RISE HEALTH

R&D Unit Presentation

rise-health.pt

MASTHEAD

Title
RISE-Health – R&D Unit Presentation

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RISE-Health Overview

RISE-Health Overview

RISE-Health is the largest research unit in Portugal, relying on a multidisciplinary panel of more than 1,300 researchers. This R&D Unit covers health from the molecule to the community, promoting better links between science and academia, and between clinical practice and biomedical innovation.

Portugal: Low Investment in Clinical Research

The strategic importance of clinical research for improving healthcare and the economy remains largely underappreciated in Portugal.

Clinical research is not a priority in the National Health Plan, and Portugal led only 7% of investigator-led clinical trials from 2012 to 2023.

This number is significantly lower than those of other European countries, which range from 18% to 45%. On the other hand, most funding comes from the pharmaceutical industry, typically for projects of this sector's direct interest.

Gaining Dimension

Based on our previous experience with national research funding, we recognised that small research units, regardless of their scientific excellence as awarded by the FCT, have had a limited influence on clinical research funding policies.

Consequently, four units (CINTESIS, UNIC, CICS-UBI, and MedInUP) merged to form RISE-Health to address this challenge, increase critical mass and improve efficiency and sustainability in clinical research.

MEDINUP CENTER FOR DRUG DISCOVERY AND INNOVATIVE MEDICINES

CICS-UBI

CINTESIS Health. Research.

UniC CARDIOVASCULAR RESEARCH CENTRE

RISE HEALTH
Health Research and Innovation
From Lab to Community and back to Lab

Medical consultation FMUP/ULS São João

Mission

To set a benchmark in promoting scientific collaboration and expanding collective expertise, be at the forefront of innovation, and foster the frontiers of clinical and translational research from the bench to the community.

Vision

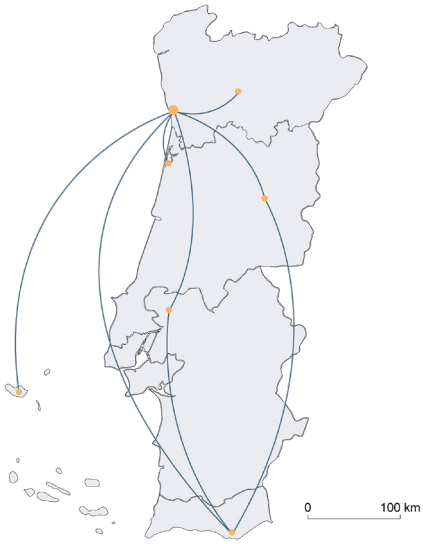
To become a major player and a catalyst in changing the landscape of clinical, translational, and community research in Portugal and beyond.

Vascular surgery FMUP/ULS São João

Where we are

637 integrated researchers
482 collaborators
230 PhD students

Headquartered at FMUP with management centres in:
5 other Faculties of U.Porto
5 other Public Universities
2 Private Universities
2 Nursing Schools
1 Polytechnic School



Distance between RISE-Health centres

With this merger, RISE-Health has become the largest research unit in the country, comprising 637 integrated researchers, 482 collaborators, and 230 PhD students. The unit is headquartered at the Faculty of Medicine of the University of Porto (FMUP) and has another 16 management centres. Five are in other organic units of the University of Porto (ICBAS, Faculty of Pharmacy, Faculty of Dental Medicine, Faculty of Sciences, and Faculty of Nutrition and Food Sciences); 8 are in other public universities and schools (University of Trás-os-Montes and Alto Douro, University of Algarve, University of Aveiro, University of Beira Interior, University of Madeira, Nursing School of Porto, School of Health Sciences of the Polytechnic of Porto and Nursing School of the Polytechnic of Santarém); and another 3 are in private universities and schools (Fernando Pessoa University, Portucalense University, and the Santa Maria Health School).

Building on an existing core group that had already established excellent work, RISE-Health opens channels for other regions of the country to develop health research. In a world marked by conflict and inequality, we are also contributing to reducing disparities and enabling harmonious growth in research. Portugal is not a large country, and the distances between our centres are not an obstacle to promoting high-quality, sustainable research with a significant increase in critical mass, human resources, and infrastructure.

Governance Structure

RISE-Health governance is structured in 4 bodies:

01 **Representative Bodies**, including the General Assembly (all integrated researchers) and the Consortium Council (directors from the 17 management institutions).

02 **Executive Bodies** are led by the Director and supported by the Executive Committee and the Management Office, which oversees daily operations and strategic planning. This body also comprises the Executive Focal Points, which are working groups to support and promote key topics of a strategic nature for the unit.

03 **Scientific Bodies** with a Scientific Committee guiding strategic scientific direction and interdisciplinary collaboration.

04 **External Advisory Board** (EAB) who advise on strategy, resource allocation and risk management.

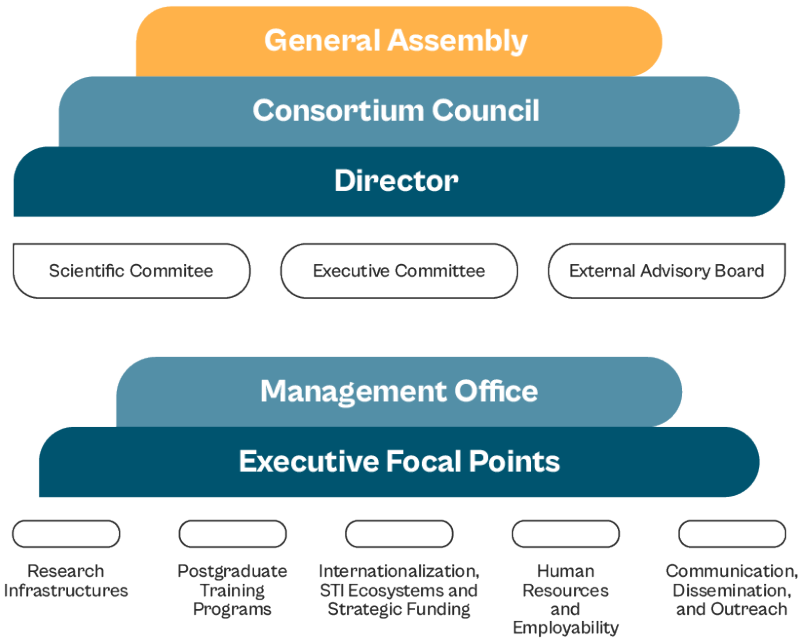


Figure 2: RISE-Health Governance Structure

Scientific Structure

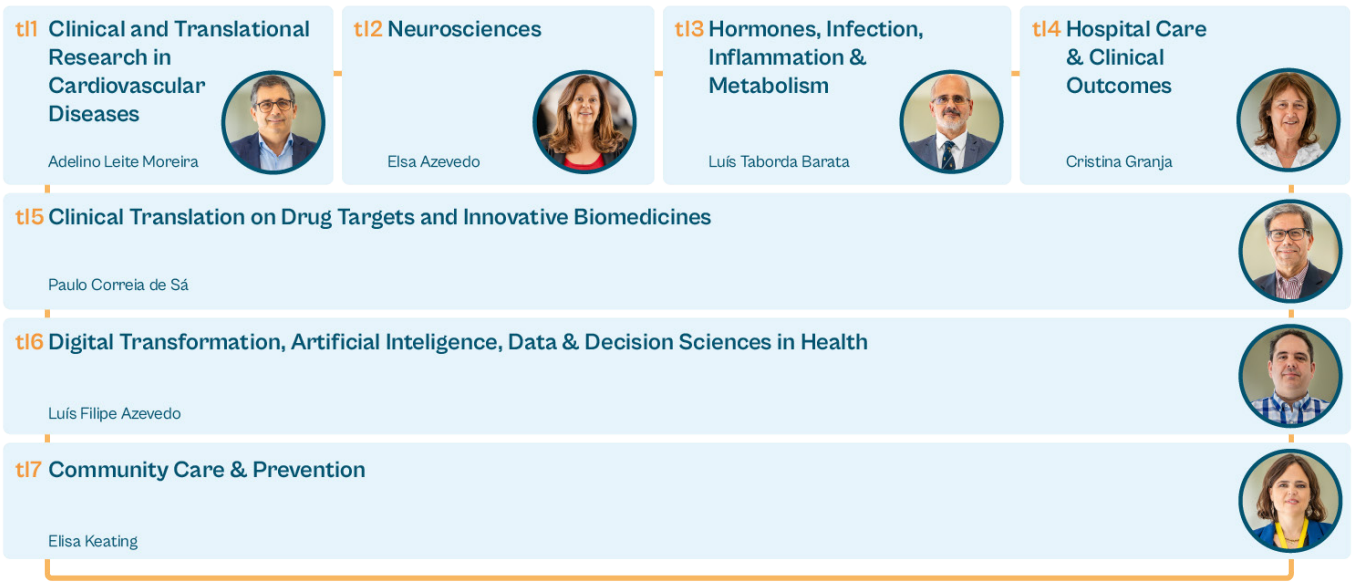


Figure 3: RISE-Health Scientific Structure

The scientific foundation of RISE-Health's research strategy is provided by 7 Thematic Lines (TL) around which our 35 research groups are distributed.

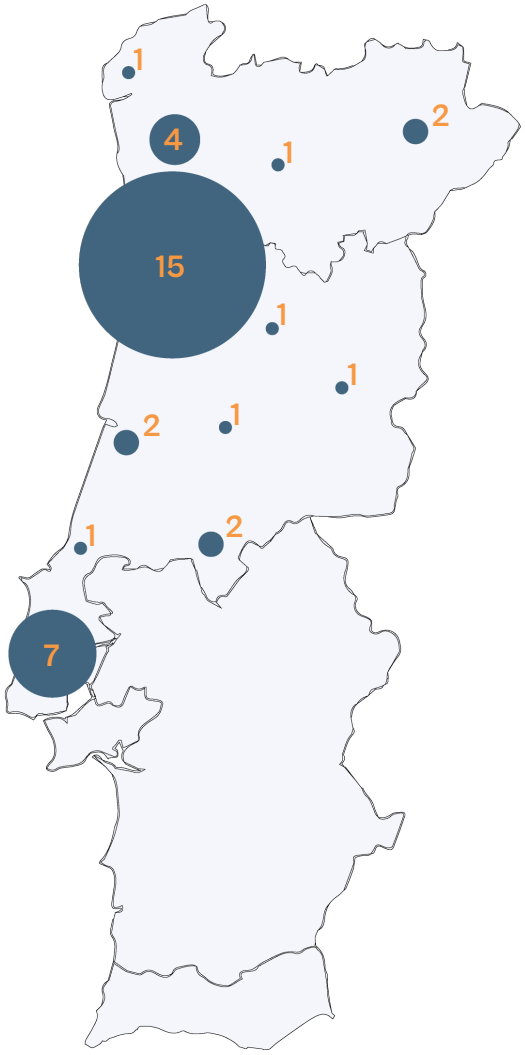
We have 4 vertical lines representing specific fields of medicine and 3 horizontal lines that support methods and technologies, focusing on enhancing Clinical Research.

The close interaction between the vertical and the horizontal lines creates hubs that foster collaboration and increase the success of competitive funding applications.

Privileged Partnerships

with Hospitals & Health Centres

RISE-Health has built a close and direct partnership with hospitals and health centres.



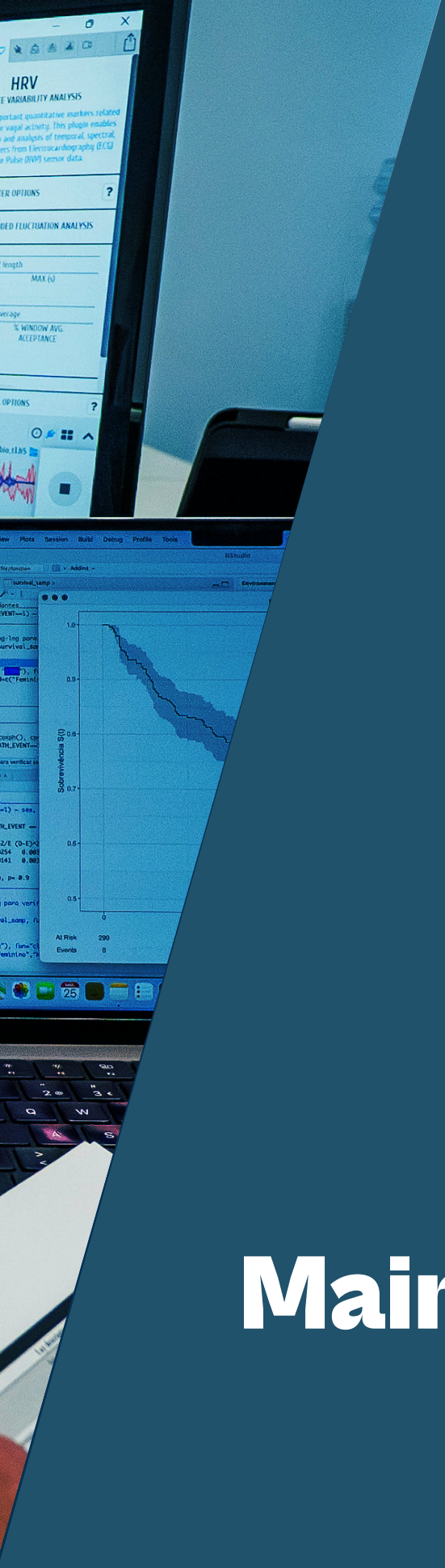
38 partnerships

with health institutions, public or private, including

Hospitals and Health Centres

ULS São João (Porto)

Casa de Saúde São João de Deus (Barcelos)



Main Achievements
2018-2023

Scientific Impact

Publications & Citations

637 researchers = 240 FTE

6,854 articles, mostly in Q1/Q2 journals (63%), collecting more than **101,000 citations**

h-index WoS/Scopus = **8**

Nuclear CVs *h*-index WoS/Scopus = **29**

29 articles/FTE

45% in open-access

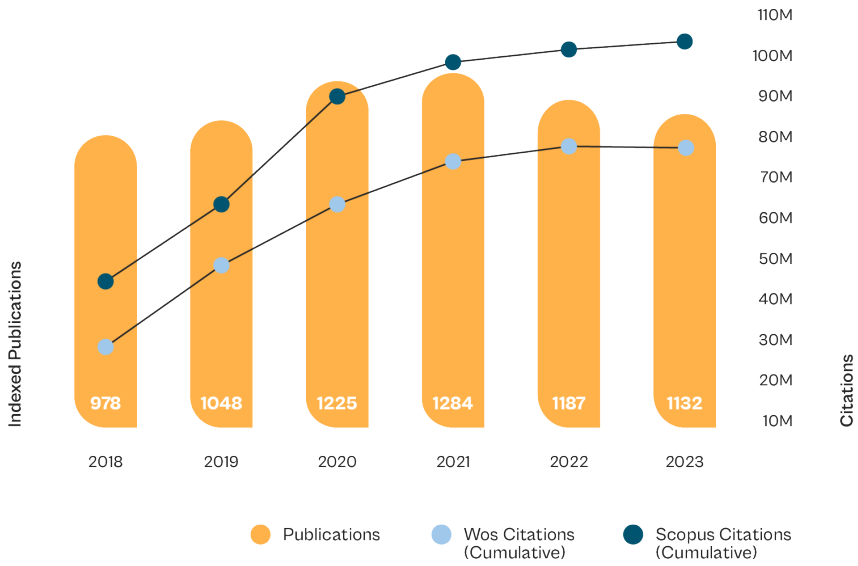


Figure 5: RISE-Health indexed publications and citations 2018-2023

Main Research Fields by WoS

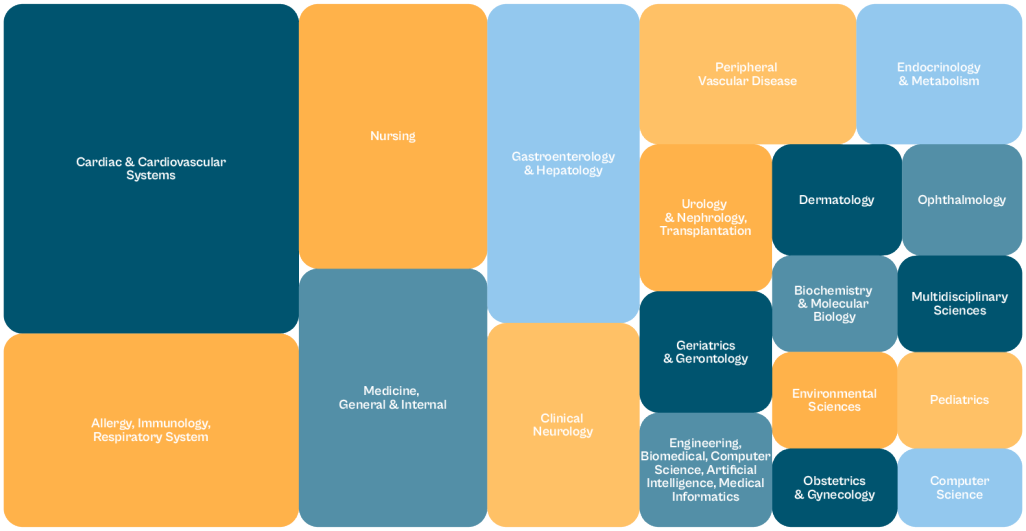


Figure 6: RISE-Health main research fields by Web of Science 2018-2023

International Collaborations

27% of publications with international co-authors from up to **147** countries.

Most frequent collaborations with authors from several **European countries**, followed by the **USA, Brazil, Australia, Canada, Turkey, Japan, Mexico, Argentina, China, Israel, Singapore, and India.**

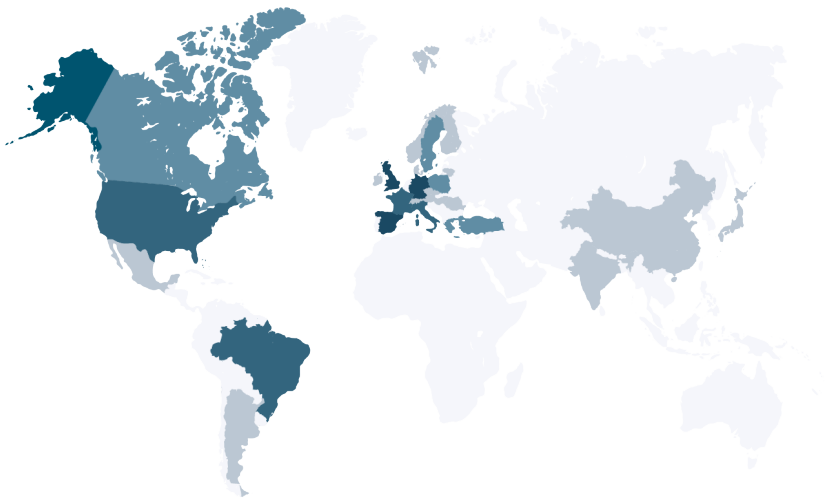


Figure 7: Location of RISE-Health international collaborations

Top 25 International Collaborations

with number of articles

CIBER Centro de Investigación Biomédica en Red, 164
Berlin Institute of Health, 151
University of London, 142
Université de Montpellier, 128
CHU de Montpellier, 121
Université Paris Cité, 121
Institut National de la Santé et de la Recherche Médicale (INSERM), 160
Humboldt University of Berlin, 151
Free University of Berlin, 152
Charité Universitätsmedizin Berlin, 150
University of Barcelona, 136
Karolinska Institutet, 134
University of Helsinki, 134
Helsinki University Central Hospital, 118
National and Kapodistrian University of Athens, 118
University of Copenhagen, 113
University of Sydney, 112
University of Amsterdam, 111
Imperial College London, 106
Universidade de São Paulo, 106
Assistance Publique - Hôpitaux de Paris (APHP), 104
Hospital Clínic de Barcelona, 95
Ghent University, 94
Medical University of Lodz, 93

Education

RISE-Health postgraduate education and training activities are comprehensive and diverse.

21	30	+600
PhD Programmes	MSc Programmes	Continuous Training Programmes
Over **3,100 students** of **20 nationalities**	Around **5,000 students** of **16 nationalities**	Over **65,000 students** of **26 nationalities** *(10,000 MDs)*

Figure 9: RISE-Health postgraduate education programmes

Postgraduation student

This R&D Unit offers 21 PhD Programmes, 30 Master's Programmes, and 611 Continuing Education Programmes, most of which are in the medical field.

All these programmes receive students from various countries, highlighting the international reach and excellence of our educational offerings.

Innovation

We have strong industry partnerships, and over the last five years, our researchers have developed 13 patent families, 14 spin-off companies, various software, and prototypes and are involved in more than 1000 clinical studies.

Secured protection for
13 Patent Families
in several countries

Led or participated in
+ 1,100 Clinical Studies

Developed several
Digital Health Technologies, Software, Prototypes, and Tools
ObsCare, mINSPIRE, mCARAT, etc.

27 Research Contracts
= 2 M€

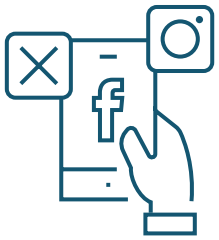
Helped create
14 Spin-off Companies
Currently 11 are supported by RISE-Health researchers

Figure 10: RISE-Health innovation highlights 2018-2023

Biomedical engineering equipment

Social Impact

Regarding the promotion and dissemination of results, we have had thousands of mentions in mainstream and social media, organised 500 science communication events, and hosted 1,000 scientific events.



Mainstream Media

10,000 news
published on mainstream media
including national and international broadcasters and leading newspapers

4 news pieces/day
(Average)

Over 122 M€
AAV – Automatic Advertising Value

Social Media

30,000 posts
on events and research results

290,000 followers
On social media networks

Events

500 SciCom Events
Impacting over 170,000 px

1,000 Scientific Events
33% of them International with over 100,00 participants (total)

Open Access

Over 3,000 publications
45% of the scientific production

Figure 11: RISE-Health social impact highlights 2018-2023

1st RISE-Health Meeting FMUP

Consolidation

59% of our integrated researchers hold permanent positions, with the majority in teaching posts and only 4 as full-time researchers. Of our fixed-term positions, 51 are in research roles. Our challenge now is to create permanent positions for researchers. New programmes from FCT, like the FCT Tenure program, will be critical in this strategy.

379 Permanent Positions
99% Teaching Positions
= 126 FTE

Only
4 Research Positions

59%
of integrated researchers with
Permanent Positions

242 Fixed-Term Positions
71% Teaching Positions
= 108 FTE

51 Research Positions

33% with Medical Background

Figure 12: RISE-Health career consolidation highlights 2018-2023

Medical doctor using an e-health app

Competitive Funding 2018-2023

From 2018 to 2023, we attracted 31 million euros in competitive funding across 209 projects. Notably, 28% came from international sources, including 20% from the EU, while 72% came from national sources, with 37% provided by FCT. Industry funding accounted for 5.9%. These numbers demonstrate our ability to secure diverse funding streams.

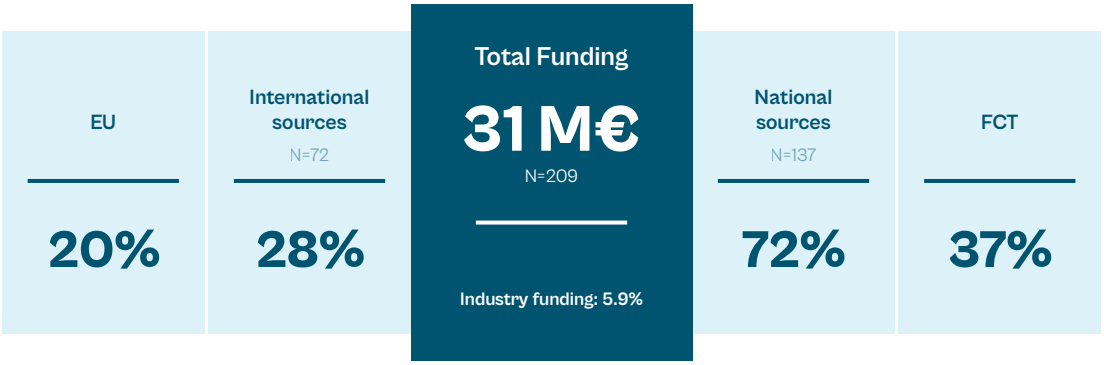


Figure 9: RISE-Health competitive funding highlights 2018-2023

Nuclear CVs

14 MD + 6 PhD
from other scientific areas
(4 from Biology, 1 from Computer Science and 1 from Nursing)

4
Heads of Medical Services

2
Deans of Faculties of Medicine

5
Heads of Academic Departments

3
Coordinators of PhD Programmes

2
Directors of Bachelor Courses

2
Heads of R&D Units

1
Director of R&D in a pharmaceutical company

1
Head of University incubator for start-ups and spinoffs

1
Head of Department in a foreign R&D Institution

8 RISE-Health Researchers
with Nuclear CVs are listed in the TOP 2% SCIENTISTS LEADING MINDS IN SCIENCE

Many of our nuclear CVs also hold leadership roles in clinical and medical services, as well as in cross-disciplinary and multisector strategic collaborations, including positions such as directors of R&D in the pharmaceutical industry, leadership in start-up incubators, and coordinators of national initiatives aimed at improving research and life sciences.

Additionally, many hold several leadership positions in international scientific and medical associations and editorial leadership roles in prestigious journals and publications.

They also have a significant presence in international research associations, are very active as evaluators for prestigious international funding agencies and programmes and have successfully competed and led national and international projects from different research funding agencies, as well as established research contracts with industry.

Nuclear CVs

Altamiro da Costa Pereira

Cristina Granja

Elisa Keating

Elísio Costa

Elsa Azevedo

Fernando Magro

Fernando Schmitt

Inês Falcão Pires

João Fonseca

João Pedro Ferreira

Joaquim A. Leite-Moreira

José Miguel Padilha

Lia Fernandes

Liliana Inácio Bernardino

Luís Filipe Azevedo

Luís Taborda Barata

Manuel Lemos

Patrício Soares da Silva

Paulo Correia de Sá

Pedro Pereira Rodrigues

In Essence

RISE-Health is in a solid position to carry out an ambitious and comprehensive research plan over the next 5 years. This R&D Unit has the methods, a skilled and multidisciplinary team, and a shared infrastructure to achieve its strategic goal and advance scientific discovery, taking knowledge from the bench to the community and back.

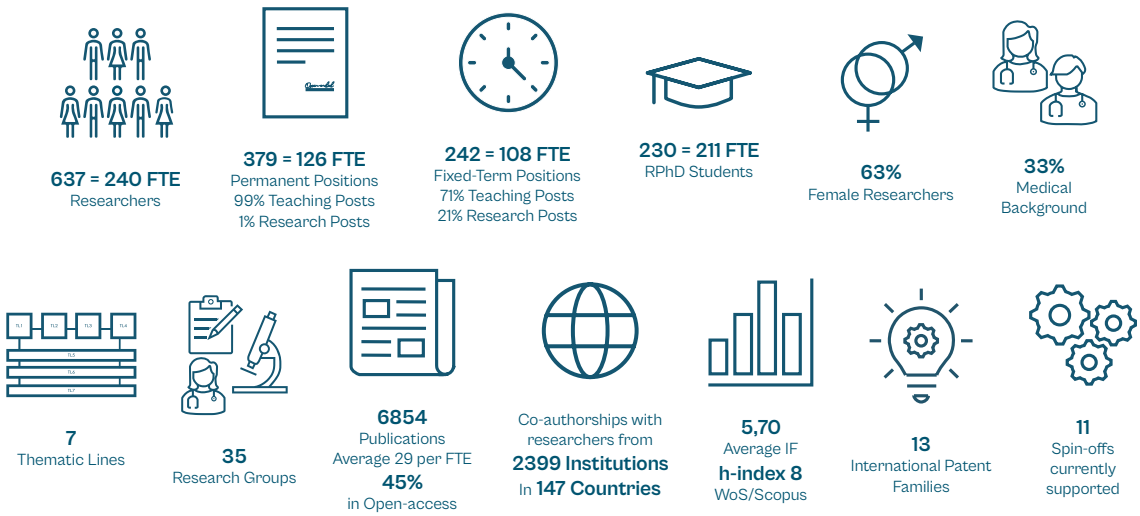


Figure 14: RISE-Health in numbers 2018-2023

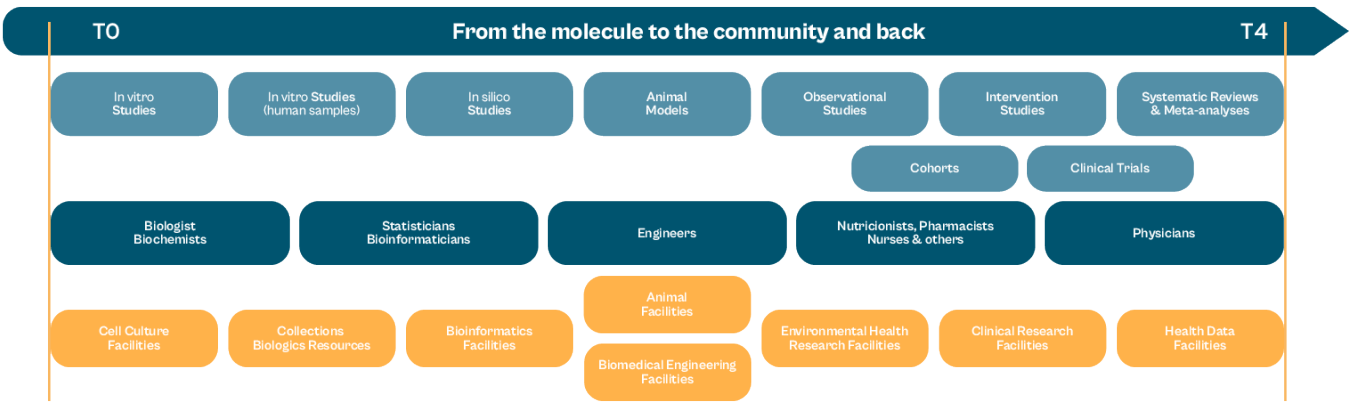


Figure 15: RISE-Health research continuum

Strategic Plan

Strategic Plan

Our strategic plan for 2025-2029 focuses on 5 key areas:

01 Consolidation

- Maximise collaborations and resource
- Increase interactions between vertical and horizontal research lines
- Develop a set of high-standard key infrastructures

02 Internationalisation

- Strengthen collaboration with international networks and associations
- Increase and diversify international funding
- Promote international mobility of PhD students and researchers
- Transform own institutional PhD programmes in Joint PhD Programmes in collaboration with leading European universities

03 Talent Attraction & Retention

- Support young researchers with mentorship
- Seed funding and career development opportunities
- Implement a well-structured human resources plan including FCT tenure positions (already secured) to attract and retain talented researchers

04 Education

- Foster advanced training programmes and further develop continuing education programmes of the R&D Unit

05 SciCom & Citizen Science

- Organise international conferences, workshops and seminars
- Promote health literacy and knowledge dissemination through digital platforms to maximize impact

Consolidation

We aim to maximise internal and external collaborations, strengthen international networks, support young researchers, and enhance Continuing Education Programmes for medical professionals. Additionally, we will promote citizen science and knowledge dissemination through international events and digital platforms to increase our impact.

Internationalisation

RISE-Health will commit to its internationalisation by supporting mobility and participation in international funding programmes, promoting PhD and Postdoc fellowships, reinforcing its international clinical and research networks, and supporting open-access publishing and participation in international fora.

Main Focus	Reasearchers	Advanced Training Programmes	Internacional Partnerships & Meetings	Publications
RISE-Health resources	Internal PhD and PostDoc fellowships Granted 60 FCT-Tenure positions External PhD and PostDoc fellowships Support to mobility grants Support to grant writting, including ERC	National network of affiliated health institutions PhD programmes internal fellowships Support to MSCA doctoral networks application	Established international clinical and research networks Support for grant writting and proposal development International project fees SoA research infrastructures	Open Access internal policy Supported APC fees RISE-PBJ platform (PBJ indexed journal)

Figure 16: RISE-Health internationalisation framework

Talent Attraction & Retention

For attracting and retaining talent we will offer paths, from early-stage to leading positions, going from fixed-term to permanent contracts. 60 positions have already been secured under the FCT-Tenure to hire: 29 Assistant Professors, 3 Associate Professors, 1 Full Professor, 17 Assistant Researchers, and 10 Principal Researchers.

Laboratory work

We also focus on competitive grants supported by an ecosystem of innovation and business for career development.

60 PhD to be hired in 5 years

Total amount of **7,770,154 €**

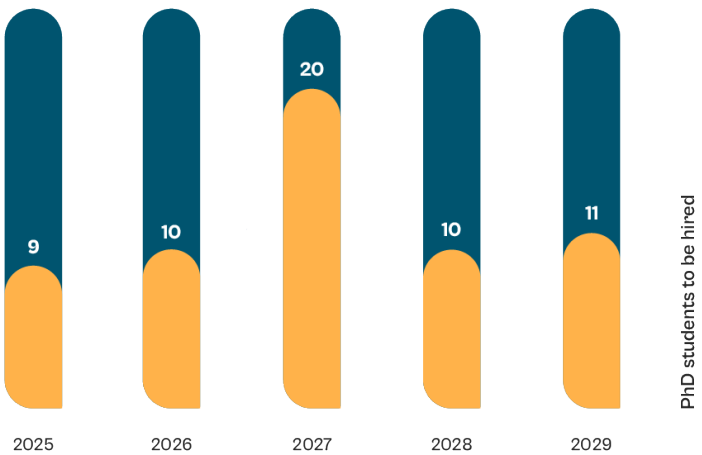


Figure 17: RISE-Health PhD students to be hired 2025-2029

	Career Track (contract type)	RISE-Health resources	Main recruitment focus	Funding opportunity
R1	**Doctoral Researcher** **Project Researcher** (fixed-term)	Internal small project funding Internal PhD fellowships MSc, PhD programmes	Internal training programmes	FCT PhD fellowships FCT PhD programmes La Caixa PhD grants MSCA Doctoral networks Fullbright Scientific societies mobility and travel grants
R2	**PostDoctoral/** **Junior Researcher** **Assistant Professor** **Research to business track** (fixed-term, mostly)	Internal small project funding; Internal PostDoc fellowships; Granted FCT-Tenure positions Established scientific networks National network of affiliated health institutions SoA research infrastructures Support for grant writing and proposal development	National and international competitive grants Innovation/business ecossystem	CEEC (assistant) FCT-Tenure (assistant) IC&DT (as a researcher) PeX (as PI) La Caixa CaixaResearch ERDF projects Horizon Europe (as researcher or WP leader) ERC Starting Grant Mobility Outgoing grants
R3	**Senior Researcher** **Associate Professor** **Business to Researcher** (fixed-term or permanent)			CEEC (principal) FCT-Tenure (principal) IC&DT (as Pi) PeX (as PI) La Caixa CaixaResearch ERDF projects Horizon Europe (as WP leader or coordinator) ERC Consolidator Grant Mobility Incoming grants
R4	**Senior Researcher/** **Director** **Full Professor** (permanent positions)			CEEC (coordinator) FCT-Tenure (coordinator) IC&DT (as Pi) ERDF grants Horizon Europe (as WP leader or Coordinator) ERC Advanced Grant EIC Pathfinder Mobility Incoming grants

Figure 18: RISE-Health career framework

Education

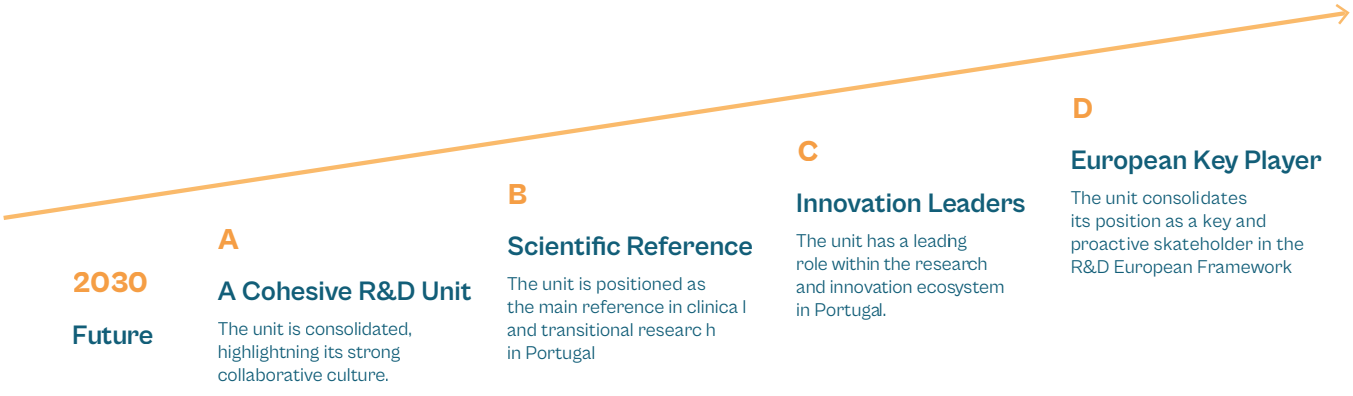
RISE-Health places PhD programmes at the forefront of its mission by supporting 16 A3ES-accredited PhD programmes that span the core research areas within the UID, aligning closely with our strategic research plan for 2025-2029. Admission to these programmes is highly competitive, based on the merits of applicants' CVs, and each PhD programme aims to equip professionals with the skills to conceive, design, adapt, and execute original and impactful research. We aim to offer 40 4-year PhD fellowships annually for the top-tier students of all programmes. Additionally, RISE-Health will ensure necessary technical and coordinating support for these programmes. Similarly, we will continue supporting and developing our master's degrees as well as classroom-based and e-learning continuing education programmes in the areas of interest to RISE-Health.

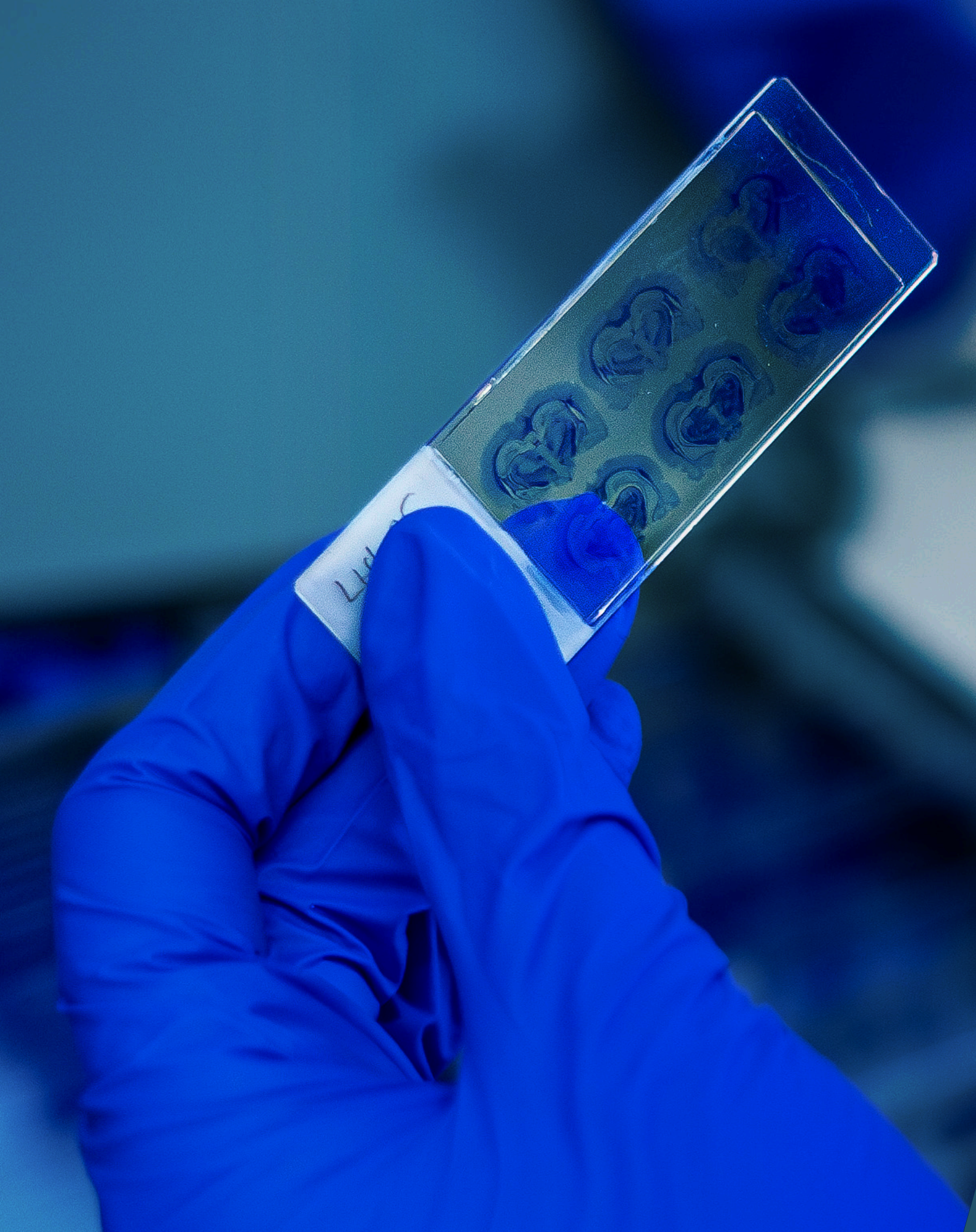
Science Communication and Citizen Science

We aim to implement a comprehensive strategy for science dissemination and citizen science. We have defined a clear plan for science communication, enhanced use of digital platforms, and translation of knowledge to the community. Continuing our previous achievements, we aim to organise several international conferences, colloquia and seminars. We will also pay particular attention to health literacy and other dissemination and communication actions relevant to society.

Where we want to be in 2030

By 2030, we aim to be a cohesive R&D unit with a strong collaborative culture. We plan to establish ourselves as a reference in clinical and translational research in Portugal, take a leading role in the national clinical research and innovation ecosystem, and solidify our position as a proactive stakeholder in the R&D European Framework.





Thematic Lines

tl1 Clinical and Translational Research in Cardiovascular Diseases

Research Group	Name of group PI
Heart Failure and Myocardial Remodelling	João Pedro Ferreira
Integrative Vascular Research	Amândio Rocha Sousa
Metabolism and Cardiovascular Risk	Inês Falcão Pires
Cardiovascular Diagnostic, Signal, and Imaging Technologies	Ricardo Fontes Carvalho
Innovation and Development in Cardiovascular Intervention	Roberto Roncon Albuquerque

The Thematic Line 1 – Clinical and Translational Research in Cardiovascular Diseases (TL1) focuses on clinical and translational research in cardiovascular diseases, which remain the leading cause of death and disability in Portugal and European countries.

This thematic line bridges a national gap in clinical and translational research in this field, pursuing a strategy of bringing together basic and clinical researchers, data scientists, engineers, and other collaborators.

Towards shared lab facilities and resources and benefiting from a strong collaboration with hospitals and biobank storage, TL1 aims to cover a wide range of topics and establish a broader integrative perspective through a bench-to-bedside-to-bench approach.

Coordinator: **Adelino Leite Moreira**

This thematic line is fully justified because cardiovascular diseases remain the leading cause of death and disability in Portugal and European countries, accounting for over a third of deaths as well as a major burden in healthcare expenditure.

This TL will pursue our strategy of bringing together clinical and basic science researchers, data scientists, engineers, and other collaborators to establish a robust translational and integrative perspective through a bench-to-bedside-to-bench approach.

Groups are organised to cover a wide range of topics while fostering effective team interactions and promoting innovation in cardiovascular disease research. The groups' scope of activity is intertwined, as groups complement each other and strongly interact. Its strengths are:

i. Extensive clinical characterisation
ii. Large biobanks (with well-defined standard operating procedures)
iii. Imaging
iv. Experience with animal models
v. Skills to evaluate myocardial function and remodelling, from isolated myofilaments, intact cardiomyocytes, and muscle strips to the isolated heart and in vivo cardiac function evaluation by pressure-volume loops.

The TL1 benefits from strong collaborations with two central hospitals' cardiology, cardiac surgery, and intensive care departments, lab facilities for diverse experimental works, and biobank storage.

tl2 Neurosciences

Research Group	Name of group PI
Neuroinflammation, Neuridegeneration, Epilepsy and Neurooncology	Joana Guimarães
Cerebrovascular Diseases, Neurocritical Care and Neurorehabilitation	Elsa Azevedo
Pain, Neurourology and Spine	Francisco Cruz
Psychiatry, Psychology & Mental Health	Lia Fernandes
Pre-clinical & Translational Neuroscience	Patrícia Monteiro

The Thematic Line 2 – Neurosciences (TL2) delves into the study of prevalent neurological, psychiatric, and mental health conditions. Through collaborative research initiatives with a strong translational focus, our multidisciplinary team of clinicians and researchers aims to advance scientific knowledge and clinical management within neurosciences. This thematic line will explore the intricate relationships between molecular neurobiology and the clinical manifestations observed in various neurological disorders. Comprising a diverse array of expertise ranging from pre-clinical and translational researchers to various medical specialities and allied health professionals, our team orchestrates a seamless continuum from laboratory research activities to bedside applications. The research projects target a wide spectrum of clinical neurosciences topics, including the complex domain of pain.

Coordinator: **Elsa Azevedo**

Our overarching mission is multifaceted: discovering disease biomarkers, establishing novel diagnostic mechanisms, and pioneering innovative treatment and rehabilitation modalities. A pivotal aspect of this translational process is our clinicians who run specialised outpatient clinics, thus enabling the collection and rigorous analysis of human biological samples and neuroimaging, duly authorised for research purposes.

By integrating diverse disciplines, this TL aims to gain a comprehensive understanding of the pathophysiology of major neurological and mental disorders, thereby advancing their clinical assessment, prognostication, and effective management strategies.

This line benefits from strong collaboration with neurology, neurosurgery, neurorehabilitation, neuroradiology, neurocritical care, and other clinical departments at the intersection of neurosciences with other clinical disciplines, research labs, including a cerebrospinal fluid lab, and biobank storage.

In addition, our researchers actively disseminate academic knowledge, contributing to undergraduate and postgraduate teaching initiatives. Concurrently, our outreach endeavours extend beyond the academic realm as we collaborate with scientific and patient-support societies. These efforts are expected to expand the impact of our work within the broader community while fostering health education and disease prevention.

tl3 Hormones, Infection, Inflammation & Metabolism

Research Group	Name of group PI
Hormones & Metabolism	Manuel Lemons
Medical Microbiology & One Health	Acácio Rodrigues
Exposome-Related Inflammatory & Allergic Diseases	Luís Taborda Barata
Metabonomics, Obesity & Related Disorders	Cristina Prudêncio

The Thematic Line 3 – Hormones, Infection, Inflammation & Metabolism (TL3) focuses on the study of pathophysiological mechanisms, biomarkers of disease initiation, progression, and subtypes, as well as on the response to therapy (including antimicrobial resistance) and its clinical implications in pathological contexts with a hormonal, metabolic, infectious or inflammatory component and a significant disease burden. Several of the diseases studied in this TL are among the main causes of the global burden of disease worldwide. Furthermore, this thematic line is fully justified by the fact that these components are often interconnected. For example, inflammation is involved not only in infection and allergies but is also a component that arises in the context of hormone-induced cancers, diabetes, obesity and other metabolic syndromes.

Coordinator: **Luís Manuel Taborda Barata**

The TL3 is based on four multidisciplinary groups, following a translational perspective, from bench to bedside to bench, in which clinicians and non-clinicians work together on new observations, ideas and concepts to transform them into innovative knowledge and products with scientific and societal impact. In addition, the groups working in this research line benefit from cutting-edge laboratories for various types of experimental work, as well as technologies and approaches that support the translational component. Moreover, this research line also involves strong collaborations with clinical departments (immunoallergology, respiratory medicine, endocrinology, primary care, among others) of central university teaching hospitals and primary care units that are part of two clinical academic centres, as well as having direct access to the storage of human samples in biobanks, namely for the two human cohorts (asthma; ageing) associated with this line of research.

The TL3 also contributes to RISE-Health's ambition to strengthen the research-education interplay, expressed in its contribution to various master's and doctoral programmes that are part of this R&D Centre involving higher education institutions.

Additionally, the TL3 aims to develop strong links with other RISE-Health research lines in a synergistic, complementary and transdisciplinary approach to dealing with the main health issues affecting society. Some links are already strong, namely with TL6, TL7, with joint project submissions and published work. This collaborative work extends beyond RISE-Health, with TL3 groups playing a significant role in international networks addressing specific and related health issues.

Finally, groups within the TL3 are also committed to outreaching and engaging the general public and the patient community in a joint effort to tackle the key clinical and research issues associated with hormonal, metabolic, infectious or inflammatory diseases, from prevention to treatment, thus addressing society's unmet needs.

tl4 Hospital Care & Clinical Outcomes

Research Group	Name of group PI
Critical Med	Joana Berger-Estilita
Digestive Health	Guilherme Macedo
Lung Diseases	António Martins
Surgical Care	José Barbosa
Maternal and Child Health	Inês Azevedo
Personalised Medicine	Nuno Vale

The Thematic Line 4 – Hospital Care & Clinical Outcomes (TL4) aims to advance hospital care and clinical outcomes through interdisciplinary research within the RISE-Health initiative.

Promoting Interdisciplinary Research: actively promote interdisciplinary research by fostering collaboration among researchers from various disciplines, such as medicine, nursing, pharmacy, and allied health professionals. By integrating diverse perspectives and expertise, the TL4 aims to address complex healthcare challenges more effectively, specifically by combining the expertise of Personalised Medicine (PM) with Maternal and Child Health in the field of genetic diseases and with PM and CriticalMed in the field of anaesthesia depth management.

Coordinator: **Cristina Granja**

Improving Patient Care: the TL4's main objective is to improve patient outcomes by developing and implementing innovative approaches to prevention, diagnosis, treatment, and management. By conducting translational research, TL4 will bridge the gap between scientific discoveries and clinical practice, ultimately leading to better patient care and health outcomes. Examples include cancer research in Surgical Care, Lung Diseases, and Digestive Health, as well as research in Maternal and Child Health, Personalised Medicine, and Critical Medicine, with the aim of identifying the most effective ways to improve patient care.

National and International Collaboration: actively collaborate with partners to address pressing issues in hospital care and clinical outcomes. Leveraging global expertise and resources, TL4 aims to tackle challenges such as sepsis prevention and treatment, critical care outcomes, and cancer research, including digestive health, surgical interventions, maternal and child health, prevention, and PM.

Specialised Research Areas: establish specialised research groups in key areas of hospital care, including critical care, emergency and perioperative medicine, surgical care, digestive health, lung diseases, maternal and child health, and personalised medicine.

Education and Training: contribute to clinical teaching master's and doctoral programmes, cultivating expertise in hospital care and research among students and trainees. We will also develop training programmes in various healthcare fields, such as cancer, emergency and critical care, anaesthesia, maternal and childcare, and palliative care. For example, TL4 is already collaborating with the University of Barcelona on a master's programme in Emergency Care for nurses and doctors, beginning at FMUP.

Community Impact: disseminate research findings and best practices to the community, including healthcare providers, policymakers, and the general public. By translating research into practical knowledge, TL4 aims to have a positive impact on healthcare delivery and outcomes at local, national, and global levels.

Overall, the TL4 presents a collaborative, multidisciplinary approach to advancing hospital care and clinical outcomes through innovative research, education, and cooperation.

tl5 Clinical Translation on Drug Targets and Innovative Biomedicines

Research Group	Name of group PI
Cell signalling, biomarkers and new drug targets	Patrício Soares da Silva
Mechanosensing, Cellular Interactions and Regenerative Therapies	Paulo Correia de Sá
Pharmaceutical and biotechnological drug innovation	Carla Freire Cruz
Translation research, drug safety and clinical pharmacology	Maria Augusta Vieira Coelho

The major goal of RISE-Health's Thematic Line 5 – Clinical Translation on Drug Targets and Innovative Biomedicines (TL5) is to identify and support multidisciplinary disease-oriented research projects leading to cutting-edge R&D programmes in drug discovery to booster pharmacological / pharmaceutical / biotechnological innovation, regenerative cell therapies, and personalised medicine. This TL aims to cooperate with the other six RISE-Health TLs. To this end, the TL5 relies on the collaboration of experts from a broad spectrum of Fundamental Biomedicine and Clinical Specialties, which is critical for the necessary translation of basic science discoveries into more effective therapeutic strategies and/or validation of new disease biomarkers. Such a strategy also aligns with the needs and expectations of national and international biotech and pharmaceutical companies to comply with major therapeutic challenges and healthcare burdens.

Coordinator: **Paulo Correia de Sá**

Four Research Groups (G1-G4) contribute to this TL (see above). Overall, the core skills include (i) high-precision biochemical/immunological/biopharmaceutical assays for drug screening and function optimisation, (ii) a complete panel of isolated cells- and tissue-based in vitro assays for drug testing, including advanced functional bioimaging, (iii) biopharmaceutical expertise in innovative drug delivery systems, (iv) pharmacological, toxicological and genetic animal models of Human diseases for in vivo pre-clinical testing, and (v) Clinical Pharmacology competences authorised to design and perform Human clinical trials.

The TL5 integrated members are very active at competitive fundraising; as PI's, they amassed more than 6 million EUR in the last 5 years, mostly due to contracts with national and international funding agencies, nonprofit organisations, and pharma and biotechnology companies. Research groups denote high laboratory intensity grounded on cutting-edge equipment spanning from molecular biology, advanced cell bioimaging, high throughput drug screening, and network facilities for chemical identification/quantification/development of novel druggable compounds. Research infrastructures also include cell/tissue culture resources, human and animal tissue biobanking, and small animal facilities (with continuous Veterinary assistance for pre-clinical studies).

The TL5's team members have major responsibilities in providing Biomedical Education and Training to more than 100 PhD students with ongoing theses, most of these supported by FCT and other funding agencies grants. TL5 members support outreach education programmes, namely the PhD Programme in Experimental and Clinical Pharmacology and Toxicology resulting from a joint venture among FMUP, FFUP and ICBAS. Besides this, the TL5 team members integrate the board of other PhD programmes, including Neurosciences FMUP/ICBAS, Biomedicine FMUP and UBI, Biomedical Sciences ICBAS, Clinical Medicine ICBAS, Pharmaceutical Sciences UBI, Biochemistry UBI, and Chemistry UBI.

tl6 Digital Transformation, AI, Data & Decision Sciences in Health

Research Group	Name of group PI
Data Science and Artificial Intelligence in Health	Pedro Pereira Rodrigues
Digital Health and Clinical Simulation	Alberto Freitas
Entrepreneurship for Innovative Health Solutions	Ricardo Correia
Evidence and Decision Sciences in Health	Luís Azevedo

The Thematic Line 6 – Digital Transformation, Artificial Intelligence, Data and Decision Sciences in Health (TL6) – focuses on the effectiveness, quality, sustainability, and digital transformation of healthcare. The core topics of the TL6 include methodological and applied research on digital health, health informatics, patient-centred technologies, clinical simulation, artificial intelligence, health data science, signal processing, biostatistics, clinical research methods, health services research, health decision sciences, evidence-based decision-making, evidence synthesis, health technology assessment and health economics.

The TL6 is organised into four intertwined and closely collaborating research groups, covering the fundamentals of our core topics: (1) Data Science and Artificial Intelligence in Health, (2) Digital Health and Clinical Simulation, (3) Entrepreneurship for Innovative Health Solutions, and (4) Evidence and Decision Sciences in Health.

Coordinator: **Luís Filipe Azevedo**

The TL6 is underpinned by FMUP's two major Doctoral Programmes: Health Data Sciences and Clinical and Health Services Research and two Master Programmes: Medical Informatics and Evidence and Decision Making in Health. The TL6 is also involved in the development and coordination of the new BSc degree in Digital Health and Biomedical Innovation at FMUP.

The TL6 aims to play a leading role in establishing strong methodological, technological, and quantitative foundations to support the design, collection, management, analysis, and application of data, information, and scientific knowledge as the cornerstone for evidence-based and person-centred decision-making, health policy, and technological innovation. Furthermore, this TL aims to have a leadership position in the digital transformation of health systems by conceptualising, developing, and adequately assessing digital technologies to transform healthcare. Additionally, The TL6 aims to consolidate and expand its leadership position in its core topics, focusing on the internationalisation of the students and research projects and participating in international networks and consortia. Finally, this line aims to develop relevant and innovative education and training initiatives and promote health literacy and knowledge transfer to all relevant stakeholders in the community.

The TL6 is aligned with FCT's Thematic Agenda for Clinical and Translational Health Research and Innovation and with the challenges identified by the National Health Plan for 2021-2030. Thus, it aims to contribute with knowledge, technology, and policies to strengthen our health system, accelerate its digital transformation, prevent health disparities, and promote the sustainability of healthcare.

tl7 Community Care & Prevention

Research Group	Name of group PI
Nutrition & Metabolism	Rita Negrão
Healthy Ageing	Oscar Ribeiro
Environment & Healthy Lifestyles	Nelson Barros
Preventive & Family Health Care	Carlos Martins
Primary Health Care	Paulo Santos
Self-Care & Adaptation to Illness	Carlos Sequeira
Bioethics	Guilhermina Rego

The Thematic Line 7 – Community Care & Prevention (TL7) aims to explore new pathways to favour people-centred health promotion and disease prevention, with a strong focus on community engagement on a global scale. Aligned with the UN's critical sustainable development goals that advocate healthy living at all ages (SDG 3) and better nutrition for all (SDG 2) this thematic line is organised into 7 research groups that carry out fundamental, clinical and translational research aiming to:

- Identify critical food determinants of chronic diseases with a special focus on how dietary choices impact fetal programming of metabolic dysfunction
- Screen environmental determinants of human health, exploring different environmental contexts such as work, public buildings, public water supplies and personal lifestyle choices
- Provide critical data on healthy ageing, paying particular attention to special

Coordinator: **Elisa Keating**

population subgroups up to 100 years and over, divided in shorter age intervals, with diverse gender orientation or with highly care-demanding chronic diseases
- Promote health literacy strategies and the use of digital tools to impact service organisation and fundamental health principles
- Design, implement and assess the tools that facilitate a person-centred approach of Family Medicine from prevention to treatment
- Empower self-care and illness adaptation, namely through the validation of intervention programmes and exploration of cost-effective and sustainable alternatives
- Define ethical priorities in the health sector for emergent fields such as artificial intelligence, while keeping with the principles of academic integrity.

The TL7 bridges the gap with the other TLs offering the proximity to the community. The TL7 will be central for a successful articulation of the fundamental knowledge acquired by other TLs (e.g., heart, brain or hormonal and metabolic diseases, new targets and drugs) with community projects. Furthermore, by bringing to light specific health concerns identified in the community, it will be a starting point for new hypotheses to be explored by other TLs. This TL benefits from strong partnerships, also fitting in with Sustainable Development Goal 17, namely through:

a. Collaboration with several university hospitals and international academic institutions
b. The support of management centres of RISE-Health, covering a great portion of the Portuguese territory, including Porto, Aveiro, Santarém, the regions of Trás-os-Montes e Alto Douro and Beira Interior, and Madeira. These partnerships guarantee multidisciplinary specialisation and access to a variety of laboratory and clinical facilities.

In the academic field, the TL7 runs and/or collaborates with several post-graduation programmes, including but not limited to PhD Programmes in Clinical Nutrition, Nutrition Sciences, Ecology and Environmental Health, Primary Health Care, Pharmaceutical Sciences, Gerontology and Geriatrics, and Master's Programmes in Nursing and Mental and Psychiatric Health, Dental Medicine and Applied Gerontology.

RISE-Health Management Institutions

1. Escola Superior de Enfermagem do Porto - ESEP
2. Escola Superior de Saúde de Santa Maria - ESSSM
3. Escola Superior de Saúde de Santarém - Instituto Politécnico de Santarém - ESS-IPSantarém
4. Escola Superior de Saúde do Politécnico do Porto - E2S | P.PORTO
5. Faculdade de Ciência da Universidade do Porto - FCUP
6. Faculdade de Ciências da Nutrição e da Alimentação da Universidade do Porto - FCNAUP
7. Faculdade de Farmácia da Universidade do Porto - FFUP
8. Faculdade de Medicina da Universidade do Porto
9. Faculdade de Medicina Dentária da Universidade do Porto - FMDUP
10. Fundação Ensino e Cultura Fernando Pessoa - FFP
11. Instituto de Ciências Biomédicas de Abel Salazar da Universidade do Porto - ICBAS-UP
12. Universidade da Beira Interior - UBI
13. Universidade da Madeira - UMa
14. Universidade de Trás-os-Montes e Alto Douro - UTAD
15. Universidade do Algarve - UAlgarve
16. Universidade Portucalense Infante D. Henrique - UPT
17. Unversidade de Aveiro - UAveiro

1. Nursing School of Porto - ESEP
2. School of Health of Santa Maria - ESSSM
3. Santarém School of Health - Polytechnic Institute of Santarém - ESS-IPSantarém
4. School of Health of the Polytechnic of Porto - E2S | P.PORTO
5. Faculty of Science of the University of Porto - FCUP
6. Faculty of Nutrition and Food Sciences of the University of Porto - FCNAUP
7. Faculty of Pharmacy of the University of Porto - FFUP
8. Faculty of Medicine of the University of Porto
9. Faculty of Dental Medicine of the University of Porto - FMDUP
10. Fernando Pessoa Teaching and Culture Foundation - FFP
11. School of Medicine and Biomedical Sciences of the University of Porto - ICBAS-UP
12. University of Beira Interior - UBI
13. University of Madeira - UMa
14. University of Trás-os-Montes and Alto Douro - UTAD
15. University of the Algarve - UAlgarve
16. Universidade Portucalense Infante D. Henrique - UPT
17. University of Aveiro - UAveiro

Abbreviations & Acronyms

BSc – Bachelor of Science
CICS-UBI - Health Sciences Research Centre of the University of Beira Interior
CINTESIS – Centre for Health Technology and Services Research
CV – Curriculum Vitae
FCT – Foundation for Science and Technology
FMUP – Faculty of Medicine of the University of Porto
ICBAS – School of Medicine and Biomedical Sciences
MedInUP – Center for Drug Discovery and Innovative Medicines
MSc – Master in Science
PhD – Doctor of Philosophy
R&D – Research and Development
TL – Thematic Line
UnIC – Cardiovascular Research Unit
WoS – Web of Science

Notes

Notes

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