The ARISE Associated Laboratory brings together the R&D Units CDRSP, CEMMPRE, ISISE, ISR-UC and SYSTEC to undertake R&D and innovation activities targeting the excellence in Manufacturing, Robotics, Materials, Construction, Energy, Management and Information Technologies targeting the renovation and reindustrialization of national production systems and built environment in a decarbonization context to ensure competitiveness as well as environmental and socio-economic sustainability.

These objectives encompass:

- Significant increase of highly qualified PhD researchers coached towards the ARISE goals;
- Strengthening the pertinent RNIE - Research infra-structures of the National Roadmap;
- Strong alignment with the ENEI 2014-20 strategic axis: Production Technologies, Materials, Energy, Mobility, Information and Communication Technologies, with a significant relevance on Habitat, Economy of the Sea, Health, Agriculture and Forestry, and Internationalization of the national R&D and Innovation.

## AREAS OF ACTIVITY

The ARISE AL addresses the challenges underlying the design and the deployment of Portuguese Public Policies along the following axes of the ENEI 2014-20:

- A2. Production Technologies for Process and Product industries
- A5. Habitat and Health
- A3. Materials and Components
- A1. Information Technologies and Energy

This is achieved by articulating R&D of excellence with Innovation to promote the:

- Advancement of the National R&D Agenda concerning the Reindustrialization and Decarbonization of Production Systems
- Advanced training and stability of highly qualified employment
- Active participation in the National Plan for the Economic Recovery and Resilience.
- Alignment with the EU Horizon and the United Nations strategies, imperative for the World Sustainable Development
- Strengthening of the pertinent entities of the National Roadmap of Research Infra-structures
- International cooperation with emphasis on the EU by taking advantage of the network PERIN.

# Aveiro Institute of Materials

**CICECO**

university of aveiro  
Theoria possumus praxis

ciceco  
aveiro institute of materials

## LEAD R&D UNIT

CICECO-Aveiro Institute of Materials (CICECO)

## DESCRIPTION

CICECO-Aveiro Institute of Materials received the status of Associated Laboratory of the University of Aveiro (UA) in 2002 and became the best rated (Excellent, 15 points) national Materials Science and Engineering Institute (MSE) in the 2017/18 FCT research assessment. It comprises ca. 500 chemists, physicists and materials engineers, including over 200 PhD scientists and 203 PhD students.

CICECO reached European standing and has a strong aptitude to attract foreign talents, as the following witnesses. In the last 5 years, we received 9 ERC Grants (2 Starting, 2 Consolidator, 2 Advanced, 3 PoC), and 11 people have h-index >50. 30% PhD researchers and 16% PhD students are non-nationals. In 2020, 21% of 456 SCI papers were published in top 10% journals (category normalised), including Science and Nature series, and had over 50% foreign co-authors. In 2016-2020, we raised 10.2 M€ from EC programmes and other international funders. We engaged in 1 PhD and 3 Erasmus Mundus MSc programmes. Our equipment infrastructure is the best in Portugal for materials research.

As an engineering-oriented institute, a strong collaboration with Industry is part of our DNA. In 2016-2020 we have raised 15.4 M€ in projects with (multi)national industry. 19 projects have been running since 2018. In 2018-2020, we have filled 47 patents (22 international). 3 start-

ups are running.

To tackle the challenges addressed by public policies, we Thematic Lines 'Materials Science and Engineering, and Nanotechnology', 'Sustainability and Circular Economy', 'Biomedical Science and Engineering', and a transvers axis 'Industry and Manufacture' that intercepts all Lines, and scientific, social, environmental, economic, sanitary and wellbeing objectives. We will create and Observatory for Materials capable of bringing together the academic, industrial stakeholders, and decision makers to produce a material's knowledge-informed consensus on issues such as the replacement of plastics and the adoption of biopolymers, identification of secondary sources of raw materials, decarbonisation, blue and green hydrogen, among others.

## STRATEGICAL OBJECTIVES

**Mission:** To develop the scientific and technological knowledge necessary for the innovative production and transformation of materials for a sustainable development and the benefit of society (from ceramics to soft matter and hybrids).

**Vision:** To strengthen our leading role as an interdisciplinary European research laboratory in the field of materials; contribute to the development of a scientific culture at the national level and educate students to high levels of scientific literacy; stimulate innovation within the industrial sector.

## WEBSITE

www.ciceco.ua.pt

## FCT FUNDING FOR AL

880 770 Euros

## INTEGRATED RESEARCHERS

211

## KEYWORDS

- Materials
- Nanosciences
- Sustainability
- Bioengineering

## AREAS OF ACTIVITY

In the frame of CICECO's mission and vision, the aims of our strategic plan address the thematic Lines 'Materials Science and Engineering, and Nanotechnology', 'Sustainability and Circular Economy', 'Biomedical Science and Engineering', and a transvers axis 'Industry and Manufacture' that intercepts all Lines, and scientific, social, environmental, economic, sanitary and wellbeing objectives.

The 'scientific objectives' are in the DNA of any research institute and, thus, they are shared by our 3 Lines. Among the 'social objectives' advanced training, and the promotion of a scientific culture at the national level, equally pervade all Lines. While environmental awareness and sustainability is a concern of all Lines, it is at the core of the Line 'Sustainability and Circular Economy'. 'Economic objectives' are also in the agenda of all Lines, although Sea Economy and Blue Biotechnology issues are pursued essentially in Lines 'Sustainability and Circular Economy' and 'Biomedical Science and Engineering'. These objectives characterise the transversal axis Industry and Manufacture. While all Lines are concerned with 'sanitary and wellbeing' objectives these are the core activity of the Line 'Biomedical Science and Engineering'.

# Institute of Nanostructures, Nanomodelling and Nanofabrication

i3N



## LEAD R&D UNIT

Institute of Nanostructures, Nanomodelling and Nanofabrication (I3N)

## DESCRIPTION

Created in 2006 as an Associate Laboratory by the Portuguese Minister of Science, Technology and Higher Education, i3N was a partnership between 2 leading research units in fundamental and applied science: CENIMAT (Materials Research Center, NOVA University Lisbon) and FS-COSD (Physics of Semiconductors, Optoelectronics and Disordered Systems, Aveiro University). After 13 years, i3N has successfully achieved a leading position with strong national and international impact, being a pioneer, for example, in the fields of photovoltaics, thin-film microelectronics, paper electronics and transparent (oxide) electronics, having contributed in these areas to National and European public policies. i3N is a cross-interdisciplinary institute built on existing institutional strengths, and offers world class, in the area of development and innovation at leading-edge of research and education. I3N integrates chemists, physics, materials science, engineers and others from Aveiro University and NOVA University Lisbon being organized in 6 research groups to address the challenges of i3N strategic research fields. In order to address the challenges imposed by the 19 goals of OECD, the public policies as well as the societal needs, i3N proposes a set of 4 Thematic Lines (Sustainable Micro and Nanofabrication; Green and Clean Energy Systems; Nanomaterials Engineering and Functional Interfaces; Biomedical Devices

es and Systems) that covers in part some of these objectives, covers in part some of these objectives, and which are the core of the activity of i3N, each one focused on a critical societal issue..

## STRATEGICAL OBJECTIVES

To reach the targets, i3N will consolidate and implement its strategic research activity around the following main objectives: establishment of a coherent approach to research and science policy; planning and execution of joint research projects; common management of resources and knowledge; integration of human resources by exchange, training and joint supervision; integration of equipment and facilities by increasing the availability, access and throughput; encouragement of the free flow of expertise, methods, experimental and theoretical tools; exploitation of the scientific progress for industrial applications.

By virtue of this, i3N will be a relevant partner to activate and to support public policies based on the scientific evidence, connected to Sustainable Micro and Nanofabrication (SMNF), Sustainable Green and Clean Energy (SGCE), Nanomaterials Engineering and Functional Interfaces (NEFI), Biomedical Devices and Systems (BDS). Therefore, i3N activities have been focused on: 1. Innovation: to accelerate the exploitation of knowledge generated, boosting its role as driver of social and societal prosperity.

## WEBSITE

www.i3n.org

## FCT FUNDING FOR AL

1 251 965 Euros

## INTEGRATED RESEARCHERS

114

## KEYWORDS

- Nanofabrication
- Micro-Nanotechnologies
- Nanostructured Materials
- Advanced Functional Materials

2. Education: to be engaged in specialized training of students, young academics and industrial scientists on next-generation technologies, interdisciplinary methodologies and data management skills. 3. Policies: to increase coherence between European, national and regional priorities and policies, within the Green Deal tender. 4. Data: to exploit the data science and data engineering expertise for the development of the European Open Science Cloud with consistent access protocols and production of FAIR datasets and metadata

## AREAS OF ACTIVITY

The Scientific Areas of i3N are:

- Materials Engineering
- Nanotechnology
- Physical Sciences

The multidisciplinary area targeted by i3N includes the realization of 4 TLs which crosscut different scientific areas and require complementary synergies from all. The proposed 4 Thematic Lines encase key strategic areas of our development, crosscutting the fundamentals of the needs for a consolidated strategy related to the public policies, aiming to bring comfort and welfare to all. The TLs cover very different thematic scientific areas for which converging synergies are required.

Thematic Lines:

- Sustainable Micro and Nanofabrication

- Green and Clean Energy Systems
  - Nanomaterials Engineering and Functional Interfaces
  - Biomedical Devices and Systems
- i3N, besides conducting research in the multidisciplinary fields above mentioned, aims to be in the leading edge of:
- Promoting scientific excellence and innovation in Sustainable Functional Advanced Materials, using green technologies, to serve a plethora of fields and for socio-economical ends, aligned with the Sustainable Development Objectives and the Green Deal;
  - Remaining at the international leading edge of research by fostering breakthroughs concepts and exploiting materials and device properties at nanoscale level;
  - Promoting practical application of R&D+I results, including the transfer to the industry;
  - Providing access of the institute's facilities and equipment to the technical-scientific community and lending assistance to industry;
  - Training and enabling the continuous education of scientific (including MSc and PhD students) and technical researchers, able to account for the challenges of science and technology cross cutting fields;
  - Fostering public awareness, engagement and understanding of advanced materials, nanoscale science, engineering and nanotechnology;
  - Providing scientific and technical evidences able to sustain the Public Policies for the changes of the future.

# Associate Laboratory, Life and Health Sciences Research Institute / Biomaterials, Biodegradables and Biomimetics Research Group

## DESCRIPTION

The ICVS/3Bs aggregates since 2011 two independent Research Units: ICVS and 3Bs Research Group.

It develops activities in Biomedical Engineering, Bioengineering, Biomedical Technology and Health Sciences (Biomedical & Clinical). Its mission at the Health Sciences/Technologies interface is to promote better healthcare by fostering the advance of knowledge in mechanisms of disease and advanced therapies, and to promote the generation of value through the development of innovative products/services and clinical interventions. It fosters the development of new technologies, therapies and medical products for prevention, vaccination, diagnosis, regenerative and precision medicine, minimally invasive therapeutic procedures and nanomedicine.

The ICVS/3Bs has implemented a unique ecosystem in health sciences and technology in alignment with the European Research Area of the EC, the Thematic Agenda for R&D in Health, Clinical and Translational Research, and the implementation of the Portuguese Strategic Roadmap of Research Infrastructures. The AL delivers important contributions in terms of scientific, public health, social, and economic progress.

The ICVS/3Bs AL has human and material resources that strategically cover the complete development pipeline, from fundamental research, to tests in cellular and ani-

## ICVS/3B's



### LEAD R&D UNIT

ICVS/3B's - Associate Laboratory

mal models for pre-clinical validation, up to clinical trials through the Clinical Academic Center - Braga (2CA), transposing to the market innovative therapeutic solutions.

The 3Bs Research Group develops its research in the following Thematic Lines (TL): i) Bioinspired and Engineered Biomaterials and Nanomedicine; ii) Tissue Engineering, Regenerative and Precision Medicine.

The ICVS Group develops its research in the following Thematic Lines: i) Biomedicine & Translational Sciences ; ii) Clinical Sciences.

The ICVS/3Bs AL has been particularly successful in the last years in what regards international research funding, particularly from the European Union. In fact, the ICVS/3Bs AL has uniquely attracted funds from all the instruments in the Widening scheme within the Research and Innovation Framework Programme Horizon 2020. Besides, it has been also competitive regarding the European Research Council, with 2 AdG, 4 CoG, 1 StG and 2 PoC that have already been granted.

### STRATEGICAL OBJECTIVES

The ICVS/3Bs Associate Laboratory embraces the following Strategic Aims: (1) Develop basic and applied research in the interface Health Sciences/Technology; (2) Provide advanced education and training offered to undergraduate/postgraduate students and healthcare/engineering

### WEBSITE

icvs3bs.pt/icvs3bs

### FCT FUNDING FOR AL

249 114 Euros

### INTEGRATED RESEARCHERS

173

### KEYWORDS

- Tissue Engineering and Regenerative Medicine
- Biomaterials and Nanomedicine
- Biomedicine and Translational Sciences
- Clinical Sciences

professionals; (3) Services, consulting and technology transfer with industrial/clinical partners; (4) Dissemination and fostering of public awareness of science.

This sustainable strategy is designed to pursue ICVS/3Bs' mission to promote scientific and technological progress towards better healthcare. More specifically, research efforts are focused in advanced disease prevention measures, diagnosis tools and therapies, such as vaccination, theranostics, regenerative medicine, nanomedicine, minimally invasive therapeutic procedures and personalized treatments. The ICVS/3Bs' plan supports the translation of applied research to generation of added value for population, companies and healthcare providers.

### AREAS OF ACTIVITY

The ICVS/3Bs Associate Laboratory established a research ecosystem in health sciences and technology at Uminho. By supporting the Thematic Agenda for Research and Innovation in Health, Clinical and Translational Research and the Roadmap of Research Infrastructures from FCT, we provide benefits in scientific, social, and economic progress to the populations.

The ICVS/3Bs supports the public policies by: (i) maintaining a competitive and sustainable research ecosystem with stable research careers; (ii) producing relevant scientific outputs that generate economic and healthcare pro-

gress; (iii) being a reference center for clinical and applied research, which offers access of patients to healthcare innovations and attract competitive funding and international talent; (iv) training highly-skilled researchers and clinicians, contributing for the fight against the COVID-19 pandemic to assist the public needs in healthcare, particularly when those needs are unknown and unpredictable.

# Institute for Systems and Computer Engineering, Technology and Science

## DESCRIPTION

INESC TEC is a major national science and technology (S&T) policy actor, with growing visibility in Europe. It gathers researchers from multiple Higher Education Institutions, counting among its Associates the University of Porto, the Polytechnic of Porto, the University of Minho and the University of Trás-os-Montes e Alto Douro. INESC TEC's contributions to S&T policy in 35 years of history are manifold. It contributes to the building blocks of the S&T system, with R&D ranging from fundamental research to technological development in line with national priorities, highly qualified talent in critical STEM areas, technology infrastructures shared with the S&T community, and communication with students and the general public, while developing international partnerships.

In the areas of activity of relevance for INESC TEC, both Europe and Portugal have well established visions and priorities. The European priorities include the European Green Deal and the Europe Fit for the Digital Age. The Portuguese government specified in 2016 a set of research and innovation thematic areas and recently defined priorities related to Digital Transition, Climate Transition, and Resiliency. Under this framework, the research goals at INESC TEC are the following:

- In the Computer Science Line, we help implement agendas and lead topics instrumental to the country's digital

INESC TEC



## LEAD R&D UNIT

Institute for Systems and Computer Engineering, Technology and Science (INESC TEC)

transformation and related policies, by combining our key competences on big data and machine learning, privacy-preserving computing, virtual environments, and tools for reliable software.

- In the Industrial and Systems Engineering Line, we design systems and services for managing value streams. We aim to lead complex decision-making in end to end, customer centric, agile supply chains across different industries, including manufacturing, process industries, retail, health and mobility, supporting competitiveness and resilience.
- In the Networked Intelligent Systems Line, we design systems which can aggregate sensing, computer vision, communications, and navigation components. These systems are mostly low power and implement edge intelligence (including cyber-physical systems and autonomous systems), adapt and cooperate, and are able to learn from experience.
- In the Power & Energy Line, we work towards the digitalisation and decarbonisation of the energy sector by combining our competences in smart grids and digital energy systems, renewable energy integration, and power systems planning and operation.

## STRATEGICAL OBJECTIVES

Apply its expertise in 4 Thematic Lines of scientific rele-

## WEBSITE

www.inesctec.pt

## FCT FUNDING FOR AL

1 308 258 Euros

## INTEGRATED RESEARCHERS

323

## KEYWORDS

- Intelligence
- Electrical
- Computers
- Systems

vance for national and European policies:

- Computer Science, Industrial and Systems Engineering, Networked Intelligent Systems, and Power and Energy.
- Strengthen its research capacity in line with scientific employment policies, from 85 hired PhDs in 2020 to 105 by 2025 (and from 29 to 72 permanent employment contracts).
- Create future visions and lead trends related to the Thematic Lines, with (1) regular discussion forums with scientists, innovators and policy makers, and (2) open access white papers.
- Evolve the programmatic vision to be more effective in the assistance to the modernisation of Portuguese society along the scientific areas associated with its thematic areas.

## AREAS OF ACTIVITY

Considering INESC TEC's S&T aspiration to foster pervasive intelligence, translated at mission level as the creation of new digital intelligence paradigms and their application in its domains of expertise, the Institute strengthens its role as a relevant S&T partner in the design, implementation and evaluation of public policies related to digital and climate priorities, focusing on the following research and innovation thematic areas: Industry and Manufacture; Sustainable Energy Systems; Sea; Agrofood, Forests and

Biodiversity; Health; Cyber-physical Systems and Advanced Forms of Computation and Communications.

# Institute of Telecommunications

IT



## LEAD R&D UNIT

Instituto de Telecomunicações (IT)

## DESCRIPTION

The Instituto de Telecomunicações is a private, not-for-profit, multi-site association of six universities, one polytechnic institute and two private companies, which was granted the statute of Associated Laboratory in 2001. Having a wide national coverage, the three main sites of IT are located at Universidade de Aveiro, Universidade de Coimbra and Instituto Superior Técnico of the Universidade de Lisboa, but has also delegations at U-Porto, UBI-Covilhã and IP-Leiria. IT is managed by a Board of Directors with individualized responsibilities regarding human resources, finances, planning and control and business development. IT's scientific organization encompasses a Scientific Board, arranged in 16 clusters of research groups and an Advisory Board composed of a Scientific Committee and a Business Committee.

IT's mission addresses the creation and dissemination of scientific knowledge, technology transfer and societal challenges on technologies of information, communication and electronics (TICE), with a strong emphasis on Telecommunications. Its research is organized around 4 Thematic Lines devoted to major TICE topics, and a 5th that supports the previous ones with fundamental research on basic sciences and enabling technologies. IT is a member of 2 Digital Innovation Hubs and co-promoter of a Technological Free Zone (ZLT).

IT activities are focused on both fundamental research on TICE, and on applied research, technology transfer aligned with portuguese societal challenges and public policies (e.g., Information and Communication Technologies, Digital Transition of the Economy, Defense, Mobility, Space, Education, and Health). Building on IT's rich track-record on those challenges, IT's strategic plan is focused on supporting related R&D, on continuing technology transfer and intellectual property through cooperative projects with industry. Additionally, IT will continue hosting and training MSc and PhD students, to feed national highly qualified work force on TICE, and continue supporting (with its own patents and laboratory facilities) the creation of technological startups.

Relying on top-level laboratories, 30 clerks and technicians as well as around 200 integrated researchers holding a PhD degree, IT is well prepared to respond to societal challenges as well as to support public policies in the rich field of TICE.

## STRATEGICAL OBJECTIVES

The objectives of the AL Instituto de Telecomunicações concern the creation and dissemination of new knowledge and support advanced training and public policies in the broad field of the Technologies of Information, Communications and Electronics (TICE), with a special emphasis on

## WEBSITE

www.it.pt

## FCT FUNDING FOR AL

928 400 Euros

## INTEGRATED RESEARCHERS

194

## KEYWORDS

- Telecommunications
- Information
- Electronics
- Technology

Telecommunications, in close cooperation with its associated institutions. As an Associated Laboratory, IT objectives focus on addressing societal challenges and public policies by providing enabling TICE through transdisciplinary cooperation with specialists in relevant fields.

IT activities are organized around four thematic lines devoted to major TICE topics, namely wireless communications, optics and photonics, information and data sciences and networks and services, as well as a fifth that supports the previous ones with fundamental research on basic sciences and enabling technologies.

## AREAS OF ACTIVITY

IT will support public policies putting at the service of public authorities a team of world class experts to answer identified challenges, as well as to continue supporting the creation and dissemination of technical and scientific culture, namely promoting the scientific literacy of the common citizen.

IT is committed to maintain a tight R&D unit, by joining competences of different experts from universities and polytechnics, contributing to the country's interior development and thus territorial cohesion, as well as to promote the name of Portugal in the international scientific fora.

Furthermore, IT will contribute with project results for solutions to societal challenges, not only in the specific

fields of TICE, but also in other fields such as health, space, automation, digital transition of the economy, security, defense and sensor networks, protecting portuguese intellectual property rights, and looking forward to transfer the technology to the industry and nurturing start-ups.

# Associate Laboratory on Biotechnology, Bioengineering and microElectromechanical Systems

**LABBELS**



## LEAD R&D UNIT

Centre of Biological Engineering of the University of Minho (CEB-UM)

## PARTICIPANT R&D UNITS

Microelectromechanical Systems Research Unit (CMEMS-UMinho)

## DESCRIPTION

LABBELS is committed to contribute to public policies related to:

A - Industrial Biotechnology

- (i) accelerating the decarbonisation of the economy;
- (ii) the circular economy;
- (iii) the National Plan for the Promotion of Biorefineries 2030;

B - Environmental Biotechnology

- (i) the European Green Deal;
- (ii) the government strategies to improve waste management;
- (iii) the government strategies to improve the management of the urban water cycle;
- (iv) to promote integrated solutions for the treatment of agricultural waste, associated with recovery of biogas for energy production;
- (v) to support innovation and collaborative farmer networks for energy transition and decarbonization of the sector;

C - Health Biotechnology

- (i) delivering technological solutions to better manage health and diseases and for designing sustainable approaches for the digital transformation;
- (ii) improving biological technologies to tackle chronic and infectious diseases;

(iii) alignment with the National Strategy for the Health Information Ecosystem. The emergence of technologies such as robotics, AI, ML, natural language processing, wearables, the IoT will raise the impact of telehealth;

D - Food Biotechnology

- i) widening and diversifying the business opportunities associated with the efficient and regenerative use of local resources;
- ii) supporting the creation of pilot-scale, prototypes or scale-up solutions targeting the objective of achieving a circular bioeconomy;
- iii) supporting R&D&I linked to food quality control and safety;
- iv) alignment with the strategies of the National Plan for a Healthy Food and with the actual main trends of the food sector: regenerative, upcycling, biodiverse and organic farming;

E - Microelectromechanical Systems

- (i) ocean governance optimization and monitoring, by sensing, data collection, and information extraction for decision making;
- (ii) sustainability of marine resources through intelligent platforms and new cyber-physical systems to assess resources health and stability;
- (iii) cooperation with coastal municipalities to implement active monitoring solutions and policies to predict climate

## WEBSITE

www.labbels.uminho.pt

## FCT FUNDING FOR AL

499 501 Euros

## INTEGRATED RESEARCHERS

149

## KEYWORDS

- Biotechnology and Bioengineering
- Bioprocess Engineering
- Microelectromechanical Systems
- Environment, Food and Health

changes impact;

- (iv) To promote the deployment of IoT everywhere, from logistics to healthcare sector;
- (v) Aging and quality of life by remote monitoring of several physiological, environmental, and societal parameters;
- (vi) Promote the sensing, connectivity and orchestration of industry and territories.

## STRATEGICAL OBJECTIVES

LABBELS is an Associate Laboratory based at the University of Minho linking 4 well established thematic lines of Industrial Biotechnology, Environmental Biotechnology, Health Biotechnology and Bioengineering, and Food Biotechnology, with a clear-cut expertise in computational modelling, micro/nano fabrication, smart devices integration and testing. LABBELS will enable both step and leap changes in Biotechnology and Bioengineering, by delivering an outstanding scientific groundwork underpinning the development of innovative biotech solutions and devices, oriented for accelerated market implementation. Linking life and technology, we will shape the future by contributing significantly to the global challenges of securing a Sustainable Bioeconomy. LABBELS gathers a relevant critical mass and an excellent research capacity to pursue the objectives of National Science and Technology policy in addition to sustaining research and technical careers for qualified PhD holders.

## AREAS OF ACTIVITY

LABBELS will be a leading research institution to be formally consulted by the Government and by the Public Administration regarding the definition of national scientific and technological policy instruments aligned with a) Climate change with a focus on i) energy transition, ii) Circular economy and iii) Valuing the territory - from the Sea to the Forest; b) Digital society, creativity and innovation, with a focus on i) promoting a technological step change by supporting the use of emerging technologies, ii) promoting the sensing, connectivity and orchestration of industry and territories, iii) boosting ocean digitization, iv) developing new ways of delivering health care and services, in particular by developing new medical devices and sensors. Clearly LABBELS should be an active contributor on the “National Strategy for Sustainable Bioeconomy 2030”. LABBELS will also be a relevant partner of the Government in the Recovery and Resilience Plan for the period 2021-2026.

# Associate Laboratory of Energy, Transports and Aerospace

LAETA



## LEAD R&D UNIT

Associate Laboratory of Energy, Transports and Aeronautics (LAETA)

## DESCRIPTION

Created in 2006, LAETA is an Associate Laboratory in the fields of Energy, Transportation and Aerospace, which also addresses other emerging fields where its scientific knowledge, grounded on Mechanical, Materials and Aerospace Engineering, can be applied. The core of LAETA is a dynamic, connected community of 264 Integrated Researchers (IRs) and 255 PhD students, located in all regions of continental Portugal. This human capital has been of paramount importance for LAETA's success in the different dimensions of its activity.

For the period 2021-2030, LAETA's work program includes a set of actions focused on the support to the national scientific and technologic policy (NSCP), considering the specific needs of each of its main sectors concerning public policies, namely:

- Energy: to implement at local level the methodologies, tools and technologies most appropriate to effectively face the climate change, with a focus on the energy system, the management and recovery of natural systems, but also on the improvement of existing infrastructures.
- Transport: to promote the use of more sustainable transports, with a reduction of about 25% in greenhouse emission gases in 2030, when compared to 2005. It mainly focus on the vehicle's durability, recy-

clability and safety, contributing to the decarbonisation of the automotive, aeronautics and railroad sectors and, in parallel, to increase the competitiveness of the national companies operating in them.

- Aerospace: to accelerate the implementation of the Portuguese Space 2030 Strategy, particularly in the area of 'Space Technologies', aiming to bring scientific and technological results to higher TRL levels, to increase the participation of Portugal in international scientific missions.
- Industry: to promote the adoption of enabling technologies, such as flexible industrial automation (e.g. robotics and cyber-physical systems), advanced materials processing (e.g. additive and hybrid processes), state-of-the-art ICT and Artificial Intelligence, aiming to increase the efficiency and resilience of the national industrial production.

## STRATEGICAL OBJECTIVES

- To secure effective support to public policies, by insuring that the R&I outputs of LAETA's multi-annual R&D program effectively support policy-making in its target sectors, namely Energy, Transports and Aerospace, and positively impact the resilience of the related industrial value-chains.
- To secure careers and employment for PhDs in LAETA's areas of intervention, creating attractive career devel-

## WEBSITE

laeta.pt/en

## FCT FUNDING FOR AL

193 408 Euros

## INTEGRATED RESEARCHERS

276

## KEYWORDS

- Mechanical Engineering
- Aerospace Engineering
- Transport Technologies
- Energy

opment conditions, as experience plays a key role in supporting the implementation of public policies, in capturing international funds, and in establishing strategic international partnerships.

- To attract talent, by encouraging high-potential (international young researchers to develop their career in LAETA's areas of specialization, thus building stable and high-performing R&I teams.
- To leverage international prominence and secure funding, by reinforcing targeted networking and dissemination activities among the several European organizations in which LAETA is involved.

## AREAS OF ACTIVITY

- Energy: Replacement of the most pollutant fossil technologies by low carbon technologies; Response to climate change and adaptation; Prevention and reduction of the impact of forest fires; New paradigm of inclusive, safe and sustainable cities.
- Transport: Sustainable Mobility - More sustainable transports and reduction of related GEE emissions; Consolidation of a technological base in advanced materials to support an innovative and competitive vehicles components industry; Circular Economy – Design of new products, processes and Services.
- Aerospace: Positioning in Space Technologies Devel-

opment - Development, construction and operation of equipment, systems and infrastructures relevant for Space applications; capacity and skills through Space-related scientific research, innovation, education and scientific culture.

- Industry: Resilience of the industrial sector; Resources circularity and efficiency; Digitalisation; Human-centred manufacturing.

# Laboratory of Robotics and Engineering Systems

LARSyS



## LEAD R&D UNIT

Laboratory of Robotics and Engineering Systems (LARSyS)

## DESCRIPTION

The Laboratory of Robotics and Engineering Systems (LARSyS) was established in 2001 to conduct basic and applied research in engineering technologies while addressing societal challenges and supporting the public policies. Seeking to combine theoretical, practical, and socio-technical impacts, LARSyS has diversified its efforts and approaches to essential application domains from the oceans to aerospace, including disruptive digital technologies (such as advanced robotics and human-centric AI) and life sciences.

LARSyS brings together four R&D units to address the challenges across 5 thematic lines (AIR, OCEANS, URBAN, LIFE, and INTERACTION). Through this unique combination of research capacities, spanning across ten groups conducting specialized work in their core fields of expertise, LARSyS seeks an enhanced capacity to support public policies on a broad set of Portuguese and European societal challenges, by fostering research at new knowledge frontiers across different disciplines, while pursuing world-class excellence in R&D.

LARSyS pursues a twofold mission: i) To conduct cutting-edge research fostering new knowledge at the forefront of science and technology; and ii) To transfer technology to the production system and society through end-users such as companies, public institutions, and pol-

icymakers. The two missions are closely interconnected because new technologies originate from new knowledge and discoveries while informing and influencing public policy. Transforming pioneering research ideas into applicable technologies that impact the world requires a strong effort to balance fundamental research, technology development, and public policy.

The global nature of the public policy strategic challenges defined by the Portuguese Government is aligned with the European priorities of the Green Deal, the New European Bauhaus movement, and the European fit for the digital age as well as the major global concerns associated with climate change. These are areas where LARSyS is traditionally well suited to promote new knowledge in an international context that supports the overarching priorities of the European way of life such as an economy that works for people and a stronger influence in the world. LARSyS is synergistically well aligned with these national and European priorities and strategically placed to attract and retain international talent capable of promoting the networked institutional framework required to sustain their societal impact.

## STRATEGICAL OBJECTIVES

Active intellectual collaboration among researchers with varied backgrounds and perspectives acquired in different

## WEBSITE

larsys.pt

## FCT FUNDING FOR AL

1 064 861 Euros

## INTEGRATED RESEARCHERS

118

## KEYWORDS

- Robotics and Cyber-physical Systems
- Engineering Systems
- Human Computer Interaction
- Environmental Technologies

kinds of science (e.g., experimental, computational, and theoretical), different sectors (university, industry, governmental and regional administration), and different regions; Scientific research and technological development in emerging areas of interest in Robotics and Engineering Systems, through major research projects with national or international Universities, R&D institutions, and industrial companies;

The diffusion of scientific results through publications and by organizing seminars, conferences, exchange visiting programs, and scientific meetings at a national or international setting.

It also aims to provide education and research experience for graduate and undergraduate students, post-doctoral researchers, and industrial fellows by providing exposure to leading-edge research and introducing the students to large-scale collaborative research ventures.

## AREAS OF ACTIVITY

Climate change: promoting the energy transition and the circular economy (Oceans, Urban, Interaction); promoting a new paradigm for cities and mobility (Urban, Interaction); valuing the territory from the sea to the forest (Oceans, Air).

Demography and inequality: promoting education, aging with quality of life (Life, Interaction).

Digital Society: promoting digital skills, culture, Economy 4.0, administrative modernization and social protection in the transition (Interaction, Urban, Oceans, Air).

# Medical and Health Sciences

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# S.2.3

CIBB  
i3S  
iMM  
ITR  
REAL  
RISE

# Center for Innovative Biomedicine and Biotechnology - Associate Laboratory

CIBB



## LEAD R&D UNIT

Center for Innovative Biomedicine and Biotechnology (CIBB)

## DESCRIPTION

As an Associate Laboratory, CIBB reinforces the unit's partnership between the Center for Neuroscience and Cell Biology (CNC) and the Coimbra Institute for Clinical and Biomedical Research (iCBR), merging excellence in both fundamental science and clinical investigation with a sustainable professional structure capable of addressing some of the most pressing societal challenges of our days. Featuring the largest critical mass of biomedical/biotechnology investigators in the Center region of Portugal, CIBB hosts researchers from the UC Faculties of Medicine, Pharmacy and Sciences and Technology, as well as clinicians from the Coimbra University Hospital (CHUC) and healthcare system, and key collaborators from the biotech and pharmaceutical industry. Its team includes ca. 300 integrated PhD-holders, within which nearly 10% are full-time career researchers with permanent positions, a ratio CIBB plans to surpass by 2025 with a sustainable recruitment strategy.

Such strategy is focused on reinforcing CIBB's thematic scientific lines and the associated research infrastructures and key supporting offices, aimed at efficiently attracting international competitive funding to

- Advance knowledge in Neuroscience, Metabolism, Ageing and Infection;
- Address mechanisms of age-related diseases, towards identification of new therapeutic targets;

- Develop innovative therapies based on the identified new therapeutic targets and state-of-the art technological approaches;
- Promote active & healthy ageing through lifestyle, digital health and targeted services;
- Create health-related economic value, from intellectual property creation and biotechnological and clinical exploitation of innovative products;
- Develop impactful strategies to promote science-based health literacy.

This work plan is to be advanced at the heart of a multidisciplinary inter-sectoral regional ecosystem with an extensive transnational network, which includes the BIOCANT Biotechnology Park that hosts one of CIBB's R&D sites (the UC-Biotech) and is home of 40% of all biotech companies operating in Portugal. In sum, CIBB is set to understand why disease develops and transform this knowledge into clinical applications and technological innovations aimed at preventing, diagnosing and treating health conditions.

## STRATEGICAL OBJECTIVES

The Associate Laboratory CIBB leverages on the homonymous R&D Unit of the University of Coimbra (UC) to deliver excellent science with societal impact in the realm of Biomedicine and Biotechnology, offering highly-specialized services to healthcare institutions and the entrepreneurial

## WEBSITE

cibb.uc.pt

## FCT FUNDING FOR AL

1 347 940 Euros

## INTEGRATED RESEARCHERS

294

## KEYWORDS

- Brain Disorders
- Aging and Metabolism
- Advanced Therapies
- Biotechnology

community while creating AL-specific permanent scientific and technical careers for doctorates. Its strategic objectives are to:

- Sustain excellence in scientific research in health and disease mechanisms;
- Achieve rapid and measurable translation of knowledge into clinical and technological applications, and to society;
- Attain ample international projection and attract EU/international funding;
- Attract highly talented researchers and foster their successful career development and integration;
- Provide cutting-edge advanced training (including doctoral) and innovative ways to engage society in science.

## AREAS OF ACTIVITY

CIBB's knowledge-based contribution to the scientific, technological and socio-economic development of Portugal responds to the Health, Clinical and Translational Research agenda of the National Plan for Science & Technology. This agenda reflects the overarching UN Sustainable Development Goal "Good health and well-being" and the WHO's Global strategy and action plan on ageing and health, to which Portugal is committed. CIBB is also in tune with the Portuguese Economic Recovery Plan 2020-2030, notably in the Health Biotechnology domain, bound

to attract and retain young talents while providing them with a high-demand set of professional competencies and qualifications towards the development of high-added value applications for diagnostic and testing as well as advanced therapy medicinal products. Moreover, CIBB's research capacity and (technological) infrastructures makes it able to promptly respond to societal demands in crises like the recent COVID-19 pandemic.

# Institute for Research and Innovation in Health

i3S



## LEAD R&D UNIT

Institute for Research and Innovation in Health (i3S)

## DESCRIPTION

i3S is a very dynamic research hub, with 70 research groups, ca. 450 researchers with PhD and ca. 290 PhD students enrolled in PhD programs of the UPorto. We foster high-level post-graduate training, providing a multidisciplinary environment with ample opportunities for training in research. We publish over 600 publications/year, many in top international journals following the principles of Open Science. Internationalization is embedded in our research activities, as indicated by the large number of international collaborative projects, participation in international scientific/infrastructure networks, joint publications with international institutions, and organization of international events. i3S hosts researchers and students from 34 countries, demonstrating our capacity to attract international researchers. Researchers are supported by several Scientific Platforms managed by highly qualified technicians that provide access to state-of-the-art instrumentation, as well as training for students and researchers that include: Genomics, Proteomics, Biomolecular Analysis, Cell Analysis, Imaging and Animal Experimentation. We are members of 6 national and 10 international scientific/infrastructure networks. Researchers are also supported by a number of transversal units that include: Research and Innovation, Advanced Training and Career Development, Office for Responsible Conduct in Research, Com-

munication and Events, Facilities and Maintenance, Health Quality and Safety, Information Systems and Technology, Institutional Affairs and Lab Support. i3S has three clinical services that provide services in: genetic counselling and molecular and genetic diagnostics for diseases in neurology, psychiatry, paediatrics, neuropaediatrics, ophthalmology, haematology, oncology and cardiology; surgical pathology, cytopathology and molecular pathology, namely in the area of cancer; and molecular diagnostics for SARS-CoV-2. We are also committed to economic valorisation of our research results through the Research Innovation Unit. We manage over 24 patents that support 23 licencing agreements, engage in industry-contract research and have promoted 5 spin-offs and 7 marketed products. i3S has a strong commitment to educational and outreach activities. Our educational program in health sciences has national impact, reaching over 7,000 high school students. Outreach initiatives covering seminars, workshops, Sci&Art exhibitions, and sports events also mobilized local communities and general audiences.

## STRATEGICAL OBJECTIVES

Our strategy to contribute to public policies responding to scientific, health, social and economic challenges relates intimately with our commitment and capacity to develop sustainable careers for highly differentiated doc-

## WEBSITE

www.i3s.up.pt

## FCT FUNDING FOR AL

3 926 516 Euros

## INTEGRATED RESEARCHERS

435

## KEYWORDS

- Health
- Biomedicine
- Bioengineering
- Biological Sciences

torate researchers and technicians. In addition, we rely on our proven capacity to raise funding for R&D&I activities through diversified international sources, including the European Commission. Thus, the i3S-AL constitutes a rich ecosystem that aims to cover the full cycle from basic Biology in the areas of Cancer, Immunology and Infection, Neurobiology and Regenerative Medicine, to patients. We want to raise the regional, national and international profile of Life and Health Sciences, clustering research, advancing training and innovation, and consolidating several domains of the national and European public policies for science.

## AREAS OF ACTIVITY

The i3S-AL is fully aligned with national and international aims in public policy such as: 2030 Agenda for Sustainable Development; Towards a Sustainable Europe by 2030; the Portuguese Thematic Agenda for Research and Innovation: Health, Clinical and Translational Research and the national Technological and Business Innovation Strategy 2018-2030. Our researchers contribute regularly to requests from the National Health Service, the Health Regulatory Agency, the Regional Health Agency, the Ministry of Science, Technology and Higher Education, Foundation for Science and Technology, National Veterinary Agency and the Agency for Clinical and Biomedical Research. We

have provided guidance to government agencies into areas such as regulations for laboratories of Clinical Genetics and Pathology, procedures for Anatomical Pathology, pharmacological approaches to diabetes, training in active psychoactive substances, legislation on the use of animal for research and procedures for evaluation of Research.

# Institute of Molecular Medicine João Lobo Antunes

iMM



## LEAD R&D UNIT

Institute of Molecular Medicine João Lobo Antunes (iMM)

## DESCRIPTION

iMM entails groundbreaking projects in order to increase the competitiveness of research in Portugal towards the European and international benchmarks of scientific excellence. iMM has an outstanding research portfolio with its 34 research groups organized in 4 Research Lines: Molecular and Cellular Biology; Development, Ageing and Cancer; Infection and Immunity; Neurosciences and Behavior. iMM's interdisciplinary approach ensures critical mass, and its scientific impact is reflected in over 300 original peer-reviewed publications in 2021 alone, and shared authorship with groups from 100+ countries worldwide. iMM runs a MSc Program and an international PhD Program - LisbonBioMed – promoting multidisciplinary, critical thinking and entrepreneurial attitudes towards biomedical research. Additionally, the scientific training of medical doctors within CAML renews the “teaching hospital” concept securing the essential compatibility of medical education & research & patient care. iMM's career structure for doctorates lays upon four core principles: Career development ensuring scientific freedom and progression/retention based solely on merit, evaluation results and alignment with scientific strategy of iMM; Transparent and fair procedures for recruitment and progression; Tailored training and continuing professional development; Promotion of research culture.

iMM has a consistent diversification of funding applications, translated in app. 60% of the secured funding coming from international funding sources. The outstanding performance of iMM in H2020 makes it the #1 Portuguese research institute in terms of EU H2020 secured funding (€32M).

Additionally, iMM has been the most successful Portuguese institution in the prestigious funding scheme la Caixa Health Research program (11 awarded grants in the 4 editions of the program).

iMM created a Technology Transfer Office in 2018 and, since then, iMM registered 80 new inventions, 103 patent applications, 16 patents licensed to companies, 110 collaborations with industry, and 13 startup companies. Three of these start-up companies raised more than 23 million euros in the last 2 years from leading European venture capital (VC) funds.

iMM has always invested in state-of-the-art infrastructures strongly contributing to the National Roadmap of Research Infrastructures (integrating 9 RIs and coordinating the National Network of Biobanks), and integrating European RI's - EATRIS, BBMRI, EuroBioimaging, EU-OPENSREEN.

## STRATEGICAL OBJECTIVES

iMM aims to nurture innovative ideas in basic, translation-

## WEBSITE

imm.medicina.ulisboa.pt

## FCT FUNDING FOR AL

1 823 563 Euros

## INTEGRATED RESEARCHERS

162

## KEYWORDS

- Molecular and cellular biology
- Development, ageing and cancer
- Infection and immunity
- Neurosciences and behavior

al and clinical Biomedical Research, towards maximizing their impact on society. Since iMM's creation in 2002, our overarching mission has been defined by the promotion of scientific excellence, leveraged by top quality human resources (including through outstanding training programs) that are supported by state-of-the-art infrastructures, and knowledge transfer to the society. Hence, iMM's strategy is laid upon three major objectives:

1. Promote SCIENTIFIC EXCELLENCE to foster new and disruptive discoveries, creating room for bold initiatives that cannot be anticipated today.
2. Nurture ADVANCED TRAINING AND CAREER DEVELOPMENT enabling the most promising researchers to succeed in internationally competitive environments of academia, industry and clinical medicine.
3. Galvanize TRANSLATION FOR HUMAN HEALTH as we strongly advocate that outstanding science is the motor of groundbreaking applications.

## AREAS OF ACTIVITY

iMM's activity within its Strategic Pillars - I. Scientific Excellence; II. Advanced Training & Career Development; III. Translation for Human Health - and Lines of Action - Lisbon Academic Medical Centre, Clinical Research Center, CoLife, CoLab, Public Engagement & Science Education - are strong and decisive contributors to public policies,

namely:

- European
- Prioritise investments and reforms in research and innovation
- Improve access to excellent facilities and infrastructures
- Transfer results to the economy
- Strengthen mobility of researchers and free flow of knowledge and technology
- National Transversal Domains
- Innovation and Knowledge
- Qualification, Training and Employment
- Demographic sustainability
- Regional Strategic Pillars
- Qualification (Human Capital, Internationalization)
- New Technologies
- Knowledge economy, open innovation, research and investment, specialization
- Active Ageing
- Regional Structuring projects
- Schools for the world – international excellence centers
- Precision Medicine

# Laboratory for Integrative and Translational Research in Population Health

ITR



## LEAD R&D UNIT

Epidemiology Research Unit - Institute of Public Health, University of Porto (EPIUnit)

## PARTICIPANT R&D UNITS

Research Center in Physical Activity, Health and Leisure (CIAFEL)

Unit for Multidisciplinary Research in Biomedicine (UMIB)

## DESCRIPTION

The ITR is organized into four lines of research:

**L1– Life course Research and Healthy Ageing:** With a particular focus on prospective cohort studies, the research developed in this thematic line intends to help build a society that guarantees a healthy life, from birth to old age and intends to serve the purpose of guiding Public Health interventions that improve populational well-being, integrating the perspectives of policy makers, clinicians and citizens, considering the most relevant research topics for populations.

**L2 – Syndemics, Health inequalities and vulnerable populations:** With a longstanding partnership with community stakeholders, most of the research is anchored in community-based participatory research. Also, it makes use of quantitative and qualitative research methods as well as mixed-method research designs to get a holistic view of the complexity of sensitive subjects and phenomena. The combined syndemic, health, and human rights approach advanced herein will provide concrete insights, tools, and strategies to tackle the health inequities that affect mostly the more disadvantaged and vulnerable groups.

**L3 – Genetic, Environmental & Behavioural determinants of health and disease:** This thematic line emphasizes the study of lifestyles, such as sedentary behavior and physical activity/exercise, as well as nutrition. It also studies

environmental aspects and modifiable determinants of health, such as outdoor and domestic air pollution, drinking water contamination, occupational exposure to hazardous materials, lead exposure, and built environments. It investigates biological, behavioral, environmental and psychosocial processes and how they shape gene expression.

**L4 – Patient and Population Outcomes Research:** towards a precision approach to medicine and public health: The ultimate goal of this thematic line is to improve population health through progress in clinical medicine and public health strategies, by conducting multidisciplinary research projects.

Synergistic collaborations between epidemiologists, clinical researchers and core basic scientists allow us to focus our research efforts into the most relevant health conditions or unmet clinical needs with a high level of rationalization of human and technical resources.

Each thematic line has individual Labs led by one principal investigator supported by their team.

## STRATEGICAL OBJECTIVES

The ITR strategy aims to provide responses taking a multilevel approach during the life course and exploring dynamic interactions. Also, it goes from the individual to the exposome expecting to grasp a comprehensive human information system essential for public policies. ITR will

## WEBSITE

ispup.up.pt/laboratorio-asso-  
ciado-ittr

## FCT FUNDING FOR AL

75 000 Euros

## INTEGRATED RESEARCHERS

163

## KEYWORDS

- Population Health
- Life course
- Multifactorial causality
- Translation

favor complementary perspectives and the contribution of different basic sciences, a continued attention to clinical work and enquiry, the inspiring source of knowledge to understand the problems of populations, addressed both as clusters of individuals or clinical populations, and as communities. ITR will deal with the challenges of preventive medicine and public health. It will address another continuum that sees health and life sciences moving from the bench side to the bedside and finally to the population, underscoring that there is an essential loop effect leading population findings to feedback fundamental approaches to knowledge.

## AREAS OF ACTIVITY

ITR covers essential objectives related to public policies, such as:

- To propose theoretic models relating exposures across the life course to later health outcomes.
- To understand the origins and effects of social, political, and structural determinants of health.
- To advance the right to health as an opportunity for people to develop their full range of human capabilities and to have an equal chance to live a flourishing life, by mapping environments of syndemic vulnerability and leveraging structural and political change.
- To promote synergistic collaborations between epide-

miologists and other public health scientists, clinical researchers and core basic scientists, which ultimately will allow improving population health, by focusing research efforts into the most relevant health conditions or unmet clinical needs.

- To understand disease mechanisms allowing better diagnosis and treatment towards improved health outcomes, and to inform policies at the different levels of prevention.

# Translation and Innovation towards Global Health

REAL



## LEAD R&D UNIT

Comprehensive Health Research Center - Research, Education, Training and Innovation in Clinical research and Public Health (CHRC)

## PARTICIPANT R&D UNITS

Global Health and Tropical Medicine (GHMT)  
Laboratory for Instrumentation, Biomedical Engineering and Radiation Physics (LIBPhys)

excellent by FCT; and Laboratory for Instrumentation, Biomedical Engineering and Radiation Physics (LIBPhys), classified as very good by FCT.

REAL laboratory gathers 160 integrated PhD researchers that investigate, collaborate, innovate, teach and train across 5 thematic lines (I-V): I) Health Promotion through Life Course, Health Trajectories and Transitions, behavioral insight and inequalities; II) New therapies, biomarkers and personalized medicine in high burden and high mortality diseases; III) Global health in One Health; IV) Health policies, universal coverage, patient centered and efficient healthcare; V) Digital health, Medtech, Health Technology Assessment and access to the market.

REAL benefits and capitalizes from a strong and organized administrative department that provides support in financial and project management, legal and regulatory affairs, internal and external communication, and institutional and international relationships. We will build research capacity through our career development department, responsible for talent recruitment and retention, research exchange partnerships, identifying training opportunities offered by the medical and health science schools' members of our consortium. We have a long tradition of partnerships with primary care centers and hospitals, patient associations, several companies, non-profit organizations, and Portuguese Governmental

## DESCRIPTION

The Associated Laboratory in Translation and Innovation Towards Global Health (REAL) is a multidisciplinary, multi-institutional and highly collaborative new associated laboratory aiming at advancing translation science and medicine, in a bench-to-bedside approach, discovering and developing new diagnostic tools and treatments and ensuring that proven strategies for disease treatment and prevention are actually implemented within the community. The main strategic goal is to encourage and increase R&D activities, involving strategic national and international partners, seeking to increase the impact on global health, based on the various existing funding opportunities. To bridge the gap between science and populations needs, REAL will invest on policy making effort by working with national and international health authorities in order to effectively implement the discovered solutions. REAL is grounded in four pillars: 1) researchers career development; 2) strategic alliances with international and national, private and public institutions; 3) open science, fairness, confidentiality and trust; 4) Community/patient engagement, health education and dissemination.

REAL brings together 3 R&D Units: 1) Comprehensive Health Research Centre (CHRC), classified as excellent by Fundação para a Ciência e Tecnologia (FCT); 2) Global Health and Tropical Medicine (GHMT) also classified as

## WEBSITE

n.a.

## FCT FUNDING FOR AL

135 078 Euros

## INTEGRATED RESEARCHERS

241

## KEYWORDS

- Global Health
- Public Health
- Translational Medicine
- Digital Transformation

Agencies that help us to accomplish our mission.

## STRATEGICAL OBJECTIVES

- To emphasise research work produced by the several trans and interdisciplinary Research Groups. This cross transdisciplinary of research fields, will allow the discovery of new knowledge, resulting from the intercepting frontiers of each thematic line and related scientific areas.
- To prepare international research projects, accessing funding opportunities and attracting funding from the European Union for R&D activities in Portugal.
- To implement active intellectual collaboration, networks and research platforms with other national and international centres, allowing the development of international networking.
- To invest in the approach with society in general, hospitals, companies and industry, focusing in knowledge transference to respond to respond to scientific, health, environmental, social and political challenges.
- To provide education and research experience, introducing students to large-scale collaborative research ventures

## AREAS OF ACTIVITY

Public Policy Issues, which will be addressed by REAL Ac-

tivities:

- Clinical and information technology: improve the efficiency and timeliness of care delivery, as well as patients' access to services and information
- Ageing populations: develop preventative strategies and technological innovations to people living longer across the world.
- Preventative care: develop new therapies to combat significant global health threats, such as Cancer and communicable disease outbreaks.
- Accreditation, standards and policy: strengthen the healthcare system through national policies and standards.
- Patient-based care: develop approaches and studies to educating patients and empowering to be involved in decisions about their care.
- Implement policies promoting healthy diets, physical activity, healthy aging, and health literacy tools
- Promote mental health and healthy aging
- Reduce inequalities between citizens in access to health, promoting social inclusion
- Ensure health care, especially in situations of drug addiction, infectious diseases, and mental health diseases
- Improving health efficiency and quality

# Health Research Network: From Lab to Community Health

RISE



## LEAD R&D UNIT

Center for Health Technology and Services Research (CINTESIS)

## PARTICIPANT R&D UNITS

Cardiovascular Centre at the University of Lisbon (CCUL)  
Cardiovascular Research and Development Center (UnIC)  
IPO Porto Research Center (CI-IPOP)

## DESCRIPTION

The scientific structure of RISE relies on 5 specific thematic lines, which articulate to take on its 5 public policy challenges:

TL1 - CLINICAL AND TRANSLATIONAL RESEARCH IN CARDIOVASCULAR SCIENCES - Design to:

- Develop medical devices and new techniques in cardiovascular surgery and large animal models of cardiovascular diseases (CVD);
- Implement a National Cardiac Surgery Registry;
- Expand research on aging, cerebral autoregulation, the mechanisms of cerebrovascular disease, and the relationship between CVD in early life and upcoming adult cardiovascular risk.

TL2 - CLINICAL AND TRANSLATIONAL RESEARCH IN ONCOLOGY- Design to:

- Promote the inclusion of research as an integral part of cancer patient care;
- Contribute to cancer management from prevention, optimization of diagnosis and treatment;
- Increment clinical research, including early-phase clinical trials on targeted therapies and immunotherapy;
- Develop bioimaging, bioinformatics, and outcome assessment tools;
- Contribute to internationally competitive translational and clinical cancer research.

TL3 - CLINICAL AND TRANSLATIONAL RESEARCH IN INFLAMMATORY AND DEGENERATIVE DISEASES – Design to:

- Conduct observational studies to identify biomarkers, to develop new approaches to disease prevention, diagnosis, and treatment;
- Monitor the effectiveness and safety of new and old therapies;
- Study the characteristics of patients with inflammatory and degenerative diseases by applying artificial intelligence and machine learning systems;

TL4 – HEALTHCARE POLICY, TECHNOLOGY AND DIGITAL TRANSFORMATION - Design to catalyse the transfer of knowledge from the main field of expertise of each TL and:

- Generate, analyse and synthesise evidence and information, promoting their strategic use for policy design and evaluation;
- Promote evidence-based decision-making and health policy in Portugal and elsewhere;
- Develop and evaluate patient-centred digital health technologies;
- Develop and promote the digital transformation in Portugal.

TL5 – COMMUNITY HEALTH AND SOCIETAL CHALLENGES

- Design to:
- Set up clinical trials in the field of Nutrition;

## WEBSITE

rise.med.up.pt

## FCT FUNDING FOR AL

75 000 Euros

## INTEGRATED RESEARCHERS

383

## KEYWORDS

- Clinical Research
- Digital Transformation
- Translational Medicine
- Community Health

- Promote observational studies to monitor nutrition status and environmental exposures, particularly in at-risk groups such as school-aged children, pregnant women, elderly, vegans, vegetarians, and obese patients;
- Identify policy opportunities, from prevention to disease management, that will help ensure obesity is tackled as a chronic disease.

## STRATEGICAL OBJECTIVES

RISE's mission is to strengthen health research from the preclinical and clinical stages to the community level, fulfilling the Portuguese policy goals for science and technology. Relying on solid human resources from clinical and translational researchers to healthcare professionals and on a physical infrastructure that merges academia and the healthcare system, RISE commits to meet three key sustainability goals:

- To promote scientific and technical careers for doctorates while ensuring talent attraction for Portugal.
- To support governmental entities in monitoring public policies addressed to scientific, health, social, environmental, and economic challenges.
- To increase and diversify funding sources from European Union and other international agencies.

RISE aims to be the major catalyst in changing the landscape of Portugal's clinical, translational, and community research.

## AREAS OF ACTIVITY

RISE is grounded on solid multidisciplinary expertise that spans data and decision analysis, evidence synthesis, health technology, healthcare economy, combined with scientific backgrounds and healthcare practice on cardiovascular, metabolic, cancer, and inflammatory diseases. On this ground, RISE is set to ensure the support, promotion and monitoring of public policies through 5 specific challenges: 1. Identification and introduction of critical problems onto the political agenda in health and healthcare; 2. Generation of evidence and information, and promotion of their strategic use to inform policy design and evaluation; 3. Provision of a robust infrastructure to monitor and evaluate implemented policies; 4. Proposal of alternative solutions for identified problems with implemented health policies; 5. Promotion of implementation of designed policies by leveraging knowledge transfer to the science and healthcare professionals and the community.

# Agricultural Sciences

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# 5.2.4

AL4AnimalS  
CBQF  
Inov4Agro  
SusTEC  
TERRA

# Associate Laboratory for Animal and Veterinary Sciences

AL4AnimalS



## LEAD R&D UNIT

Centre for Interdisciplinary Research in Animal Health (CIISA)

## PARTICIPANT R&D UNITS

Center for the Study of Animal Science (CECA)  
Veterinary and Animal Science Research Centre (CECAV)

## DESCRIPTION

AL4AnimalS aims to synergistically structure the activity of the 3 existing national R&D Centers (CIISA, CECA and CECAV) exclusively dedicated to animal and veterinary science. These sciences are instrumental in meeting the challenges posed by the United Nations' sustainable development objectives for 2020-30, the FAO and WHO mission statements, and the Ministry of Agriculture's agenda for innovation (Portugal 2020-30).

The AL4AnimalS is organized in 3 thematic lines: In Green Animal Production, the challenge of sustainable animal production is met, with respect for animal welfare and the environment, simultaneously promoting consumer health, helping to improve the competitiveness of the livestock sector and valuing traditional products. In Emergent Diseases and Zoonosis, we aim to respond to the challenge of proactively controlling zoonosis and emergent animal diseases, where climate change may significantly increase their potential for emergence and/or spread, through innovation in diagnostics and vaccine development. In Comparative and Translational Medicine and Biotechnology, we meet the challenge of innovating therapeutic solutions, in animal medicine and animal models of human disease, involving preclinical and clinical trials.

## STRATEGICAL OBJECTIVES

Grounded on key partnerships with State Laboratories (INIAV, INSA), State Regulatory Agencies (DGAV) and an extensive network of collaborations, AL4AnimalS sets its main objective to develop science and knowledge directed to three major global challenges. The first challenge is put forward by the need to feed an ever-growing world Human population with safe and nutritious animal products. A second major challenge is met by the need to control emergent infectious animal diseases and zoonoses, which cause a devastating impact on production efficiency and public health. A third major challenge is the need to innovate novel therapeutic solutions for animal disease, which may be used as models for Human disease. All these major challenges are priority targets of public policies.

Additionally, to the objective of supporting public policies, AL4AnimalS goals include the production, dissemination and communication of high quality and societal impact research, promote training, mobility, and scientific employment, translate research into industry and society stakeholders, and secure funding and internationalization.

## AREAS OF ACTIVITY

Thematic line Green Animal Production (GAP). The GAP thematic line aims to establish a national research-based network dedicated to improving the sustainability of the

## WEBSITE

www.ciisa.fmv.ulisboa.pt

## FCT FUNDING FOR AL

75 000 Euros

## INTEGRATED RESEARCHERS

169

## KEYWORDS

- Green Animal Production
- Emergent Diseases and Zoonosis
- Comparative and Translational Medicine
- Biomedical Research and Biotechnology

livestock sector: Increasing the sustainability of livestock production; Safe and Healthier Animal-Sourced Foods (ASF); and Management of Animal Genetic Resources. Thematic line Emergent Infectious Diseases and Zoonoses. Innovation in diagnostics, therapeutics and vaccines for Emergent Infectious Diseases and Zoonoses. Thematic line Comparative and Translational Medicine and Biotechnology. Development of innovative therapies and diagnostic tools through a comparative and translational approach.

# Centre for Biotechnology and Fine Chemistry

CBQF



## LEAD R&D UNIT

Centre of Biotechnology and Fine Chemistry (CBQF)

## DESCRIPTION

CBQF's research is structured in 4 Thematic Lines that collectively encompass 13 Laboratories. The Environment & Resources Thematic Line aims to develop innovative approaches to environmental and sustainability challenges. The Food and Nutrition Thematic Line is centred on promoting the health and wellbeing of the citizen – focusing on the EU priorities for high standards of safe, nutritious and affordable food. The Biobased and Biomedical Products Thematic Line has been organized to combine CBQF capacity to respond to National and EU priority for future growth of Bioeconomy and Circular Economy, reinforcing capacity and opportunities on bio-based products. The Fermentation Solutions Thematic Line focuses on finding solutions for fermentation industry processes, for their by-products and on innovative use of the biomolecules produced.

Due to the research that has been developed in recent years, CBQF is perfectly positioned to translate knowledge to the priority axes of the European Economy. CBQF strives to conduct pioneering research in Biotechnology to address current and future challenges, developing solutions for many of the health and resource-based problems facing the world and creating conditions to expand scientific impact with growing international positioning and cooperation. CBQF maintains a strong internal capacity for technology transfer towards innovation in three logical sectors

(environment, food, biomedical), enabling economic outputs and competitiveness.

To pursue the goal of responding to public policy challenges and promote talent attraction and funding procurement, CBQF has assured a solid participation in numerous strategic networks, organizations and associations. CBQF participates as an active member in several Regional, National and International policy and decision-making groups, in areas including agri-food, food safety, packaging and environment. These organizations and networks are vital components of the Portuguese scientific, technological and industrial sectors and CBQF, as Associated Laboratory, endeavours to continue shaping and influencing Portugal's policies in the Environment, Food, and Circular Economy areas.

## STRATEGICAL OBJECTIVES

CBQF's strategic objectives are to continuously foster a multidisciplinary research strategy, supporting strategic collaborations with public entities to address and respond to scientific, technological, environmental, social and sanitary challenges currently identified both at national and international levels. In addition, the Associate Laboratory (AL) will contribute and respond to economic challenges by continuing its emphasis on industry partnerships and close relationship with industrial and sectoral associations

## WEBSITE

www.cbqf.esb.ucp.pt/en

## FCT FUNDING FOR AL

105 994 Euros

## INTEGRATED RESEARCHERS

117

## KEYWORDS

- Biotechnology
- Bio- and Circular Economy
- Healthier and safe foods and diets
- Resilient food and environment systems

of the target scientific areas of the AL. This will be implemented via the 4 Thematic Lines of CBQF. These objectives are strategically designed so that the Thematic Lines address and tackle areas of key national/international importance and priority, embracing societal challenges related to sustainability, society wellbeing and global economy.

## AREAS OF ACTIVITY

CBQF tackles challenges that directly focus on public policies, including:

- circularity and resource efficiency of food systems,
- sustainable bioeconomy, protecting biodiversity,
- generating value from and protect natural/local resources,
- healthy and productive soils to respond to climate changes,
- more resilient agri-food systems,
- ensure availability and sustainable water management,
- promoting the reuse of treated wastewater and upgrade selected urban wastewater treatment plants to more advanced treatment technologies,
- increase the understanding of the gut axis microbiome,
- increasing the share of citizens that adhere to healthy sustainable diets,
- promotion of new bio-based products and bio-based markets,
- improving the ability to monitor health and to prevent,

detect, treat and manage disease,

- make cities resilient and sustainable,
- exploring the water axis (land and sea) and associated resources to ensure environmentally sustainable systems.

# Institute for Innovation, Capacity Building and Sustainability of Agri-Food Production

## DESCRIPTION

Inov4Agro is a strategic consortium of two R&D units, CITAB and GreenUPorto, which have a track record of a successful long-lasting cooperation, and represent the highest scientific productivity in agriculture within this region. By combining a multidisciplinary background and a complementary expertise, Inov4Agro joins high quality PhD researchers to work on cross-disciplinary groups with a high problem-solving capacity, and with a greater ability to achieve highly reputed brand value.

A 10-year strategic plan has been developed, focused on four intervention areas: 1) Resource use efficiency and product quality, aiming to increase plant food production, improve its quality and, at the same time, reduce the environmental impact of the agri-food sector; 2) Water resources, soil health & food, targeted to provide the society with contributions to better manage water resources, improve soil health while increasing the production of high quality food; 3) Leverage local food systems, focused on fostering local food production systems and the respective short-supply chains, supported by the novel concept of “food hubs”. This intervention area aims to address the creation of a food environment that makes the “healthy and sustainable choice” the easiest choice for consumers; 4) Technological development & innovation, envisaging to develop and foster the digitalization of agriculture (e.g.,

Inov4Agro



## LEAD R&D UNIT

Centre for the Research and Technology of Agro-Environmental and Biological Sciences (CITAB)

## PARTICIPANT R&D UNITS

Research Center in Sustainable Agri-food Production (GreenUPorto)

big data, internet of things, augmented reality, robotics, sensors, system integration, ubiquitous connectivity, artificial intelligence).

The added-value of Inov4Agro relies also on synergies which represent very attractive conditions for young scientists: relative brand new facilities and brand new laboratories from large recent investments which must be boosted by a novel dynamic in science and innovation, a fair number of solid cooperations with several companies and producers consolidated by several research projects in a great natural landscape environment of more than 20 ha, in which emerges an eco-campus, of easy access.

Thus, Inov4Agro will have excellent conditions to attract the best national and international graduate students, as well as the best young doctorates, to increase international collaborations and to better compete for international research funds, as well as to have a more prominent acceptance and intervention in the horticulture sector.

## STRATEGICAL OBJECTIVES

The mission of Inov4Agro will be to support the Government during the next crucial decade of transition to sustainability with the application of public policies in a multi-layer approach, aiming to promote smart and conservation agriculture (in particular of the horticulture sector), to foster the adaptation to climate changes, to mitigate the

## WEBSITE

inov4agro.pt

## FCT FUNDING FOR AL

131 172 Euros

## INTEGRATED RESEARCHERS

132

## KEYWORDS

- Horticulture (value chains)
- Resource efficiency
- Technological upgrade
- Added value

territorial dissimilarities by increasing the attractiveness of low density territories and by fitting the primary sector to the regional diversity of endogenous resources. This will be done by acting as an actor of capacitation closer to the youngest generations of growers and farmers, providing them the scientific and technological grounds required for essential upgrades to the digitalization of the agriculture.

## AREAS OF ACTIVITY

By 2030, with the contribution of the agriculture sector, the National Plan for Energy and Climate (PNEC 2030) aims to reduce CO<sub>2</sub> emissions in 11%. The territorial asymmetry is also a significant structural problem that has been addressed by public policies, such as the Rural Development Program (PDR 2014-2020) and still needs to be tackled. The stimulation of the Local Production with an increased use of local cultivars, creating a niche market and an added value in the production chain, is one of the best approaches to meet the objectives of the Common Agriculture Policy regarding the development of rural areas (PE-PAC 2021-2027). Sustainability of both natural resources and food systems is also a goal of the National Strategy for Organic Farming and of the National Agenda for Innovation in Agriculture 2020-2030. All the intervention areas of INOV4Agro will provide support on these main public policies.

# Associate Laboratory for Sustainability and Technology in Mountain Regions

SusTEC



## LEAD R&D UNIT

Mountain Research Center (CIMO)

## PARTICIPANT R&D UNITS

Research Centre in Digitalization and Intelligent Robotics (CeDRI)

## DESCRIPTION

The central objective of SusTEC is to go from Nature to Products through the implementation of sustainable practices and processes, and digital and clean technologies. The focus of SusTEC is not centred in a vertical thematic field but instead in transversal and transdisciplinary societal challenges aligned with the national and European agendas for research and innovation.

SusTEC is organized in 3 thematic lines (TL): TL1: Natural Resources, Agriculture, and Climate Change; TL2: Food and Bio-based Solutions, and TL3: Innovative and Tech-based SMEs. TL1 acts in the improvement of agriculture systems, namely smallholder agriculture, natural resources management, and economic and rural development, following an integrated vision with climate variability and change. TL2 tackles the development of high-value foods, natural-based ingredients and products for diverse industrial fields, through sustainable practices, which include the use of bio-residues, agroindustry side streams, recyclability, and green technologies. TL3 addresses the application of novel knowledge and technologies supporting the modernization of industry to face the current challenges under the digital transformation context, promoting the creation of more innovative, technological and knowledge-based processes and systems that allow companies to be more competitive in national and international mar-

kets. Moreover, it will also integrate expertise in product and process development that along with the described areas of action will consolidate a more solid intervention in the technology-based industries. The use of digital and clean technologies will also play a crucial role in TL1 and TL2 in the development of such novel solutions, acting as a transversal vessel to achieve sustainability and competitiveness.

## STRATEGICAL OBJECTIVES

The strategic objectives of SusTEC are:

- To promote scientific careers by establishing an ambitious but sustainable plan for hiring researchers;
- To increase the internationalization level by attracting international talented researchers, and enlarge the participation in international projects and initiatives;
- To boost the interest in sustainable agriculture, environment, ecology, bio-based and circular economy to promote social and economic development in mountain areas;
- To contribute for the modernization of the industrial, applying emergent digital and clean technologies, and sustainable and green processes;
- To actively participate in co-creation scenarios, by collective, collaborative, and living labs approaches in a perspective of regional engagement;
- To contribute to the consolidation of the network of

## WEBSITE

sustec.ipb.pt

## FCT FUNDING FOR AL

124 298 Euros

## INTEGRATED RESEARCHERS

94

## KEYWORDS

- Agriculture and sustainability
- Bio-based value chains
- Digital and clean technologies
- Bioeconomy

Innovation Hubs and Collaborative Laboratories, at national and European levels;

- To articulate with IPB mission, namely in promoting and assisting innovative and technology-driven teaching approaches.

## AREAS OF ACTIVITY

The SusTEC is fully articulated by i) European Commission Green Deal, increasing climate mitigation by promoting the transition to a clean and/or circular economy based industry; ii) “Farm to Fork” strategy and the European Digital Strategy, contributing to transform agriculture and rural areas, and modernize the industrial sector; iii) ONU Sustainable Development Goals, namely: Zero Hunger, Good Health and Well-being, Decent Work, Industrial Infrastructure and Innovation, Responsible consumption and production, Sustainable Cities and Communities and Climate action; iv) Nacional policies like the “Indústria e Manufatura” (Industry and Manufacture), “Sistemas Ciberfísicos e Formas Avançadas de Computação e Comunicação” (Cyberphysical Systems and Advanced Forms of Computing and Communication), “Economia Circular” (Circular Economy) thematic areas established by the FCT’s “Agenda de Investigação e Inovação”, and the “Programa de Valorização do Interior” (Inland Regions Valorisation Program).

# Laboratory for Sustainable Land Use and Ecosystem Services

TERRA

**LEAD R&D UNIT**

Forest Research Centre (CEF)

**PARTICIPANT R&D UNITS**

Centre for Functional Ecology - Science for People &amp; the Planet (CFE)

Centre of Geographical Studies (CEG)

Environmental Health Institute (ISAMB)

Linking Landscape, Environment, Agriculture and Food (LEAF)

**DESCRIPTION**

1-Natural capital and sustainable ecosystem services: to explore inter-links between biodiversity, ecological resilience and nature's contributions to people's well-being. Exploring links between biodiversity, ecological resilience, and nature's contributions to people well-being, to provide a clear mechanistic understanding of current threats to biodiversity in terrestrial, freshwater and marine environments, their impacts on ecosystem functioning and resilience, and effective ways to mitigate and reverse those impacts, including developing the sustainable use of ecosystem services.

2- Sustainable agriculture forestry and fisheries: harvesting food, wood, fibre and wildlife materials from land, soil and water while safeguarding the integrity of natural biological resources. Developing innovative community-based approaches for ecosystem management planning that may increase the efficiency and the effectiveness of food, wood, fibre and wildlife materials harvest scheduling while addressing ecological sustainability and intergenerational societal needs and demands, under scenarios of global change.

3- Products processing and circular economy: sustainable processing to reduce the environmental impact of land use and generate eco-friendly products. Delivering solutions and innovation towards sustainability of land-derived

products' processing in support of national and European policies towards the competitiveness of a circular bioeconomy for the agrifood sector, while developing eco-efficient and zero-waste strategies

4- Society and environmental health: interactions between the physical and social environments and development of preventive and sustainable approaches. Focused on supporting policy decision that promote an integrated and synergic perspective and action on human and planetary health. Human health conditions and well-being state are dependent of the sustainability of natural resources.

5- Socioecological systems, planning and policy: addresses climate change impact on society, adaptation to/and disaster risk management. This thematic line will address climate change impacts on society, and adaptation and disaster risk management, intertwined with societal and cultural dimensions in space and place, examining opportunities for changing entrenched resource-intensive patterns of contemporary society, while addressing strategies, policies and governance structures to achieve sustainable cities and regions.

**STRATEGICAL OBJECTIVES**

TERRA aims to deliver innovative socio-ecological scientific evidence in support of best management practices and policy decision-making towards sustainable land use and

**WEBSITE**

www.isa.ulisboa.pt/terra

**FCT FUNDING FOR AL**

223 564 Euros

**INTEGRATED RESEARCHERS**

449

**KEYWORDS**

- Sustainable Land products and services
- Circular economy in Land products processing
- Socioecological systems and territories
- Environmental health

bio-circularity of its products, while tending to the human societies they support.

TERRA aims to link Sustainable and Healthy Landscapes to Human Well-being, and bridge rural with urban spaces. By adopting a problem-solving and a cooperative approach, TERRA intends to deliver tailored responses to policies and societal needs, within the frames of the Green Deal and SDG.

TERRA is a recent Laboratory, composed of five research centres belonging to three institutes from two universities. With a team of 400 highly qualified researchers TERRA perform complementary research and innovation and have unique skills in forest, riverine, agricultural and urban ecosystems, including territorial management and human health. TERRA has a background and expertise covering the gradient of land use systems and its degree of alteration.

**AREAS OF ACTIVITY**

TERRA intends to support national and international public policies from Ecosystem health to Human health. Particularly, at national level TERRA Lab can support the national policies for agriculture and forestry, fisheries and national conservation, environmental human health, and human development, with all the tools and knowledge available, and more to be developed. Social sciences and humanities will be crucial to narrowing the understanding

of the drivers and causes of biodiversity loss.

In the European context, the Lab TERRA through its centres, has strong links to the Green Deal initiative either using research funding or being involved in several networks. On a wider context, TERRA Lab's focus is deeply framed by the United Nations Sustainable Development Goals (SDGs) with several members of TERRA involved in the evaluation and implementation of the European instruments to tackle the SDGs.

# Social Sciences

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# S.2.5

CES  
ICS-ULisboa  
SocioDigitalLab

## LEAD R&D UNIT

Centre for Social Studies (CES)

## DESCRIPTION

The Centre for Social Studies (CES) is a non-profit research association integrated in the University of Coimbra. It is a scientific institution focused on research and advanced training within the Social Sciences, Arts and the Humanities, adopting an inter- and transdisciplinary approach. Since its foundation in 1978, CES has been conducting research with and for an inclusive, innovative and reflexive society by promoting creative critical approaches in the face of some of the most urging challenges of contemporary societies.

CES is intent on enhancing the transdisciplinary potential of particularly relevant existing and emergent areas across all groups, by structuring its activities around five well-defined Thematic Lines addressing a vast array of crucial issues of the contemporary. In parallel to the Thematic Lines, CES currently has in place six Observatories, operational structures whose aim is to pursue a regular and systematic observation of the contemporary social reality, providing current, empirically anchored knowledge. Through regular strategies of dissemination of information, the observatories support public debates to provide well-informed proposals for decision-making or the construction of public opinion. They have a dynamic structure, capable of providing data and analytical information in a quick and pertinent way. Thus, they are a crucial tool at

the service of public policies, interacting directly with the institutional environments.

This is a strategy in the framework of which cutting-edge research is to be increasingly combined not just with advanced training, but also with a sustained effort to reach out to society at large as well, by way of initiatives of outreach and dissemination.

The public impact of CES research is to be pursued also through different training young scholars, high levels of publication, pushing forward an open access policy, and delivering a qualified service of a specialized public library. CES will, over the next ten years, consolidate its role in the national and international scientific community, helping at the same time to enhance the role of the Social Sciences, Arts and Humanities in understanding the great societal challenges of our time.

## STRATEGICAL OBJECTIVES

CES' scientific strategy aims to democratize knowledge, revitalize human rights and contribute to the establishment of science as a public good. We pursue this mission by continuously reshaping our research fields in response to the needs of society. CES' work covers a wide range of scientific activities, at a national and international level. We particularly focus on the North-South, South-North and South-South dialogues, contributing to the devel-

## WEBSITE

www.ces.uc.pt

## FCT FUNDING FOR AL

497 336 Euros

## INTEGRATED RESEARCHERS

179

## KEYWORDS

- Social Sciences, Arts and Humanities
- Innovative Public Policies and Public Impact
- Interdisciplinarity and Transdisciplinarity
- Advanced Training and Science with/and/for Society

opment, dissemination and application of cutting-edge science, as well as to advanced research and training of excellence. By fostering innovative epistemologies and methodologies, contributing to the development of critical thinking and to the construction of tools to undertake a critical analysis of society, and by broadening citizens' and civil society's engagement in scientific culture, CES aims to support the formulation of public policies through the development of applied research across a wide range of areas that have an impact on the well-being of societies

## AREAS OF ACTIVITY

Since its foundation, CES has made a concrete case for the relevance of the Social Sciences, Arts and Humanities for the definition, monitoring and impact assessment of public policies. For the next ten years, CES has put forward a scientific programme that unfolds in 5 transdisciplinary thematic lines:

1. (Semi)peripheral Capitalism: Crises and Alternatives;
2. Democracy, Justice and Human Rights;
3. Europe and the Global South: heritages and dialogues;
4. Risk(s), Ecologies, Health;
5. Urban Cultures, Sociabilities and Participation.

These 5 thematic lines encompass a wide range of policy areas for which CES has proven ability to contribute: e.g. housing; platform work and changing labour frameworks;

legal and judicial system, modernization of public administration, gender equality, domestic violence; foreign affairs' (cooperation) policies, migration; climate change, environmental justice, natural risks and hazards and social vulnerabilities; creative tourism, urban planning, local powers and participatory budgets, among many others.

**LEAD R&D UNIT**

Institute of Social Sciences, University of Lisbon (ICS-ULisboa)

**DESCRIPTION**

ICS is devoted to scientific research, post-graduate teaching and outreach activities, with a particular emphasis on public engagement with society and informing public policies.

Working in the fields of anthropology, political science, economics, geography, history, social psychology and sociology, ICS: 1) carries out top interdisciplinary research on contemporary societies; 2) places internationalization at the heart of its strategy, supporting and rewarding internationalization, taking part in international funding programmes, and basing its recruitment and evaluation strategy on open and competitive processes; 3) supports rigorous research by organizing key infrastructures for gathering, handling, preserving and disseminating data: PASSDA (National Infrastructure Roadmap), ICS-Iscte Polling Laboratory, XLab Experimental Laboratory, ICS Observatories, Social History Archive, publishing infrastructure; 4) focuses on doctoral and post-graduate teaching and life-long training for non-academic publics; 5) promotes diverse outreach strategies: engaging with media and social networks, dissemination through publications and events for wider publics, collaboration in public and civil society initiatives, open science platform.

The objectives underpinning ICS' commitment to support public policies will be put into practice through four The-

matic Lines which strategically coordinate policy-relevant knowledge production and public engagement. Key strategies to accomplish these objectives also include strong institutional support to infrastructure drivers, to a wide range of gateways for co-creation and outreach, and to investment in teaching and training activities.

ICS' Thematic Lines address societal challenges related to Sustainability, Citizenship, Inclusion and Vulnerabilities, Memory and Legacies. Building on ICS' consolidated research and public engagement agenda, each TL will also take up novel research topics and policy issues, driven by emerging social problems and current public policy agendas. New risks and emerging threats to societies, cultures and public health in an era of planetary turbulence, such as those brought upon the world by the COVID-19 pandemic, are major cross-cutting issues embedded in the thematic lines. The latter will contribute to 3 main scientific and public policy agendas over the next years: FCT scientific agendas; UN Agenda 2030 and the Sustainable Development Goals; Horizon Europe 2021-2027.

**STRATEGICAL OBJECTIVES**

- Innovative and top-ranking SSH research, with bridges between disciplines, research institutions and other actors, both fundamental and oriented to the demands of society, on the challenges of sustainability, citizenship,

**WEBSITE**

www.ics.ulisboa.pt

**FCT FUNDING FOR AL**

519 985 Euros

**INTEGRATED RESEARCHERS**

125

**KEYWORDS**

- Social Sciences
- Sustainability
- Inclusion and Citizenship
- Memory and Legacies

social inclusion and vulnerability, memory and legacies;

- Applied knowledge and relevant contributions on problems of national and global concern, informing and advancing evidence-based public policies;
- Doctoral and post-graduate teaching, life-long training for non-academic publics and ongoing training for researchers and technical staff;
- Dialogue between science and society, "open science" and knowledge dissemination, incentivizing varied outreach and public engagement strategies;
- International projection of knowledge produced, attracting talented students and researchers and funding, supporting internationalization of careers, research, and collaborative networks;
- Key infrastructures for gathering, handling, preserving and disseminating SSH data.

**AREAS OF ACTIVITY**

**Sustainability:** promoting the transition to more sustainable societies. Topics: climate action, energy transition and risks; sustainable production and consumption; urbanization and cities; engagement with science.

**Citizenship:** reducing political inequalities and advancing effective, accountable, and inclusive institutions of governance. Topics: rights and political equality, democratic representation and participation, quality of governance.

**Inclusion and Vulnerabilities:** examining barriers to social inclusion and effects of demographic, social and economic transformations. Topics: children, youth and families; vulnerability and inequality in life transitions; gender and sexuality; human and non-human animal relations.

**Memory and Legacies:** historical and anthropological reflexivity for designing fairer public policies. Topics: heritage and archives; socio-economic roots and structures, policies and discourses; social and racialized representations.

# Socio Digital Laboratory for Public Policy

SocioDigitalLab



## LEAD R&D UNIT

Centre for Research and Studies in Sociology (CIES-IUL)

## PARTICIPANT R&D UNITS

Business Research Unit - BRU-IUL (UNIDE)  
 Center for International Studies (CEI-IUL)  
 Centre for Psychological Research and Social Intervention (CIS-IUL)  
 DINAMIA'CET -IUL - Centre for Socioeconomic and Territorial Studies (DINÂMIA'CET)  
 Information Sciences, Technologies and Architecture Research Center (ISTAR – IUL)

## DESCRIPTION

The Socio Digital Laboratory for Public Policy promotes a unique interdisciplinary approach to the study of public policy and contributes to the resolution of contemporary societal problems and global challenges. The complexity of the modern world requires a new approach that integrates social sciences and digital technologies to address societal problems and contribute to public policy. The Socio Digital Lab was specifically designed to assume this mission. To that effect, six research units with scientific expertise in diverse and complementary fields in the social sciences and digital technologies joined together. These research units consist of qualified experienced research teams with know-how in the fundamentals, the analysis, the implementation and the evaluation of public policies. The Socio Digital Lab will permit the development of a more advanced, integrated level of interdisciplinary work between social sciences and digital technologies to develop innovative contributions with impact for public policy. The first research policy thrust focuses on environmental problems and addresses climate change, decarbonisation, renewable technologies and how cities, regions and territories can preserve the biodiversity of the planet. The second research policy address inequalities, disenfranchise and marginalisation, with an aim to promote equity and equality of opportunities and encourage school completion

and greater qualifications. The third research policy thrust seeks to contribute to better and fairer public health policies, combining social sciences and artificial intelligence. It will co-produce cutting-edge knowledge, technologies, tools and opportunities to empower and encourage citizens, groups and organizations to promote health and to engage with health policies. The fourth research policy thrust is on global issues, including migration, development, participatory and representative democracy, and promoting international partnerships with a focus on achieving a fair and secure world. The fifth research policy thrust is on how digital technologies transform and modify services, processes and impact society, promoting digital skills and supporting innovation and efficiency across a broad spectrum of services, aiming at contributing to policy.

## STRATEGICAL OBJECTIVES

The objectives of the Lab is to become a reference centre for public policies in the next decade based on four pillars: a) the production of new scientific knowledge aimed at supporting public policies, b) the production of reliable information concerning public policies, c) the transparent and independent evaluation of existing public policies, ultimately building knowledge and critical thinking in this domain, and d) the development of a new generation of experts in data science and artificial intelligence to sup-

## WEBSITE

sociodigitallab.iscte-iul.pt

## FCT FUNDING FOR AL

75 000 Euros

## INTEGRATED RESEARCHERS

430

## KEYWORDS

- Public Policy
- Societal challenges
- Digital Transformation
- Sustainability

port decision making and public policy. The objectives of the Lab are aligned with the national plan 'Commitment to Knowledge and Science: the Commitment to the Future', in particular to the Thematic Agendas on climate changes, urban science and the cities for the future, culture and cultural heritage, circular economy, social inclusion and citizenship, health, clinical and translational research, and labor, automation and job qualification in Portugal.

## AREAS OF ACTIVITY

The Socio Digital Lab for Public Policy is organized around five interdisciplinary policy thrusts. This policy focus provides a basis for innovative solutions to today's global challenges. The main research policy thrusts (or thematic lines) are: Regenerative territories for carbon neutrality; Social inclusion, equality and citizenship; Societal health; Global governance; Digital transformation and public policies. Each thematic line consists of a wide variety of disciplinary contributions, from fields such as anthropology, architecture, business and management sciences, cognitive and behavioural sciences, communication sciences, computer science, data science, digital technology, economics, history, international studies, political science, public administration, public policy, social psychology, social work, and sociology.

# Humanities

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# 5.2.6

IN2PAST

# Associate Laboratory for Research and Innovation in Heritage, Arts, Sustainability and Territory

IN2PAST



## LEAD R&D UNIT

HERCULES Laboratory - Cultural Heritage, Studies and Safeguard (HERCULES)

## PARTICIPANT R&D UNITS

Art History Institute (IHA/FCSH/NOVA)  
Centre for Art History and Artistic Research (CHAIA)  
Centre for Research in Anthropology (CRIA)  
Centre for the Study of the Sociology and Aesthetics of Music (CESEM)  
Institute of Contemporary History (IHC)  
Landscapes, Heritage and Territory Laboratory (Lab2PT)

## DESCRIPTION

IN2PAST is dedicated to the preservation, study and promotion of cultural heritage, generating intensive collaborative relations between: 1) academic, laboratory-based, theoretical and empirical research; 2) public policies concerning the domains of cultural heritage, arts and civic memory; 3) an important set of Portuguese cultural institutions and facilities, namely monuments, museums, archives, archaeological sites and natural parks.

The study and promotion of cultural heritage finds in IN2PAST a perfect institutional environment, encouraging the establishment of links between tangible and intangible (including digital) cultural heritage. Bringing together scientific areas often set apart by academic tradition, IN2PAST extends its operations from laboratorial innovation in the field of heritage sciences to the design of public policies of collective memory, favouring the emergence of an integrated vision with the related partners and stakeholders.

## STRATEGICAL OBJECTIVES

The vision driving IN2PAST is to make heritage a central player in the sustainable development of our society by making it meaningful, sustainable, and accessible, in a multicultural and ever-changing world, for the benefit of the wider population.

IN2PAST set out the following strategic priorities, taking into consideration the consortium's unique combination of skills and resources:

- Preventive conservation and risk assessment;
- Massive digitalisation to protect, preserve and enhance collections, artefacts, archives, and monuments and increase accessibility to cultural goods;
- Expand heritage preventive conservation to new areas, from traditional to contemporary materials and sound, following initiatives such as the creation of the National Sound Archive;
- The establishment of a strong relationship between cultural heritage and tourism;
- The creation of a permanent state policy regarding the production of Portuguese and European civic memory;
- The making of a pluralistic collective memory.

## AREAS OF ACTIVITY

IN2PAST has the following thematic Lines:

TL1 | Science and Technology for Cultural Heritage. Preserve and debate the authenticity of cultural heritage's various expressions and enhance these legacies, underlining their role in the cultural identity of the territories and projecting them as a basis for economic activities. Heritage research must be based on multi- and transdisciplinary approaches that create dynamics and synergies

## WEBSITE

n.a.

## FCT FUNDING FOR AL

113 025 Euros

## INTEGRATED RESEARCHERS

462

## KEYWORDS

- Cultural Heritage
- Heritage Sciences
- Arts
- Collective Memory

between the humanities, social sciences, and natural sciences. Moreover, the preservation and the valorisation of cultural heritage are fundamental issues that require the implementation of integrated strategies vis-à-vis the production of new knowledge, the transfer of knowledge to make it socially useful and relevant, and the dissemination to raise awareness and value such knowledge.

TL 2 | Landscapes, Territories and Cultural Heritage. This thematic line of research and action revolves around a common interest for the study of the territory, its landscapes and heritage, which are understood as the material, spatial and cultural expressions of societies over time. Interpreting cultural heritage as a proactive resource, IN2PAST articulates heritage with development through innovative geographical methodologies towards the territory.

TL3 | Museums, Monuments and their Collections. Individual and collective research projects developed by IN2PAST's researchers have contributed to the making of policies, governance, curatorship, management and conservation of tangible and intangible heritage in all forms, as well as timely scientific advancement and education that will secure future generations' awareness of the need to care for and preserve heritage.

TL4 | Archives, from Preventive Preservation to Digitalisation. Research within this TL will address the pressing concerns about memory institutions stemming from trans-

versal problems related to both preservation — including the crucial selection of memory objects, conservation (especially preventive conservation) and restoration of materials and contents — and access, in order to advise on criteria for public policies and ethics in this area.

TL5 | Cultural Circulation, Public Policies on Memory and Inclusive Citizenship. Encompassing diplomatic, scientific, and artistic undertakings, this TL seeks to support, accompany, and implement the development of memory policies leading to a more active and renewed global positioning of Portugal and to more inclusive and creative societies.

# Annex

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ACRONIM	NAME	WEBPAGE
<b>NATURAL SCIENCES</b>		
ARNET	Aquatic Research Infrastructure Network	n.a.
CESAM	Centre for Environmental and Marine Studies	www.cesam-la.pt
CHANGE	Global Change and Sustainability Institute	n.a.
CIMAR LA	Centre for Marine and Environmental Research	cimar-la.pt
i4HB	Institute for Health and Bioeconomy	i4hb-la.pt
IDL	Institute Dom Luiz	idl.campus.ciencias.ulisboa.pt
IMS	Institute of Molecular Sciences	n.a.
InBIO	Research Network in Biodiversity and Evolutionary Biology	inbio-la.pt
INESC-ID	Institute for Systems and Computer Engineering, Research and Development	inesc-id.pt
IPFN	Institute for Plasmas and Nuclear Fusion	www.ipfn.tecnico.ulisboa.pt
LaPMET	Laboratory of Physics for Materials and Emergent Technologies	www.lapmet.org
LAQV/REQUIMTE	Associated Laboratory for Green Chemistry - Clean Technologies and Processes	laqv.requimte.pt
LASI	Intelligent Systems Associate Laboratory	lasi-research.pt
LIP	Laboratory for Instrumentation and Experimental Particle Physics	www.lip.pt
LS4FUTURE	Life Sciences for a Healthy and Sustainable Future	www.ls4future.pt

#### ENGINEERING AND TECHNOLOGY SCIENCES

ALiCE	Associate Laboratory in Chemical Engineering	www.alice.fe.up.pt
ARISE	Advanced Production and Intelligent Systems	arise-la.pt
CICECO	Aveiro Institute of Materials	www.ciceco.ua.pt
i3N	Institute of Nanostructures, Nanomodelling and Nanofabrication	www.i3n.org
ICVS/3B 's	Associate Laboratory, Life and Health Sciences Research Institute Biomaterials, Biodegradables and Biomimetics Research Group	icvs3bs.pt/icvs3bs
INESC TEC	Institute for Systems and Computer Engineering, Technology and Science	www.inesctec.pt
IT	Institute of Telecommunications	www.it.pt
LABELLS	Associate Laboratory on Biotechnology, Bioengineering and microElectromechanical Systems	www.labbels.uminho.pt
LAETA	Associate Laboratory of Energy, Transports and Aerospace	laeta.pt/en
LARSys	Laboratory of Robotics and Engineering Systems	larsys.pt

#### MEDICAL AND HEALTH SCIENCES

CIBB	Center for Innovative Biomedicine and Biotechnology - Associate Laboratory	cibb.uc.pt
i3S	Institute for Research and Innovation in Health	www.i3s.up.pt
iMM	Institute of Molecular Medicine João Lobo Antunes	imm.medicina.ulisboa.pt
ITR	Laboratory for Integrative and Translational Research in Population Health	ispup.up.pt/laboratorio-associado-itr
REAL	Translation and Innovation towards Global Health	n.a.
RISE	Health Research Network: From Lab to Community Health	rise.med.up.pt

ACRONIM	NAME	WEBPAGE
<b>AGRICULTURAL SCIENCES</b>		
AL4AnimalS	Associate Laboratory for Animal and Veterinary Sciences	www.ciisa.fmv.ulisboa.pt
CBQF	Centre for Biotechnology and Fine Chemistry	www.cbqf.esb.ucp.pt/en
Inov4Agro	Institute for Innovation, Capacity Building and Sustainability of Agri-Food Production	inov4agro.pt
SusTEC	Associate Laboratory for Sustainability and Tecnology in Mountain Regions	sustec.ipb.pt
TERRA	Laboratory for Sustainable Land Use and Ecosystem Services	www.isa.ulisboa.pt/terra

#### SOCIAL SCIENCES

CES	Centre for Social Studies	www.ces.uc.pt
ICS-ULisboa	Institute of Social Sciences, University of Lisbon	www.ics.ulisboa.pt
SocioDigitalLab	Socio Digital Laboratory for Public Policy	sociodigitallab.iscte-iul.pt

#### HUMANITIES

IN2PAST	Associate Laboratory for Research and Innovation in Heritage, Arts, Sustainability and Territory	n.a.
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