



# NOVA SCIENCE

**NOVA**  
UNIVERSIDADE NOVA  
DE LISBOA

2020

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**NOVA**  
SCIENCE

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NOVA Science

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# 1 WELCOME TO NOVA



Delivering high-quality education together with top-notch research, NOVA ensures the preference of employers and the success of graduates in the job market to tackle the major societal challenges.

NOVA University Lisbon has Academic Units in Lisbon, Almada, Oeiras and in Carcavelos:

- NOVA School of Science and Technology
- NOVA School of Social Sciences and Humanities
- NOVA School of Business and Economics
- NOVA Medical School
- NOVA School of Law
- NOVA Institute of Hygiene and Tropical Medicine
- NOVA Information Management School
- NOVA Institute of Chemical and Biological Technology António Xavier
- NOVA National School of Public Health
- Rectorate

NOVA University Lisbon (NOVA) is a public higher education institution. Its mission is to serve society at local, regional and global level, by advancing and disseminating knowledge, and by fostering the understanding among cultures, societies and people.

Located in Lisbon, NOVA is a young, comprehensive, and European university. It develops activities across a broad range of areas from engineering and technology to humanities, from medicine, health and life sciences to economics and management, and from social sciences and law to information and data science.

NOVA is a global and civic University. **Global** since its teaching and research follow an international agenda with a quality well recognized by its partners overseas; and **civic**, because it is committed to the development of society, culture and economy of the Lisbon metropolitan area, of the country, of Europe and also of the Portuguese-speaking countries, reinforcing centuries of common history.

Delivering high quality training at all levels of education that ensures the preference of employers and the success of graduates in the job market is a key priority for NOVA, together with the development of top-notch research contributing to tackle major societal challenges, in line with the United Nations Sustainable Development Goals and the European Green Deal.

The recognition of its quality, both in teaching and research, ensured by international accreditations and high positions in prestigious rankings in all areas of knowledge among young European Universities, guarantees the participation in important international academic networks.

With 9 academic units, more than 21,000 students and 2,500 teaching staff and researchers, and over 3,400 international students from 110 nationalities enrolled in its programmes, NOVA stands out for its comprehensive nature, internationalization culture in teaching, research and in its commitment to the major challenges of society. ■■



# 2

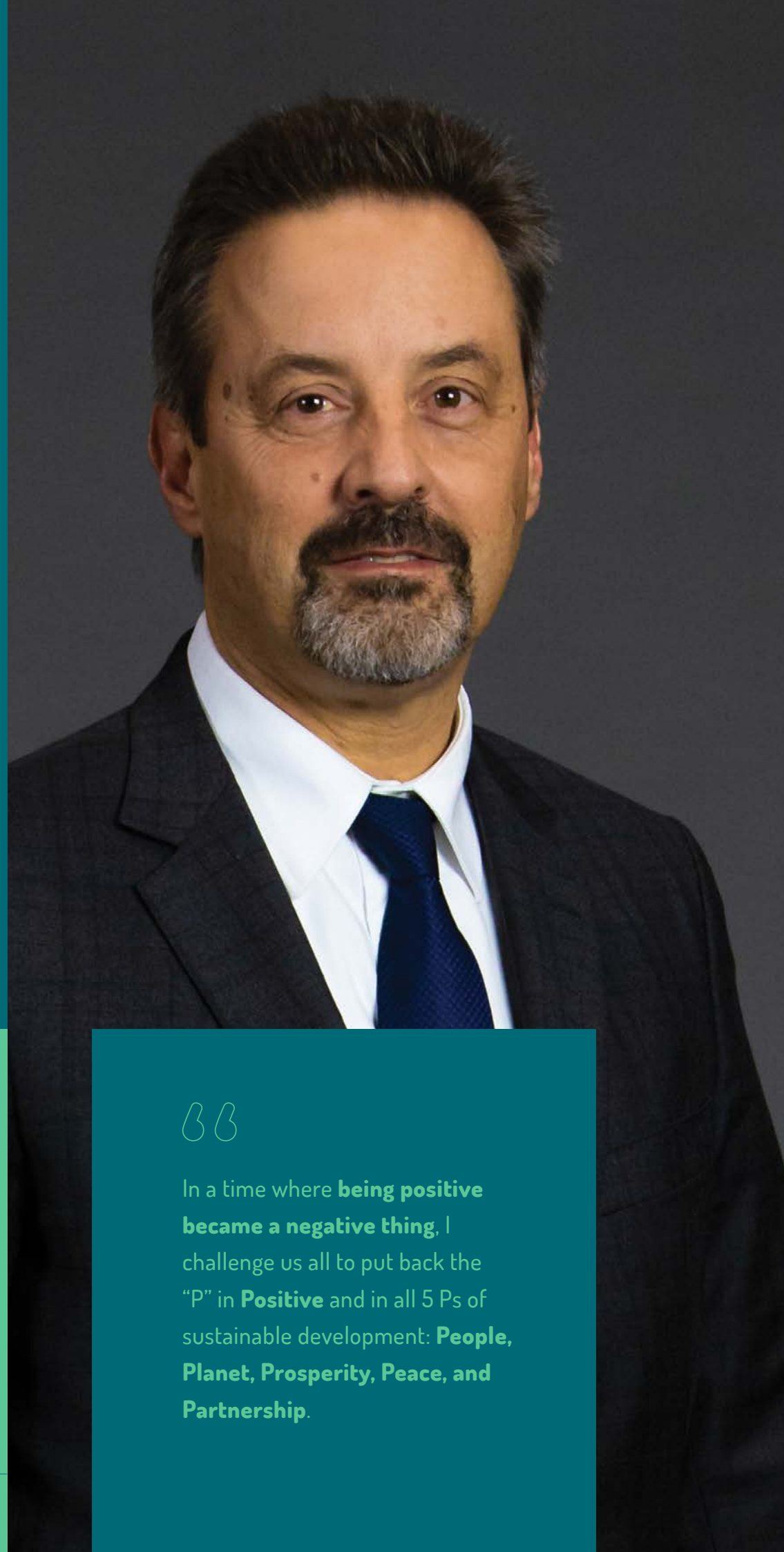
## A WORD FROM THE RECTOR

JOÃO  
SÀÁGUA

NOVA UNIVERSITY LISBON



In a time where **being positive became a negative thing**, I challenge us all to put back the “P” in **Positive** and in all 5 Ps of sustainable development: **People, Planet, Prosperity, Peace, and Partnership**.



## 2

### THE MANY FACES OF SUSTAINABILITY

**Sustainability is the main challenge in the 21st century.** It focuses on our current projects as a global civilization and on meeting the needs of the present without compromising the ability of future generations to develop their own projects and meet their needs.

There are **three interlocked concerns** that represent the centerpiece of sustainability: with climate, with inequality, with territory.

**Climate change** is a main concern of our time because **we only have one planet** and only through a more responsible and sustainable approach to life, we will be able to prevent a global disaster. From shifting weather patterns that threaten food security, to rising sea levels that lead to flooding, climate change is already having a dramatic effect on natural environments, plants and animals, and may soon lead to biodiversity loss and affect many sectors that depend on natural resources.

**Social concern** with **inequality** poses a significant threat to human societies, each one *per se*, and to the overall globalized society that is in the making. Different access to opportunities at large, to education, to healthcare, to decent jobs, to culture, to verifiable information, and to many other essential things upon which we build our personal and collective projects, may risk to ‘implode’ or ‘explode’ the social fabric. Health is a good example: pollution, increased mortality and morbidity, changes in the seasonal distribution and impact of viruses and other diseases, affect disproportionately the most vulnerable populations.

**Territorial concern** touches several areas: the increasing vulnerability to heat waves, flooding and droughts, demographic ‘desertification’ vs. huge concentration, and many other issues, require urgent action in terms of **investing in urban planning and green infrastructure, and promoting more territorial cohesion**.

In that sense, the United Nations Member States have adopted the **Sustainable Development Goals** as a universal call to action to ensure that all people enjoy peace and prosperity by 2030. At the regional level, the European Commission outlined the **European Green Deal**, which includes a series of initiatives that will protect the environment and boost the green economy, and announced **NextGenerationEU** as the main instrument for implementing the recovery package in response to the socio-economic consequences of the pandemic. At national level, the Portuguese government has endorsed

the **Strategic Vision for the 2020-2030 Economic Recovery Plan of Portugal**, which is very much aligned with Europe’s new growth strategy.

However, today’s development agendas call for a new collaborative paradigm based on the concept of **“full global partnership”**, which requires the mobilization and engagement of several actors, guided by missions focused on achieving the SDG.

Universities, as sources of knowledge creation and dissemination, cannot be alienated from this process, on the contrary, **they are critical partners for governments and communities in general**, in addressing the many faces of sustainability challenges.

**Science, combined with technology and innovation**, provides the necessary knowledge to address global challenges in an effective way and the **fact-based evidence that is crucial to create social awareness for sustainability** and to fight the proliferation of **fake news**, which are endangering the democratic values of modern societies.

Having said that, NOVA is **strongly committed** with the UN Agenda for Sustainability, with Europe’s mission to become Green, Digital and more Resilient, and with our Government’s Strategic Vision for the Economic Recovery of Portugal. Our ambition is to become, at national level, **the leading university in interdisciplinary research with high social impact** and, at European level, among the frontrunners in the commitment to Sustainable Development and to the Green Deal.

By fostering interinstitutional collaborations, at national and international level, in critical areas such as Sustainable and Inclusive Cities, Green Mobility and Energy, Water Efficiency, Blue Economy, Agriculture and Food Security, Cultural Heritage, and Tourism, NOVA will be reaffirming **its role as a civic, global, and research-oriented university**.

In a time where **being positive became a negative thing**, I challenge us all to put back the “P” in **Positive** and in all 5 Ps of sustainable development: **People, Planet, Prosperity, Peace, and Partnership**.

From our end, we will keep pursuing **our mission to serve society**, locally and globally, through quality education, cutting-edge research and partnerships with Society for a more **equal, sustainable and greener world**.

■ ■ João Sàágua



# 3

## MESSAGE FROM THE VICE- RECTOR FOR RESEARCH

ELVIRA  
FORTUNATO  
NOVA UNIVERSITY LISBON

“

This year's edition was dedicated to **Sustainability** and NOVA is proud of making a path oriented towards this direction throughout the years

Tiago Miranda - Jornal Expresso

## 3

### A STRONGER NOVA UNIVERSITY AFTER THE PANDEMIC!

This year's edition was dedicated to **Sustainability** and NOVA is proud of making a path oriented towards this direction throughout the years and whose results are evidenced and shared in this third edition.

Given the great involvement of all NOVA schools in sustainability and that this topic is transversal to all scientific areas, we present in this issue the testimonies of the 9 NOVA schools covering aspects ranging from sociology to climate change. The importance of the subject is highlighted by the special contribution of Dr. António Ferrari, who is the Communication Advisor for Portugal in the United Nations Regional Information Centre for Western Europe.

In each edition, the NOVA Science magazine has always given prominence to relevant topics for the university in relation to its research, and this year we highlight the 15 infrastructure networks funded by FCT I.P., under the National Roadmap of Research Infrastructures of Strategic Interest, in various scientific and technological areas with a global funding of 29.3M €. These scientific and research infrastructures are understood as platforms, resources and associated services that the scientific communities use to carry on research and develop activities in specific scientific subjects in all fields of knowledge.

The Strategic Research Council was created early this year. It is chaired by the Vice-Rector for Research, who presides it, and by representatives from all Academic Units of NOVA, recognised by their competence in the related area of scientific and technological research. The Strategic Research Council is a consultative body of the Rector and aims to promote research in interdisciplinary areas and provide ideal conditions for collaborative research with more impact, aligned with the European Agenda for Knowledge and Innovation as well as with the UN 2030 Agenda for Sustainable Development. This council also aims to share experiences and procedures, aggregate competences in the various schools and, above all, always give a voice to scientific research.

Due to the growing involvement in more projects and more transversal activities across the whole university, the NOVA Research Office was redesigned this year, to respond in a more dynamic and comprehensive way to the new challenges ahead, besides continuing to stimulate and challenge the scientific community of NOVA and to promote more and more synergies among the different schools.

Once again, we had the Santander-NOVA award, this year in the Social Sciences and Humanities area, in which two projects were awarded in ex aequo. We congratulated the awardees of this 13th edition (Nuno Boavida and Maria Micaela Fonseca) as well as greeted Santander for believing in this project since the beginning. I would like to take this opportunity to remember Dr. António Vieira Monteiro, who has given us all the support and care for this particular award, over the years.

The internationalisation and the “NOVA 4 the Globe” platform presented by the Vice-Rector for Internationalisation, João Amaro de Matos, go in line with NOVA strategic plan and highlights the work carried out at NOVA that is related to the Sustainable Development Goals. NOVA's performance in the world rankings was also shown along with brief explanations of the methodologies used by the various rankings.

The coronavirus pandemic stroked the world carrying the human tragedy, the multiple lockdowns and the economic backlash, but NOVA reacted internally in all its pillars. The Vice-Rector for Health, José Fragata, presented some of NOVA's initiatives during COVID-19 and the perspective from the UNIVERSITY side. In short, NOVA's initiatives were done at six major levels:

- Diagnosis of the disease
- Devices
- Social impacts
- Social and scientific responsibility
- Communication
- Scientific projects and collaborations

NOVA **responded and still responds** very actively to the various calls and is involved in multiple COVID-19-related projects. In this edition, we give a brief overview of 30 projects that NOVA's researchers are coordinating or participating concerning COVID-19 relief or mitigation efforts.

Dear colleagues, dear all, one thing is very clear, we want to have, and we will have for sure, a much better and strong NOVA UNIVERSITY after the PANDEMIC.

As it was mentioned by António Guterres: “This is time for science and solidarity”.

■ ■ Elvira Fortunato



# 4

## RESEARCH



CREATION OF THE STRATEGIC RESEARCH COUNCIL IN 2020 - ORDER N°4575/2020 (ONLY IN PT)

### 4 RESEARCH AT A GLANCE

Research is a strategic priority at NOVA that aims to tackle societal challenges by combining fundamental research with collaborative agendas. The impact of NOVA's published research is ranked as the highest among Portuguese institutions by the Leiden ranking. Through a gendered lens, NOVA has the highest proportion of publications by female authors (50.6%) nationally, is the sixth in Europe and the ninth worldwide. NOVA's commitment towards Gender Equality is expressed in its Strategic Plan for 2020-2030 and places NOVA in line with the UN Sustainable Development Goal 5. This commitment has also been translated in NOVA's participation in the European project SPEAR to support the implementation of Gender Equality Plans in Academia and Research.

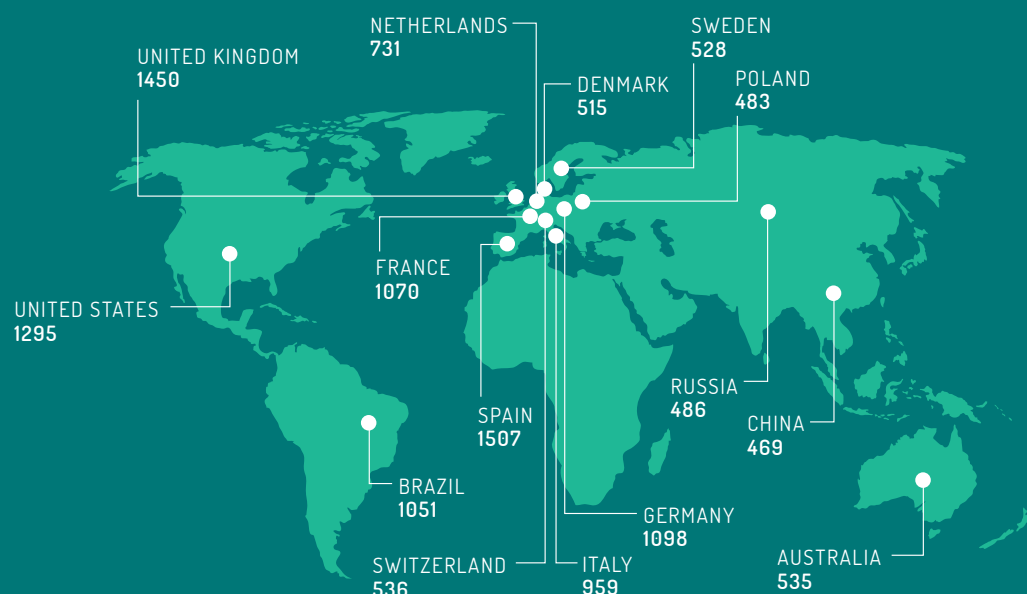
Research at NOVA has been thriving both qualitatively and quantitatively: not only NOVA currently hosts 39 R&D Units, 23 of which represent partnerships with other national institutions, but also 92% were considered units of excellence, placing NOVA in the top 3 of national universities with international recognition.

Aligned with national Science and Technology policies prioritising the technological and scientific system growth and consolidation, NOVA strives to attract significant resources from different funding mechanisms to be more competitive on a national and international levels. In one hand, NOVA has integrated around 500 highly qualified and internationally competitive researchers in its R&D Units based on national funding. And on the other hand, the European Horizon 2020 framework has been the top funding source, which ranks NOVA as the second Portuguese university in terms of absolute funding volume, but the first in terms of funds per capita. In 2020, NOVA was the first Portuguese university distinguished with an ERC Synergy grant in the field of humanities, which reflects the work of excellence that NOVA has been developing and reinforces the importance of its strategic pillars.

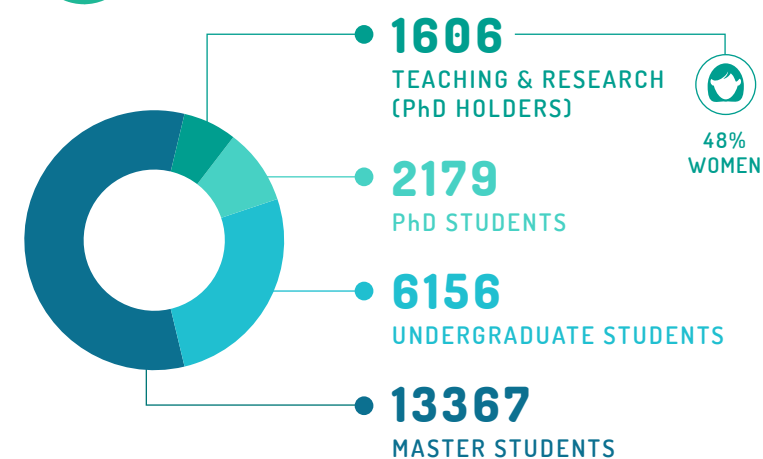
Finally, NOVA has been investing in the TALENT@NOVA training programme to increase the academic performance and competitiveness of its researchers at national and international levels and has been strengthening the scientific visibility of NOVA's community with national and international partners. These initiatives promote collaboration and provide the necessary tools to NOVA's R&D Units to explore existing synergies and associate them with the SDG, a determining element of research strategies for the future. ■■■

### NUMBER OF COLLABORATIONS PER COUNTRY

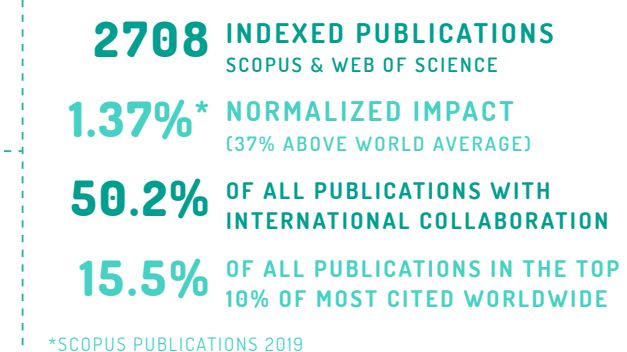
SOURCE: SciVal 2020



### STAFF 2020



### PUBLICATIONS 2020



### 9 CoLAB COLLABORATIVE LABORATORIES SINCE 2018

28,5M €



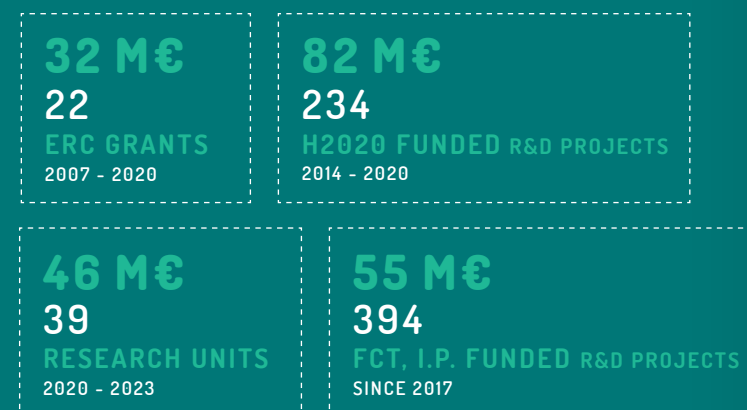
### 15 RESEARCH INFRASTRUCTURES

29.3M €

NOVA 6.4M €



### FUNDING



### RESEARCH HIGHLIGHTS



22 European Research Council (ERC) Grants, one of which is the **FIRST SYNERGY GRANT in Portugal** in the scientific domain of Social Sciences and Humanities.



92% of NOVA's Research Units evaluated by the Portuguese Foundation for Science and Technology (FCT, I.P.) with "Exceptional", "Excellent" and "Very Good".



NOVA is in the **TOP 3** of the Portuguese Universities with the best performance at H2020 Framework Programme

### COVID-19 360 by NOVA

NOVA had a great contribution in Research related to pandemic COVID-19 resulting in **45 initiatives** and **30 scientific projects** awarded.



NOVA renews protocol with Santander Universidades and guarantees the continuation of the **Research Collaborative Award**. Is currently in its 14th annual edition.



NOVA wins national call from FCT, I.P. that allows our research community to create **Digital Object Identifiers (DOIs)** with a sponsored subscription of Datacite.



NOVA integrates **15** National Research Infrastructures, of which **5** are coordinated by NOVA.

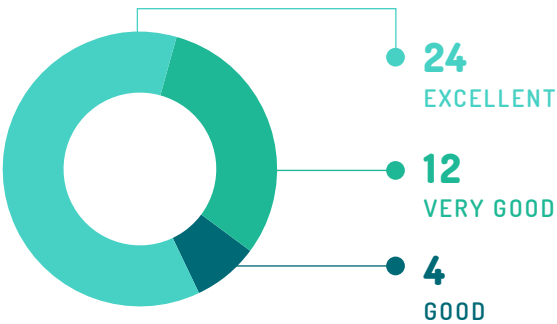
# RESEARCH UNITS

RESULTS OBTAINED FROM THE EVALUATION EXERCISE PERFORMED BY THE PORTUGUESE FOUNDATION FOR SCIENCE AND TECHNOLOGY (2017-2018)

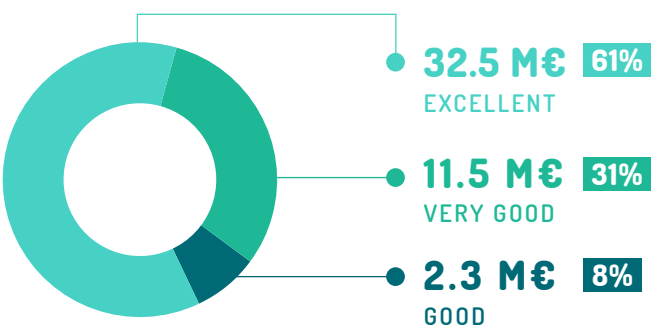
## 40 R&D UNITS



### EVALUATION



### FUNDING



## NOVA SCHOOL OF SCIENCE AND TECHNOLOGY | FCT NOVA

**CEFAGE** | NAME Center for Advanced Studies in Management and Economics  
**COORDINATOR** Joaquim Pina  
**WEBSITE** [www.cefage.uevora.pt](http://www.cefage.uevora.pt)  
**EVALUATION** Good

**CEFITEC** | NAME Centre of Physics and Technological Research  
**COORDINATOR** Orlando Teodoro  
**WEBSITE** [www.cefitec.fct.unl.pt](http://www.cefitec.fct.unl.pt)  
**EVALUATION** Good

**CENSE** | NAME Center for Environmental and Sustainability Research  
**COORDINATOR** Rui Ferreira dos Santos  
**WEBSITE** [www.cense.fct.unl.pt](http://www.cense.fct.unl.pt)  
**EVALUATION** Excellent

**CIUHCT** | NAME Interuniversity Center for the History of Science and Technology  
**COORDINATOR** Isabel Amaral  
**WEBSITE** [ciuhct.org](http://ciuhct.org)  
**EVALUATION** Excellent

**CTS** | NAME Centre of Technology and Systems  
**COORDINATOR** Luís Camarinha de Matos  
**WEBSITE** [cts.uninova.pt](http://cts.uninova.pt)  
**EVALUATION** Excellent

**GeoBioTec** | NAME GeoBioSciences, GeoTechnologies and GeoEngineering  
**COORDINATOR** Fernando Lidon  
**WEBSITE** [sites.fct.unl.pt/geobiotec](http://sites.fct.unl.pt/geobiotec)  
**EVALUATION** Very Good

**CENIMAT I i3N** | NAME Institute of Nanostructures, Nanomodelling and Nanofabrication  
**COORDINATOR** Elvira Fortunato  
**WEBSITE** [www.cenimat.fct.unl.pt](http://www.cenimat.fct.unl.pt) | [www.i3n.org](http://www.i3n.org)  
**EVALUATION** Excellent

**LAQV** | NAME Associated Laboratory for Green Chemistry - Clean Technologies and Processes  
**COORDINATOR** João Paulo Crespo  
**WEBSITE** [laqv.requimte.pt](http://laqv.requimte.pt)  
**EVALUATION** Excellent

**CMA** | NAME Center for Mathematics and Applications  
**COORDINATOR** António Malheiro  
**WEBSITE** [www.cma.fct.unl.pt](http://www.cma.fct.unl.pt)  
**EVALUATION** Very Good

**MARE** | NAME Marine and Environmental Sciences Centre  
**COORDINATOR** Maria Graça Martinho  
**WEBSITE** [www.mare-centre.pt](http://www.mare-centre.pt)  
**EVALUATION** Excellent

**METRICS** | NAME Mechanical Engineering and Resource Sustainability Center  
**COORDINATOR** Ana Luísa Fernando  
**WEBSITE** [www.metrics.com.pt](http://www.metrics.com.pt)  
**EVALUATION** Very Good

**NOVA LINCS** | NAME NOVA Laboratory for Computer Science and Informatics  
**COORDINATOR** Luís Caires  
**WEBSITE** [nova-lincs.di.fct.unl.pt](http://nova-lincs.di.fct.unl.pt)  
**EVALUATION** Excellent

**LIBPhys** | NAME Laboratory for Instrumentation, Biomedical Engineering and Radiation Physics  
**COORDINATOR** José Paulo Santos  
**WEBSITE** [www.libphys.fct.unl.pt](http://www.libphys.fct.unl.pt)  
**EVALUATION** Very Good

**UCIBIO** | NAME Applied Molecular Biosciences Unit  
**COORDINATOR** Maria João Romão  
**WEBSITE** [www.requimte.pt/ucibio](http://www.requimte.pt/ucibio)  
**EVALUATION** Excellent

**UNIDEMI** | NAME Research & Development Unit in Mechanical and Industrial Engineering  
**COORDINATOR** António Grilo  
**WEBSITE** [www.unidemi.com](http://www.unidemi.com)  
**EVALUATION** Excellent

**VICARTE** | NAME Glass and Ceramic for the Arts  
**COORDINATOR** Márcia Vilarigues  
**WEBSITE** [vicarte.org](http://vicarte.org)  
**EVALUATION** Excellent

## NOVA SCHOOL OF SOCIAL SCIENCES AND HUMANITIES | NOVA FC SH

**CESEM** | NAME Research Centre for the Sociology and Aesthetics of Music  
**COORDINATOR** Manuel Pedro Ferreira  
**WEBSITE** [cesem.fcsh.unl.pt](http://cesem.fcsh.unl.pt)  
**EVALUATION** Excellent

**CETAPS** | NAME Centre for English, Translation and Anglo-Portuguese Studies  
**COORDINATOR** Carlos Ceia  
**WEBSITE** [www.cetaps.com](http://www.cetaps.com)  
**EVALUATION** Excellent

**CHAM** | NAME Centre for the Humanities  
**COORDINATOR** Cristina Brito  
**WEBSITE** [www.cham.fcsh.unl.pt](http://www.cham.fcsh.unl.pt)  
**EVALUATION** Very Good

**CICS.NOVA** | NAME Interdisciplinary Centre of Social Sciences  
**COORDINATOR** Helena Serra  
**WEBSITE** [www.cics.nova.fcsh.unl.pt](http://www.cics.nova.fcsh.unl.pt)  
**EVALUATION** Good

**CLUNL** | NAME Linguistics Research Centre of the UNL  
**COORDINATOR** Rute Costa  
**WEBSITE** [clunl.fcsh.unl.pt](http://clunl.fcsh.unl.pt)  
**EVALUATION** Very Good

**CRIA** | NAME Centre for Research in Anthropology  
**COORDINATOR** José Mapril  
**WEBSITE** [cria.org.pt](http://cria.org.pt)  
**EVALUATION** Very Good

**ICNOVA** | NAME NOVA Communication Institute  
**COORDINATOR** Cristina Ponte  
**WEBSITE** [www.icnova.fcsh.unl.pt](http://www.icnova.fcsh.unl.pt)  
**EVALUATION** Excellent

**IELT** | NAME Institute for Studies of Literature and Tradition  
**COORDINATOR** Teresa Araújo  
**WEBSITE** [ielt.fcsh.unl.pt](http://ielt.fcsh.unl.pt)  
**EVALUATION** Very Good

**IEM** | NAME Institute of Medieval Studies  
**COORDINATOR** Maria João Branco  
**WEBSITE** [iem.fcsh.unl.pt](http://iem.fcsh.unl.pt)  
**EVALUATION** Excellent

**IFILNOVA** | NAME NOVA Institute of Philosophy  
**COORDINATOR** João Constâncio  
**WEBSITE** [www.ifilnova.pt](http://www.ifilnova.pt)  
**EVALUATION** Excellent

<b>IHA</b>	<b>NAME</b> Institute of Art History <b>COORDINATOR</b> Joana Cunha Leal <b>WEBSITE</b> <a href="http://institutodehistoriadaarte.wordpress.com">institutodehistoriadaarte.wordpress.com</a> <b>EVALUATION</b> Excellent	<b>INET-md</b>	<b>NAME</b> Ethnomusicology Institute - Center for Studies in Music and Dance <b>COORDINATOR</b> João Soeiro de Carvalho <b>WEBSITE</b> <a href="http://www.inetmd.pt">www.inetmd.pt</a> <b>EVALUATION</b> Excellent
<b>IHC</b>	<b>NAME</b> Institut of Contemporary History <b>COORDINATOR</b> José Neves <b>WEBSITE</b> <a href="http://ihc.fcsh.unl.pt">ihc.fcsh.unl.pt</a> <b>EVALUATION</b> Very Good	<b>IPRI</b>	<b>NAME</b> Portuguese Institute of International Relations - NOVA University Lisbon <b>COORDINATOR</b> Nuno Severiano Teixeira <b>WEBSITE</b> <a href="http://ipri.pt">ipri.pt</a> <b>EVALUATION</b> Excellent

## NOVA SCHOOL OF BUSINESS AND ECONOMICS | NOVA SBE

<b>NOVA SBE</b>	<b>NAME</b> Nova School of Business and Economics <b>COORDINATOR</b> Pedro Vicente <b>WEBSITE</b> <a href="http://www2.novasbe.unl.pt/en/faculty-research/research/research-unit">www2.novasbe.unl.pt/en/faculty-research/research/research-unit</a> <b>EVALUATION</b> Excellent
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## NOVA MEDICAL SCHOOL | NMS

<b>CINTESIS</b>	<b>NAME</b> Center for Health Technology and Services Research <b>COORDINATOR</b> Conceição Calhau <b>WEBSITE</b> <a href="http://cintesis.eu">cintesis.eu</a> <b>EVALUATION</b> Very Good
<b>CHRC</b> In collaboration with ENSP	<b>NAME</b> Comprehensive Health Research Centre - Research, Education and Innovation in Clinical Research and Public Health <b>COORDINATOR</b> Helena Canhão <b>WEBSITE</b> <a href="http://www.nms.unl.pt/main/index.php?option=com_content&amp;view=article&amp;id=2376:comprehensive-health-research-centre-chrc&amp;catid=2:uncategorised&amp;Itemid=500&amp;lang=pt">http://www.nms.unl.pt/main/index.php?option=com_content&amp;view=article&amp;id=2376:comprehensive-health-research-centre-chrc&amp;catid=2:uncategorised&amp;Itemid=500&amp;lang=pt</a> <b>EVALUATION</b> Excellent
<b>iNOVA4Health</b> In collaboration with ITQB	<b>NAME</b> Programme in Translational Medicine <b>COORDINATOR</b> Manuel Carrondo <b>WEBSITE</b> <a href="http://www.inova4health.com">www.inova4health.com</a> <b>EVALUATION</b> Excellent
<b>ToxOmics</b>	<b>NAME</b> Centre for Toxicogenomics and Human Health <b>COORDINATOR</b> José Rueff <b>WEBSITE</b> <a href="http://cigmh.fcm.unl.pt">cigmh.fcm.unl.pt</a> <b>EVALUATION</b> Good

## NOVA SCHOOL OF LAW

<b>CEDIS</b>	<b>NAME</b> Research Center on Law and Society <b>COORDINATOR</b> Armando Marques <b>WEBSITE</b> <a href="http://cedis.fd.unl.pt">cedis.fd.unl.pt</a> <b>EVALUATION</b> Very Good
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## NOVA INSTITUTE OF HYGIENE AND TOPICAL MEDICINE | IHMT-NOVA

<b>GHTM</b>	<b>NAME</b> Global Health and Tropical Medicine <b>COORDINATOR</b> Miguel Viveiros <b>WEBSITE</b> <a href="http://ghm.iht.unl.pt">ghm.iht.unl.pt</a> <b>EVALUATION</b> Excellent
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## NOVA INFORMATION MANAGEMENT SCHOOL | NOVA IMS

<b>Magic</b>	<b>NAME</b> Information Management Research Center <b>COORDINATOR</b> Tiago Oliveira <b>WEBSITE</b> <a href="http://www.novaims.unl.pt/magic">www.novaims.unl.pt/magic</a> <b>EVALUATION</b> Very Good
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## NOVA INSTITUTE OF CHEMICAL AND BIOLOGICAL TECHNOLOGY ANTÓNIO XAVIER | ITQB NOVA

<b>GREEN-IT</b>	<b>NAME</b> Bioresources 4 Sustainability Unit <b>COORDINATOR</b> Margarida Oliveira <b>WEBSITE</b> <a href="http://www.itqb.unl.pt/green-it">www.itqb.unl.pt/green-it</a> <b>EVALUATION</b> Excellent	<b>MOSTMICRO</b>	<b>NAME</b> Molecular, Structural and Cellular Microbiology Unit <b>COORDINATOR</b> Cláudio Soares <b>WEBSITE</b> <a href="http://www.itqb.unl.pt/mostmicro">www.itqb.unl.pt/mostmicro</a> <b>EVALUATION</b> Excellent
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## NOVA NATIONAL SCHOOL OF PUBLIC HEALTH | ENSP-NOVA

<b>CHRC</b> In collaboration with NMS	<b>NAME</b> Comprehensive Health Research Centre - Research, Education and Innovation in Clinical Research and Public Health <b>COORDINATOR</b> Helena Canhão <b>WEBSITE</b> <a href="http://www.nms.unl.pt/main/index.php?option=com_content&amp;view=article&amp;id=2376:comprehensive-health-research-centre-chrc&amp;catid=2:uncategorised&amp;Itemid=500&amp;lang=pt">http://www.nms.unl.pt/main/index.php?option=com_content&amp;view=article&amp;id=2376:comprehensive-health-research-centre-chrc&amp;catid=2:uncategorised&amp;Itemid=500&amp;lang=pt</a> <b>EVALUATION</b> Excellent
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# 5

## SUSTAINABILITY AT NOVA





## JÚLIA SEIXAS FCT NOVA

### HOW CAN UNIVERSITIES SUPPORT THE UNITED NATIONS' SUSTAINABILITY AGENDA AND THE EUROPEAN COMMISSION'S GREEN DEAL?

Universities are crucial to the achievement of the UN Sustainability Agenda and the EU Green deal as well, for three main reasons. Both agendas require a systemic approach, which is very demanding in knowledge and competences, and in technological and social innovation to deliver welfare for all. Universities are corner stones on research, development and innovation in all the thematic areas included in those agendas and then are able to contribute with effective solutions to achieve the targets. The successful implementation of processes and solutions towards those agendas requires the joint commitment of key stakeholders from science, business, public policies makers and non-governmental organizations. Universities have a culture of sharing and commitment towards public common goals, and then are very well positioned to motivate and push the relevant stakeholders into that process. Last but not the least, universities are the golden field of youth education and then have the responsibility to contribute to the personal development of citizens committed with those agendas, as they will be engaged to put them in practice.

### IN WHAT WAY DOES YOUR SPECIFIC RESEARCH AREA CONTRIBUTE TO THOSE AGENDAS?

The Energy and Climate Change research area is crucial, at least for two sustainable development goals - SDG 7 on affordable and clean and 13 on climate action - and for the European ambition to achieve carbon neutrality in the EU economy by 2050. These targets require a long-term vision on technology development and deployment, on energy demand, on collective and individual choices, and on economic and social costs and benefits. Integrated modelling tools together with stakeholders' engagement are pillars to find the adequate social and cost-effective options towards carbon neutral and climate resilient energy system.



Research and innovation in energy and climate change is at the core of economic systems transformation towards a clean and just future for all.

## NUNO SEVERIANO TEIXEIRA NOVA FCSH

### HOW CAN UNIVERSITIES SUPPORT THE UNITED NATIONS' SUSTAINABILITY AGENDA AND THE EUROPEAN COMMISSION'S GREEN DEAL?

As education, research and innovation are essential to respond to the planetary ecological crisis of the Anthropocene, Universities have a key role to play in supporting both the achievement of the UN's Sustainable Development Goals (SDGs) and the advancement of the European Green Deal agenda. Universities should offer their students a comprehensive understanding of the interrelated socioecological challenges facing the global community and the planet today - in other words, of the inherent intertwinement between societies and the Earth system, or how every manifestation of our economic, social and political lives is necessarily entangled with nature. Rejecting strictly technical and managerial approaches to the ecological crisis, Universities should stimulate students to question the beliefs, norms and values that rule everyday life, and to think and relate to the world differently. Additionally, it is critical that Universities build, strengthen and institutionalize sustainable partnerships with communities and governments to achieve societal impact. Leading by example is also absolutely essential - consequently, in addition to teaching and research, socioecological considerations should be integrated into university management as well. Sustainable campus management can include measures to promote the consumption of plant-based foods; sustainable mobility within the university community and around the campus in collaboration with city councils; waste reduction; energy saving or resource efficiency.

### IN WHAT WAY DOES YOUR SPECIFIC RESEARCH AREA CONTRIBUTE TO THOSE AGENDAS?

At the Portuguese Institute of International Relations (IPRI), a diversified group of researchers working in the fields of Political Science and International Relations contribute to our understanding of critical political, economic and social challenges to the implementation of several SDGs, and suggest policy options to advance the national, European and global sustainability agendas. Research projects in course focus, for example, on questions related to poverty (SDG no. 1) and inequality (SDG no. 10), the energy transition (SDG no. 7,) the international political economy of climate change (SDG no. 13), forest governance (SDG no. 15) and the promotion of peace, security and democracy (SDG no. 16).



Universities should offer their students a comprehensive understanding of the interrelated socioecological challenges facing the global community and the planet today - in other words, of the inherent intertwinement between societies and the Earth system.





## ANTONIETA CUNHA E SÁ NOVA SBE

### HOW CAN UNIVERSITIES SUPPORT THE UNITED NATIONS' SUSTAINABILITY AGENDA AND THE EUROPEAN COMMISSION'S GREEN DEAL?

To deliver the European Green Deal and to pursue the implementation of the UN Sustainability Goals a transformational change of societies involving the social, economic and environmental dimensions is required. This imposes large-scale, multi-disciplinary, disruptive research and innovation which will involve permanent reskilling and upskilling of the work force. Therefore, Universities are at the core of these developments. Moreover, since the Universities are now more integrated into the local communities, campi are often serving as living labs where in collaboration with the different stakeholders (municipalities, citizens, firms, organizations, among others) experimentation becomes part of their everyday life. Thus, Universities definitely play their unique role in building social capital by contributing not only to a more inclusive and sustainable society, but also to the design of better informed public policies. All the challenges that Universities face cannot be overcome without significant funding. Fostering multidisciplinary national and international cooperation between Universities will leverage national public and private investments for excellence.



**Fostering multidisciplinary national and international cooperation between Universities will leverage national public and private investments for excellence.**

### IN WHAT WAY DOES YOUR SPECIFIC RESEARCH AREA CONTRIBUTE TO THOSE AGENDAS?

The **Nova SBE Environmental Economics Knowledge Center** was launched in the end of 2017 with the mission to produce high quality multidisciplinary research by fostering cooperation between economists, social and environmental scientists to evaluate existing and proposed environmental policies at national and international level. We focus on applied research, developing knowledge and expertise to assist businesses and society decision making for sustainable development by promoting cooperation with other stakeholders in Portugal and abroad. Partnerships with public policy institutions and other Schools, national and international, were established and innovative research has been developed aiming to contribute to protect and preserve the natural environment.

The current research program focuses on the following thematic areas: climate mitigation and adaptation; energy transitions; sustainable transportation; air pollution; water resources management; valuation of ecosystem services, urban greening and land use management; oceans and marine resources management, smart cities.

Therefore, our research agenda is aligned with the European Green Deal as well as, in general, the international research agenda regarding the most pressing environmental problems that threaten life on earth.

Finally, we also contribute by teaching different field courses at the Master of Economics and the PhD in Economics and Finance. Moreover, we also take advantage of the high-quality of our students and hire them as RAs in the different on-going research projects according to our needs and their preferences. We typically supervise several Master theses every academic year, either in Economics or in Management. The interest in the field has been increasing significantly which can be acknowledged by the increase in the number of students that search for a possibility of working with us.



### SUSTAINABILITY AT NOVA

## PAULO PEREIRA NMS

### HOW CAN UNIVERSITIES SUPPORT THE UNITED NATIONS' SUSTAINABILITY AGENDA AND THE EUROPEAN COMMISSION'S GREEN DEAL?

NOVA Medical School (NMS) mission is to contribute to the global health and well-being of humankind. This mission is accomplished by generating new knowledge that contributes for the advancement of the health sciences and by training a new generation of excellent professionals in the areas of Medical and Health Sciences.

NMS fosters a collaborative culture that cuts across disciplines and institution as a means to continuously improve the training of students, the quality of research and overall societal impact of the school.

According to the World Health Organization (WHO) of the United Nations (UN), health is inseparable from well-being, both of which are considered essential elements for the existence of more prosperous and more just societies, and are therefore transversal to several of the UN Sustainable Development Goals within the 2030 Agenda. In pursuit of this objective, clinical and translational research assume a fundamental role.

### IN WHAT WAY DOES YOUR SPECIFIC RESEARCH AREA CONTRIBUTE TO THOSE AGENDAS?

The core activities of NMS and its Research Centre CEDOC – Research Centre on Chronic Diseases are fully aligned both with UN Sustainable Development Goal 3 (SDG#3) – **Ensure healthy lives and promote well-being for all at all ages** – and with the **Health Cluster within the Global Challenges and Industrial Competitiveness**, Pillar II of the Horizon Europe – Framework Programme. The research goals of NMS – CEDOC are also aligned with the national strategy for research and innovation, specifically with the Agenda for Health, Clinical and Translation Research.



**A Global Medical School to face global health challenges.**

The main objectives of NMS-CEDOC fully aligned with UN SDG#3 are:

**A) Active and Healthy Aging** – By investigating the aging processes and the shared mechanisms that underlie age related diseases such as cancer, neurodegenerative and cardiovascular diseases, diabetes, and emerging infections with age dependent morbidity (e.g. Covid19).

**B) Personalized Medicine and Biomarkers** – By identifying new molecular profiles to improve patient stratification; developing high throughput analytical methods (“omics”); including minimally invasive technologies; developing new study systems representative of disease, namely animal models and advanced human tissue culture; and developing integrated analysis systems big biomedical data.

**C) Novel Therapies and Pharmacological Approaches** – By developing novel therapies that help address chronic non-communicable diseases, microbial resistance and emerging infections; developing genetic therapies, including new methods and systems for editing and delivering genes in vitro and in vivo; developing regenerative medicine approaches.

**D) Better Public Health and health services** – By producing robust evidence to improve current clinical practice, health policy and healthcare services organization and by promoting patient health education and empowerment and exploiting research findings into commercial applications.

At NMS – CEDOC these topics are approached with a transdisciplinary vision and at various levels of complexity in all stages of the research cycle including fundamental, applied, translational and public health research with the ultimate goal of translating knowledge into healthcare products, services and processes, directly addressing societal and economic needs.



SUSTAINABILITY AT NOVA

CLAIRE BRIGHT  
NOVA SCHOOL OF LAW

HOW CAN UNIVERSITIES SUPPORT THE UNITED NATIONS' SUSTAINABILITY AGENDA AND THE EUROPEAN COMMISSION'S GREEN DEAL?

Universities have a critical role to play in supporting the UN Sustainable Development Goals and the European Commission's Green Deal. Through high quality research and teaching, Universities have very important part to play in raising awareness and capacity building around these issues. For instance, at Nova School of Law, we have recently developed a course – a postgraduate course – on business, human rights and sustainability where we look in particular to one important actor associated with these issues, which are corporations. We look in particular as to the role of Law in fostering responsible business conduct, thereby advancing the UN Sustainable Goals. We have also put in place a number of events and webinars series on the developments in these fields. We had the first episode last week focused on Portugal and then we will explore other regions of the world.

IN WHAT WAY DOES YOUR SPECIFIC RESEARCH AREA CONTRIBUTE TO THOSE AGENDAS?

Regulating corporate behaviour is a key part in ensuring Sustainable Development. At the moment, there are important regulatory moves happening at the National, European and International level and this is something that NOVA School of Law is in the forefront, playing a key role in contributing to these moves. For instance, earlier this year I contributed to a study for the European Commission, published in February, where we looked at corporate practises in relation to adverse Human Rights and Environmental Due Diligence of business activities in EU. We also made a number of suggestions as to the regulatory options for intervention at the EU level. In April 2020, EU Commissioner for Justice – Didier Reynders, presented our study to the European Parliament. Based on the findings, he announced the commitment of the European Commission to introduce a legislative initiative on these issues as part of their post COVID-19 recovery package in 2021. This would make it mandatory for companies in the EU to undertake Human Rights and Environmental Due Diligence to identify, address and remedy their adverse Human Rights and Environmental Impacts. This is something that has the potential of being very important and having actual impacts, positive impacts for people and for the planet. At NOVA School of Law, we will also be opening and new knowledge Centre on business, human rights and the environment. In this Centre, we will continue pushing further towards these regulatory improvements that will revolve around three objectives in particular: fostering high quality, collaborative and multidisciplinary research in the field, building awareness and capacity building around these issues, and finally creating an Observatory of Portuguese companies practises in relation to due diligence for advanced human rights and environmental impacts.

BB

We look in particular as to the role of Law in fostering responsible business conduct, thereby advancing the UN Sustainable Goals.



# TIAGO CORREIA

## IHMT-NOVA

HOW CAN UNIVERSITIES SUPPORT THE UNITED NATIONS' SUSTAINABILITY AGENDA AND THE EUROPEAN COMMISSION'S GREEN DEAL?

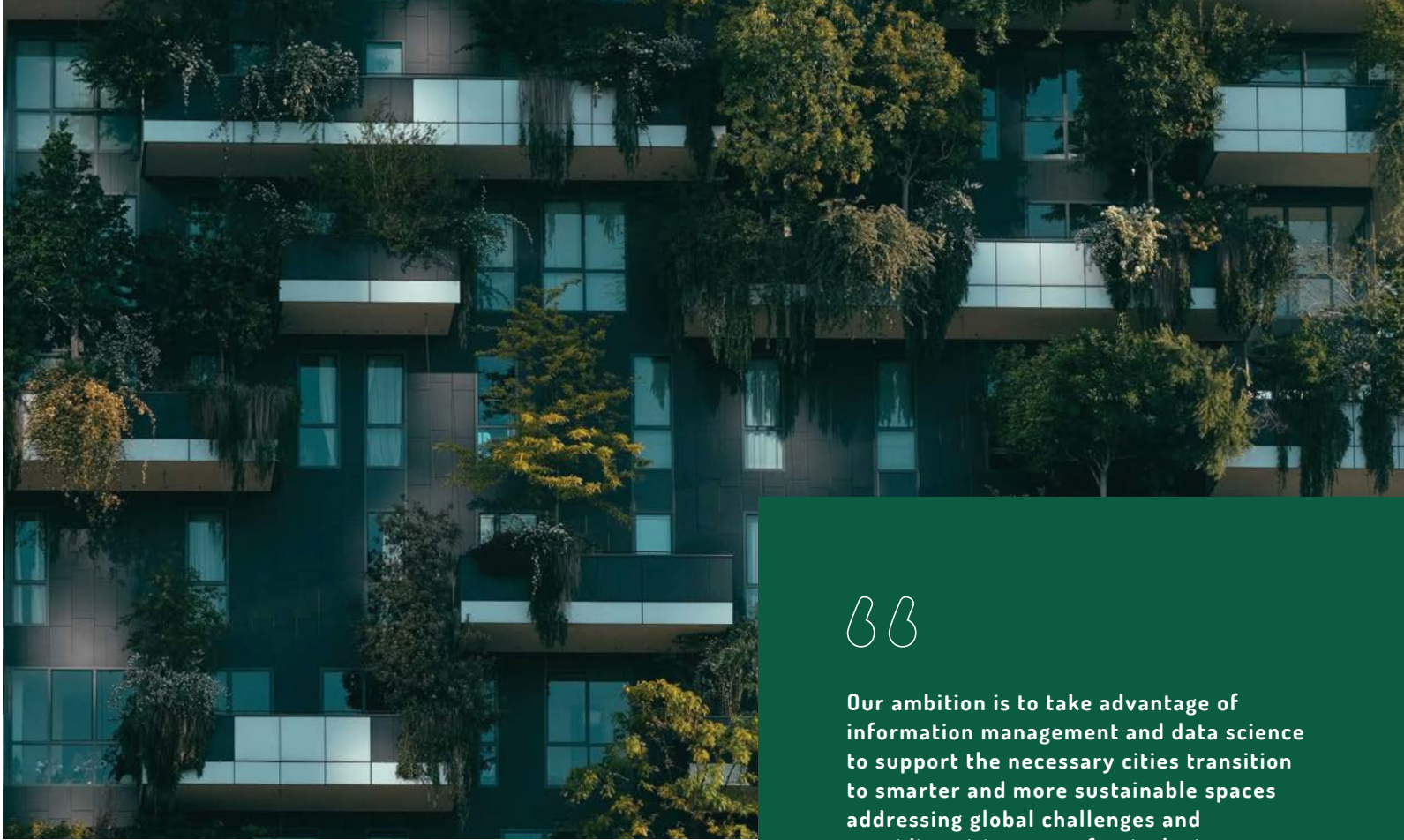
Universities should raise awareness of students and the public. The way to do it is by teaching new courses, by adapting the syllabus to be more aligned with Sustainable Development, the UN Sustainable Development Goals, and the European Green Deal, and by connecting to people in the community. These can be achieved by showing how research and research outputs can have an in positive impact on people's life and on our day-to-day communities. For this reason, I believe that these are two ways of universities to comply with Sustainable Development, the UN Sustainable Development Goals and the European Green Deal.

IN WHAT WAY DOES YOUR SPECIFIC RESEARCH AREA CONTRIBUTE TO THOSE AGENDAS?

My field of research in Global Health contributes to Sustainable Development and the UN Sustainable Development Goals by understanding how our individual health and wellbeing is comprehensive and should link structural and more individual dimensions of our collective life. Furthermore, my research also contributes to understanding how to foster international corporations with other universities in other countries, and how to help governments implement new policy decisions informed by research evidence, which I believe is the way to move forward. Complex problems require interdisciplinary approaches, and this is something that NOVA University can bring to our society. Therefore, our key challenge is how to make academic research applied and how can it contribute to improve public decision-making.



**Complex problems require interdisciplinary approaches, and this is something that NOVA University can bring to our society.**



**Our ambition is to take advantage of information management and data science to support the necessary cities transition to smarter and more sustainable spaces addressing global challenges and providing citizens a safer, inclusive, resilient and sustainable future.**

# MIGUEL NETO

## NOVA IMS

HOW CAN UNIVERSITIES SUPPORT THE UNITED NATIONS' SUSTAINABILITY AGENDA AND THE EUROPEAN COMMISSION'S GREEN DEAL?

The challenges society faces today and that are addressed in both the United Nations' Sustainability agenda and the European Commission's Green Deal, due to the diversity, complexity and the need for global collective action require the best knowledge available to achieve the defined goals. In this context Universities can play a major role by leading research and innovation in order to create the answers that can support us in addressing climate emergency, energy transition and the necessary evolution to circular economy.

IN WHAT WAY DOES YOUR SPECIFIC RESEARCH AREA CONTRIBUTE TO THOSE AGENDAS?

At NOVA Cidade – Urban Analytics Lab, a research and innovation group I lead at NOVA Information Management School, we collaboratively develop a set of activities that promote the creation and transfer of applied knowledge in the context of urban intelligence aiming to actively contribute to the construction of smarter and more sustainable cities and territories. NOVA Cidade wants to be an active player in the necessary change we must make, strongly leveraged by research and innovation on the potential use of information management and data science to support urban spaces planning and management to answer SDG 11 ambition of sustainability, inclusion, security and resilience for cities and communities. Furthermore, our field of action is clearly aligned with the Green Deal, namely the objective of making Europe a climate neutral continent by 2050 (and the Horizon Europa ambition of having 100 smart and climate neutral cities by 2030). To reach those goals we need to build data-driven public policies at city level supported by data science and artificial intelligence since these are the spaces where today 55% of the world's population lives and although cities occupy only 3% of the total land surface, they are responsible for the production of 80% of global GDP and consume 75% of the natural resources, produce 50% of global waste, and account for 60–80% of Greenhouse Gas Emissions.



## NELSON SAIBO

### ITQB NOVA

#### HOW CAN UNIVERSITIES SUPPORT THE UNITED NATIONS' SUSTAINABILITY AGENDA AND THE EUROPEAN COMMISSION'S GREEN DEAL?

The United Nations' Sustainability Developmental Goals (SDGs) and the European Commission's Green Deal must be strongly supported by Universities. The science required to meet these agendas depend on education and research, and improving quality of life through sustainable development.

Universities can contribute to the SDGs as well as to the Global Green Deal by training and educating people at all levels; by promoting research projects associated with different SDGs or the Green Deal (contributing to boost the efficient use of resources, cut pollution, and increase biodiversity), but also by being an example and promoting activities and educating people to contribute to these agendas on their daily lives and beyond.

#### IN WHAT WAY DOES YOUR SPECIFIC RESEARCH AREA CONTRIBUTE TO THOSE AGENDAS?

ITQB NOVA develops different areas of research contributing to the United Nations' Sustainability agenda and the European Commission's Green Deal, namely: plant responses to adverse environmental conditions (abiotic and biotic stresses); plant biodiversity; enzymes for environmental and industrial applications; microorganisms that are relevant to the environment and or for environmentally sustainable bioprocesses; synthetic biology and bioremediation and biocatalysis. These different areas intend to identify and investigate different ways to improve the way we meet our daily life needs, under the predicted global changes and in an environmentally sustainable way. We aim at contributing to increase the know-how needed to produce more food, feed, and energy in the available land as well as to extend it to marginal lands. We conduct both basic and applied research, and our goals can easily and rapidly be translated into application. Our work contributes to different Sustainable Developmental Goals. Given the positive impact it can have on crop production, the most direct are "Zero hunger" and "No poverty". Working on plants that have a more efficient CO<sub>2</sub> assimilation, a higher water use efficiency, or that can grow in marginal lands (e.g. high salinity), and using microorganisms to produce added value compounds and sustainable energy, will definitely have an impact on DGS, such as "Clean water and sanitation", "Climate action", "Affordable and clean Energy", and "Life on Land". Still, the impact of our research goes beyond these SDGs. Being based on a large and strong collaborative network that includes researchers from developed and developing countries, our research also contributes to the SDG "Partnerships for the goals". In addition, we highlight our involvement in training many national and international students, including students from Portuguese Speaking countries (e.g. Cape Verde, Mozambique, Brazil). Some good examples of our contribution to "Quality education" are the MSc in Biotechnology for Sustainability and the PhD program in Plants Sciences, both coordinated by ITQB NOVA, and the PhD program Science for Development, coordinated by IGC.



Our work is to take care  
of people and the planet.

## ANDREIA LEITE

### ENSP-NOVA

#### HOW CAN UNIVERSITIES SUPPORT THE UNITED NATIONS' SUSTAINABILITY AGENDA AND THE EUROPEAN COMMISSION'S GREEN DEAL?

United Nations' Sustainability agenda presents a shared vision and a call for action and Universities are essential to achieve this vision. Being an educational setting, they will contribute to quality education, regardless of individuals' background. As a place of research and development, Universities can also contribute to a comprehensive understanding of complex phenomenon and identify innovate solutions to address challenges ahead. Finally, universities include academic and non-academic staff, and students living in their own community and are part of daily lives of these individuals. Therefore, Universities can integrate an active contribution towards sustainable development in their daily activities. We can imagine a wealth of measures and activities incorporating the ideas of sustainable development. Examples include the introduction of climate change measures, reduction of the adverse impact of their infrastructures, and promoting safe and secure working environments for their all workers.

Public Health defined as the organized efforts of society to improve, promote, protect, and restore the health of the population. By acknowledging that all society areas are interlinked and they influence each other, thus requiring and an integrated action, the United Nations' Sustainability agenda reaches the core of public health definition. As a school of public health, NOVA National School of Public Health (NOVA ENSP) includes a team of multidisciplinary researchers, contributing to various Sustainable Development Goals (SDGs). First and foremost, we have a key contribution to *SDG 3 – Good health and well-being* and *SDG 10 – Reduce inequalities within and among countries*. Our research fosters a comprehensive understanding of disease distribution and its determinants. We work on the epidemiology of both communicable and non-communicable diseases, assessment of disease determinants and inequalities. For example, we have described previously described how delays in diagnosing pulmonary tuberculosis occur and what determines them. Delayed diagnosis of tuberculosis cases challenges the end of this epidemic by 2030 as intended by UN agenda. Understanding delays will be central to contribute to meet this target. Researchers at NOVA ENSP also work in health promoting, having designed and evaluated interventions to promote health, as well as health policies. Such knowledge will be central to support decision-making on how to best address these challenges and meet the agendas' targets.

#### IN WHAT WAY DOES YOUR SPECIFIC RESEARCH AREA CONTRIBUTE TO THOSE AGENDAS?

Our research lines also include occupational health, which contribute to advancing knowledge regarding work-related risks and risk management strategies. This research area thus contributes to *SDG 8 – Promote inclusive and sustainable economic growth, employment and decent work for all*, in particular to promote safe and secure working environments for all workers, as identifying risks and manage them adequately is cornerstone to this target.

Our work is achieved through multiple partnerships, including other academic partners, healthcare providers, government, municipalities, social sector, patient associations, civil society, and schools. Such partnerships directly address *SDG 17 – Revitalize the global partnership for sustainable development*. At NOVA ENSP, we constantly build on the experience and resources of our partnerships, which place us at a better place to contribute to all the remaining goals.



At NOVA ENSP, we constantly  
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remaining goals.



# 6

## NOVA'S RESEARCH INFRASTRUCTURES ROADMAP



• **2020** PTCRIN  
PTCAC  
PT-MBRCN/MIRRI-PT  
PT-OPENSREEN

• **2019** BIOBANCO  
CECOLAB  
CRYOEM-PT

• **2014** BIODATA  
CONGENTO  
DATALAB  
PPBI  
PTNMR  
RNEM  
ROSSIO  
VIASEF



## BIOBANCO.PT

### > NAME

NATIONAL BIOBANKS  
INFRASTRUCTURE

### > ACRONYM

BIOBANCO.PT

### > RESEARCH INFRASTRUCTURE COORDINATOR

Sérgio Dias (iMM)

### > COORDINATORS AT NOVA

Helena Canhão (NMS)  
Ana Paula Arez (IHMT-NOVA)

### > CONTACTS

atavares@ihmt.unl.pt  
(BIOTROP, GHTM/IHMT-NOVA)  
saba.abdulghani@nms.unl.pt  
(CHAIN, CHRC/NMS)

### > WEBSITE

<http://biobanco.pt>

## BRIEF DESCRIPTION

Nowadays, biobanks are central structures for innovation on global health and advance of precision health care. Through biobanks, a variety of biological specimens may be conserved under exceptional quality conditions, anticipating collection needs for prospective applications, mainly related with development or application of new biomarkers, new therapies, or diagnostic methods.

**Biobanco.pt** was created thanks to the joint effort of several national research institutions to form a unique platform within the Portuguese Roadmap of Research Infrastructures. Its mission is to support biomedical research focused on human diseases. Among its activities are the promotion of national and international collaborative research projects by providing access to high quality sample collections and associated clinical data and concurrently promoting the standardization of all biobanking activities and the optimisation of sample processing and storage facilities. Additionally, it promotes the sharing of existing resources and expertise to improve existing national capacities. Within this infrastructure, which encloses population-based, clinical and multispecialty biobanks, samples are collected from patients who were recruited within research projects (with signed informed consents) and approved by local ethics committees. A fundamental objective of this infrastructure is to increase the international competitiveness and the excellency of national biomedical research and create unique opportunities to integrate international academic or industrial research, acting synergistically towards the development and improvement of national science and economy.

**Biobanco.pt** impact is based on the following:

1. Sharing and establishing common national biobanking standard operating procedures (SOP), to ensure cooperation and centralized coordination that are crucial for integrating major international research consortia.
2. Integrating international networks of Biobanking such as Pan-European Biobanking and BioMolecular resources Research Infrastructure - European Research Infrastructure Consortium (BBMRI-ERIC) and Registries and Biobanks in Transition of the European Institute of Innovation and Technology (EIT) at a relatively early stage, thus providing opportunities for future growth and international collaborations.
3. An active cooperation between clinicians and basic researchers is a key aspect of biomedical research; **Biobanco.pt** is an efficacious networking node that will provide all the necessary support for Institutions interested in engaging in biomedical research activities.
4. Optimization of costs and efficiency.

## INFRASTRUCTURES AND FACILITIES

Biobanco.pt consortium has already 11 members with different origins and characteristics including academic centres, private corporate bodies of public interest or hospital-associated structures, which also offer different kind of sample collections ranging from population-based to disease-oriented biobanks.

**NOVA University of Lisbon** participation in this national infrastructure is strongly demonstrated through two of its schools that have implemented local biobanks in Infectious Diseases - Biotropical Resources (BIOTROP Biobank) at GHTM/IHMT and Chronic Diseases - Comprehensive Health Research Centre (Comprehensive Health Biobank, CHAIN), at CEDOC/NMS. As research collaboration in chronic and infectious diseases is essential to promote research excellence and health improvement worldwide, these two infrastructures, in addition to the activity within the Biobanco.pt network, have been intimately collaborating with exchange of expertise and standard procedures. Together, they constitute a major asset at NOVA University of Lisbon to strengthen research quality and encourage national and international collaborations.

**BIOTROP** was created in 2016 to improve research in tropical medicine and infectious diseases. BIOTROP's collections (total of 20 905 samples), are heterogeneous, ranging from pathogens of human and animal origin to their vectors and reservoirs. Due to this mixed nature of collections, not only of human but also non-human origin, besides the component of a biobank, BIOTROP is also a Biological Resource Centre, being part of the Portuguese microBiological Resources Center Network (Pt-mBRCN). BIOTROP is prepared to receive, preserve, and distribute the biological products, in compliance with legal and ethical issues, Nagoya protocol and the international best practice guidelines for these infrastructures. Data management and confidentiality good practices were recognized by the Data Privacy Impact Assessment evaluation performed by NOVA Data Protection Officer (2019).

**The Comprehensive Health Biobank (CHAIN)** was created in 2019 and its mission is to support biomedical, translational, and clinical research activities that are directly related to chronic diseases such as musculoskeletal, cardio and respiratory disorders as well as mental health. One main asset of CHAIN is its collections from national cohorts, namely EpiReumaPt as part of EpiDoC (~3500 samples of a population-based cohort representative of the Portuguese population), and a collection of hundreds of bone femoral heads. Among its newest collections are the serology COVID-19 survey in collaboration with NMS, placenta and samples from babies of mothers with COVID with and the initiation of the NMS human eye bank for retinal disorders.

Both are approved by ethics committee and CNPD. Technical coordination of BIOTROP is provided by Ana Tavares and CHAIN by Saba Silva.



## SCIENTIFIC AREAS HEALTH AND FOOD

**YEAR OF ENTRY  
IN THE NATIONAL ROADMAP**  
2019

**FUNDING  
FOR 2017-2021**  
N.A.

**TYPE**  
DISTRIBUTED

### INSTITUTIONAL PARTNERS / NODES

NOVA IS REPRESENTED BY:

BIOTROP - NOVA Institute of Hygiene and Tropical Medicine (IHMT-NOVA) Biobank and CHAIN - NOVA Medical School (CHRC) Biobank.

**BIOBANCO.PT** is coordinated by Instituto de Medicina Molecular João Lobo Antunes (iMM).

**PARTNERS:**

University of Aveiro (UA)

Centro Hospitalar e Universidade de Coimbra (CHUC)

NOVA Medical School (NMS)

National Health Institute Doutor Ricardo Jorge (INSA)

Fundação D. Anna de Sommer Champalimaud e Dr. Carlos Montez Champalimaud (FC)

Hospital de Santo Espírito da Ilha Terceira (HSEIT)

Institute of Molecular Pathology and Immunology of the University of Porto (IPATIMUP)

Institute of Public Health of the University of Porto (ISPUP)

NOVA Institute of Hygiene and Tropical Medicine (IHMT-NOVA)

University of Minho (UM)





BIODATA

> NAME

BIODATA.PT | ELIXIR PT -  
PORTUGUESE DISTRIBUTED  
INFRASTRUCTURE FOR  
BIOLOGICAL DATA

> ACRONYM

BIODATA.PT

> RESEARCH  
INFRASTRUCTURE  
COORDINATOR

José Pereira Leal (FCG-IGC)

> COORDINATOR  
AT NOVA

Isabel Rocha (ITQB NOVA)

> CONTACTS

info@biodata.pt

> WEBSITE

www.biodata.pt

BRIEF DESCRIPTION

**BioData.pt** is a virtual distributed infrastructure for biological data and the Portuguese ELIXIR node that aims to support the national scientific system through best practices in data management and state of the art data analysis. Such data will serve as a basis for biodiscovery and innovation, fostering research excellence, internationalization, training, entrepreneurship and collaborative R&D work between academia and industry.

ACTIVITIES & IMPACT

**BioData.pt** activities range from value creation projects based on biological information, in partnership with business R&D to map and disseminate ELIXIR resources to Portuguese users in academia and industry, and builds training and services focused on fulfilling national needs and promoting excellence. **BioData.pt** is implementing a sustainable infrastructure for biological information to support the development of a stronger bioinformatics community in close proximity to the life sciences and the industry. It will also expose the Portuguese bioinformaticians to international researchers, thus promoting international collaborations. **BioData.pt** gathers expertise in a broad range of scientific topics, spanning from health, biological, agriculture to marine sciences, and more than 100 students have been trained in bioinformatics and data management.

Through its Communities & Platforms, **BioData.pt** aims to:

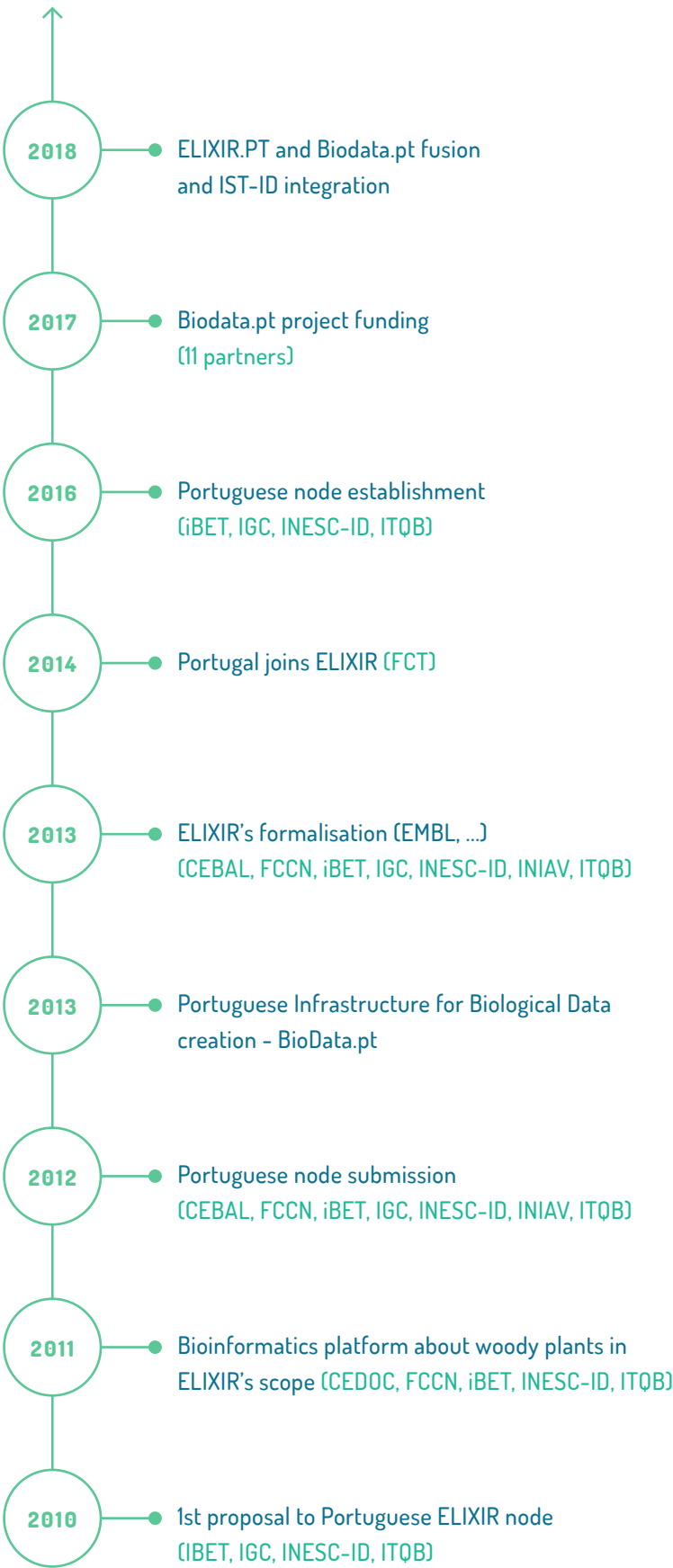
- develop standards, protocols and best practices for managing and accessing sensitive human data, and for plant data publication;
- foster a community, by providing tools, compute resources, and training;
- develop the necessary infrastructure to support marine metagenomics, and tailored-made microbial and biological systems and model gene regulation networks in yeasts.

By promoting data re-use, **BioData.pt** will contribute to the cost-effectiveness of research funding, reducing redundant data generation, insuring maximal usability of datasets. Due to its distributed nature, training and recruiting in different locations will contribute to dilute regional asymmetries in the development of bioinformatics and data management as crucial skills for the present and future generations of researchers and bio-entrepreneurs in Portugal.

INFRASTRUCTURES AND FACILITIES

**BioData.pt** is a consortium of the following twelve member institutions:

- Centro de Biotecnologia Agrícola e Agro-Alimentar do Alentejo (CEBAL);
- Centro de Ciências do Mar (CCMAR);
- Champalimaud Foundation (CF);
- Instituto de Engenharia de Sistemas e Computadores, Investigação e Desenvolvimento em Lisboa (INESC-ID);
- Institute for Bioengineering and Biosciences (iBB);
- Instituto de Biologia Experimental e Tecnológica (iBET);
- Instituto de Biologia Molecular e Celular (iBMC);
- Instituto de Tecnologia Química e Biológica António Xavier (ITQB NOVA);
- Instituto Gulbenkian de Ciência (IGC);
- Instituto Superior Técnico (IST);
- Portugal's Biotechnology Industry Organization (P-BIO);
- Universidade do Minho (UMinho)



SCIENTIFIC AREAS  
HEALTH AND FOOD

YEAR OF ENTRY  
IN THE NATIONAL ROADMAP  
2014

FUNDING  
FOR 2017-2021  
TOTAL PUBLIC INVESTMENT  
2 728 292 €  
NOVA  
63 820 €

TYPE  
VIRTUAL

INSTITUTIONAL PARTNERS /  
NODES

Calouste Gulbenkian Foundation -  
Instituto Gulbenkian Ciência (FCG-IGC)

Association of Instituto Superior  
Técnico for Research and Development  
(IST-ID)

Portugal's Biotechnology Industry  
Organization (P-BIO)

Centro de Biotecnologia Agrícola e  
Agro-Alimentar do Alentejo (CEBAL)

Centre of Marine Sciences (CCMAR)

D. Anna de Sommer Champalimaud  
and Dr. Carlos Montez Champalimaud  
Foundation (CF)

Instituto de Biologia Experimental e  
Tecnológica (iBET)

Institute for Molecular and Cell Biology  
(iBMC)

Instituto de Engenharia de Sistemas  
e Computadores, Investigação e  
Desenvolvimento em Lisboa (INESC-ID)

Instituto superior Técnico (IST)

University of Minho (UM)

Institute of Chemical and Biological  
Technology António Xavier (ITQB NOVA)

## CECOLAB

> **NAME**  
ASSOCIAÇÃO CECOLAB –  
COLLABORATIVE LABORATORY  
TOWARDS CIRCULAR ECONOMY

> **ACRONYM**  
CECOLAB

> **RESEARCH  
INFRASTRUCTURE  
COORDINATORS**  
João Miguel dos Santos  
Almeida Nunes (BLC3)

> **COORDINATOR  
AT NOVA**  
João Paulo Crespo (FCT NOVA)

> **CONTACTS**  
circular@cecolab.pt

> **WEBSITE**  
www.eco-lab.pt

### BRIEF DESCRIPTION

The collaborative laboratory CECOLAB aims the development of sustainable Circular Economy market solutions for a strategic Value Chains: (1) Forest; (2) Agroindustry; (2) Urban; (3) Water; (4) Manufacture industry; (5) Construction and (6) Servitization, based on technologic platforms. The initiative thus intended to contribute to the creation of qualified scientific employment oriented towards research and innovation with the creation of environmental, economic and social value. Recognized as a scientific and research infrastructure of national strategic interest, for the coordination of the National network in Circular Economy, the CECOLAB Association aims to develop sustainable market solutions in a Circular Economy model for strategic national value chain, with high repercussion effect on other chain values of Portuguese economy.

### ACTIVITIES & IMPACT

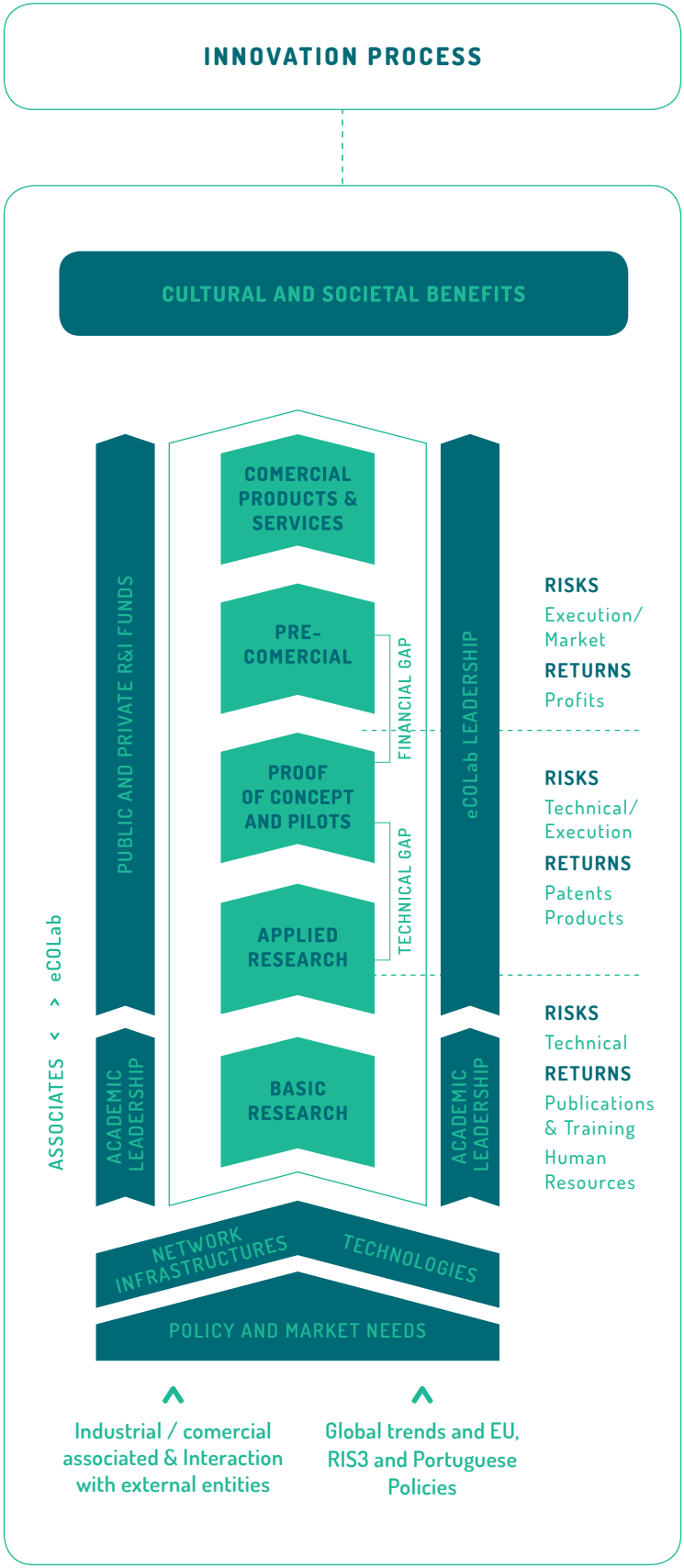
The main activities in the field of Circular Economy are to:

- support the economic fabric as a response towards circular economy challenges, with the development of R&D+i activities oriented towards market needs;
- become an international reference for knowledge development, response capacity and solution implementation;
- provide advanced training for the human resources, in order to capacitate the economic tissue;
- increase the synergies between different entities.
- CECOLAB will have a main impact on the change in paradigm from a Linear to a Circular Economy (CE) setup. This shift is essential to a more responsible economy towards resources and people and more efficient in its life cycle. Thus, CECOLAB will develop and foster transfer knowledge and technology to the market, with the creation of scientific jobs, and assume Portugal's leadership and position in the Circular Economy. CECOLAB will contribute to:
- develop knowledge and advanced technology to boost commercial concepts for international market;
- increase the value of the abandoned territory, with the perspective to create new market pathways at international level, enhance the natural resources and reduce the external dependence;
- increase innovation and efficiency in value chain systems of key sectors of the Portuguese economy, by developing new processes and products with potential for internationalization for different types of commercial scale, in addition to the economic, social and environmental impact expected;
- mobilize key stakeholders around a common strategy to increase capacity, competitiveness and critical mass;
- reduce regulatory, cultural and technological obstacles that still persist to have a more efficient economy.

### INFRASTRUCTURES AND FACILITIES

CECOLAB Association – Collaborative Laboratory Towards Circular Economy, is a non-profit institution, headquartered in Oliveira do Hospital, in the Central region of Portugal, that have 15 associates: Aquitex – Acabamentos Químicos Têxteis, S.A.; BLC3 Evolution – Association BLC3: Technology and Innovation Campus; LIPOR – Intermunicipal Waste Management Service of Greater Porto;

Mota-Engil Engenharia; RAIZ – Forest and Paper Research Institute; TMG Group; National Laboratory of Energy and Geology (LNEG); Welding and Quality Institute (ISQ); University of Aveiro (UA); Portuguese Catholic University; University of Coimbra (UC); University of Minho (UMinho); **Universidade Nova de Lisboa (NOVA)**; University of Porto (UP).



### SCIENTIFIC AREAS

PHYSICAL SCIENCES  
& ENGINEERING

**YEAR OF ENTRY  
IN THE NATIONAL ROADMAP**  
2019

**FUNDING  
FOR 2017-2021**  
N.A

**TYPE**  
SINGLE-SITED

### INSTITUTIONAL PARTNERS / NODES

Association BLC3 – Technology and Innovation Campus: BLC3 Evolution, Lda (Coordinating Entity)

Aquitex – Acabamentos Químicos e Têxteis, S.A.

LIPOR – Intermunicipal Waste Management Service of Greater Porto (LIPOR)

Mota Engil Engenharia e Construção, S.A. (Mota-Engil)

TMG – Tecidos para Vestuário e Decoração, S.A. (TMG)

RAIZ – Forest and Paper Research Institute, Navigator Group (RAIZ)

National Laboratory of Energy and Geology (LNEG)

Instituto de Soldadura e Qualidade (ISQ)

University of Aveiro (UA)

Universidade Católica Portuguesa (UCP)

University of Coimbra (UC)

University of Minho (UM)

NOVA University Lisbon (NOVA)

University of Porto (UP)



## CONGENTO

### > NAME

CONSORTIUM FOR GENETICALLY  
TRACTABLE ORGANISMS

### > ACRONYM

CONGENTO

### > RESEARCH INFRASTRUCTURE COORDINATOR

Henrique Veiga-Fernandes (CF)

### > COORDINATOR AT NOVA

António Jacinto (NMS)

### > CONTACTS

info@congento.org

### > WEBSITE

www.congento.org



### BRIEF DESCRIPTION

Joining the efforts of 4 prominent biomedical research institutions, CONGENTO aims to address the need of top-quality services in genetically tractable organisms in the Portuguese research landscape. For the last decade, all the CONGENTO members have strived to develop animal facilities and services able to answer the needs of their own researchers, competing at a European level. CONGENTO benefited from the expertise – complementary in many ways – developed by its members, and established a network stronger than the sum of its parts.

Being the only infrastructure in Europe providing services in the three main animal models employed in R&I – mouse, zebrafish and fruit fly – the activity of the consortium has been developed around 3 main cornerstones: 1) maintenance and hosting of strains (live or cryopreserved); 2) generation of new genetically modified strains and related technological development; 3) Training and continuous education, according to the needs of the research community and following the European guidelines.

Besides the space and equipment constraints for hosting laboratory animals accordingly to the best practices on animal welfare; most of the services that this infrastructure offers are extremely time-demanding and require an extensive know-how. Making the best use of this non-for-profit highly-specialized Infrastructure can help scientists in Portugal to achieve excellence by accelerating the pace of their research, saving time and resources.

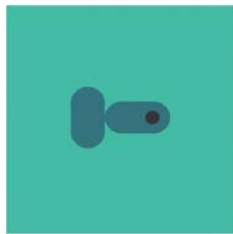


### ACTIVITIES & IMPACT:

2020 marked the end of the first funding granted directly to the consortium, through FCT and ERDF/Lisboa2020. During 3.5 years, funds were used to endow the infrastructure with state-of-the-art equipment and highly specialized human resources, to the benefit of the national biomedical research community working with genetically tractable organisms. At CEDOCINMS this funding was particularly important for the renovation of its vivarium, completed in 2020, allowing researchers to have access to improved facilities.

During this funding period, the infrastructure provided services to more than 800 users, contributing to more than 130 publications, and developed more than 50 training actions, gathering around 1400 participants. It also expanded the scope of its action, by including molecular biology and pathology services. Nevertheless, one of the main impacts of CONGENTO was to bring together the facilities of its 4 members, establishing a consistent network of experts.

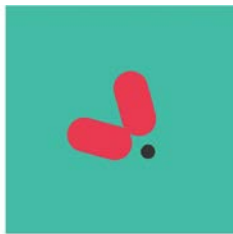
Due to the SARS-CoV-2 outbreak, the planning for 2020 suffered several changes. However, the infrastructure kept providing services to the research community, contributing to keep science running during lockdown periods. CONGENTO adjusted as possible to the contingencies and remote training activities were developed – from webinars to video tutorials – including launching an innovative online Laboratory Animal Science theoretical course (required to apply to a license to perform procedures in animals).



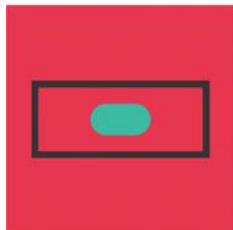
ZEBRAFISH



RODENTS



DROSOPHILA



HISTOPATHOLOGY



TRAINING



MOL. BIOLOGY,  
VIRUS AND  
TRANSGENESIS

### SCIENTIFIC AREAS HEALTH AND FOOD

**YEAR OF ENTRY  
IN THE NATIONAL ROADMAP**  
2014

**FUNDING  
FOR 2017-2021**

**TOTAL PUBLIC INVESTMENT**  
3 508 029 €

NOVA  
934 833,60 €

**TYPE**  
DISTRIBUTED

### INSTITUTIONAL PARTNERS / NODES

D. Anna de Sommer Champalimaud  
and Dr. Carlos Montez Champalimaud  
Foundation (CF)

NOVA Medical School (NMS)

Calouste Gulbenkian Foundation –  
Instituto Gulbenkian Ciência (FCG-IGC)

Instituto de Medicina Molecular João  
Lobo Antunes (iMM)

## CRYOEM-PT

### > NAME

NATIONAL ADVANCED ELECTRON  
MICROSCOPY NETWORK FOR  
HEALTH AND LIFE SCIENCES

### > ACRONYM

CRYOEM-PT

### > RESEARCH INFRASTRUCTURE COORDINATOR

Paulo Ferreira (INL)

### > COORDINATOR AT NOVA

Pedro Matias (ITQB NOVA)

### > CONTACTS

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### > WEBSITE

www.cryoem-pt.pt



## BRIEF DESCRIPTION

Portugal has a track record of excellence in health and life sciences research where, among other advanced experimental techniques, Electron Microscopy plays a fundamental role. The National Advanced Electron Microscopy Network for Health and Life Sciences (CryoEM-PT) creation aims to achieve state-of-the-art research and development in the areas of Health and Life Sciences, with the latest generation of Cryo Electron Microscope. This Network will promote a broad spectrum of research, development and training activities to improve industrial and scientific outcomes. Therefore, it will have a great impact in the development of industries in the areas of Health and Life Sciences as well as in research programs.

In more detail, CryoEM-PT will:

- Provide technical and scientific support to Portuguese companies in the Health Sciences field;
- Foster the creation and growth of start-ups, by providing access to advanced instrumentation and highly specialized technical support;
- Reinforce industrial and academic research activities against health threats, and enable future institute-level collaborative research activities;
- Enable the education/recruitment/training/mentoring of graduate students, postdoctoral researchers, and faculty in life sciences and bioengineering disciplines;
- Serve as a platform to attract and retain world-renowned scientists and outstanding brain talent from all regions of the world to work with Portuguese scientists;
- Enable a quantum leap in advanced life sciences research with applications in the development of new therapies against diseases;
- Serve as a meeting point (or hub) between established and start-up companies and researchers.

## ACTIVITIES & IMPACT

### Activities

CryoEM-PT is still in its implementation stages and the activities are focused on equipment configurations and the search for funding opportunities.

In April 2018 a Workshop to advocate for the need of a National Network of this type was held at the INL, with the support of the then-president of the FCT, Prof. Paulo Ferrão, and the participation of representatives from the North and Lisbon Regional Development Commissions.

During 2018 and 2019 meetings were held by members of its Founding Commission with the Presidents of the Regional Development Commissions of the North, Center, Lisbon and Algarve Regions, with the vice-President of FCT Prof. José Paulo Esperança, and the Minister of Science, Technology and Higher Education Prof. Manuel Heitor.

The last meeting resulted in the inclusion of CryoEM-PT in the National Infrastructure Roadmap, thus making it eligible to apply for funding for National Research Infrastructures.

### Impact

CryoEM-PT will overcome a severe limitation in competitiveness and internationalization of Portuguese institutions and companies working in R&D.

The companies Bluepharma, TreatU and Immunetep have declared their intent to use cryoelectron microscopy, in part to meet the regulations of FDA (USA) and EMA (EU). The CryoEM-PT strategic plan includes a commitment to provide 25% of the available instrument time to industrial partners, enhancing

the transfer of scientific and technological knowledge to the business sector, a central regional and national socioeconomic goal.

Academic researchers will be able to access a state-of-the art instrument that will allow them to independently pursue research activities hitherto impossible except in the framework of international collaborations. The results obtained will not only be in many cases enough to promote the development of those activities but can also be used as preliminary data to support applications to access higher-end CryoEM instruments located at European Centers through INSTRUMENT-ERIC.

The CryoEM-PT Scientific Commission will promote events to showcase the impact of cryoelectron microscopy in academic and industrial R&D activities, and the inclusion of a BluePharma representative in the Management Commission will ensure timely monitoring of technology transfer opportunities.

CryoEM-PT will promote training of doctoral students and postdoctoral researchers on advanced cryoelectron microscopy techniques that are in high demand across the world, effectively increasing employability and meeting this socioeconomic goal across all Portuguese regions included in the CryoEM-PT network.

The cryoelectron microscope and associated research will be included in outreach programs at the INL and its partner institutions, which includes open days, high-school and university student visits.

### PHASE 1 BRAGA

#### Central node (INL)

Microscope, sample preparation, data processing

#### University of Minho node

Sample preparation, data processing

### PORTO

#### IBMC / I3S / University of Porto node

Sample preparation, data processing

### COIMBRA

#### University of Coimbra node

Sample preparation, data processing, data center

### OEIRAS

#### Oeiras node I (ITQB NOVA)

Sample preparation, data processing

#### Oeiras node II (IGC)

Sample preparation, data processing

### PHASE 2 COVILHÃ

#### University of Beira Interior node

Sample preparation, data processing

### LISBON

#### University of Lisbon node (iMM)

Sample preparation, data processing

### ÉVORA

#### University of Évora node (ICAAM)

Sample preparation, data processing

### FARO

#### University of Algarve node (CCMAR)

Sample preparation, data processing

## SCIENTIFIC AREAS

### HEALTH AND FOOD

### YEAR OF ENTRY IN THE NATIONAL ROADMAP

2019

### FUNDING FOR 2017-2021

N.A.

### TYPE DISTRIBUTED

### INSTITUTIONAL PARTNERS / NODES

International Iberian Laboratory of  
Nanotechnology (INL)

University of Minho (UM)

Instituto de Investigação e Inovação  
em Saúde (I3S)

University of Coimbra (UC)

Institute of Chemical and Biological  
Technology António Xavier (ITQB  
NOVA)

Calouste Gulbenkian Foundation -  
Instituto Gulbenkian Ciência (FCG-IGC)

University of Beira Interior (UBI)

Instituto de Medicina Molecular João  
Lobo Antunes (iMM)

Institute of Mediterranean Agricultural  
and Environmental Sciences of Évora  
University (ICAAM)

Centre of Marine Sciences (CCMAR)



## DataLab

### > NAME

SOCIAL SCIENCES DATALAB

### > ACRONYM

DataLab

### > RESEARCH INFRASTRUCTURE COORDINATORS

Miguel Luís Sousa de  
Almeida Ferreira (Nova SBE)

### > COORDINATORS AT NOVA

Miguel Luís Sousa de  
Almeida Ferreira (Nova SBE)

### > CONTACTS

alice.caetano@novasbe.pt

### > WEBSITE

datalab.novasbe.pt

## BRIEF DESCRIPTION

Funded by intra-community funds FEDER, PO Norte and PO LVT, DataLab is a research infrastructure that integrates the Portuguese Roadmap of Research Infrastructures as published by Fundação para a Ciência e a Tecnologia (FCT) in it RNIE 2020, on June 2020.

This research infrastructure provides all the essential conditions for advanced research in Social Sciences. It does so by providing access to the most complete bibliographic and statistical datasets in the fields of Economics, Finance and Management.

DataLab has also set up its Safe Center, a physical infrastructure that hosts unique administrative microdata. This infrastructure provides support to global researchers and students, as well as to public and private institutions that can use it to host their data, making it broadly available to the scientific community. Said creates opportunities for conducting cutting-edge research in a secured environment.

Furthermore, DataLab supports the SHARE Project, which offers a multidisciplinary and cross-national database of microdata on health, socio-economic status, and psychological aspects of approximately 140,000 individuals (over 50 years old) from across Europe. SHARE is a research infrastructure for studying the effects of health, social, economic and environmental policies over the life-course of European citizens and beyond. The participation in this infrastructure is a major asset to DataLab, as it places Portugal in an international network as one of the countries with the highest number of registered users in the SHARE project per 1000 inhabitants.

## ACTIVITIES & IMPACT

DataLab's main activity is to provide free access to the most complete set of databases for research in the Social Sciences. DataLab also supports public and private institutions by providing an infrastructure where they can make their data available to the scientific community. It also provides research assistance to studies using the databases at the DataLab. Finally, it provides users with training and support, as well as communication services.

DataLab works towards scientific excellence and, in 2020, it has contributed to the development of 120 published scientific articles, 803 Master thesis, 11 PhD thesis and 25 working papers. In association with public institutions, it also offers the research community access to unique administrative microdata, through its Safe Center.

SHARE Project contributes to evidence-based policy design on EU/global levels, having organized a national conference (2018) in which users discussed the results of research based on data from the project - "Ageing in Portugal and Europe: SHARE as a Social Research Infrastructure" at Calouste Gulbenkian Foundation, and in 2019 participated in the international user conference in Budapest. By fostering the SHARE Project, DataLab helps political decisions become more targeted and effective. With its broad data on the economic, social and health situation of European citizens, SHARE enables national policy makers to base difficult decisions on evidence and allows for the measurement of the impact of political decisions. SHARE data is distributed online through a dedicated data centre.

## FACTS AND FIGURES SHARE PROJECT

## INFRASTRUCTURES AND FACILITIES

DataLab has recently set up an additional feature in its Safe Center, which supports research projects, forthcoming publications, and overall scientific production by fostering data collection, storage, and analysis. On that sense, DataLab provides computing capacity, namely access to servers for storage, with the possibility to run data analysis software such as Python, R, Stata, and Octave. Users of this infrastructure are strongly invited to make their research broadly available to the scientific community. Access to these functionalities follows specific security measures that protect data from being damaged, lost, or used by unauthorized users.

## RESEARCH OUTPUTS

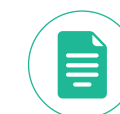
All NOVA SBE students and the scientific community benefit from resources provided by DataLab for their research. Thus, in the year 2020, DataLab contributed to the following scientific production:



**120 PUBLISHED SCIENTIFIC ARTICLES**



**11 PHD THESIS  
803 MASTER THESIS**



**25 WORKING PAPERS**

### TEACHER'S IMPACT ON STUDENT LEARNING: ESTIMATES FOR PORTUGAL

**COORDINATOR: PROF. LUIS CATELA NUNES  
STATUS: ONGOING**

### GPS4SUCCESS: EARLY IDENTIFICATION OF STUDENTS AT RISK OF SCHOOL SUCCESS / FAILURE

**COORDINATOR: PROF. ANA BALCÃO REIS  
STATUS: ONGOING**

**204** Researchers associated with Portuguese scientific institutions

More than **2950** publications based on SHARE data have been published by worldwide users

## SCIENTIFIC AREAS

### SOCIAL & CULTURAL INNOVATION

**YEAR OF ENTRY  
IN THE NATIONAL ROADMAP**  
2014

**FUNDING  
FOR 2017-2021**

**TOTAL PUBLIC INVESTMENT**  
2 139 599 €  
**NOVA**  
1 265 554 €

**TYPE**  
DISTRIBUTED

### INSTITUTIONAL PARTNERS / NODES

NOVA School of Business and  
Economics (Nova SBE)  
University of Minho (UM)

## PPBI

### > NAME

PORTUGUESE PLATFORM  
OF BIOIMAGING

### > ACRONYM

PPBI

### > RESEARCH INFRASTRUCTURE COORDINATOR

Paula Maria Sampaio Fonseca  
(IBMC)

### > COORDINATORS AT NOVA

António Jacinto (NMS)  
Adriano Henriques (ITQB NOVA)

### > CONTACTS

aoh@itqb.unl.pt

### > WEBSITE

www.ppbi.pt



## BRIEF DESCRIPTION

NOVA represents two important nodes of the Portuguese Platform form Bioimaging (PPBI): the Bacterial Imaging Cluster (BIC) from ITQB NOVA and CEDOC Microscopy Facility from Nova Medical School (NMS). Both nodes also integrate the COLife network, a collaborative infrastructure in the Lisbon area. The BIC cluster is housed in a biosafety level II facility and includes equipment optimized for work on microbiology and host-pathogen interactions. Although centered on microbiology applications, BIC also supports researchers from other fields including plant cell biology, animal cell biology and developmental biology. The CEDOC Microscopy Facility includes equipment optimized to work on live specimens both for cells and whole organisms, but also for fixed imaging and super-resolution. Further, both nodes congregate highly specialized researchers with expertise in advanced imaging and image analysis solutions, with special emphasis on microbiology and host-pathogen interactions on BIC node and image analysis and quantification on CEDOC Microscopy Facility.

## ACTIVITIES & IMPACT

The activities of the nodes, in the context of the PPBI, are well illustrated by selected publications: Silva A V., Edel M, Gescher J, Paquete CM. Exploring the Effects of *bolA* in Biofilm Formation and Current Generation by *Shewanella oneidensis* MR-1. *Front Microbiol.* 2020;11. doi:10.3389/fmicb.2020.00815; Reichmann NT, Tavares AC, Saraiva BM, et al. SEDS-bPBP pairs direct lateral and septal peptidoglycan synthesis in *Staphylococcus aureus*. *Nat Microbiol.* 2019;4(8):1368-1377. doi:10.1038/s41564-019-0437-2; Fernandes CG, Martins D, Hernandez G, et al. Temporal and spatial regulation of protein cross-linking by the pre-assembled substrates of a *Bacillus subtilis* spore coat transglutaminase. *PLoS Genet.* 2019;15(4):e1007912. doi:10.1371/journal.pgen.1007912; Nunes F, Fernandes C, Freitas C, et al. SpoVID functions as a non-competitive hub that connects the modules for assembly of the inner and outer spore coat layers in *Bacillus subtilis*. *Mol Microbiol.* 2018;110(4):576-595. doi:10.1111/mmi.14116; Monteiro JM, Pereira AR, Reichmann NT, et al. Peptidoglycan synthesis drives an FtsZ-treadmilling-independent step of

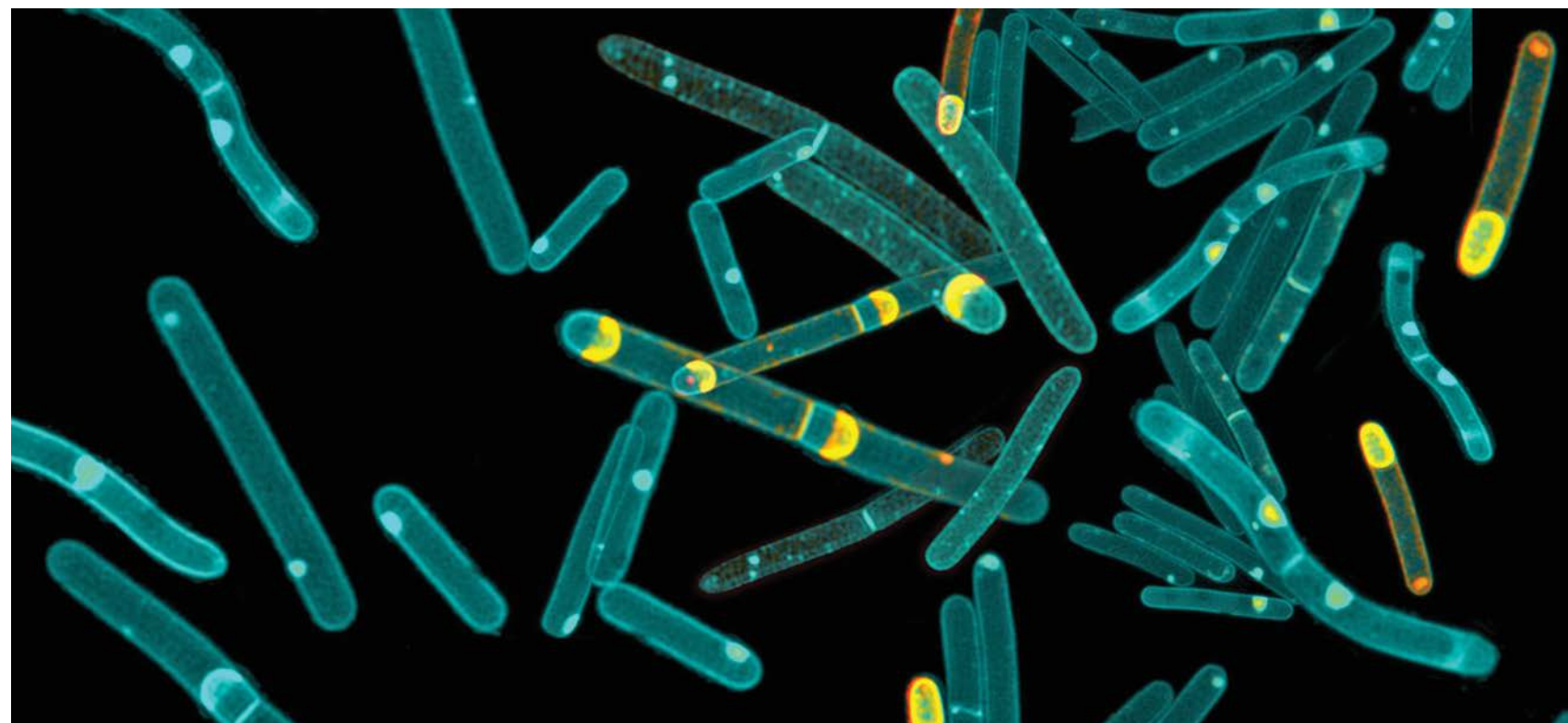
cytokinesis. *Nature.* 2018;554(7693):528-532. doi:10.1038/nature25506; Joana F. Silva-Rodrigues, Cátia F. Patrício-Rodrigues, Vicente de Sousa-Xavier, Pedro M. Augusto, Ana C. Fernandes, Ana R. Farinho, João P. Martins, Rita O. Teodoro, Peripheral axonal ensheathment is regulated by *RalA* GTPase and the exocyst complex, *Development* 2020 147: dev174540 doi: 10.1242/dev.174540

In addition, both BIC and CEDOC Microscopy Facility participate regularly in science communication and outreach activities such as the Microdia (PPBI initiative), Microbe Day, and both ITQB NOVA and NMS CEDOC Open Day. Both nodes have also organized several courses on both basic and advanced concepts and techniques in conventional and super-resolution fluorescence microscopy, including the following examples: TBD Advanced course in the basics of microscopy, COLife organised course at the Champalimaud Center for the Unknown (20-30 students); Yearly (since 2019) Super-resolution microscopy at MolBios ITQB-NOVA PhD program Course: MolBios ITQB-NOVA PhD program (15 students), Fluorescence microscopy at Masters Biochemistry in Health (20 students), introduction to Fluorescence Microscopy at NOVA Biomedical Research Masters (20 students) and Super-resolution microscopy ITQB-NOVA, Oeiras, Portugal (25 students). Also, yearly since 2018, Fluorescence Microscopy and Flow Cytometry at Master in Biotechnology for Sustainability (10 students).

## INFRASTRUCTURES AND FACILITIES

The BIC cluster is housed in a biosafety level II facility at ITQB NOVA and includes two custom build Single Molecule Localization Microscopy (SMLM), one Zeiss Airyscan Confocal, two Widefield systems and one cell sorter all optimized for microbiology and host-pathogen interaction centered biological questions.

The CEDOC Microscopy Facility at NMS includes one Spinning-disk confocal with laser ablation system, two laser scanning confocals, a state of the art Zeiss 980 with Airyscan 2 and a Zeiss 710, a Zeiss Screening widefield platform among other widefield systems and stereoscopes, all equipped with live imaging capabilities.



## SCIENTIFIC AREAS HEALTH AND FOOD

### YEAR OF ENTRY IN THE NATIONAL ROADMAP

2014

### FUNDING FOR 2017-2021

TOTAL PUBLIC INVESTMENT 2 139 599 €  
NOVA 838,00 €

### TYPE DISTRIBUTED

### INSTITUTIONAL PARTNERS / NODES

Institute for Molecular and Cell Biology (IBMC)

CNC - Center for Neuroscience and Cell Biology (CNC)

Calouste Gulbenkian Foundation - Instituto Gulbenkian Ciência (FCG-IGC)

University of Minho, Life and Health Sciences Research Institute (ICVS/3B's/UMinho)

International Iberian Laboratory of Nanotechnology (INL)

Instituto Nacional de Engenharia Biomédica (INEB)

Institute of Molecular Pathology and Immunology of the University of Porto (IPATIMUP)

University of Aveiro, Institute of Biomedicine (iBiMED/UA)

University of Coimbra (UC)

Health Sciences Research Centre of University of Beira Interior (CICS-UBI)

Instituto de Medicina Molecular João Lobo Antunes (iMM)

Faculty of Sciences of the University of Lisbon (FCUL)

Institute of Chemical and Biological Technology António Xavier (ITQB NOVA)  
NOVA Medical School (NMS)

D. Anna de Sommer Champalimaud and Dr. Carlos Montez Champalimaud Foundation (CF)

Instituto Superior Técnico, Institute for Bioengineering and Biosciences (iBB/IST)  
University of Algarve (UALg)



## Pt-mBRCN/MIRRI-PT

### > NAME

PORTUGUESE MICROBIOLOGICAL  
RESOURCES CENTER NETWORK/  
MICROBIAL RESOURCE RESEARCH  
INFRASTRUCTURE – PORTUGAL

### > ACRONYM

Pt-mBRCN/MIRRI-PT

### > RESEARCH INFRASTRUCTURE COORDINATOR

Nelson Lima (MUM, CEB/UM)

### > COORDINATOR AT NOVA

José Paulo Sampaio  
(FCT NOVA)

### > CONTACTS

jss@fct.unl.pt

### > WEBSITE

www.mbrcn.pt



Portuguese  
microBIOlogical  
Resource Center  
Network

### BRIEF DESCRIPTION

Pt-mBRCN is a national network of microbial culture collections that covers different types of microorganisms and includes various microbial taxonomic experts. This network provides microbial resources for the advancement of biotechnology, human health, and research in Life Sciences. Pt-mBRCN congregates Portuguese microbial culture collections from academic and governmental research institutions that aim at implementing common policies and procedures for quality control and quality assurance. Pt-mBRCN provides high quality microbial resources, their associated data and related services, under an updated legal framework.

The role of NOVA in the network is mediated through PYCC, the Portuguese Yeast Culture Collection (<https://pycc.bio-aware.com/>). This culture collection is specialized in yeasts and is the oldest culture collection in Portugal, having been founded in 1952. PYCC was transferred to NOVA in 1996. PYCC together with MUM, the collection of Universidade do Minho coordinated by Nelson Lima, steered the formation of the network in 2017. PYCC is involved in the coordination of the Portuguese Microbiological Resources Center Network since then.

### ACTIVITIES & IMPACT

Products derived from microorganisms include drugs, antimicrobials, biopesticides, biomass and industrial enzymes. Their uses include nutrition, biocontrol, and biofuel production. Pt-mBRCN aims for better-managed resources which will lead to further discoveries in all areas of the life sciences including healthcare and innovative solutions and products for biotechnology. The network is working to launch a one-stop website platform that will constitute the Portuguese catalogue of microorganisms. Also, Pt-mBRCN will coordinate the participation of Portugal in the ESFRI research infrastructure MIRRI whose headquarters are located at University of Minho, Portugal. The technology to be used in the project will contribute to the long-term preservation of microbial resources, increasing the competitiveness of the whole network, as well as that of its users, including academia and the full spectrum of industry players, while the entire society will benefit from securing the national microbial diversity in the right hands.

### INFRASTRUCTURES AND FACILITIES

Eleven culture collections located at Braga (CDB, MUM), Coimbra (ACOI, UCCB), Lisbon (INIAV, GHTM, PYCC), Porto (IVDP, LEGE-CC), Vila Real (IPB), and Azores (LRV).



### INSTITUTIONAL PARTNERS / NODES

MUM – Micoteca da Universidade do Minho, CEB/Centro de Engenharia Biológica, Universidade do Minho (CEB/UM)

CDB – Coleção do Departamento de Biologia, CBMA/Centro de Biologia Molecular e Ambiental, Universidade do Minho (CBMA/UM)

LEGE-CC – Blue Biotechnology and Ecotoxicology Culture Collection, CIIMAR/Centro Interdisciplinar de Investigação Marinha e Ambiental, Universidade do Porto (CIIMAR/UP)

CIMOCC – Mountain Research Centre Culture Collection, CIMO/ Centro de Investigação de Montanha, Instituto Politécnico de Bragança (CIMO/IPB)

Instituto dos Vinhos do Douro e Porto, I.P., (IVDP); Laboratório Regional de Veterinária dos Açores, DRAG/Direção Regional da Agricultura (LRV/DRaAg)

ACOI – Algoteca de Coimbra, Universidade de Coimbra (UC)

UCCCB – Coleção de Culturas de Bactérias da Universidade de Coimbra, Universidade de Coimbra (UC)

PYCC – Portuguese Yeast Culture Collection, NOVA School of Science and Technology (FCT NOVA, Co- Coordinating entity)

BIOTROP – Biotropical Resources, Global Health and Tropical Medicine Center, NOVA Institute of Hygiene and Tropical Medicine (GHTM/IHMT-NOVA)

Instituto Nacional de Investigação Agrária e Veterinária, I.P., State Laboratory of the Ministry of Agriculture, Forests and Rural Development (INIAV)

## SCIENTIFIC AREAS HEALTH AND FOOD

YEAR OF ENTRY  
IN THE NATIONAL ROADMAP  
2020

FUNDING  
FOR 2017-2021  
N.A.

TYPE  
DISTRIBUTED





## PT-OPENSREEN

### > NAME

NATIONAL INFRASTRUCTURE  
FOR CHEMICAL BIOLOGY  
AND GENETICS

### > ACRONYM

PT-OPENSREEN

### > RESEARCH INFRASTRUCTURE COORDINATOR

Antonio Pombinho (i3S)

### > COORDINATOR AT NOVA

Pedro Cravo (IHMT-NOVA)  
(CEDOC)  
(ToxOmics)

### > CONTACTS

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### > WEBSITE

www.pt-openscreen.pt

### BRIEF DESCRIPTION

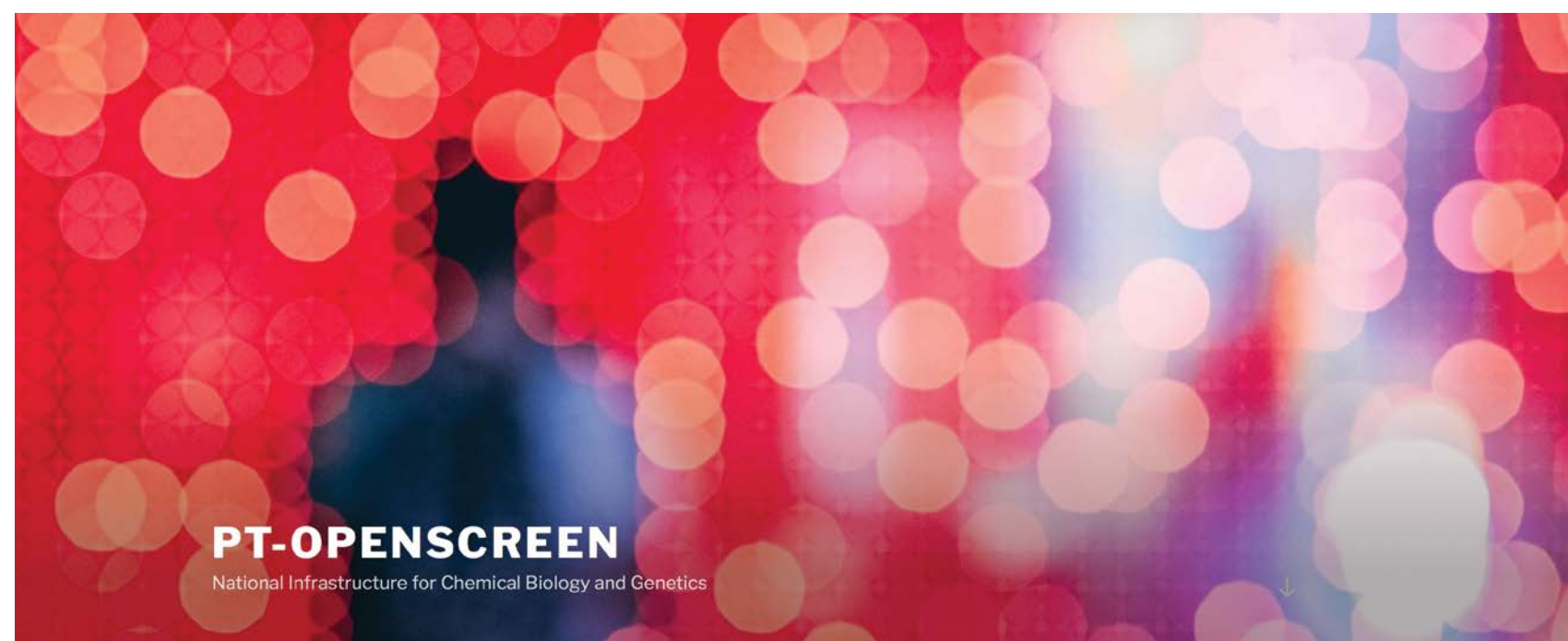
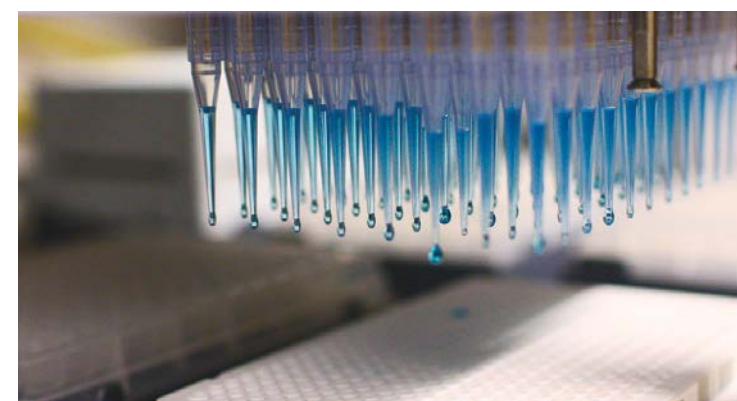
PT-OPENSREEN brings together national chemistry and biology academic institutions with the goal of finding new biological activities for chemical compounds that can be further explored as therapeutics. Through sample miniaturisation and state of the art technologies, hundreds of thousands of compounds are cost and time effective screened in biological assays. Including target discovery and medicinal chemistry for optimisation of compounds, PT-OPENSREEN aims to provide high quality candidate compounds to clinics.

### ACTIVITIES & IMPACT

PT-OPENSREEN aims to bridge traditional research areas such as cell, molecular and structural biology, and organic and medicinal chemistry; to operate a state of the art infrastructure for basic and applied research in the fields of chemical biology and genetics and to provide Open Access to users; to build a library of Portuguese chemical compounds; and to coordinate the participation of Portugal in the Pan European ESFRI infrastructure EU OPENSREEN, accessing the European Chemical Biology Library. Ultimately, the mission of PT OPENSREEN is to identify new molecular probes/tools for research and new potential therapeutics. PT-OPENSREEN co-development strategies with national and international partners from academia, industry and clinics, have high translational and application potential of research outcomes for pharmaceutical, biotechnology and agrochemical industries. In each sector, it could serve the full spectrum of companies, from SMEs and mid-size biotech to large pharmaceutical and agricultural companies. Since PT-OPENSREEN activities rely on the newest technologies and gathers members of industry and academia, it will allow to attract and create the conditions to train and retain specialised human resources in the knowledge and pharma and biotech sectors, to increase the collaboration between these sector companies and the number of pharmaceutical SMEs/start-ups with export activity. Altogether, state of the art equipment, participation in the EU-OPENSREEN, and the chemical biology knowledge base of the PTOPENSREEN, will position Portugal as very competitive in the life sciences area in Europe. Therefore, this project is expected to result in a strong positive impact on the participation of national institutions in international networks and projects, and on the national production of scientific publications and patents.

### INFRASTRUCTURES AND FACILITIES

PT-OPENSREEN congregates several research centres with state-of-the-art infrastructures, instruments and expertise to address important public health and biology related issues. High throughput, high content technologies are available for compound screening, genetic screening, toxicology assessment, assay and development, liquid handling, automated microscopy, multimode microplate readers and image and data analysis. Infrastructures for in vivo compound screening are also available.



### SCIENTIFIC AREAS

#### HEALTH AND FOOD

#### YEAR OF ENTRY IN THE NATIONAL ROADMAP

2020

#### FUNDING FOR 2017-2021

N.A.

#### TYPE DISTRIBUTED

#### INSTITUTIONAL PARTNERS / NODES

Instituto de Investigação e Inovação em Saúde (i3S) – Coordinating entity

Centro de Biologia Molecular e Ambiental (CBMA)

Centro de Biotecnologia dos Açores (CBA)

Centro de Engenharia Biológica da Universidade do Minho (CEB-UM)

Centro de Estudos de Doenças Crónicas (CEDOC)

Centro de Investigação de Engenharia Química e Biotecnologia (CIEQB)

Centro de Investigação em Química da Universidade do Porto (CIQUP)

Centro de Neurociências e Biologia Celular (CNC)

Centro de Química da Madeira (CQM)

Centro de Química da Universidade do Minho (CQUM)

Centro de Química de Coimbra (CQC)

Centro de Química Estrutural (CQE)

Centro de Toxicogenómica e Saúde Humana (ToxOmics)

Centro Interdisciplinar de Investigação Marinha e Ambiental (CIIMAR)

Instituto de Biomedicina – Aveiro (iBiMED)

Instituto de Biosistemas & Ciências Integrativas (BioISI)

Instituto de Ciências da Vida e da Saúde (ICVS)

Instituto de Higiene e Medicina Tropical (IHMT)

Instituto de Investigação do Medicamento (iMed.Ulisboa)

Instituto de Medicina Molecular (iMM)

## PtCAC

### > NAME

PORTUGUESE NETWORK OF  
CLINICAL ACADEMIC CENTERS

### > ACRONYM

PtCAC

### > RESEARCH INFRASTRUCTURE COORDINATOR

Manuel Sobrinho Simões (FMUP)  
Agência de Investigação Clínica  
e Inovação Biomédica (AICIB)

### > COORDINATOR AT NOVA

Jaime Branco (NMS)

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### > WEBSITE

Under construction

## BRIEF DESCRIPTION

The “National Network of Clinical Academic Centres”, coordinated by AICIB – Agência de Investigação Clínica e Inovação Biomédica, integrates eight clinical academic centres already established, as well as in those to be established in the future. This Infrastructure aims to stimulate and ensure the development of care, teaching, clinical, and translational research activities in an integrated way, with the purpose of applying knowledge and scientific evidence to improve health.

The University Medical Centre of Lisbon (Centro Médico Universitário de Lisboa – CMUL) is a consortium between Centro Hospitalar Universitário de Lisboa Central (CHULC) and NOVA Medical School (NMSIFCM), as established through Portaria n°225-A/2015 of 30th July.

The creation of the University-Medical consortium has enhanced the expertise of each institution. The organised and systematic use of the existing synergies between CHULC and NMSIFCM achieve this in an integrated way between research (with knowledge creation), knowledge application (with improvement of care provided to the population) and education (regarding pre and post-graduate education, and training of professionals). The experience of the last decades shows that care, teaching and research are inseparable and their combination is mandatory for today's success of any institution that aims to develop excellence and a highly differentiated medical care. There are no outstanding services without the support of research and without the encouragement of teaching, which are fundamental drivers of knowledge development and innovation. Likewise, there is no quality in a medical education disconnected from the clinical practice. Just as there is no innovative research without a regular contact with clinicians who deal with patients on a daily basis. This is the reason why, globally, hospitals are recognised today as benchmarks for quality, innovation and efficiency. Institutions that know not only how to integrate care, education and research, but also to develop strategies that enhance synergies between all three components. Thus, affirming themselves as the scientific support of a diversified network of health services in a given geographic area, according to the model of academic or university medical centres. CHULC and NMSIFCM have already developed a highly demanding path in the modernisation of their services and programmes, and in the coordination between its various areas of intervention.

CHULC has taken significant steps in the reorganisation and development of excellence in the hospital services in key areas of healthcare. NMSIFCM has carried out an ambitious curricular reform of the medical degree, launched new doctoral programmes, and developed considerably its research capacity with the creation of new research centres along with the inauguration of a new research location at the Santana Campus. Thanks to this work, the vast majority of clinical teaching at NMSIFCM is already carried out in collaboration with CHULC services, a significant number of young doctors from the CHULC develop their doctoral programmes at NMSIFCM and an increasing number of research projects involve the participation of NMSIFCM and CHULC researchers and clinicians. Finally, the launch of the iNOVA4Health platform, with a significant participation of members from NMSIFCM and CHULC, has paved the way for the involvement of both parties in one of the most innovative medical research projects in Portugal.

Finally, the consortium may in the future include other public institutions that, due to their relevance, enable the development of differentiating expertise in the promotion of care, academic and research activities.

## ACTIVITIES & IMPACT

The consortium aims to pursue the following objectives:

- A** Effective use of synergies in the various areas of action and promotion of highly differentiated human resources mobility;
- B** Introduction of innovative programmes and strategic partnerships that enable qualitative improvements in community participation and contribution to obtain external funding;
- C** Rationalisation and maximisation of human, financial and technological resources available;
- D** Development of collaborative actions that promote quality health care based on basic and clinical medical sciences contributions and medical services available at the Hospital;
- E** Development of collaborative actions that contribute to the development of innovative integrated care based on an increased contact between primary, hospital and continued care;
- F** Development of collaborative research projects that strengthen national and international cooperation, maximising the opportunities offered by the participation of both parties in iNOVA4Health and or in other similar initiatives that may be created;
- G** Modernization and qualification of medical education, in both post-graduate and continued-medical education dimension, taking advantage of the synergies that may be created with the education and training that will be developed for future professionals;
- H** Promotion of a common culture focused on academic and clinical excellence in an international context and trans-European networks;
- I** Promotion of the quality of care provided to the population based on an adequate response to their different needs;
- J** Deepen investment in strategic areas;
- K** Develop the maximum potential available, both in terms of human and material resources, to ensure the combination of basic and translational research with services, clinical care and medical education that is necessary to achieve significant improvements in health care.

## SCIENTIFIC AREAS

### HEALTH AND FOOD

**YEAR OF ENTRY  
IN THE NATIONAL ROADMAP**  
2020

**FUNDING  
FOR 2017-2021**  
N.A.

**TYPE**  
DISTRIBUTED

### INSTITUTIONAL PARTNERS / NODES

Conselho Nacional dos Centros Académicos Clínicos (CNCAC):

Centro Académico Clínico das Beiras (CACB): Centro Hospitalar Cova da Beira, E. P. E., Unidade Local de Saúde da Guarda, Unidade Local de Saúde de Castelo Branco, Centro Hospitalar Tondela-Viseu, E. P. E., Universidade da Beira Interior (Faculdade de Ciências da Saúde), Centro de Investigação em Ciências da Saúde, Instituto Politécnico de Castelo Branco (Escola Superior de Saúde Dr. Lopes Dias), o Instituto Politécnico da Guarda (Escola Superior de Saúde) and Instituto Politécnico de Viseu (Escola Superior de Saúde);

Centro Académico Clínico de Coimbra (CHUC – UC): Centro Hospitalar e Universitário de Coimbra, E. P. E. (CHUC), Universidade de Coimbra (UC);

Centro Académico Clínico ICBAS – CHP (ICBAS-CHP): Centro Hospitalar do Porto, E. P. E., (CHP), Universidade do Porto (Instituto de Ciências Biomédicas Abel Salazar - ICBAS);

Centro Académico de Investigação e Formação Biomédica do Algarve (AD-ABC): Centro Hospitalar Universitário do Algarve, E. P. E., (CHUA), Universidade do Algarve (CBMR – Center for Biomedical Research, Departamento de Ciências Biomédicas e Medicina, DCBM);

Centro Académico de Medicina de Lisboa (CAML): Centro Hospitalar de Lisboa Norte, E. P. E. (CHULN), Faculdade de Medicina da Universidade de Lisboa (FMUL), Instituto de Medicina Molecular João Lobo Antunes (iMM);

Centro Clínico Académico — Braga (2CA.Braga): Universidade do Minho (UMinho), Escala Braga – Entidade Gestora de Estabelecimentos, S. A., Hospital CUF Porto, S. A.;

Centro Médico Universitário de Lisboa (CMUL): Centro Hospitalar de Lisboa Central, E. P. E. (CHLN), Faculdade de Ciências Médicas da Universidade Nova de Lisboa (NMS) em fase de alargamento aos Centro Hospitalar de Lisboa Ocidental, Centro Hospitalar Psiquiátrico de Lisboa, Escola Nacional de Saúde Pública e ACEs correspondentes aos Centros Hospitalares;

Centro Universitário de Medicina FMUP – CHSJ (CUME), Centro Hospitalar de São João, E. P. E. (CHSJ), Universidade do Porto (Faculdade de Medicina – FMUP).



## PtCRIN

### > NAME

PORTUGUESE CLINICAL  
RESEARCH INFRASTRUCTURE  
NETWORK

### > ACRONYM

PtCRIN

### > RESEARCH INFRASTRUCTURE COORDINATOR

Maria Emília Monteiro (NMS)

### > COORDINATOR AT NOVA

Maria Emília Monteiro (NMS)

### > CONTACTS

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### > WEBSITE

www.ptcrin.pt

## BRIEF DESCRIPTION

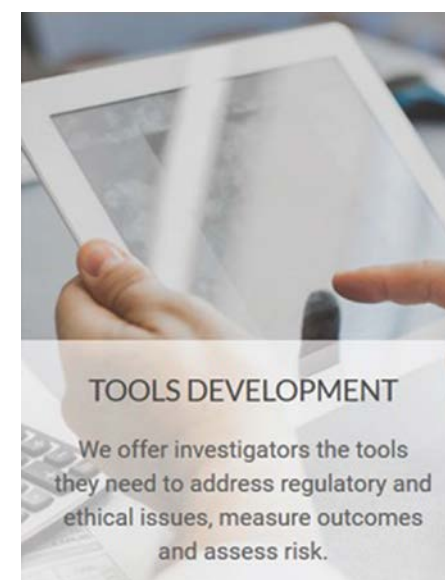
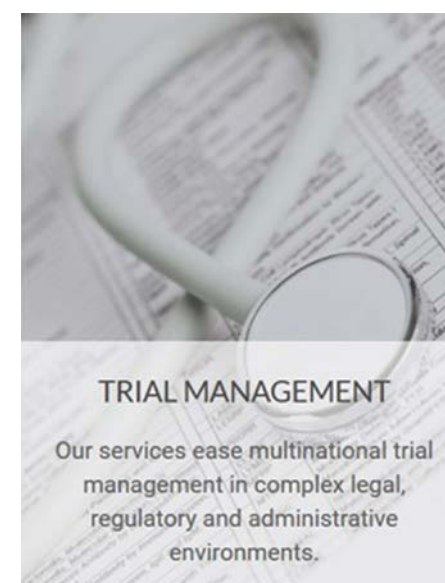
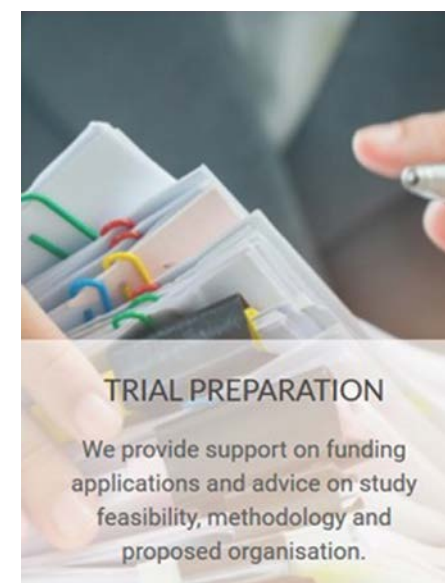
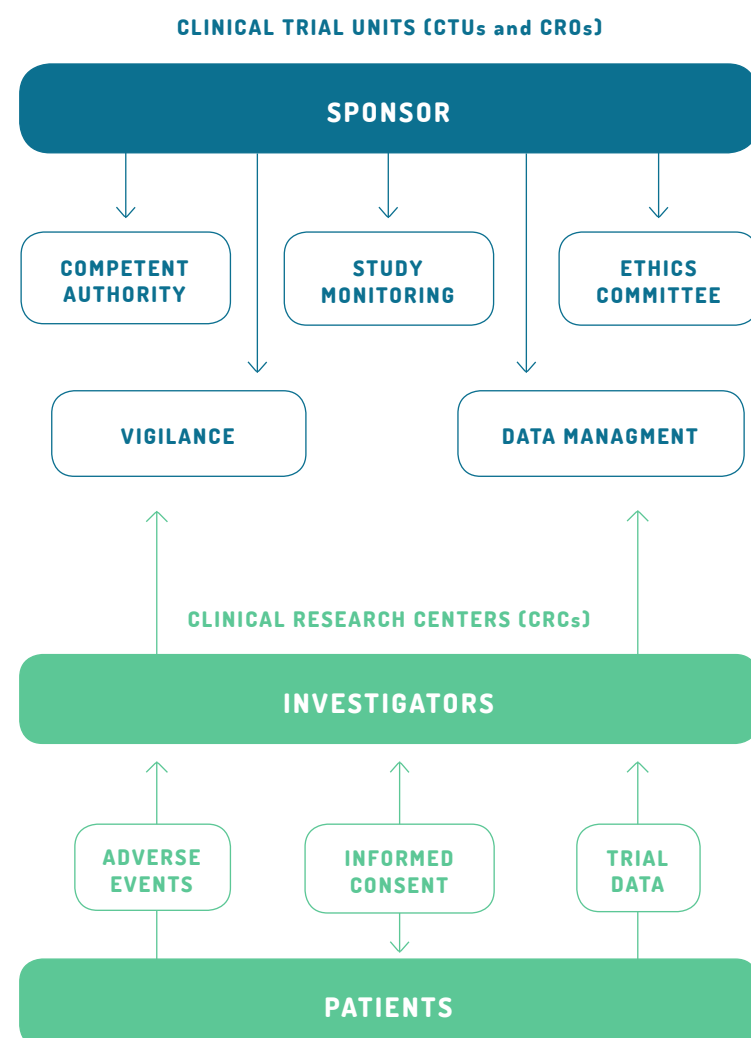
PtCRIN is an infrastructure dedicated to improve national clinical research by promoting a more efficient implementation of multinational investigator initiated clinical trials, fostering the capture of international fund and making Europe a single area for clinical research through the link to European counterpart's infrastructure – ECRIN-ERIC (<https://ecrin.org/>). PtCRIN is the Portuguese hub of ECRIN-ERIC.

## ACTIVITIES & IMPACT

Multinational clinical trials provide the highest level of evidence to support the use of health technologies (drugs, cell therapies, devices, etc) but require specific infrastructures to deal with the complex requirements: – clinical research centers (CRC) that manage the patients and implement the studies, and clinical trial units (CTUs or CROs) that manage the whole study from the design, funding, regulatory approval, monitoring, publication, etc.

## INFRASTRUCTURES AND FACILITIES

- PtCRIN implemented a network of academic CTUs in Portugal that provide general services for clinical studies following the standards/certification of the ECRIN-ERIC, at a not-for-profit rates to public sponsors and SMEs.
- Currently PtCRIN is a consortium of 10 national R&D institutions that host CTUs or equivalent units limited to the provision of specific services (statistics, informatics), and 11 affiliated health care units that work in close articulation, but is open to all.



## SCIENTIFIC AREAS

### HEALTH AND FOOD

## YEAR OF ENTRY IN THE NATIONAL ROADMAP

2020 (since 2014 in the European Roadmap, founding member of ECRIN-ERIC)

## FUNDING

FOR 2017-2021

50 000€ / YEAR

## TYPE

DISTRIBUTED

## INSTITUTIONAL PARTNERS / NODES

Full members:

Nova Medical School da Universidade Nova de Lisboa (NMS/UNL);

Centro de Investigação em Tecnologias e Serviços de Saúde da Faculdade de Medicina da Universidade do Porto (CINTESIS - FM/UP);

Unidade Multidisciplinar de Investigação Biomédica do Instituto de Ciências Biomédicas Abel Salazar (UMIB - ICBAS/UP);

Centro Hospitalar Universitário do Porto (CHUP);

Centro Clínico Académico de Braga (2CABraga);

Instituto de Biomedicina da Universidade de Aveiro (iBiMED);

Centro de Imagem Biomédica e Investigação Translacional da Universidade de Coimbra (CIBIT-UC);

Associação Para a Investigação Biomédica e Inovação Em Luz e Imagem (AIBILI);

Centro Cardiovascular da Universidade de Lisboa (CCUL);

Comprehensive Health Research Centre da Nova Medical School da Universidade Nova de Lisboa (CHRC-NMS/UNL);

Instituto de Medicina Molecular João Lobo Antunes (IMM), includes CIC-CAML;

iNOVA4Health – Programa de Medicina Translacional (iBET, CEDOC-NMS/UNL, IPOLFG e ITQB-UNL).

Affiliated Members:

Centro Hospitalar de Lisboa Ocidental (CHLO);

Centro Hospitalar Universitário de Lisboa Central (CHULC);

Hospital Prof. Doutor Fernando Fonseca (HFF);

Hospital da Luz Learning Health;

Centro Hospitalar Universitário Cova Beira (CHUCB);

Centro Hospitalar e Universitário de Coimbra (CHUC);

Centro Hospitalar de Leiria (CHL);

Centro Hospitalar Universitário de São João (CHSJ);

Instituto Português de Oncologia do Porto (IPO-P);

Hospital da Senhora da Oliveira Guimarães (HSOG);

Algarve Biomedical Center (ABC);

Hospital do Santo Espírito da Ilha Terceira (HSEIT).

## PTNMR

### > NAME

PORTUGUESE NUCLEAR  
MAGNETIC RESONANCE  
NETWORK

### > ACRONYM

PTNMR

### > RESEARCH INFRASTRUCTURE COORDINATOR

Eurico Cabrita (FCT NOVA)

### > COORDINATORS AT NOVA

Eurico Cabrita (FCT NOVA)  
Ricardo Louro (ITQB NOVA)

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### > WEBSITE

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### BRIEF DESCRIPTION

Nuclear Magnetic Resonance (NMR) spectroscopy covers a plethora of methods and techniques, key for the study and characterization of new materials, fine chemicals and biological samples at the molecular level, with applications in health, nutrition, energy and environment.

PTNMR is distributed over 4 regions, joining 9 academic institutions, and providing a coordinated access to a state-of-the-art and competitive platform of equipment, services and skills in NMR for the use of the scientific community in general, from the national and international private sector and academia.

The main goal of PTNMR is to promote innovation by providing scientific support for R&D activities in all scientific areas that require advanced characterization of materials, fine chemicals and biological samples, foster collaborative work between industry and academia, and organize and support advanced training activities. This can only be done by the maintenance of a single platform that supports the technical integration, sharing of knowledge and resources, and a combined management of the national NMR infrastructure, enabling access to modern and fully operational NMR spectrometers and the support to training and R&D initiatives.

The strategy to achieve PTNMR mission encompasses: (i) providing access to powerful state-of-the-art equipment, competitive at the national and international level; (ii) supporting fundamental and applied R&D initiatives from academia (iii) strengthening academia-industry interactions by actively promoting industry access to the RI; (iv) promoting the creation of scientific jobs; (v) promoting internationalization by creating synergies between PTNMR and related ESFRIs.

At NOVA, with a budget corresponding to 30 % of the total funding of the RI, the project supports 3 PhD technician positions and the upgrade and purchase of new NMR spectrometers (1.4 M € investment). This allows not only to reinforce routine analytical services but in particular to increase and expand the unique capabilities of the FCT and ITQB nodes concerning high-end structural biology services and techniques with a particular impact in Lifesciences research.

### ACTIVITIES & IMPACT

The PTNMR Network supports S&T activities, fostering knowledge transfer and promoting the involvement of national and foreign researchers in R&D projects in all areas of application of NMR including structural biology, materials science, drug design, metabolomics, natural products, and food science.

These activities comprise both fundamental and applied research in multiple areas of knowledge and most are in direct support of national or international funded R&D projects conducted by researchers from its associated Research Institutes and Universities; more than 200 scientific publications/year are directly supported by routine analytical services provided by PTNMR.

PTNMR provides access to cutting edge equipment that is crucial to increase the success rate of national researchers in calls for European projects, this has been recognized in several awards of MSCA, H2020 projects and grants from the European Research Council.

Through its nodes at NOVA, PTNMR is part of the Portuguese Centre for Integrated Structural Biology (PCISBIO) (coordinated by NOVA, Maria Arménia Carrondo), approved as an Affiliate Centre of Instruct-ERIC a pan-European Research Infrastructure in Structural Biology, which enhances opportunities for international collaborative research.

Currently, the support of PTNMR is a key factor to the success and implementation of approximately 100 on-going funded research projects in emergent areas of Life Sciences, Materials, Nanotechnologies and Nanosciences with a direct and broad impact on the socio-economic activities of the regions and the country. Access to the PTNMR infrastructure is available to academic and industry researchers from all countries.

The NOVA nodes at FCT and ITQB support routine analytical service in structural elucidation and provide NMR time for R&D for more than 200 researchers as internal users and service to companies.

PTNMR supports many graduate and postgraduate programs in its affiliated Research Institutes and Universities and directly supports a FCT PhD Program (PD00065/2013, coordinated by FCT-NOVA) in the field of NMR (12 PhD students). Through PTNMR endorsed training activities, researchers, PhD, MSc and BSc students have contact with experts and cutting-edge technologies, contributing at a significant level to increase their level of expertise and employability.

NOVA organizes regularly beginner and advanced NMR courses and supports NMR teaching by allocating spectrometer time to curricular units in different Master courses (e.g. Biochemistry and Bioorganic Chemistry) and PhD programs (e.g. Molecular Biosciences).

PTNMR has been continuously working to collaborate with industrial partners, to promote the technology available and to offer its analytical services to companies. The support of PTNMR to R&D initiatives has already allowed the establishment of joint research projects with industrial partners that wouldn't be possible without the infrastructure and associated know-how. The PTNMR network provides analytical and consulting service and support both in the quality control of raw materials and product identification, which are crucial to maintain the competitiveness of national companies in the global market.

### INFRASTRUCTURES AND FACILITIES

The infrastructure and facilities of PTNMR are the NMR laboratories of the 9 academic institutions in the network that gather 30 NMR spectrometers with a classical repartition of frequencies (6x300 MHz, 11x400 MHz, 7x500 MHz, 4x600 MHz, 1x700 MHz, 1x800 MHz) that can be generally grouped into two types: (a) Low field NMR spectrometers for routine analytical service (< 600 MHz) and (b) high field NMR spectrometers for specialized R&D (≥ 600 MHz). PTNMR is committed to a smart specialization strategy and complementary of services that take advantage of the excellence and expertise of each node. The nodes at NOVA are a good example of this specialization:

FCT-NOVA hosts two NMR laboratories with very distinct specialization fields, one located in the Chemistry Department (liquid state NMR mainly to support drug design and structural biology R&D) and another in the Materials Science Department (solid state NMR with emphasis in materials science and microimaging R&D).

At ITQB-NOVA the CERMAX (Centro de Ressonância Magnética António Xavier) has the sole high-field NMR spectrometer of 18.8T in the country operating at a proton frequency of 800 MHz, equipped with a cryogenic probehead for maximum sensitivity and particularly suitable for biomolecular NMR research and metabolomic studies.

### SCIENTIFIC AREAS

PHYSICAL SCIENCES  
& ENGINEERING

YEAR OF ENTRY  
IN THE NATIONAL ROADMAP  
2014

FUNDING  
FOR 2017-2021

TOTAL PUBLIC INVESTMENT  
6 843 554 €

NOVA  
1 148 251,14 € (FCT NOVA)  
913 902,14 € (ITQB NOVA)

TYPE  
DISTRIBUTED

### INSTITUTIONAL PARTNERS / NODES

NOVA School of Science and  
Technology (FCT NOVA)

Institute of Chemical and Biological  
Technology António Xavier (ITQB  
NOVA)

Instituto Superior Técnico (IST-UL)

University of Aveiro (UA)

University of Beira Interior (UBI)

University of Coimbra (UC)

University of Madeira (UMa)

University of Minho (UMinho)

University of Porto (UPorto)



## RNEM

> **NAME**  
PORTUGUESE MASS  
SPECTROMETRY NETWORK

> **ACRONYM**  
RNEM

> **RESEARCH  
INFRASTRUCTURE  
COORDINATOR**  
Maria Helena Ferreira  
da Silva Florêncio (FC/UL)

> **COORDINATOR  
AT NOVA**  
Isabel Abreu (ITQB NOVA)

> **CONTACTS**  
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> **WEBSITE**  
rnem.fc.ul.pt



### BRIEF DESCRIPTION

RNEM: The Portuguese Mass Spectrometry Network (Rede Nacional de Espectrometria de Massa, RNEM) is a distributed research infrastructure included in the Portuguese Roadmap of Scientific Research Infrastructures of Strategic Interest that provides state-of-art scientific expertise, advanced technology, training, and services in the areas of mass spectrometry, proteomics, and metabolomics. Established in 2006 under Fundação para a Ciência e a Tecnologia (FCT) scientific re-equipment program, it became integrated into the National Roadmap in 2016. RNEM comprises 10 Nodes that have been working synergistically as an FCT National Network since 2008.

The main objectives of RNEM are to enable scientific excellence, to support innovation, to foster scientific training and employment, thus empowering Portugal to address the Europe 2020 challenges. By rationalizing mass spectrometry and proteomics resources, RNEM provides competitive, state-of-art services and technologies that support research in chemistry, biochemistry, biotechnology, environment, pharmacology, and medicine that no single infrastructure in Europe can presently provide. Indeed, RNEM is critical to enable omic applications such as metabolomics, lipidomics and proteomics that are complementary to genomics but not limited to it. RNEM also provides applications and services based on small molecule identification and characterization, structural mass spectrometry (biological macromolecules and supramolecular chemistry), isotope ratio analysis and radiochemistry, among others. RNEM thus incorporates a wealth of multidisciplinary knowledge, technical skills and instrumental support that are unmatched by any other European facility.

**In particular, the ITQB NOVA node** is part of the Mass Spectrometry Unit (UniMS), a collaboration with its partner institution iBET. Its mission is to provide state-of-the-art MS services to the scientific community and Industry, guaranteed by the continuing increase in Mass Spectrometry know-how and infrastructures within our unit. This node involves a team of 2 PhD holders and one MSc holder.

Within RNEM, the ITQB NOVA node guarantees access to matrix-assisted Laser desorption/ ionization through its MALDI-TOF/TOF, a high-throughput tandem time-of-flight (TOF) MS/MS system with soft ionization. The MALDI-TOF/TOF is mainly used for protein identification, intact mass measurements and purity profile determination. Additionally, it is the ideal platform for mass spectrometry imaging. This system is easily operated and can therefore allow training for independent users and students. The equipment is routinely used to train MSc students in mass spectrometry and thus crucial in supporting teaching. Additionally, the ITQB NOVA node facilitates access to metabolite analysis and metabolomics within RNEM through its Q Exactive Focus mass spectrometer, allowing LC-MS/MS analyses.

### RNEM'S ACTION PLAN

The implementation plan was based on the critical selection and installation of differentiating equipment, complemented by mainstream equipment to reinforce the operational capacity in the areas of great demands, redefining RNEM's service portfolio according to experience and future needs of the scientific, governmental, and industrial communities. Qualified human resources were hired to implement this plan in the whole infrastructure and a Science Manager to support the infrastructure's activities, namely management, marketing, and dissemination actions.

To implement this action plan, four work-packages were foreseen, corresponding to the four tasks of the Project: WP1 – Excellent Research; WP2 – Services supporting academia, industry, and innovation; WP3 – Marketing and dissemination; WP4 – Training.

ITQB NOVA node is involved mostly in WP2 by providing services that support academia, industry, and innovation. Training (WP4) is a central aspect of the node as well – we provide teaching opportunities and are involved in training activities for the technical staff to keep knowledge up to date. For example, UniMS is a partner in a twinning project ("SymbNET" led by Dr. Luís Teixeira at IGC), which will provide exchange training opportunities with European MS facilities.

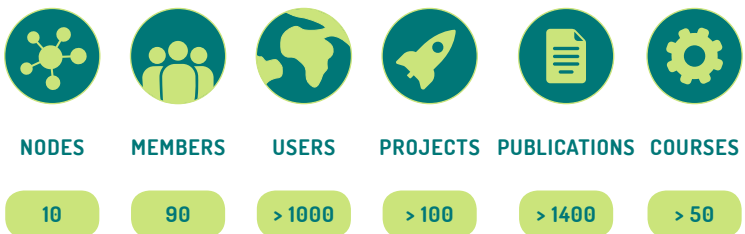
### IMPACT

RNEM was intentionally designed as a research and support infrastructure to provide scientific services and a technology platform to serve the national scientific community, the industrial and technological grid, and the Governmental agencies. This is the most direct route to render mass spectrometry technology and know-how available to Portugal in a distributed way. RNEM established, since its inception, a network of research and training activities and analytical services that could easily be accessed through a publicly available network portal. The web portal centralizes access to analytical services and the advertisement of the network's activities. Moreover, RNEM capacitated and enhanced the capabilities of strategic Portuguese Government agencies like INIAV, ASAE, The Portuguese Army and The Portuguese Criminal Police. RNEM will further evolve and become part of the country's global economy, attaining "world-class" status. RNEM is part of the national node of INSTRUCT-ERIC – Structural Biology.

### OUTLOOK

RNEM is the sole mass spectrometry infrastructure in the country and the only one of its kind in Europe. It represents Portugal in the main international scientific mass spectrometry and proteomics organizations and the participation of Portugal in Instruct-ERIC, the European Research Infrastructure on Integrative Structural Biology. Instead of being focused on a single application or technology, like its European counterparts, RNEM grants access to virtually all major mass spectrometry applications through a single access point at its web portal.

RNEM aims to achieve global recognition as an infrastructure of excellence in the field of mass-spectrometry and its applications. Thus, it will continue to increase research efficiency through networking, redundancy limitation, and maximization of resources. By providing access to the most advanced mass spectrometry resources, RNEM fosters scientific productivity, qualification of human resources and their employability. It will contribute to the finding of solutions for grand societal changes in biological and medical sciences, including healthy ageing, food safety and environment, by providing advanced technology, innovative services and consulting. Finally, RNEM intends to achieve operational sustainability and to invest in new instrumentation, novel technologies and to employ qualified human resources (either through fellowships or contracts).



## SCIENTIFIC AREAS HEALTH AND FOOD

**YEAR OF ENTRY  
IN THE NATIONAL ROADMAP**  
2014

**FUNDING  
FOR 2017-2021**  
**TOTAL PUBLIC INVESTMENT**  
3 194 900 €  
NOVA  
203 055,60 €

**TYPE**  
DISTRIBUTED

### INSTITUTIONAL PARTNERS / NODES

Faculdade de Ciências da Universidade  
de Lisboa (FC/UL)

Faculdade de Farmácia da Universidade  
de Lisboa (FF/UL)

Instituto de Tecnologia Química e  
Biológica (ITQB NOVA)

Instituto Superior Técnico (IST/UL)

Instituto Nacional de Saúde Dr. Ricardo  
Jorge (INSARJ)

Centro de Neurociências e Biologia  
Celular (CNBC/UC)

Universidade de Coimbra (UC)

Universidade de Aveiro (UA)

Instituto de Patologia e Imunologia  
Molecular (IPATIMUP/UP)

Universidade da Madeira (UMa)

## ROSSIO

### > NAME

SOCIAL SCIENCES, ARTS  
AND HUMANITIES

### > ACRONYM

ROSSIO

### > RESEARCH INFRASTRUCTURE COORDINATOR

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(NOVA FCSH)

### > COORDINATOR AT NOVA

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### BRIEF DESCRIPTION

ROSSIO is a research infrastructure that aims at aggregating, organizing and contextualizing digital objects in social sciences, arts and humanities (SSAH) based on their metadata descriptions. The latter are provided by a consortium of seven Portuguese academic, public and private institutions. The consortium is coordinated by the NOVA School of Social Sciences and Humanities (NOVA FCSH), and further includes the Municipal Archive of Lisbon, the Portuguese Film Archives, the Directorate General for Books, Archives and Libraries, the Directorate General for Cultural Heritage, the Calouste Gulbenkian Foundation and the D. Maria II National Theatre. The infrastructure also includes content provided by Arquivo.pt (Portuguese web-archive). ROSSIO is the Portuguese representative of DARIAH, the Digital Research Infrastructure for Arts and Humanities in Europe.

### ACTIVITIES & IMPACT

A platform is being developed to provide free and open access to search and content curation services based on the aggregated datasets. These services, aimed at researchers and the general public, will include the development and curation of digital exhibitions (DE), digital collections (DC) and a virtual research environment (VRE). The platform and its services will be made available to the public by the end of 2021.

Influenced by international platforms, such as the Digital Public Library of America, the British Library, PARTHENOS, the Europeana or the Pelagios project, ROSSIO's services intend:

- to promote the development of high-quality research on SSAH, stimulating scientific innovation and dissemination;
- to contribute to the internationalization of the Portuguese resources, deepening relations between "communities of practice"; and
- to build a network between academic and non-academic communities, such as researchers, teachers, students, archivists, librarians, and tourist guides.

Developed to disseminate scientific knowledge, the DE and DC services ensure the representativity of the consortium's institutions and the commitment with national and international open access policies. Adopting an interdisciplinary perspective, DE are directed to wider audiences, following a clear and direct narrative, by providing original research combined with impressive digital resources. DC are targeted at a more circumscribed audience, including scholars, students, and cultural industries. The topics of DC are more specialized, focusing on digital resources curated by ROSSIO's team. These services and datasets will also be made available through a web-based and comprehensive working environment, the VRE, which will include tools to optimize ROSSIO's platform experience.

The development of DE, DC, and VRE implies the reusing of tools, software, and data, assuring the future sustainability and interoperability of the platform. Directed to broader audiences, the DE and DC services will be built around the aggregated datasets, which requires the processing of data in different formats: text, image, video and audio. This eases the access to information, allowing the creation of dynamic digital narratives and the response to several societal needs, such as those caused by the COVID-19 pandemic. In this context, ROSSIO has collaborated with the Division of Libraries and Documentation of NOVA FCSH in creating a DE about epidemics through the centuries, using the digital collections of ROSSIO's partners.

As an innovative and community-oriented working environment, VRE will provide different tools for platform users, ensuring efficiency, flexibility and security. This allows the selection and organization of data, the creation of personal notes, and the promotion of collaborative scientific work through secure data sharing. The users of the VRE will be able to participate in the enrichment of the resources' metadata.

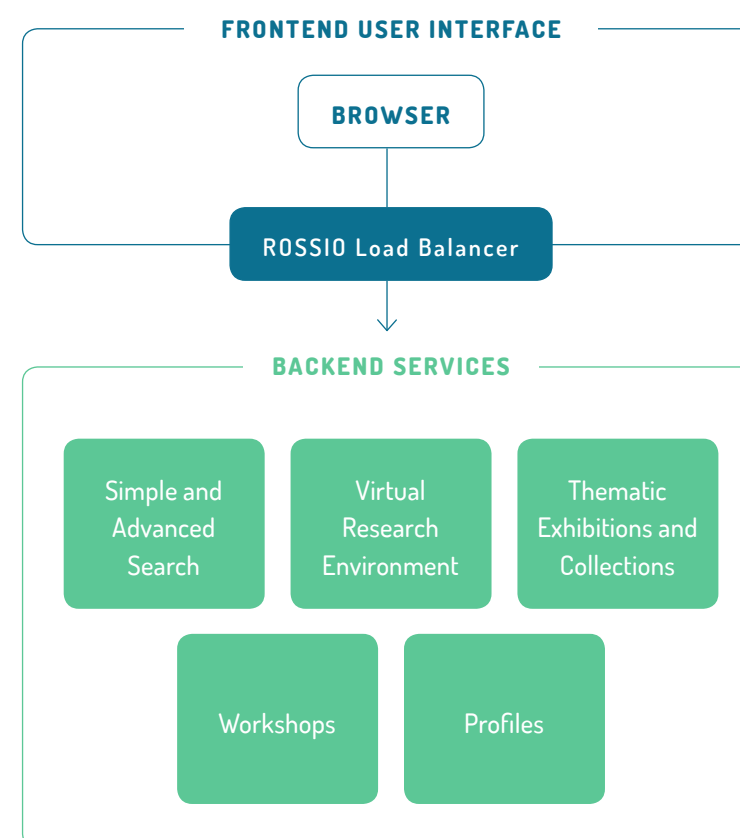
The ROSSIO platform will also provide functionalities to support researchers in the execution of their research data management plans and will publish any research data in compliance with the FAIR principles. The aggregated datasets will be described according to DCAT 2 (Data Catalogue Vocabulary), a W3C recommendation for enhancing the discoverability of datasets and data services in the Web, which will allow for interoperability with relevant aggregation services such as RCAAP (Scientific Open Access Repository of Portugal), OpenAire and the European Data Portal.

Data curation, management and discovery will be supported by several SKOS concept schemes, which are presently in development. The concept schemes include a vocabulary of general concepts, the ROSSIO Thesaurus as well as vocabularies for Agents, Places and Time periods. The vocabularies will be published as Linked Open Data following their integration in the platform.

### INFRASTRUCTURES AND FACILITIES

The ROSSIO Infrastructure will have two levels: one is a network of content providers that already reinforced their information and technology systems and hardware; the second is a data centre of several high-performance servers, maintained in collaboration with DGLAB that will support the aggregator, the indexer and the portal of services of the ROSSIO platform. The ROSSIO Infrastructure researchers and technical team operate in a dedicated room with nine workstations, several laptops and other IT material in the Colégio Almada Negreiros building.

### SYSTEM'S GENERAL ARCHITECTURE



### SCIENTIFIC AREAS

#### SOCIAL & CULTURAL INNOVATION

#### YEAR OF ENTRY IN THE NATIONAL ROADMAP 2014

#### FUNDING FOR 2017-2021

TOTAL PUBLIC INVESTMENT  
4 864 951 €  
NOVA  
1 151 612,60 €

#### TYPE DISTRIBUTED

#### INSTITUTIONAL PARTNERS / NODES

Faculdade de Ciências Sociais e  
Humanas (NOVA FCSH)

Câmara Municipal de Lisboa – Arquivo  
Municipal de Lisboa (CML-AML)

Cinemateca Portuguesa – Museu do  
Cinema (CPMC)

Direção Geral do Livro, dos Arquivos e  
das Bibliotecas (DGLAB)

Direção Geral do Património Cultural  
(DGPC)

Fundação Calouste Gulbenkian (FCG)

Teatro Nacional D. Maria II (TNDM II)



## VIASEF

### > NAME

IN VIVO ARTHROPOD  
SECURITY FACILITY

### > ACRONYM

VIASEF

### > RESEARCH INFRASTRUCTURE COORDINATOR

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### > COORDINATOR AT NOVA

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## BRIEF DESCRIPTION

VIASEF is a high security infrastructure that offers to the scientific community and industry the possibility to develop in vivo studies with autochthonous (e.g. sandflies), invasive (e.g. *Aedes aegypti*), exotic (e.g. tsetse flies) or transgenic arthropod vectors. It also provides safe laboratorial conditions to develop projects with human pathogens (vector-borne and others), including those classified as biohazard level 3 (e.g. chikungunya virus, *Mycobacterium tuberculosis* multi-resistance strains, or corona virus).

VIASEF is part of the PORTUGUESE ROADMAP OF RESEARCH INFRASTRUCTURES since 2014, and it is a nuclear research facility of the Global Health and Tropical Medicine, a FCT research center of IHMT.

## ACTIVITIES & IMPACT

VIASEF offers to both public (e.g. research institutes, universities, and mosquito surveillance & control services) and private (e.g. biotech companies, pest companies) users four types of services:

**SERVICE 1** - Alive/dead specimens, or specific biological materials (e.g. salivary glands) of mosquitos and sandflies.

Specimens or biological derivatives are provided upon request. These refer to four mosquito species and one sandfly species currently reared by the institution. Two additional *Aedes aegypti* colonies are also available: an insecticide susceptible and an insecticide-resistant strain. Other arthropod colonies including invasive, non-autochthonous species, may be installed upon demand.

**SERVICE 2** - Bioassays with autochthonous, non-autochthonous and/or invasive arthropod species.

This type of service is designed to help in the development of new natural and/or synthetic products with insecticide/repellent effects in the framework of joint-ventures with the industry. This service can be performed with invasive or non-autochthonous arthropod species with medical, agricultural or veterinary relevance.

**SERVICE 3** - Establishment of extrinsic development cycles of human vector-borne pathogens.

Extrinsic cycles of *Plasmodium falciparum*, *Leishmania infantum*, mosquito-borne viruses (e.g. dengue) and *Phlebotomus perniciosus*-transmitted viruses (e.g. Toscana) are made available according to proposals presented. This tool allows studies on host-pathogen interactions, vector competence, or climate-dependent transmission effects. It also permits the production of infected specimens, or of their biological derivatives, for vaccine development or other immunological-based studies. Depending on demand, other arthropod-pathogen cycles may be established.

**SERVICE 4** - Space rent with or without technical support.

This is a service available upon the presentation of specific proposals. Within the scope of this service, insectaries and the BLS-3 laboratory may be rented for the development of specific, time-limited, research studies. Within the frame of this service, projects related to non-vector BSL-3 pathogens can also be fostered by VIASEF.

The access to VIASEF is universal to the scientific or industry communities. An on-line request form is available at VIASEF web pages (<http://viasef.ihmt.unl.pt/>). This form is detailed according to the type of service requested and is mandatory for both external and internal (IHMT researchers) users.

VIASEF conducts studies primarily in the context of malaria, arboviruses (dengue, chikungunya and Zika) and leishmaniasis operating in an Iberian-South Mediterranean geographic context and in close collaboration with

partners of the Community of Portuguese Speaking Countries (CPLP). VIASEF offers to institutions developing research in arthropod-transmitted diseases, the possibility of expanding current research lines with the use of human pathogens and their arthropod vectors, in a cost-effective manner.

The facility also supports advanced training actions (including MSc and PhD projects) and working conditions for researchers and post-doctoral fellows, serving as a basis for researcher's mobility and science exchange programs.

The VIASEF's link to industry support is particularly prominent. The facility comprises a laboratorial area devoted to the development of new products and innovative strategies to control arthropods that act as agricultural pests or vectors of human/veterinary diseases. Support to the development and testing of new products such as insect-repellent solar-activated surfaces or insecticide impregnated textiles is already underway. VIASEF can also foster studies related to the development of disease prevention approaches using genetically-modified organisms (i.e. transgenic or paratransgenic mosquitoes) and scalable, eco-friendly, vector-control techniques to be implemented in touristic or natural protected areas with high pressure of nuisance-mosquitos.

VIASEF is also contributing in terms of product technological innovation through its support to SMEs, most of them without capacity to maintain autonomous research departments, by providing access to an highly equipped infrastructure, specialized "know-how" and standardized experimental procedures for the evaluation and optimization of their products.

Recognition of VIASEF as a member of the "Portuguese roadmap of research infra-structures" and the consolidated track record of the host institution in vector-borne diseases research, will allow in the short-term the establishment of an international networking structure contributing for harmonization of methodologies, security measures and accessibility mechanisms devoted to the study of human pathogens inside their vectors.

## INFRASTRUCTURES AND FACILITIES

VIASEF is structured in three security-levels areas.

The first area is composed by five ACL-2 insectary rooms, for maintenance of non-invasive arthropod vectors, and supporting rooms. Three rooms harbour ACL-2 reference colonies of malaria and leishmaniasis vectors. The other two rooms are dedicated to maintain temporary colonies of vectors of interest (e.g. tsetse flies). Supporting rooms include two storage compartments, an office and a washing room for handling non-contaminated materials of the ACL-2 insectaries.

A second area is dedicated to maintain colonies of invasive vectors (e.g. dengue vectors) or transgenic arthropods. There is also a bioassays laboratory devoted to the testing of insecticidal/repellent compounds and other pharmacological-induced or natural behavioural and physiological vector traits.

A third high security, area is composed by two interconnected laboratory facilities:

1. a fully equipped BSL-3 devoted to in vitro cultures of vector-borne and other, non vector-borne, pathogens classified as biohazard level 3;
2. a group of four additional chambers, three to infect and process arthropods carrying BSL-3 pathogens and a fourth to infect and maintain specific laboratory vertebrates (e.g. humanized mouse models).

VIASEF has a modular structure that allows converting the purpose of available spaces according to market demand. This operating model provides a high versatility to infrastructure and a better management of maintenance costs.

## SCIENTIFIC AREAS HEALTH AND FOOD

YEAR OF ENTRY  
IN THE NATIONAL ROADMAP  
2014

FUNDING  
FOR 2017-2021  
TOTAL PUBLIC INVESTMENT  
821 683 €  
NOVA  
821 683 €

TYPE  
SINGLE-SITED

INSTITUTIONAL PARTNER /  
NODE

NOVA Institute of Hygiene and Tropical  
Medicine (IHMT-NOVA)



## NOVA PLATFORMS

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### COORDINATOR

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### COORDINATOR

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### COORDINATOR

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### CONTACTS

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> **NAME**  
NOVA DOCTORAL SCHOOL

> **COORDINATOR**  
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#### > HIGHLIGHTS

NOVA Doctoral School is an opportunity for:

- Transversal training
- Cross fertilization
- Transferable skills development
- Research collaboration
- Food for thought

#### > FACTS & NUMBERS 2017-2021



221 Course Editions  
3553 Participants  
157 Supervisors

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#### > HIGHLIGHTS

NOVA SIMAQ allows NOVA to:

- Develop a culture of Quality that is transversal to all the activities carried out at the University, establishing appropriate evaluation mechanisms;
- Promote the active involvement of students and other stakeholders (internal and external) in the processes of continuous improvement of the institution;
- Comply with the standard guidelines for internal Quality Assurance defined by A3ES Agency;
- Monitor the different KPIs produced.



NOVA's Doctoral School (NDS) was created in 2013. Without interfering with the structured PhD programmes of each Academic Unit (AU), NDS offers to PhD candidates, supervisors, researchers and top university professionals (ex: research managers) a range of complementary, transversal activities and short (2/3 days) courses.

NOVA Doctoral School's goals can be organized in two domains. Internally we aim to reinforce personal and professional development through transversal skills training; to enhance an open space for discussion within NOVA and to share best PhD practices and resources, promoting cross-fertilization among different scientific areas. Externally NDS aims to create mechanisms of interaction and collaboration with enterprises and the society in general.

NDS courses are voluntary and free of charge and they are delivered in English and in Portuguese. ECTS are accounted for as elective curricular units (if the PhD programme integrates optional modules) or in the Supplement to the Diploma. Classes take place in the various campi of NOVA and integrate students from all the AU. The academic staff integrate Professors from the various NOVA's AU.

NOVA's Doctoral School is not an autonomous Academic Unit and has a simplified and flexible organizational model, benefiting from the organizational resources already in place either at the Rectorate or at the different AU.

Courses cover a large range of thematic domains (see scheme) and are systematically evaluated by participants and by faculty.

From 2013 until the end of 2020 NDS offered a total of 211 editions of its 14 courses, with a total of 3.553 participations. In what concerns the Supervisors' course, 157 professors have already attended the course (see facts and numbers).

## NOVA SIMAQ

NOVA Internal Quality Monitoring and Evaluation System (NOVA SIMAQ) has a primary purpose of being the system that contributes to the University continuous Quality improvement by monitoring all the activities developed by NOVA and, concurrently, responding to the legal requirement of implementation of a Quality Assurance system.

NOVA SIMAQ is aligned with the University's Strategic Plan, encompassing all its activities and ensuring all stakeholders' involvement for the continuous improvement of NOVA's Quality. NOVA SIMAQ is structured along with five core domains: Teaching-Learning, Research and Development, Value Creation, Internationalization and Interinstitutional and Community Collaboration, the latter two being transversal to the others. The support areas for these domains correspond to Human Resources, Material Resources and Services, Social Welfare Services, Information Management and Public Information.

NOVA SIMAQ follows the PDCA (Plan, Do, Check and Act) management cycle approach during which evidence of the system's effectiveness is produced.

To support the operationalization of the PDCA management cycle, the NOVA SIMAQ Portal was created as a digital infrastructure that, being a repository of information related to NOVA's Quality System, constitutes one of the basic elements of NOVA SIMAQ and contributes significantly to the consolidation of a true culture of Quality at NOVA.

> **NAME**  
NOVA HEALTH

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#### > FACTS & NUMBERS 2017-2021



31 Scientific Conferences  
and meetings

8000 participants, including  
23 external key speakers



21 Collaborations, including  
industry, universities and  
public health organizations



1 Workshop



VOH.CoLAB



NOVAhealth was born with the mission of creating value in the health area through scientific production, innovative solutions and knowledge dissemination and promoting research collaborations between the academic units of NOVA, as well as with external partners from science, industry and society. From the molecule to global health, the Platform focuses on several strategic areas, including aging, nutrition, chronic disease and infection, value improvement of health and care, the impact of climate change on public health, integrated care, migration and health, quality and patient safety and health policies and systems.

NOVA University has a strong commitment to health sciences that encompasses all its nine organic units - ranging from molecular biology to the health of populations. Three of NOVA's schools are directly committed to health: NOVA Medical School, the Institute of Hygiene and Tropical Medicine and the National School of Public Health, while two others are dedicated to molecular biology and life materials, by so contributing to life sciences: the school of biotechnology (Faculty of Science and Technology) and the school of molecular biology (Institute of Chemical and Biological Technology António Xavier). Faculty of Social and Human Sciences, the school of management (Nova School of Business and Economics), the school of data (NOVA Information Management School) and the Law School, do collaborate to research in health sciences, namely covering social dimensions and interactions of health.

We may rightly state that NOVA covers the entire health spectrum - from molecule to patient's bedside - linking fundamental biology, technology and health care to ultimately improve the health of populations.

#### RESEARCH GROUPS

- NOVAhealth Ageing
- NOVAhealth Nutrition
- NOVAhealth Chronic Disease and Infection
- NOVAhealth Value Improvement in Health and Care
- NOVAhealth Healthcare Dynamics
- Integrated Care
- Migration and Health
- Quality Improvement and Patient Safety





> **NAME**  
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> **FACTS & NUMBERS**  
2017-2021

**R** 47 trademarks  
215 active patents  
71% are international

**90 active startups that together raised more than EUR 600 million**  
18 are recognized as NOVA Spin-offs®

**About 10000 students at NOVA have been involved in entrepreneurship training activities and idea competitions**

**Constitution of the Value Creation Council in 2019, and launch of NOVA's revised Intellectual Property Policy in 2020;**

**More than 250 active R&D and Innovation collaborations with industry and non-academic institutions**



NOVA IMPACT promotes a **knowledge-based and high-impact value creation activity** through cross-cutting collaborations with society and industry. Its mission is to contribute to the social and economic development of the country by supporting and developing initiatives that add value based on the knowledge produced at NOVA, in line with the principles of innovation and sustainability.

The vision of NOVA IMPACT is to create an **impactful innovation ecosystem** with NOVA University at its heart.

NOVA IMPACT contributes to the University's societal benefit by working with academics, researchers and students to apply and **maximize the impact of their expertise and research, to foster knowledge transfer** and transform innovative **results into value**, whether it is social or economic value.

Typical activities include the protection, development and commercialization of Intellectual Property Rights, the promotion of an entrepreneurial culture within the academic community – from students to faculty and researchers –, the creation of spin-off, startups or social enterprises, and reinforcing the link between the University, industry and other organizations towards impact-driven collaborative projects and initiatives.



> **NAME**  
NOVA 4 THE GLOBE

> **COORDINATOR**  
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> **WEBSITE**  
www.unl.pt/en/nova/nova-4-globe

> **FACTS & NUMBERS**  
2017-2021

**4 Research Events**  
Europe, Africa, Latin America, and Asia

**Mapping of existing initiatives across NOVA's Academic Units**

**Regular applications to the Times Higher Education Impact Rankings in the past 3 years**

**General policies developed for NOVA: Gender Equality and Smoking-free**

**Established partnerships (among others)**

- Águas do Tejo Atlântico;
- Sustainable Campus Network
- NOVA-LANCASTER 4 Sustainability
- National Observatory for Social Responsible in Higher Education Institutions (SAS Partnership)



'NOVA 4 The Globe' is an interdisciplinary platform that promotes dialogue across members of NOVA's community towards sustainability. N4G is the natural platform for co-operation with international partners on sustainable development and capacity building with a focus on Africa and Latin America.

NOVA 4 The Globe seeks to enhance the societal impact of NOVA as a university in the local communities and to facilitate its internal organisational transformation towards sustainable best practices, complying with the Green Deal, the Paris Agreement, and the Sustainable Development Goals. NOVA aims to become a reference among young European universities in terms of commitment towards an innovative, knowledge-based policy for sustainability, delivering scientific, technological, economic, environmental, and societal impact.

Three specific axes of action reflect the University's mission in this context:

**COMMUNITY ENGAGEMENT (IMPACT AND VALUE CREATION):** To promote knowledge and technology transfer, capacity building, outreach activities, and community engagement, while facilitating the organizational transformation towards sustainability.

**RESEARCH:** To facilitate interdisciplinary dialogue, fostering concerted actions involving different stakeholders, to better relate research and innovation to society and citizens' needs.

**EDUCATION:** To stimulate the integration of interdisciplinarity and sustainability in all study cycles and educational programmes, shaping talent towards a stronger commitment to the planet and engaging students with local communities.

NOVA's commitment to the SDG is evaluated by Times Higher Education Impact Rankings. NOVA's efforts are highlighted in Good Health and Well-being, Quality Education, Gender Equality, Industry, Innovation and Infrastructure, Sustainable Cities and Communities, Peace, Justice and Strong Institutions, and Partnerships for the Goals.



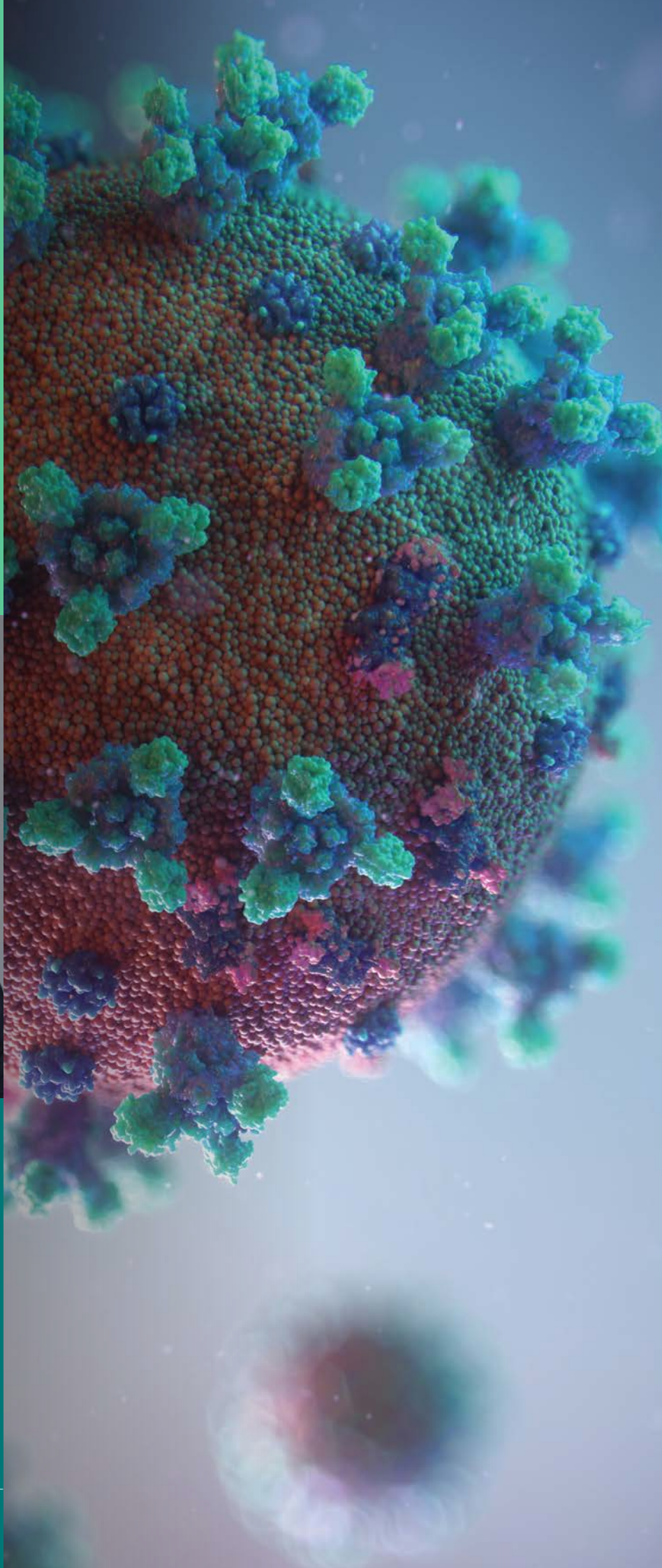
# 8

## COVID-19 RESEARCH AT NOVA



### MESSAGE FROM THE VICE-RECTOR FOR HEALTH

JOSÉ FRAGATA  
NOVA UNIVERSITY LISBON



## 8

### THE UNIVERSITY AND COVID PANDEMIC COVID - 19 @ NOVA | COVID 360 BY NOVA

A year ago, the world was stroked by COVID-19 pandemic that soon became an unprecedented global health emergency and would unfold in a social and economic crisis of unforeseen dimension and consequences. Universities were no exception.

NOVA is a Portuguese young university with a strong commitment to Health: NOVA has three Health Schools, two Biomolecular and Material Schools, and four Social Sciences and Humanities Schools that also participate in health programs. Science production is remarkable and relevant and is done mostly in cooperation.

In 2020, the University responded shortly to the pandemic over the following dimensions:

- **Internal safety** – by confining very early and adopting every public health measure to detect and stop transmission of the virus among staff, teachers and students. Cases at NOVA were few and with no fatalities.
- **Emergent health response** – by immediately providing masks, hand sanitizers, swabs, diagnostic tests, and sophisticated appliances, such as ventilators.
- **Adapting teaching** – of relevance the fact that, although the schools had to shut down along severe confinement periods, teaching continued in the virtual and blended modalities, achieving a large degree of normality, even allowing student exams. Exceptions were clinical teaching and Lab work, where impacts were of significance. Nevertheless, research continued largely and much refocused on COVID topics.
- **Research** – during this period a large number of activities were launched:
  - 45 Initiatives
  - 25 New Partnerships
  - A research funding of 1.6M €, distributed over more than 30 projects
- **Social role** – Testing nursing homes (protocol with Authorities), testing civil care workers, ensuring remote monitoring for COVID patients and cooperation with Portuguese-speaking African countries in the fields of Public Health and Covid response, as well as teaching and training staff.
- **Media** – the presence of the University on the media was robust: a COVID 19 – 360 microsite was created, several TV and radio programs, the COVID Barometer, Literacy material, conferences, webinars, etc. NOVA has been a constant presence but above all a useful one, namely by supporting health authorities with studies, statistics and analysis.
- **Seeking normality in safety** – the continuous search to recommence normality pushed us all to constantly adapt our contingency plans, to implement every safety measure, to implement rapid testing at the point of action (namely for labs) and even to certify all schools with ISQ “COVID out” stamp. Thus creating a safe ecosystem that would enable work to continue in safety. This effort stays today as strong as it ever was.

Crisis have always left profound marks and triggered change. For example Influenza pandemic as allowed the developed of virology, II World War has much developed engineering, etc. Developments for Science and Society have always derived from crisis and COVID-19 will be no exception.

Universities adapted, but I am confident they will change profoundly after the pandemic, namely in the following domains: new teaching methodologies (blend), administration simplification, with leaner methods, and they will refocus more in health disciplines. With more e-learning, more access and higher level of democratization for the university teaching will come. I hope that this will help to solve the equity and access issues.

Definitely, a time of change will come after this crisis. For example, Science has already changed regarding work and publishing that turned out to be much quicker under pressure conditions. In addition, Universities will start teaching differently and be open to larger segments of student populations, while cooperation between Universities and Industry will be improved and become closer, on the track of recent successful examples – see the case of the vaccines.

All of this can be achieved by combining the lessons from the pandemic, the tranquility provided by the vaccines and the desired overall immunity that will prevail. However, change will not be effective without Leadership, both internally and externally to Universities that played such relevant roles during the COVID crisis. NOVA was indeed one of them, and it is prepared and ready for that CHANGE! ■ ■ José Fragata



# AI 4 COVID-19

SUPPORTED BY



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239.715 €

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TITLE

ARTIFICIAL INTELLIGENCE AND DATA SCIENCE  
SUPPORTING TOOL FOR THE DETECTION, DIAGNOSIS  
AND PROGNOSIS OF THE COVID-19 DISEASE

ACRONYM

COVOICE-19

BRIEF DESCRIPTION

The key objective of the COVOICE-19 project is the development of predictive models based on Artificial Intelligence, more specifically Machine Learning, to support the activities in the clinical contexts of rapid diagnosis and of prognosis in suspected or detected COVID-19 cases, respectively. These activities will be carried out based on a dataset collected and aggregated from different available sources during the initial stages of the project, leveraging the expertise and the close collaboration of the CHLO/HEM team. This dataset will be made openly available in order to promote the advancement of research efforts on the topic of COVID-19 carried out by the scientific community. In addition to this, web-based applications will be developed to operationalize the aforementioned models in order to make them easily usable by both the general population and medical professionals alike, without requiring any prior knowledge of Machine Learning to do so.

The need for the research and development of novel forms of rapid testing as an alternative or complement to the current diagnosis method using RT-PCR have been declared as being of the utmost importance by both the World Health Organization and the national General Health Directorate. This is mostly due to the high turnaround times and costs associated with RT-PCR testing, which often needs to be carried out in specialized labs off-premises, as well as their generally low availability at a global scale, making it impossible to ensure the proper and thorough testing of the general population.

Additionally, the scenario of the current pandemic has led several healthcare systems to the brink of collapse due to the immense strain imposed by the rapid spread of COVID-19, making the prognostic and follow-up of the evolution of identified cases with resource to the visual interpretation of Chest X-Ray (CXR) or Computed Tomography (CT) scan imaging rather difficult. In these scenarios, healthcare professionals can be (and have been) forced to come face to face with extremely hard decisions involving the allocation of resources concerning for instance which patients should be given access to treatment based on a series of factors. A decision-support system, capable of providing a rapid and thorough analysis with additional insights into such cases can bring considerable added value to the table to aid in the decision-making process carried out by medical experts.

PHASE 01  
Data  
Acquisition



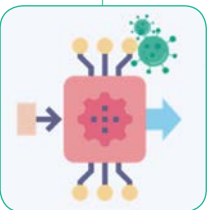
PHASE 02  
Exploratory  
Treatment  
& Analysis



PHASE 04  
Prototype  
for  
Diagnostic  
Support



PHASE 03  
Creating  
Predictive  
Models



TITLE

AN INTELLIGENT SYSTEM TO IMPROVE PATIENTS' SAFETY AND  
REMOTE SURVEILLANCE IN FOLLOW-UP FOR CARDIOTHORACIC  
SURGERY

ACRONYM

CARDIOFOLLOW.AI

BRIEF DESCRIPTION

The COVID-19 pandemic caused several surgeries to be delayed or performed under emergency circumstances due to activated hospital protocols to reduce nosocomial transmission of this severe air-transmitted virus. Cardiac surgery is a medical intervention vital for cardiac disease treatment that is highly susceptible to severe postoperative complications, and which recovery follow-up is crucial in the post-op period. However, due to cardiac patients' frail health, these patients are identified as a risk group in pandemic contexts, being inadvisable hospitals visits due to high risk of infection.

CardioFollow.AI joints the multi-domain expertise of researchers from VOH.CoLAB, FhP-AICOS, NMS-UNL and HSM-CHULC. We tackle current limitations with the introduction of a telemonitoring service in Cardiothoracic Surgery Service of HSM-CHULC, to support clinicians in the follow-up of cardiothoracic surgery patients after hospital discharge. An Internet-of-Things (IoT) system will remotely collect daily outcomes of monitored patients to complement and improve the current follow-up process, which consists of periodic phone calls and consultations over the first year after the procedure.

An Artificial Intelligence (AI) module will leverage electronic health records (EHR) and one-year patient follow-up data collected by clinicians since 2011. Patients will take home a telemonitoring kit that will automatically record a set of clinical parameters (ex. weight, blood pressure, heart rate). Through an intelligent natural conversation module, patients will self-report symptoms and receive automatic feedback from processed clinical notes. The multimodal data collected from patients' health pathways will identify risks of complications throughout the follow-up process, namely: (1) estimate, in the pre-surgery period, optimal follow-up resources; (2) identify patients who will benefit the most from telemonitoring; and (3) early detection of complications at home, which leads to prompt medical intervention.

With CardioFollow.AI, is expected to empower health systems with mechanisms to deal with COVID-19 and future pandemics by means of: (1) providing treatment and provision to large numbers of patients while maintaining essential healthcare using telemonitoring provisioned by AI and exploitation of available health data in strict compliance with all ethical and privacy issues; (2) minimizing the risk of nosocomial transmission, as it avoids unnecessary hospital visits and commutes; and (3) supporting the continuity of healthcare with remote provision of care. This project will also contribute to patients' reassurance, as they feel safe for recovering at-home avoiding viral exposure.

# AI 4 COVID-19

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TOTAL BUDGET  
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NOVA  
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## COVID-19 RESEARCH AT NOVA

# GENDER RESEARCH 4 COVID-19

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VERA DUARTE

The project was based on a collaborative approach between the NOVA National School of Public Health, the Public Health Research Centre (CISP), the Comprehensive Health Research Centre (CHRC), the NOVA School of Social Sciences and Humanities (NOVA FCSH), the Interdisciplinary Centre of Social Sciences (CICS.NOVA), the School of Criminology of the Faculty of Law of the University of Porto, and the University Institute of Maia (ISMAI).

#### TITLE

VIOLENCE IN INTIMATE RELATIONSHIPS IN TIMES OF COVID-19: GENDER INEQUALITIES AND (NEW) CONTOURS OF DOMESTIC VIOLENCE?

#### ACRONYM

VD@COVID19

#### BRIEF DESCRIPTION

Domestic violence (DV) is a public health problem on a global scale that affects, at different levels, individuals, families and societies. Since the beginning of the COVID-19 pandemic, measures have been taken to slow the spread of the SARS-CoV-2 virus, including the imposition of social distancing and mandatory confinement periods. The request for staying at home creates a paradoxical situation as, for the victims of DV, home may not be a safe place. This context restricts aggressors and victims in the same space, reducing social contacts and potentially aggravating the occurrence of DV. The existing information about DV in pandemic times, at international and national levels, shows a concerning reality, which remains to be known, namely regarding its magnitude, characteristics of the victims and its impacts. The VD@COVID19 project analysed the self-reported psychological, physical and sexual DV during the COVID-19 pandemic, some associated factors, including stress and anxiety, substance consumption, new situations of DV in times of COVID-19 but also VD situations related with previous history of violence, disaggregated by gender and socioeconomic indicators. Furthermore, help-seeking behaviour, respective responses and reasons for not seeking help or reporting were also described. An online survey targeted at the general population was conducted between April and October 2020 and covered a non-probabilistic sample of 1062 respondents. The questionnaire was disseminated through partners' networks, digital social networks, social media, and community institutions, including those working within the scope of violence.

A consultation of 14 experts was conducted to further understand the effects of COVID-19 on DV and the responses of organizations that provide support to victims. The experts included specialists from units of primary intervention with victims of DV (victim support technicians, security forces, health professionals, family intervention technicians) and from academic research in this field. The experts' inputs focused on the characterization (frequency and intensity) of the DV during the pandemic, the report to the official authorities and victim support entities, as well as the main difficulties and barriers faced in the response and intervention in this area. Based on the results, recommendations and action strategies were outlined at three levels - knowing, planning, acting - seeking to be a useful instrument for strategic decision and strengthening of the responses on prevention, combat and support to victims of DV in times of COVID-19.



#### TITLE

THE IMPACT OF COVID-19 ON VIOLENCE AGAINST WOMEN: A LONGITUDINAL ANALYSIS

#### BRIEF DESCRIPTION

The objective of the project is to perform a longitudinal analysis of the COVID-19 pandemic in violence against women, including domestic violence, of its dynamics, patterns and psychosocial impact on victims and households (before, during and after the state of emergency of March/April). In a study carried out by an interdisciplinary team, a survey will be carried out, with a random sample of women aged 18+, articulated with 2 focus groups with victims and with victims' support services.

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#### TITLE

LISBON + EQUALITY - SUPPORT SERVICE FOR VICTIMS OF DOMESTIC VIOLENCE

#### BRIEF DESCRIPTION

The objective of the project is the creation and maintenance of a municipal support service for victims of domestic violence, guaranteeing personalized telephone and face-to-face assistance to victims of domestic violence during the COVID-19 pandemic. It also includes a study leading to the evaluation of the functioning of the municipal service and an exploratory study on the relation between domestic violence and the COVID-19 pandemic.

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## COVID-19 RESEARCH AT NOVA

# GENDER RESEARCH 4 COVID-19

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40 000€

THE IMPACT OF COVID-19 ON  
VIOLENCE AGAINST WOMEN:  
A LONGITUDINAL ANALYSIS

RESEARCH 4  
COVID-19

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28 512 €

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JOÃO GOES

JOÃO MARTINS

JOÃO PEDRO OLIVEIRA

LIBPHYS

JOSÉ PAULO SANTOS

LIP

MÁRIO PIMENTA

PAULO FONTE

NMS I FCM

PEDRO PÓVOA

## TITLE

VENTILADOR DE EMERGÊNCIA MINIMALISTA  
POR PRESSÃO CONTROLADA PARA COVID-19

## BRIEF DESCRIPTION

Patients that are infected with SARS-CoV-2 may develop severe Coronavirus disease (COVID19) that can evolve to severe pneumonia and require invasive mechanical ventilation. The number of patients needing mechanical ventilation has surpassed in several countries the installed capacity and the existing manufacturers are having difficulties to address this increased demand. Medical mechanical ventilators are normally sophisticated machines for general use, although this level of sophistication is not needed to save lives.

A team of medical doctors and engineers designed developed a simple mechanical ventilator implementing the pressure controlled continuous mandatory ventilation mode (PC-CMV) with settable breathing rates, inspiration/expiration time ratios, intended as a last resort to ventilate COVID-19 patients. Although very safe by design, we minimized the use of technical components and those used are common in industry or easily printed in 3D Printers, so its construction may be possible in times of logistical disruption or in areas with reduced access to technical materials and at a moderate cost, affordable to low income countries. Most of the device can be manufactured by modest technical means and construction plans are openly provided, with the final **cost being lower than 1.000 euros per ventilator unit**. On April 1st of 2020 this team publish the first scientific paper open to the community with the proof of concept (<https://arxiv.org/abs/2004.00310>).

- Following our proof-of-concept, this project has developed 20 viable prototypes, with different configurations, that implement the following main characteristics:
- Positive Inspiratory Pressure (PIP) adjustable in the range 20 to 40 cmH2O
- Positive End Expiratory Pressure (PEEP) adjustable in the range 0 to 20 cmH2O
- Safety pressure relief valve in the inspiration tube adjustable in the range 0 to 45 cmH2O
- Breathing rate adjustable in the range 12 to 25 breaths per minute (bpm)
- Inspiration/expiration time ratio (I/E) adjustable in the range 1:2 to 1:3
- Low and high PIP and PEEP alarms

The prototypes have two different baseline configurations that were developed in the laboratories of FCT NOVA (Lisbon), and in LIP Coimbra (Coimbra), with the strong medical expertise from NOVA Medical School. Medical doctors from intensive care have been involved to provide feedback



## TITLE

GLYCOVID-19 | TESTING EXISTING GLYCAN-BASED  
DRUGS TO NEUTRALIZE SARS-COV- 2

## ACRONYM

GLYCOVID-19

## BRIEF DESCRIPTION

The rapid spread of the SARS-CoV-2 virus requires quick therapeutic interventions. Strategies such as neutralising compounds avoid infection spread and are of great interest to rapidly treat COVID-19 patients and lessen this infection's burden in the healthcare systems.

SARS-CoV-2 binds to the human ACE 2 receptor through its Spike (S) protein, responsible for the virus entry into the host cell and, the subsequent fusion of the viral and cellular membrane.

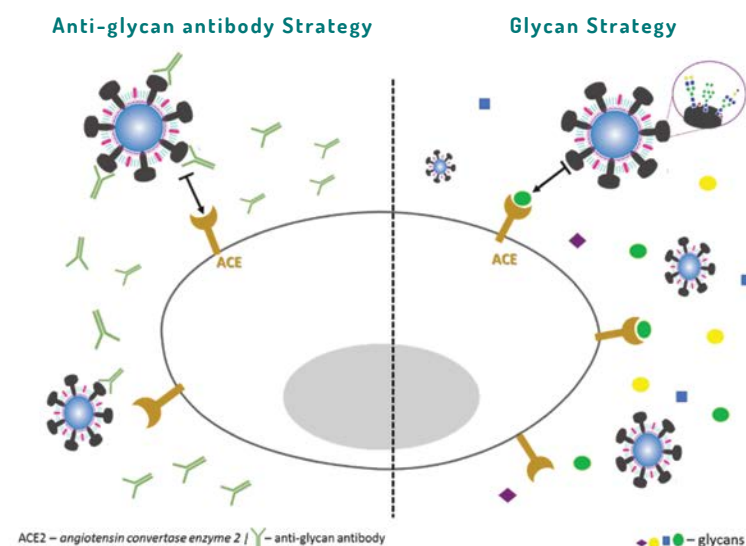
A growing body of evidence shows that protein S has unique characteristics of glycosylation in this new coronavirus. The S protein is heavily decorated with short sialylated O-glycans and high mannose N-glycans. The aberrant glycosylation emerges from the protein structure itself and profound changes in the infected cells' metabolism.

The role of SARS-CoV-2 glycans is still unclear. It may help the virus interacting with host cells and hide the virus from immune responses.

With the GLYCOVID 19 project, we propose to test compounds that, by interacting with the SARS-CoV-2 glycans, block virus adherence to the host cell. Such compounds would neutralise the viral entrance, as good as antibodies developed by convalescent patients that become immune to SARS-CoV-2.

We have tested antibodies against glycans and monosaccharides or more complex glycans that have been developed by pharma partners that are part of our consortium. Such compounds demonstrated some neutralising capacity but required further optimisation and in vivo assays to be used as therapeutics. Ongoing studies are also testing at the molecular level the affinity of these compounds for protein S and their capacity to block interaction with the human ACE2. Through an exhaustive meta-analysis, we also analysed whether the use of convalescent plasmas is a safe and effective therapy for COVID-19. Our results showed that convalescent plasma might decrease the mortality rates and promote a quick viral clearance in a significant number of patients under clinical trials.

Further studies are still ongoing to provide more robust evidence on whether anti-glycan approaches or convalescent plasma are the promising therapeutic approach to reduce mortality.

RESEARCH 4  
COVID-19

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CellmAbs

NUNO PREGO RAMOS

Pharma 73

FILIPE AGUIAR

Vector B2B

SOFIA CORTE-REAL

INSA

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RUI SARMENTO E CASTRO

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ANTONIO SARMENTO



RESEARCH 4  
COVID-19

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40 000 €

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HELENA REBELO-DE-ANDRADE  
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TITLE

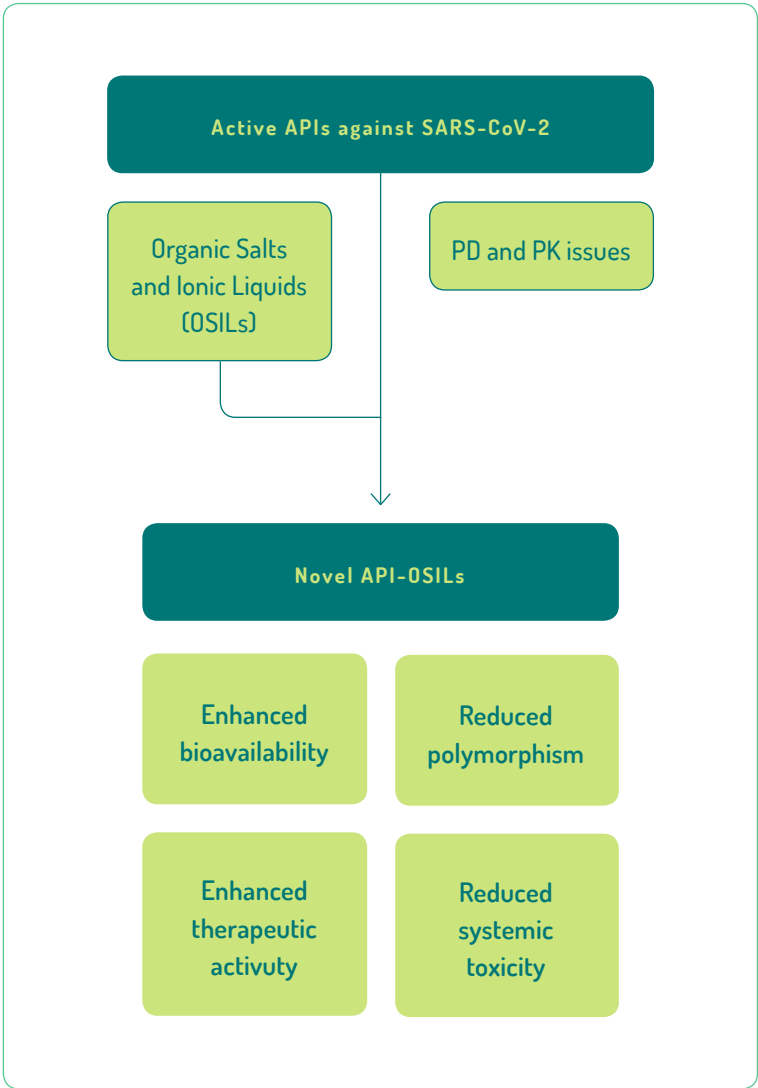
REPURPOSED ANTIMALARIAL AND ANTI-EBOLA  
DRUGS AS ORGANIC SALTS AND IONIC LIQUIDS  
TO PREVENT AND FIGHT COVID-19

ACRONYM

ILS4TREATMENT

BRIEF DESCRIPTION

This project focuses on developing novel ionic formulations of drugs with known activity against SARS-CoV-2 in order to afford more effective and safe treatments against COVID-19. The currently best available treatment for patients with severe disease consist on corticosteroids to decrease uncontrolled inflammation. However, this approach leads to the depletion of the immune system, limiting the recovery of the most vulnerable patients. As an alternative, the anti-Ebola Remdesivir is also used for treatment of COVID-19 after showing high efficacy in several clinical trials. However, patients report several side effects during and after its use. One additional alternative, although controversial, is Hydroxychloroquine. Despite its activity against SARS-CoV-2, this drug has a detrimental effect on the cardiovascular system, which further enhances the toll of the virus on such organs. Hence, herein we propose the optimization of the pharmaceutical properties of such drugs by combining them with biocompatible adjuvants in ionic form, yielding novel pharmaceutical organic salts and ionic liquids with enhanced pharmacokinetic and pharmacodynamic properties.



TITLE

REDUCING BIASED INFORMATION PROCESSING TO  
INCREASE COMPLIANCE WITH SNS'S RECOMMENDED  
MEASURES FOR COVID-19 PREVENTION

BRIEF DESCRIPTION

Citizens' compliance with the World Health Organization's recommended Covid-19 prevention measures is critical to limit the spread and impact of the virus. We explored how a cognitive bias – called confirmation bias – affects people's decision to follow these recommendations, and we tested a simple cost-effective intervention to ameliorate this bias and improve the rate of compliance.

The confirmation bias is a tendency to look mostly for information that supports pre-existing opinions and ignore or downplay the significance of counterinformation, which leads to errors in decision-making. This bias is particularly critical in the context of the pandemic because a wealth of information of varying quality reaches citizens through different channels: a biased selection of information might cause to implement fewer prevention measures, or not comply at all with them. To illustrate, people who prefer not to wear a mask might seek information that suggests that they should not wear it and to avoid information suggesting otherwise. This information search behavior might result in consolidating these people's original belief that they should not wear a mask.

Unfortunately, we did find evidence of confirmation bias. Specifically, in our study on Covid-19 vaccines, we found that people who are doubting that they should get vaccinated (and lean toward no), disproportionately select to read information against vaccines. Even if positive information concerning covid19 vaccines is just as available and accessible, people who doubt they should get vaccinated are not likely to consider it to the same extent.

We tried to reduce this bias via our intervention, based on a validated procedure that had already shown positive results in the lab, in previous research. Namely, we explained via a short video what the confirmation bias is and how to correct it. After our intervention, even though people showed a reduction of the confirmation bias in hypothetical scenarios, when it came to decisions with real-life implications, we did not observe the same effect: people who doubted they should get vaccinated still picked mostly information against vaccines. In sum, our findings show that people who have doubts concerning vaccination avoid favorable information concerning vaccines, and look mostly for negative information, even when they learn that this information search strategy is biased and can correct it in other domains.

Our current results confirm the need to monitor platforms on which questionable negative information circulates, given that this information has a disproportionately greater appeal among people who have concerns regarding Covid-19 vaccines. Moreover, media should keep in mind that individuals are not likely to balance information on their own initiative, therefore balanced articles and news comparing pros and cons of Covid19 vaccines are extremely important.

RESEARCH 4  
COVID-19

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RESEARCH 4  
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TITLE

GUT MICROBIOTA, “SPARK AND FLAME”  
OF COVID-19 DISEASE

BRIEF DESCRIPTION

**Objective:** Risk factors associated with the onset and progression of coronavirus disease 2019 (COVID-19) need to be urgently unveiled. As such, considering the pivotal role of gut microbiota on host immune and inflammatory functions, we aimed to investigate if changes in gut microbiota composition are associated with an increased clinical severity of COVID-19.

**Design:** We conducted a national multicenter cross-sectional study in 115 COVID-19 patients categorized according to: 1) location of recovery from COVID-19: ambulatory (household isolation), ward or intensive care unit; and 2) COVID-19 severity scale: asymptomatic/mild-to-moderate or severe. Gut microbiota analysis was performed through 16S rRNA gene sequencing at species-level resolution and data obtained was further correlated with clinical parameters of COVID-19 patients.

**Results:** Severely ill patients exhibited profound changes in gut microbiota composition compared with mild-to-moderate patients in ambulatory or admitted to the hospital ward (Figure 1). These changes included: a) lower overall microbial diversity, b) lower abundance of beneficial butyrate-producing bacteria such as Roseburia faecis and Coprococcus eutactus, c) lower abundance of several commensal Bifidobacterium species, and d) higher abundance of pathogenic bacteria such as liposaccharide-containing Citrobacter freundii and bacteremia-associated Staphylococcus epidermidis.

**Conclusion:** The present work identifies gut microbiota composition as a primary outcome that reflects the clinical course of COVID-19. Specifically, low microbiota diversity, low abundance of butyrate-producing bacteria and high abundance of pathogenic bacterial species may be considered potential biomarkers associated with COVID-19 severity (Figure 2). Thus, our study may open perspectives for the development of therapeutic interventions that aim to correct dysbiosis in severe COVID-19 patients. These include the administration of butyrate-producing probiotics or prebiotics and faecal microbiota transplantation from healthy donors (shown to be effective in Clostridium difficile infection). These interventions are expected to increase overall bacterial diversity and the abundance of commensal bacteria, thereby contributing to inhibit the overgrowth of opportunistic pathogens. Besides the development of microbiota-restoration therapies, our study might also have implications in the design of effective COVID-19 vaccines. In fact, the immunological response to vaccines is influenced by gut microbiota composition, and dysbiosis is considered a leading factor for diminished vaccine efficacy or failure through direct or indirect mechanisms. Direct mechanisms include modifications in the profile of microbial-associated molecular patterns presented to the gut-associated lymphoid tissue, while indirect mechanisms include changes in the levels of immunoactive metabolites secreted by bacteria in particular short-chain fatty acids. Considering this, our results highlight the need for vaccine trials to take into account gut microbiota composition, in order to offer personalized and multivalent vaccines that can perform equally well in individuals with different microbiota profiles. ClinicalTrials.gov Identifier: NCT04355741.

TITLE

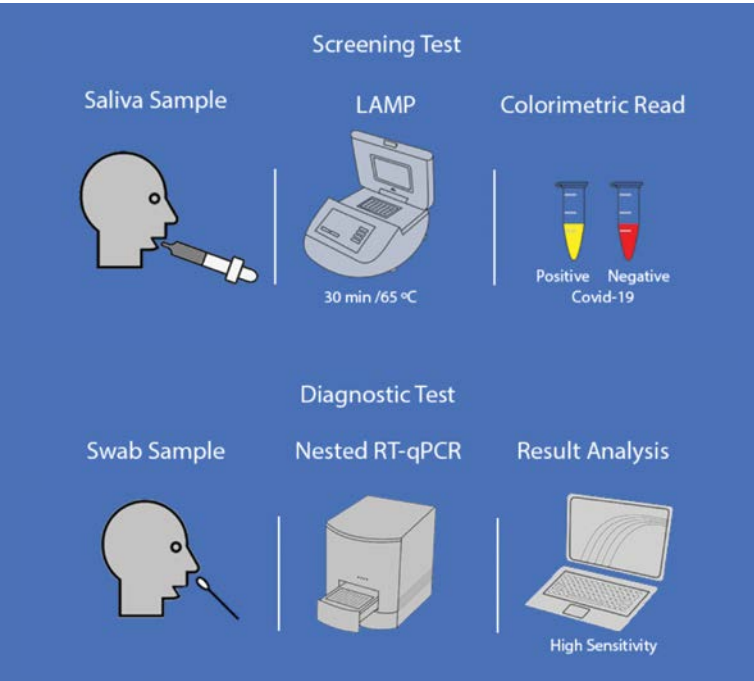
ULTRA-SENSITIVE, SPECIFIC, SCALABLE, FAST AND  
CHEAP: A COLORIMETRIC-ASSISTED SINGLE-TUBE NESTED  
CONVENTIONAL PCR TO DETECT THE SARS-COV-2 RNA IN  
NASOPHARYNGEAL SWABS

BRIEF DESCRIPTION

In 2020, the COVID-19 pandemic was responsible for an incredible rush in the scientific community to molecular tests to detect SAR-COV-2. Quantitative PCR quickly became the gold standard for testing, but its requirement for specialized equipment and personal, coupled to the hours required to obtain results, calls for alternative methods. For screening purposes, a fast, simple, and cheap method is needed to decide if, for example, someone can take a flight or go to work. In contrast, for diagnostic purposes, sensibility and specificity are of the utmost importance. In this project, we developed different diagnostic methods to convey the different needs of testing.

As a screening test, we explored the potential of colorimetric loop-mediated isothermal amplification (LAMP). Taking 30 min to amplify viral RNA, colorimetric LAMP only requires a conventional PCR machine, and the result can be observed visually through solution color change from red to yellow. Our results show that this method can be used to detect SARS-COV-2, fulfilling all the requirements for a screening test with a remarkable detection limit of 250 copies of RNA. In addition, for diagnostic purposes we optimized a single-tube nested PCR that can detect as few as 50 copies of RNA in a sample. This protocol could be further used to detect early or latent viral infection cases that go undetected by other methods with clinical significance. Due to its high sensitivity, this protocol opens the door for sample pooling, reducing the testing costs with high accuracy. Ongoing optimization work could decrease even further the detection limit.

We also compared different types of samples, nasopharyngeal swabs versus saliva samples, different RNA extraction methods, and conventional RNA extraction kits versus raw samples. Our results show that saliva is a viable biological sample for SARS-COV-2 detection with comparable results to nasopharyngeal swabs. Regarding the RNA extraction method, although bypassing extraction reduces the time, cost, and labor of the detection method, our results show that it also reduces the test’s sensibility.



RESEARCH 4  
COVID-19

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## TITLE

DEVELOPMENT OF AN INEXPENSIVE, SIMPLE AND OPEN-SOURCE DEVICE FOR SARS-COV-2 DETECTION

## BRIEF DESCRIPTION

Molecular testing is amongst the most accurate and sensitive approaches to prevent the spread of COVID-19 within a community, in addition to increase the likelihood of positive outcomes among symptomatic patients. Thus, it is critical to maximise our testing capacity. Currently, molecular diagnostic testing aims to identify the genetic material of SARS-CoV-2 through high-sensitivity molecular biology tools such as RT-PCR. These tests have been further optimized to produce a colorimetric readout providing a quicker result. Nevertheless, they require expensive and complex devices that prevent their use by a large number of entities. In this proposal we aim to overcome this problem by designing an affordable, simple to use, precise and open-source device capable to execute sensitive thermocycling protocols.

The prototype is based on an arduino-controlled cooling/heating element (peltier) that would regulate the temperature of a custom-made, aluminium tube holder capable of holding at least 48 samples. The arduino would be pre-programmed (via USB cable and wirelessly via Bluetooth) to run the proper thermocycling protocol and a temperature probe would allow a precise temperature control. An LCD display would provide relevant information and a small set of buttons will execute simple instructions such as start/stop. The interface and operation will be simple and intuitive in order to allow a fast learning curve and minimize operating errors. We will compare the performance of our prototype with the COVID-19 detection protocols currently being used at CEDOC I NOVA Medical School. Here we will access the reliability of our prototype by re-testing samples already tested using current laboratorial conditions. Moreover, we will test additional protocols under development also at CEDOC. Upon the generation of a successful prototype, we will target governmental and non-governmental agencies, and companies capable to expand the production of this device amongst entities interested in executing COVID-19 testing in Portugal and abroad. Moreover, we will share the blueprints and code in repositories such as GitHub in order to encourage its production. This device will avert the need to acquire the expensive equipment that is currently used, in addition to decentralize, expand and lower the costs associated with COVID-19 testing. This will reduce the testing burden allocated to the national health system and individuals increasing the overall COVID-19 testing capacity, which will help contain the spread of the virus, reducing the number of patients requiring hospitalization and enhancing survival chances. By providing a simple to use and inexpensive hardware solution we expect to promote widespread testing for COVID-19. This will also provide testing capabilities to developing countries and communities unable to acquire the hardware necessary to execute testing at a desired scale. Importantly, this device can be easily adapted for the identification and diagnosis of other infections diseases broadening its medical usefulness. In addition, it will also allow the execution of molecular biology experiments in a laboratorial setting both for biomedical research and education.



## TITLE

PRIMARYCARE@COVID-19: DIGITAL PLATFORM FOR SUPPORTING CHRONIC PATIENTS AND COVID-19 CONSULTATIONS AND MONITORING IN PRIMARY CARE

## ACRONYM

PRIMARYCARE@COVID-19

## BRIEF DESCRIPTION

Telemedicine and Digital Health represent an opportunity to manage chronic patients with quality during epidemics (and by extension pandemics or other catastrophes), allowing the monitoring of these patients (using a goal-oriented care approach), trying to prevent them from decompensating and having to go to the health centre or emergency unit.

An intelligent PrimaryCare@COVID-19 digital platform was developed for the follow-up and monitoring of chronic and COVID-19 infected patients, allowing healthcare professionals to remotely consult these patients at home, or while traveling (by phone, or by digital videoconferencing) and securely manage all of your patients' health information. GDPR security standards are used.

The digital platform of this project is already enabling better coverage of chronic patients at home and improving the communication with patients related to COVID-19. Health professionals are now able to communicate safely and rigorously with chronic patients and prescribe the necessary medications, in addition to informing them about COVID-19 measures.

In the case of patients in quarantine or alone, this platform also allows for health monitoring and evaluation.

The digital platform covers physiological and biochemical patients' data as well as medications, using smart algorithms to alert for specific adverse events or deterioration of health conditions.

### REMOTE MANAGEMENT OF PRIMARY HEALTHCARE@EPIDEMICS



#### ENHANCING HEALTHCARE ACCESS:

Improve chronic patients access to care during Pandemics  
Improve chronic care monitoring to avoid hospitalization  
Improve patient's adherence to COVID-19 best practices

PHYSICIANS/  
NURSES AT  
PHC CENTER

CHRONIC CARE  
MANAGEMENT  
CARE PROCESSES  
Supported by  
information systems

CHRONIC/  
COVID-19  
PATIENTS



#### PLATFORM FUNCTIONALITIES:

Enabling remote and integrated consultations (Telephone, video)  
Longitudinal disease and therapeutics management  
Manage and Inform about COVID-19  
Recording patient chronic parameters

# RESEARCH 4 COVID-19

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## TITLE

RESPONSE TO THE COVID-19 PANDEMIC IN THE CONTEXT OF  
SOCIAL INEQUALITIES IN HEALTH: A CROSS-SECTIONAL STUDY  
AMONG THE NATIVE AND IMMIGRANT POPULATION OF AMADORA

## BRIEF DESCRIPTION

The aim of this study was to analyze the socioeconomic dynamics, apprehensions and difficulties in accessing health care for 420 families living in Amadora Municipality, in Lisbon area (of which 217 are immigrants) during the month of July 2020. Telephone interviews were conducted through a semi-structured questionnaire divided into 3 sections: changes in material deprivation, income and employment; difficulties in social confinement; increased difficulties in accessing health care due to the pandemic.

Our study adds a very important dimension to the already published results for Portugal, by considering immigration as a social determinant of health. Results suggested that in immigrant households, the social and economic consequences of the pandemic are exacerbated: for example, in every 20 of the immigrant respondents 12 report having been without work and without wages or part of wages, versus only 7 on 20 of the natives; on the other hand, 15 out of 20 immigrant households saw their monthly income decrease, versus 10 out of 20 natives. Also, of the immigrants who went to the emergency room, almost half (46%) revealed having increased barriers due to the pandemic, a figure considerably higher when compared with natives (12%). Similarly, difficulties during the lock-down were more visible in immigrant households: more immigrants (20% versus 0%) mentioned they do not have a place at home where their children can have online classes; also, about 8% of immigrant families (versus 3% of natives) indicated that their children had to go to school for having a meal.

The following interventions were carried out: specific problems related health care access were reported to ACES-Amadora that, within the existing human resources restrictions, tried to solve the situation. Social cases were reported to the NGO-AJPAS (experts in community based studies with migrant population); AJPAS contacted the families directly by phone or in sending someone at home address, and proposed solutions; patients with covid-19 presenting also a complex socioeconomic situation were reported to Amadora Public Health Unit for a direct homebased intervention. Patients with covid19 in complex economic situation and very serious social cases were identified much more frequently in immigrant's households, namely in those from Portuguese-speaking African countries.

This is the first study in Portugal that provides evidence on the socio-economic consequences of covid19 in immigrant families when compared to native ones; results suggest that immigrants are more at risk because their situation was already vulnerable before the pandemic: they were more exposed to job insecurity, had lower median incomes, lower health expenditures, lived in homes more overcrowded than natives and face increased barriers in access to health care. And these persistent inequalities were exacerbated by the covid19 pandemic.

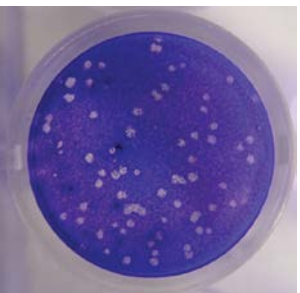
Knowing the importance of socioeconomic factors as health determinants, health systems in the near future must be prepared not only to receive the growing cases of covid-19 but also to face the additional needs arising from the economic and social transformations caused by the pandemic, in particular in the more vulnerable groups like immigration population. It is essential to continue to monitor these families with the support of NGOs so that the effects of this economic and social crisis can be mitigated, intervening early both at the adult and child level.

## TITLE

ION CHANNEL BLOCKERS MECHANISM OF ACTION AGAINST  
SARS-COV-2/COVID-19: A FAST-TRACK EX-VIVO STUDY TO  
COMPLEMENT THE CURRENT ON-GOING CLINICAL TRIALS

## BRIEF DESCRIPTION

There is no known effective pharmacological treatment for COVID19 and the current treatment of severe cases includes the use of antiviral drugs (lopinavir / ritonavir and remdesivir) eventually in conjunction with the immunomodulating antiparasitic - hydroxychloroquine - proposed as an inhibitor of in vitro SARS-CoV replication and MERS-CoV. The efficacy and safety of chloroquine (which interferes with acidification of the endosome and viral decapsidation) for the treatment of SARS-CoV-2 pneumonia is not consensual and late 2020 WHO discontinued hydroxychloroquine and lopinavir/ritonavir treatment arms for COVID19. In pioneering studies with other coronaviruses, other safe and effective drugs were chlorpromazine CPZ [Largactil®] and Verapamil VP [Isoptin®] - both currently in clinical trials in France and Poland [NCT04366739; NCT04351763]. CPZ is an inhibitor of clathrin binding in the plasma membrane that prevents viruses from entering host cells. These processes are inhibited by CPZ and VP. IHMT / NOVA has 20 years of experience in the study of the activation of microbial death by alveolar macrophages by Ca2+ channel blockers, such as CPZ and VP, using them to treat drug resistant bacterial infections. We recently described its mechanism of action/activation, via cellular and endosomal Ca2+ channels and pH change and in this project these drugs and this mechanism of action were evaluated against SARS-CoV-2, trying to describe how these drugs inhibit the internalization of the virus by Ca2+ channel-mediated endocytosis, limiting intracellular traffic and pH of the endosomes, blocking the decapsidation of the virus. CPZ and VP toxicity was evaluated in three different cell lines (VERO-E6, HEK 293T and CALU-3) to clarify the mechanism of action of CPZ against SARS-CoV-2, and an infection protocol for this virus was developed and, in parallel, an in silico chemogenomics analysis targeting viral proteins and human proteins involved in virus entry into cells was used to identify the potential inhibitory activity against SARS-CoV-2 of these drugs. We found that CPZ and VP are well-tolerated drugs at concentrations between 1-50 µM, and once used in optimized viral quantification assays preliminary results revealed significant anti-viral activity. For our SARS-CoV-2 infection experiments we have optimized plaque assays that are a quantitative method of measuring infectious SARS-CoV-2 by quantification of plaque formed in cell culture upon infection. Infectious virus titers are measured in plaque-forming units (PFU). These assays are being performed with CPZ and VP at optimized non toxic concentrations and both CPZ and VP promoted viral load reductions in a concentration dependent manner. The project continues testing the new ion channel blockers hits coming from the in silico chemogenomics analysis as well as laser irradiated phenothiazine derivatives with high affinity to the main protease (Mpro) of SARS-CoV-2. Ultimately, we aim to explain how and to what extent ion channel blockers can inhibit SARS-CoV-2 infection in safe doses and potentially become an effective therapeutic option against covid19 assisting the ongoing clinical trials.



SARS-COV-2 PLAQUE ASSAY

# RESEARCH 4 COVID-19

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## TITLE

DEVELOPMENT OF AN EASY, FAST-TRACK AND  
ECONOMICAL COLORIMETRIC TEST FOR AUTONOMOUS  
NATIONAL DIAGNOSIS OF COVID-19

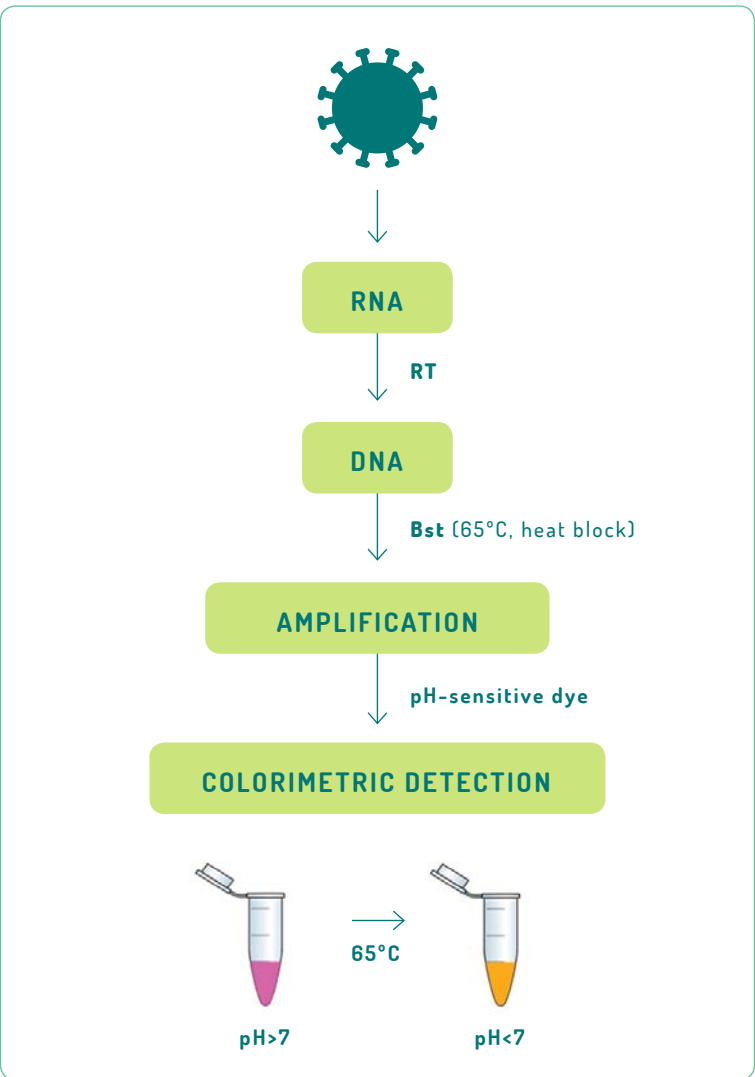
## ACRONYM

DETECT

## BRIEF DESCRIPTION

Until there is an effective implementation of COVID-19 vaccination program, a robust testing strategy, along with prevention measures, will continue to be the most viable way to control disease spread. Such a strategy should rely on disparate diagnostic tests to prevent a slowdown in testing due to lack of materials and reagents imposed by supply chain problems, which happened at the early stages of the pandemic

At ITQB NOVA we established and evaluated an RT-LAMP (reverse transcription loop-mediated isothermal amplification) colorimetric test for SARS-CoV-2 detection from RNA samples extracted from the nasopharyngeal fluid, or directly from the saliva, of COVID-19 patients. Using simple enzyme expression and purification protocols together with homemade buffers, we showed that it is possible to establish an inexpensive colorimetric assay, fully independent of specific supply chains, that efficiently detects SARS-CoV-2 RNA. We also developed a new colorimetric detection method that, when merged to LAMP, is capable of detecting SARS-CoV2 with great analytical sensitivity.



## TITLE

PRODUÇÃO E FINANCIAMENTO HOSPITALAR  
NO PERÍODO PÓS-PANDEMIA

## BRIEF DESCRIPTION

The COVID-19 pandemic context required measures to reorganize health services, in order to guarantee the National Health Service's capacity to respond and protect the health of users and health professionals. This project aimed to analyze hospital production and financing in the pre-pandemic and pandemic periods, and to estimate their evolution between July 2020 and December 2021, in the following lines of hospital care: outpatient visits and teleconsultation, hospitalizations, surgeries and urgency.

We developed scenarios based on the evolution of the COVID-19 pandemic and its impact on hospital production. The four scenarios were consistent with what occurred during past influenza pandemics: the "Peaks and valleys" scenario assumed repetitive smaller waves that gradually diminished, the "Fall peak" assumed a larger wave in the fall or winter of 2020 and one or more smaller subsequent waves, the "Slow burn" assumed a gradual decrease of transmission and case occurrence, but without a clear wave pattern, and the "No reduction" scenario assumed the production remained unaltered (this was used as the baseline scenario for analysis). The characterization of hospital production and financing was carried out using descriptive statistical analysis and the respective projections prepared using Integrated autoregressive and moving averages processes (ARIMA models).

In the period from July 2020 to December 2021, compared to the "No reduction scenario", it was estimated a reduction in production and financing between 18% and 24% for outpatient visits (4.4 million fewer consultations), between 36% and 47% for hospitalizations (which would represent 557 thousand fewer episodes less and 1.12 billion euros), between 40% and 49% for surgeries (420 thousand fewer surgeries and 467 million euros), and between 33% and 37% for urgencies (3.4 million fewer episodes). For teleconsultations, it was not possible to make robust estimates for teleconsultations due to small number of observations for most health units and the high instability of the time series.

It is worth noting the possibility of differences in the quality of the data used and in the coding between institutions, as well as limitations of the estimations made for production and financing using the aforementioned scenarios, as the epidemiological evolution of COVID-19 could be different from what was assumed and different between regions.

The findings made evident the need to define strategic plans for the use of health resources, redesigning the health care delivery system in order to reinforce coordination between levels of care and privilege high-value care. In this sense, it is extremely important to continuously monitor the evolution of the pandemic and the response capacity of the institutions, in order to adopt adaptation strategies and continuously guide assistance activities.

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**TITLE**

OCCUPATIONAL HEALTH INTERVENTIONS IN  
HEALTHCARE WORKERS EXPOSED TO SARS-COV-2  
DURING THE RECOVERY FROM COVID-19 PANDEMIC

**BRIEF DESCRIPTION**

Occupational Health Service (OHS) of CHULN had difficulties in the management of healthcare workers (HCW) during the pandemic and after, in pandemic recovery. Monitorizing the health of the HCW must be supported by effective mechanisms, in order to prevent contagion and keep them active in the face of the expected exhaustion of the teams. It is essential to manage the process of deciding the HCW fitness for work in the Hospitals Occupational Health Services and other Health Units, so it was proposed to design a dashboard for the health surveillance of the HCW.

**Main project steps and objectives:**

1. To collect and analyze the existing data from the decision-making process of fitness for work, along the pandemic progression, including the HCW with greater susceptibility to serious illness;
2. To analyze the confirmed cases among the HCW:
  - Demographic characteristics (age, sex, profession, seniority)
  - Epidemiological link, service and underlying likely exposure
  - Clinical evolution (initial symptoms, incubation time in view of the likely exposure identified, time elapsed between suspected exposure and positive analytical test, duration of symptoms, performed therapy)
  - Time elapsed until the analytical remains negative for fulfilling return to work criteria
  - Incidence
3. To collect and analyze data on suspected HCW cases:
  - Demographic characteristics of suspected cases (age, sex, profession, seniority)
  - Suspected cases, by confirmed case, identified by management according to Health Policy (HP) criteria
  - Suspicious cases corrected by OH, after interview, according to HP criteria for confirmed case
  - Rate of suspicious cases that evolve to confirmed case.

At the end of the project we created a dashboard with procedures implemented in the Occupational Health Service, that are based on the health surveillance of healthcare workers, which allows to obtain information in a systematic way in the hospital, to process the data of health professionals and to communicate with the various entities, in the contribute to preventing contagion and monitoring those infected with Covid-19, during and after the Covid-19 pandemic.

**TITLE**

CONHECER MAIS PARA INTERVIR MELHOR

**ACRONYM**

COMPRIME

**BRIEF DESCRIPTION**

The COVID-19 pandemic represents a global threat and poses challenges for health, economy, and well-being. This highlights the importance of analysing robust and timely data to support decisions regarding the implementation of public health measures at the national, regional, and municipal level. It is recommended that epidemiological studies should consider multi-level investigations of reliable environmental, societal, and population determinants. Behavioural, socioeconomic, and community factors, control measures, the effects of population mixing, and the use of appropriate spatial and temporal resolution and time frames all need to be carefully investigated.

**Objectives**

To identify municipality-level demographic and socio-economic determinants of COVID-19 in Portugal.

**Methods**

We assessed determinants of COVID-19 daily cases in 4 moments of the first COVID-19 epidemic wave in Portugal. The dates for this analysis were selected according to the public health measures in place, i.e., the date of publication of guidelines/legal documents and the maximum number of cases (determined by the 3-day moving average) occurring in the following 2 weeks. Four periods were selected: March 23 (the 1st day of lockdown with information available per municipality), May 28 (beginning of gradual deconfinement – 1st phase), June 8 (follow-up evaluation and beginning of the 2nd phase of gradual deconfinement), and June 27 (gradual deconfinement – 3rd phase).

We selected 60 potential determinants from five dimensions: population and settlement, health conditions, economy, social context, and mobility. We conducted a multiple linear regression (MLR) stepwise analysis ( $p < 0.05$ ) and an artificial neural network (ANN) analysis with the variables to identify predictors of the number of daily cases.

**Main Results and Conclusions**

We identified common variables when using both MLR and ANN analysis: living population and population density, exports, income, and people working outside the municipality of residence. However, several variables were identified using only a MLR or an ANN analysis. In one hand, we identified that stays in touristic facilities, catering and similar activities, education, restaurants and lodging, some industries and building construction, migration rate, and renting were important variables by using a MLR approach. In the other hand, urbanization, students in higher education, social housing buildings, and production services employment were identified as important variables using an ANN analysis.

At a municipality level, we identified several factors as possible determinants of COVID-19 transmission. While aspects regarding socio-economic characteristics showed varying relationships with COVID-19 cases, population density and mobility-related aspects were consistently associated with the analysed time-points. Despite some study limitations, we believe that these preliminary results should be taken into consideration to support decisions regarding COVID-19 prevention and control measures. More studies are required to enhance the robustness of this methodological approach and its results.

# RESEARCH 4 COVID-19

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COVID-19

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## TITLE

COVID-19 BAROMETER SOCIAL OPINION: KNOWING,  
DECIDING AND ACTING. THE PORTUGUESE, THE COVID-19  
AND THE NATIONAL HEALTH SERVICE RESPONSES

## BRIEF DESCRIPTION

The emergence of the COVID-19 has brought new challenges to the societies and to health systems, reinforcing the role of public health. Considering the absence of official information about how citizens are experiencing the pandemic and its effects in their lives, the Barometer COVID-19: Social Opinion, through an online survey targeted at the population (March–December 2020), monitored citizens' perceptions and behaviours regarding protection measures, risk perception related to COVID-19, confidence in the health authorities and services responsiveness, use of services, COVID-19 vaccine hesitancy, as well as the impact on physical and mental health, lifestyles changes and substance use, disaggregated by demographic and socioeconomic characteristics.

The Barometer COVID-19: Social Opinion, with regular data collection, allowed to analyse the current situation and identify trends throughout ten months of dynamic evolution and response to COVID-19. It sought to produce up-to-date knowledge for strategic rationale to political and technical decisions, as to provide useful information about access to health care (Primary and Hospital health care), confidence in the responsiveness also to non-COVID-19 patients, risk perception of being infected when using health services, and acceptance and satisfaction with complementary tools (e.g. telemedicine). In addition, the project aspired to identify needs and priority strategies for health literacy and healthy lifestyles promotion. The pandemic has exacerbated inequalities in health outcomes and access to healthcare, but also at socioeconomic level. Recognizing this, a focus was also given to most vulnerable groups who have been disproportionately affected by the pandemic, facing more aggravated social and health inequalities.

For dissemination and communication of the evidence produced, the Barometer COVID-19: Social Opinion developed a dashboard that provides all actors with useful knowledge to respond to the pandemic and mitigate its consequences. Also, strategic communication to the public in general across the media and digital platforms, and to the scientific community through papers in scientific peer-review journals contributed to disseminate the main results of the study.

The Barometer COVID-19: Social Opinion conducted a consultation of a multidisciplinary panel of 16 experts, that included doctors, health managers, epidemiologists, policy makers, specialists in public health and health promotion, professional orders and patient associations. A set of operational pilot strategies were outlined, aimed to tackle the effects of COVID-19, enhance a more adequate and equitable access to health services, reinforcing citizen-centred care, and promote healthy lifestyles and health literacy. Ultimately, by supporting policy decisions, services responses and citizens' awareness to better manage their health, as well as developing a component of translating evidence into practice, the project contributes to improve health promotion and to bring citizens closer to health services, with a focus on addressing real needs of vulnerable groups and reducing health inequalities.

Barometro  
Covid-19  
Opinião Social

## TITLE

MINIVENT – VENTILADOR MINIMALISTA PARA OS  
CUIDADOS INTENSIVOS DA COVID-19

## ACRONYM

MINIVENT

## BRIEF DESCRIPTION

Severe COVID-19 is often associated with severe acute hypoxemic respiratory failure. The number of patients requiring invasive mechanical ventilation has exceeded installed capacity in several countries. In many countries in Africa and South America, where the number of ventilators in healthcare systems is very low, they may need very low-cost ventilation equipment to be able to respond to pandemic peaks in their countries. The concept of a very low cost pressure controlled minimalist ventilator for COVID19 (<1000 € per unit, 25x less than commercial ventilator), and intended only for last resort situations (lack of commercial ventilators) was developed by a team funded by the FCT, IP within the scope of the 1st Edition of the Research4COVID program, with the project “Minimalist emergency ventilator by controlled pressure for COVID-19” (project n° 096\_596678305), which financed the development of a set of prototypes for two pilots, from April to the end of May 2020.

Following this project, a second prototype is being developed, led by NOVA School of Science and Technology and NOVA Medical School, with new features, namely: i) the use of a scissor valve to control the the inspiratory and expiratory cycles, that does not directly contact the inspired / expired air, and that allows air circulation only through medical grade materials, as well as easy replacement and sterilization of the ventilator components between different patients; ii) the mixture of Air + O<sub>2</sub> in any proportion, with changes during its operation; iii) discrete control, instrumentation, screens, and alarm electronics.

The solution we intend to develop is that of a minimalist and easy-to-produce ventilator for COVID-19 Intensive Care to be certified by INFARMED. In addition to the technological component of the solution, the results of the project will include:

- In-depth characterization of the fan's performance (namely in terms of pressure, flow and volume curves) under different operating conditions;
- Study of the reliability of the solution with longevity and stress tests on the system and its components;
- Production and Logistics Master Plan for easy, fast assembly, potentially distributed in different geographic locations (Portugal, Europe, Africa, Asia, etc.) with risk assessment to ensure the resilience of the solution supply in the face of possible chain disruptions logistics due to new waves of the pandemic;
- Certification of the solution with the national INFARMED authority, according to the “Procedimento Especial de Avaliação de Dispositivos Médicos no Âmbito COVID-19 – Ventiladores” of 20 April 2020.

## PT2020

SUPPORTED BY



## &gt; PRINCIPAL INVESTIGATORS

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157 175,09 €  
NOVA  
118 491,89 €

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> WEBSITE

<http://eco2covid.pt>

> FUNDING



> TEAM



INOVA+ - Innovation Services, S.A.

NOVA University Lisbon - NOVA  
School of Science and Technology  
(FCT NOVA)

Universidade de Coimbra (UC)

TITLE

ECO2COVID: DESENVOLVIMENTO DE PLATAFORMAS PARA  
DETEÇÃO E MONITORIZAÇÃO EM ÁGUAS DO CORONAVÍRUS

ACRONYM

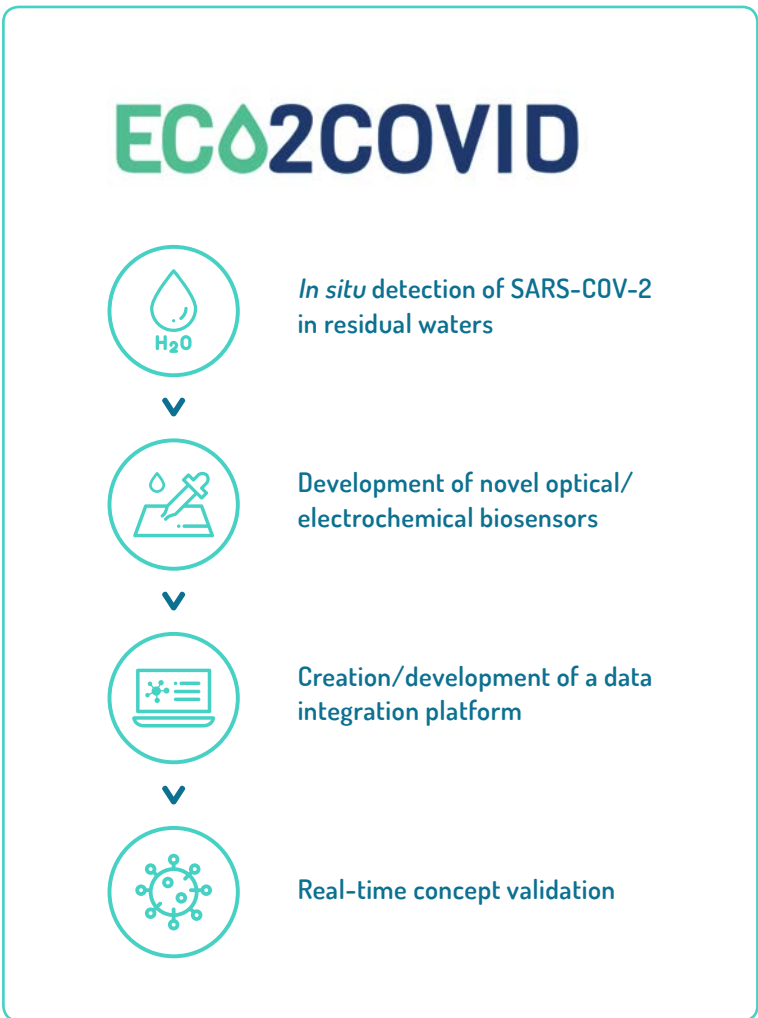
ECO2COVID

BRIEF DESCRIPTION

The main goal of the ECO2COVID project is to develop platforms for detection (monitoring) of SARS-CoV-2 coronavirus in wastewater treatment plants, through optical/electrochemical biosensor devices. These detection solutions will be expedite and low cost, safe, easy to use by the different interveners in the process, facilitate in-situ use, and mostly made of biodegradable materials that will reduce their environmental impact. The platforms will incorporate different modules, allowing an automatic collection of results along with geographic association, thus contributing to epidemiological studies.

At the end of the project, ECO2COVID expects to produce two platforms for the detection and monitoring of the SARS-CoV-2 coronavirus in wastewater, which integrate differential sensor systems to ensure the capture of a measurable signal in samples with different viral load indices. A dedicated mobile application will collect the information produced by these systems, which will centralize the information in a server for storage and processing to present a set of relevant indicators for epidemiological analysis.

At the end of the project, it is expected that the developed product will be at a TRL 3 stage.



TITLE

TECNICOV: DESENVOLVIMENTO DE TESTES RÁPIDOS  
PARA MONITORIZAÇÃO DE ANTICORPOS EM SORO E SALIVA

ACRONYM

TECNICOV

BRIEF DESCRIPTION

The TecniCOV project proposes an innovative approach for rapid monitoring of antibodies to SARS-CoV-2 in serum or saliva, materialised in independent but complementary techniques. These techniques include paper test strips (urine strip type), lateral flow systems (pregnancy test type) and electrochemical sensors (diabetes strip type), which allow optimising the cost/benefit ratio in different pandemic scenarios. The use of different techniques aims to maximise the cost/benefit ratio of each device, to be used in the different possible scenarios.

The material used as recognition element in all these techniques is innovative in the field and is expected to have a high affinity for antibodies produced in vivo, thus improving the reliability of conventional devices for antibody detection. This recognition material is synthetic and low cost, with its production already adapted to a large scale. Therefore, it is expected that the techniques will be produced at low cost, on a global scale, meeting the emerging need for worldwide/temporal replication of these analyses, in a rapid manner.

The automatic collection of data provided by the devices is also implemented, as a simple contribution to the epidemiological studies needed for pandemic control. At the end of the project, it is expected that the developed products will be at a TRL3 stage.



> PRINCIPAL INVESTIGATOR

GORETI SALES

> PRINCIPAL INVESTIGATOR AT FCT NOVA

ELVIRA FORTUNATO

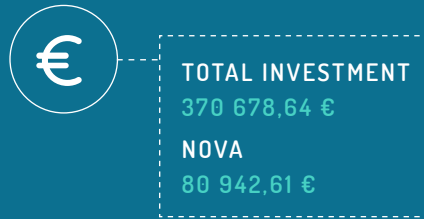
> HOST INSTITUTION

UNIVERSIDADE DE COIMBRA

> WEBSITE

<https://tecnicov.pt>

> FUNDING



> TEAM



INOVA+ - Innovation Services, S.A.

NOVA University Lisbon - NOVA  
School of Science and Technology  
(FCT NOVA)

Instituto Superior de Engenharia  
do Porto



COVID-19 RESEARCH AT NOVA  
PT2020

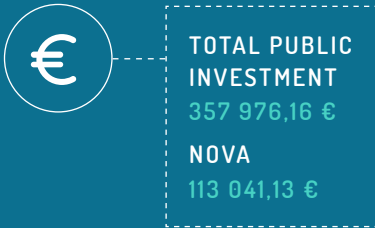
SUPPORTED BY  
PORTUGAL 2020 UNIAO EUROPEIA  
FUNDO DE COESÃO

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NOS COMUNICAÇÕES, S.A.

> PRINCIPAL INVESTIGATOR  
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LEID ZEJNILOVIC

> HOST INSTITUTION  
NOS COMUNICAÇÕES, S.A.

> FUNDING



> TEAM



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PATRÍCIA XUFRE  
LÉNIA MESTRINHO

NOS Comunicações, S.A.  
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GUILHERME BECO

NOS Technology – Conceção,  
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de Comunicações, S.A.  
CARLOS PORRAIS  
MUNICÍPIOS DE CASCAIS E  
LISBOA (TESTERS)

TITLE

ANTI-PANDEMICS ANALYTICS

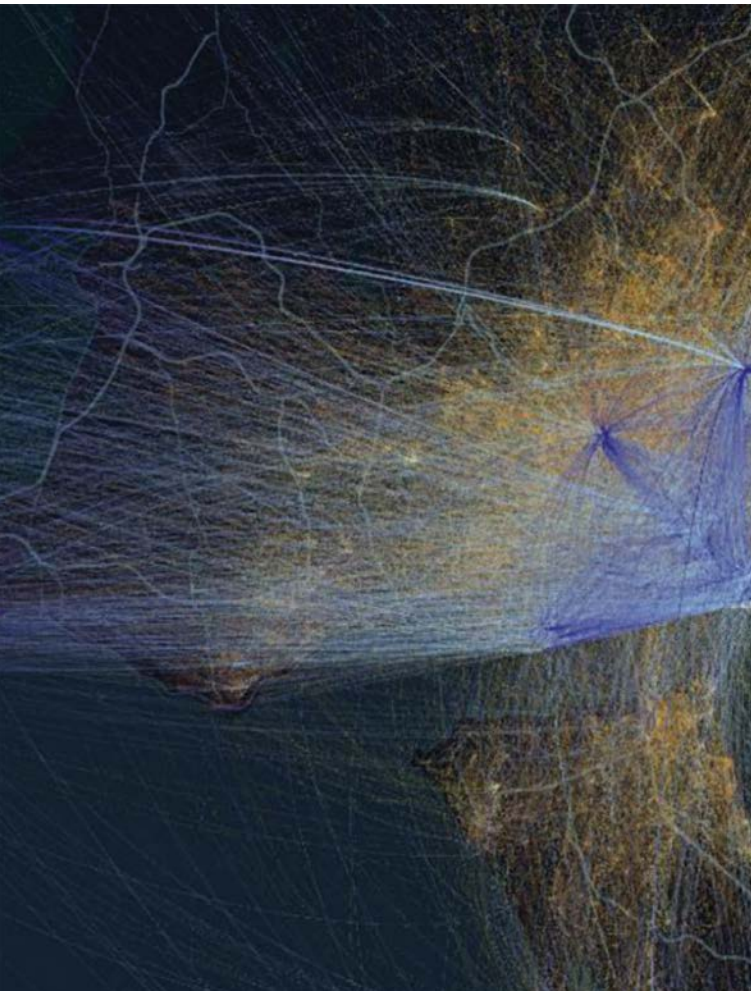
ACRONYM

ANA

BRIEF DESCRIPTION

In times of large magnitude crisis, like pandemics and other natural catastrophes, the management of population in terms of the stocks and flows on territories at risk is instrumental for saving human lives and livelihood. This project aims to contribute to an understanding of how telecom operators could use their data about individuals, augment it with data about territories, and apply machine learning algorithms to build the capacity for better response to the crises in an ethical, lawful, and responsible manner. This capacity-building initiative aims to assess existing or create new indicators of exposure to risk in different territories at different points of time during a week/day for what is termed the Advanced Anti-Pandemics Analytics. To fulfil this goal, the team of researchers and professors of Nova SBE will help in developing a segmentation model using aggregated data provided by NOS to characterize the geographical statistical sections (as defined by INE) and the nature of the population movements “from” and “to” those statistical sections. The prototype testbed for this capacity-building project will be the municipalities of Cascais and Lisbon.

NOS and Nova SBE partnered to develop an information product that aims to help municipalities visualize the risk of COVID-19 spread using augmented mobile network data, and with the information produced, plan actions to manage this risk.



TITLE

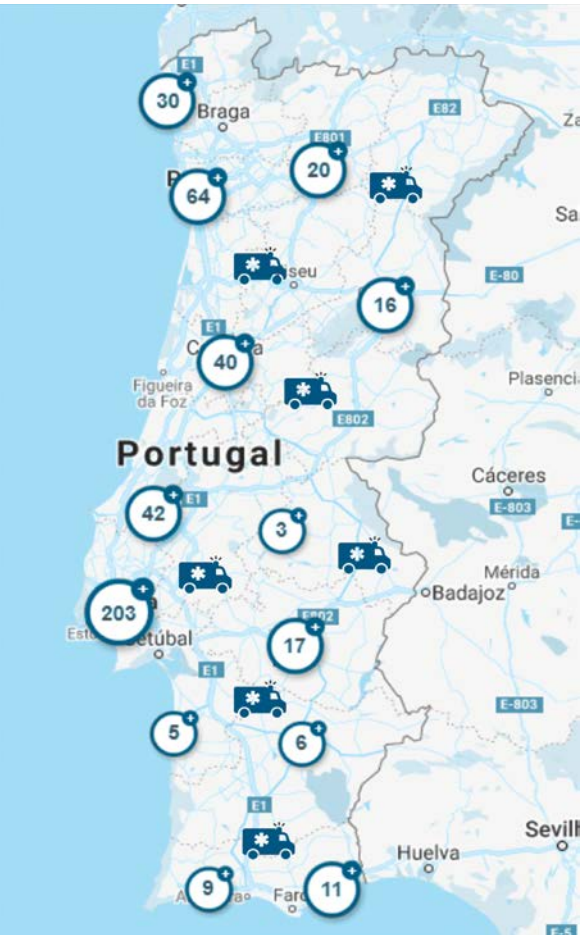
FAST TRACK COVID

BRIEF DESCRIPTION

Implement a national screening strategy for exposure to the SARS-COV2 virus based on tests of high sensitivity and specificity, combined with the ability to operate reference laboratories quickly, efficiently, comprehensively and with easy access, to support political decision-making. More specifically:

- Create and enhance a national serological screening network, capable of optimizing the allocation of existing resources, in order to guarantee accessibility and traceability for the entire Portuguese population;
- Conduct serological tests on a representative sample of the Portuguese population, well characterized and followed since 2011 (Cohort EpiDoC), consisting of more than 5,000 individuals residing in the national territory, through the analysis of its results, conduct a study of the impact of COVID-19 on the health status of the Portuguese and on socioeconomic indicators, comparing the assessments made, before and after the pandemic;
- Determine the seroprevalence (IgG and IgM antibodies) of the SARS-COV2 virus in the Portuguese population.

In this way, it is possible to test and develop a system that, in an agile, fast and effective way, is able to be expanded to a more comprehensive sample, and to respond to future outbreaks of the pandemic, detecting new patterns and clusters of infection early; this study also allows quantifying the prevalence of antibodies in the population, assessing their level of exposure, detecting an association between exposure to the SARS-COV2 virus and other comorbidities in individuals, as well as social and economic impacts.



COVID-19 RESEARCH AT NOVA  
PT2020

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PORTUGAL 2020 UNIAO EUROPEIA  
FUNDO DE COESÃO

> PRINCIPAL INVESTIGATOR  
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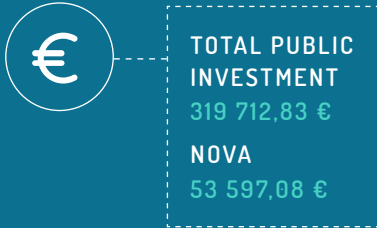
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> **PRINCIPAL INVESTIGATOR AT NOVA**  
NUNO NEUPARTH

> **HOST INSTITUTION**  
NOS INOVAÇÃO (NOSi)

> **FUNDING**



**TOTAL PUBLIC INVESTMENT**  
363 092,73 €  
**NOVA**  
116 483,13 €

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FILIPE SOARES  
INÊS SOUSA

NOSi  
JOANA SOUSA  
JOÃO FERREIRA

**TITLE**

VOICE SCREENING OF CORONA VIRUS

**ACRONYM**

OSCAR

**BRIEF DESCRIPTION**

OSCAR is a project that makes use of the Internet of Things for the study of changes in vocal sounds associated, not only with COVID-19, but also with chronic respiratory and neuromuscular diseases. The “type of cough” (dry or productive), its frequency and its pattern are different between chronic respiratory diseases and may allow their early identification. It is also verified that changes in the timbre of vocal sound, in breathing and in more neurological issues such as loss of smell or taste are also associated with chronic diseases, such as chronic obstructive pulmonary disease, asthma or amyotrophic lateral sclerosis.

Recently, it was found that COVID-19 can result in severe respiratory manifestations, with coughing and shortness of breath being the main symptoms. Thus, the study of potential vocal sounds to be investigated, in order to contribute to a first screening of suspected cases of COVID-19 and a better characterization of the disease.

This is how NOS Inovação’s intention to use its voice technology was born, through which customers control the UMA TV service, to implement a project that aims to quickly identify suspected cases of COVID-19 and that, in the medium and long term, it will also allow the study of other respiratory diseases.

In this regard, the knowledge and experience of the CHRC – NOVA Medical Medical School, the Fraunhofer Portugal Association and the Polytechnic University of Madrid come together and the Voice Screening of Corona Virus (OSCAR) is born, a project that aims to provide different screening tools and investigating these diseases, but which have a common objective – to put technology at the service of the population and the knowledge of the medical and scientific community.

**PHASE 1**

**Identification of the vocal sound pattern of patients with COVID-19 infection (development and validation of the algorithm)**

**POPULATION**

Patients COVID-19 ACES Lx ocidental Control Group with similar Age and Gender characteristics

**PHASE 2**

**Applicability of the intelligent algorithm to identify suspected cases with COVID-19 infection in the general population**

**POPULATION**

500 Users of NOS cable TV service

**TITLE**

DATA4COVID19

**BRIEF DESCRIPTION**

In the context of combating a pandemic such as that currently caused by the outbreak of COVID-19, and considering that a large part of the problems that occurred were difficult to anticipate, it is now clear that the response capacity and, above all, the effectiveness of the solutions developed, it will significantly benefit from a greater sharing of information between the multiple levels of management of our society.

The Data4Covid19 project proposes the development of a platform that enhances the crossing of multiple data sources in an integrated manner, allowing the relevant entities in each of the areas of action to design, implement, and monitor, in an articulated way, measures to combat pandemic.

The proposed action plan intends to guarantee the availability of instruments that contribute, from now on, to a better management of the current situation, but also, that enables an effective retention of knowledge, fundamental for the future combat of situations of the same type, whether in planning and construction of public policies, either in management. Through the ability to aggregate and process multisectoral information, it will be possible to obtain real-time indicators of the measures implemented, in terms of risk management and impact assessment in each of the phases.

This is an application to the R&D Companies typology, in the co-promotion modality, with the promoting consortium consisting of 3 non-business entities from the national I&I system and 2 companies: the Porto Digital Association, the project’s leading entity, the Porto University, NOVA University, NOS COMUNICAÇÕES, S.A. and Tek Privacy, Lda., as co-promoters.

**DATA4 COVID19**



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> **FUNDING**



**TOTAL INVESTMENT**  
392 496.86 €  
**NOVA**  
71 660.86 €

> **TEAM**



**TEAM**  
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TOTAL  
INVESTMENT  
310 868.06 €  
NOVA  
47 759.58 €

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CAROLINE WENTLING

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ENGENHARIA DE LISBOAEGAS MONIZ - COOPERATIVA DE  
ENSINO SUPERIORUNIDADE LOCAL DE SAÚDE DO  
BAIXO ALENTEJO, EPE

## TITLE

PLATAFORMA NACIONAL DE OBSERVAÇÃO E MONITORIZAÇÃO  
DA SAÚDE PARA DOENÇAS CRÓNICAS E COVID-19

## ACRONYM

PLANO-A-SAÚDE-C19

## BRIEF DESCRIPTION

With the advent of COVID-19, it became even more imperative to diagnose, treat and monitor patients through telehealth, minimizing the movement of citizens to health institutions, maintaining the continuum of care, and improving the quality of services provided by the NHS. In technological terms, natural evolution involves increasing the use of various digital channels, starting by optimizing the sharing of information in good time between citizens with illness and the various health agents through more advanced digital interfaces, and new support tools diagnosis and decision for doctors and health professionals. It is for this purpose that the PLANO-A-SAÚDE-C19 is developed.

The mapping of the needs and requirements of doctors and citizens with the pathology that can be served by the platform was done by ULSBA and EM, institutions that provide healthcare in these areas. The design and architecture of the platform was developed in a consortium between GS, ISEL, NOVA IMS, EM and ULSBA. The platform includes components designed to support the activities of the outpatient monitoring process, in particular:

- in the collection of biometric data, through mobile terminals (smartphones) and low-cost portable equipment (sensors) and sharing them with doctors;
- in its storage in a permissioned universal repository, for scientific and academic purposes, shared between HEIs and health institutions, respecting the privacy of users and maintaining the anonymity of data;
- analysing historical biometric data associated with chronic diseases and predicting their progression and the need for urgent and / or immediate medical care;
- in the distance interaction between doctors and citizens, through mobile and web applications that facilitate the capture and analysis of information, and complement other key processes such as therapeutic prescription and measurement schedule, scheduling in-person or remote consultations, and the launch of alerts in situations of risk, or non-compliance with the plan prescribed by the doctor.

The solution will also allow patients to have a more active role in various decision-making processes, being more involved in controlling their disease and relating more effectively and closely with their doctors and health units.



## TITLE

PERSISTENCE OF SPECIFIC HUMORAL AND CELLULAR  
IMMUNITY IN CHILDREN AFTER SARS-COV-2 INFECTION

## BRIEF DESCRIPTION

The role of children in this pandemic has been widely discussed. According to current knowledge, children have milder symptoms and are less likely to be hospitalized when compared to adults. In addition, some studies suggest that children are not significant drivers of the COVID-19 pandemic, although it is unclear why documented SARS-CoV-2 transmission from children to other children or adults is less frequent. In fact, in some studies, nasopharyngeal SARS-CoV-2 viral loads were similar to those in other age groups, raising concern that children could be as infectious as adults. Others authors suggest that children under 10 transmit the virus less often to adults while those between the ages of 10 and 19 spread the virus as well as adults do, possibly because the innate immune response in children is stronger than in adults. Taking all these data into consideration, we can say that the role of children in this pandemic may have been modest in this first wave, but with the reopening of schools it can be substantially higher.

The SARS-CoV-2 pandemic has raised many challenges to the scientific community, and one of the many questions currently under discussion is the persistence of immunity and if it eventually will give full or partial protection to reinfection. This is a crucial issue, particularly because the introduction of a vaccine is expected to be the main solution to end the COVID-19 pandemic. Some papers suggest that humoral immunity may decrease after a short period of time, but whether this decrease will lead to a corresponding increase in susceptibility to reinfection has not yet been determined. It is also not clear whether this decrease is accompanied by a decrease in the cellular immune response, a fundamental component in the antiviral immune response. Furthermore, these studies have focused in adult patients, with scarce information about the immune response in children.

The primary objective of this project is the study of the humoral and cellular immune response in children during acute COVID-19 infection and one, three and six months after it. We also aim to assess the differences in immune response between mild, moderate and severe infections.



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67 400,00 €

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Laboratory of Clinical Pathology of  
CHLC

VITÓRIA MATOS

# 9

## IMPACT RANKINGS



### MESSAGE FROM THE VICE-RECTOR FOR INTERNATIONAL DEVELOPMENT

JOÃO A. DE MATOS  
NOVA UNIVERSITY LISBON

Since Universities exist, their main instrument to generate knowledge – or science – has been to internationalize. From very old times, researchers used to work in constant dialogue across institutions and cultures, sharing innovative methodologies, findings, and failures. In modern times however, the nature of the academic institutions changed, the world itself changed and science required different means of communication, and different benchmarks. There are estimated 30,000 universities around the world and around 200 new institutions are born every year. In the midst of so much information asymmetry, the industry of rankings appeared as a communication device to clarify the waters.

As a young European research-focused University, founded less than 50 years ago, NOVA has succeeded in the most prominent rankings, as a fruit of its natural research flow. Within this group, NOVA systematically ranks in the top 10, as the 8th place in the QS top 50 under 50 ranking, 8th in the Multirank, and the 9th place in the World rank QS ranking, witness. In the rankings by area, the Times Higher Education (THE) ranks NOVA 5th in Education, 7th in Business and Economics, and 9th in Clinical & Health. In a consistent way, the QS ranks NOVA 6th in Arts & Humanities, 8th in Engineering & Technology, 7th in Life Sciences & Medicine, 5th in Natural Sciences, and 7th in Social Sciences & Management.

However, universities are nowadays more than the research performed by their scientists. Given the complex and interrelated problems faced by modern societies, science faced bravely the challenge of interdisciplinarity and societal impact of its advances. This perspective enlarged the core mission and vision of modern universities to the so-called third mission (after research and education). Following that natural trend of concern, the Times Higher Education developed the THE impact rankings, measuring in a comprehensive way the impact of institutions in the communities where they are inserted, including also, to some extent, the direct impact of research.

In the past years, NOVA has been present in that ranking. Among young European Universities founded less than 50 years ago, NOVA ranked 6th in SDG 9 (Industry and Innovation), 6th in SDG 16 (Peace, Justice, and Strong Institutions), 13th in SDG 5 (Gender Equality), 19th in Partnership for the Goals, 20th in SDG 11 (Sustainable Cities), 23rd in SDG 4 (Quality Education), and 23rd in SDG 3 (Health).

The quality and the impact of NOVA's research is and well reflected in these numbers, reinforced by others, such as EDUNIVERSAL, where several of NOVA's academic Programmes are ranked amongst the best in Europe – and very often in the World. One may however take a skeptical approach to rankings and realize that each one reflects a particular reality, and a different way of measuring – which allows interpreting all these values as relative. In the case of NOVA's number, however, no matter which one we pick, all rankings allow to position NOVA as an institution of reference among the young European research-based universities – the result is robust across all different methodologies. ■■

BB

All rankings allow to position NOVA as an institution of reference among the young European research-based universities – the result is robust across all different methodologies.

NOVA IS RANKED TOP 10 AMONG YOUNG EUROPEAN UNIVERSITIES, FOUNDED LESS THAN 50 YEARS AGO:



### RANKINGS BY SUBJECT



### OTHER RANKINGS

Eduniversal ranks Management-related Masters programmes in all areas of knowledge from the world's 1000 top Universities. In the Eduniversal – Masters Ranking 2019, NOVA was ranked in 24 of the 50 evaluated programmes.

#### NOVA is in the World Top in:

- 1<sup>st</sup> Business Intelligence and Strategy Management
- 3<sup>rd</sup> Health Management Marketing
- 4<sup>th</sup> Maritime Management
- 4<sup>th</sup> Insurance, Risk & Actuarial Sciences
- 5<sup>th</sup> Corporate social responsibility Management
- 6<sup>th</sup> Supply Chain and Logistics
- 6<sup>th</sup> Sustainable Development and Environmental Management
- 7<sup>th</sup> Entrepreneurship
- 11<sup>th</sup> Big Data Management

#### NOVA is in the European Top in:

- 1<sup>st</sup> Information Systems
- 2<sup>nd</sup> E-Business and Digital
- 3<sup>rd</sup> Economics
- 4<sup>th</sup> Data Analytics
- 4<sup>th</sup> Human Resources
- 5<sup>th</sup> Accounting
- 5<sup>th</sup> Public Administration
- 6<sup>th</sup> Corporate Finance
- 8<sup>th</sup> Marketing
- 8<sup>th</sup> General Management
- 8<sup>th</sup> International Management

### IMPACT RANKINGS



NOVA ranks in the following positions among young European institutions founded less than 50 years ago:





# 10

## SPEAR PROJECT

> **NAME**  
SPEAR

> **COORDINATOR AT NOVA**  
Elvira Fortunato

> **FUNDING**



This project has received funding from the European's Union H2020 Research and Innovation Programme under Grant Agreement No 824544

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> **PARTNER INSTITUTIONS**

University of Southern Denmark (SDU)

Uppsala University (UU)

Aachen University (RWTH)

Europa Media Non-profit Ltd.

JOANNEUM RESEARCH

South-West University (SWU)

University of Plovdiv (PU)

Vilnius University (VU)

Vytautas Magnus University (VMU)

NOVA University Lisbon (NOVA)

University of Rijeka (UNIRI)

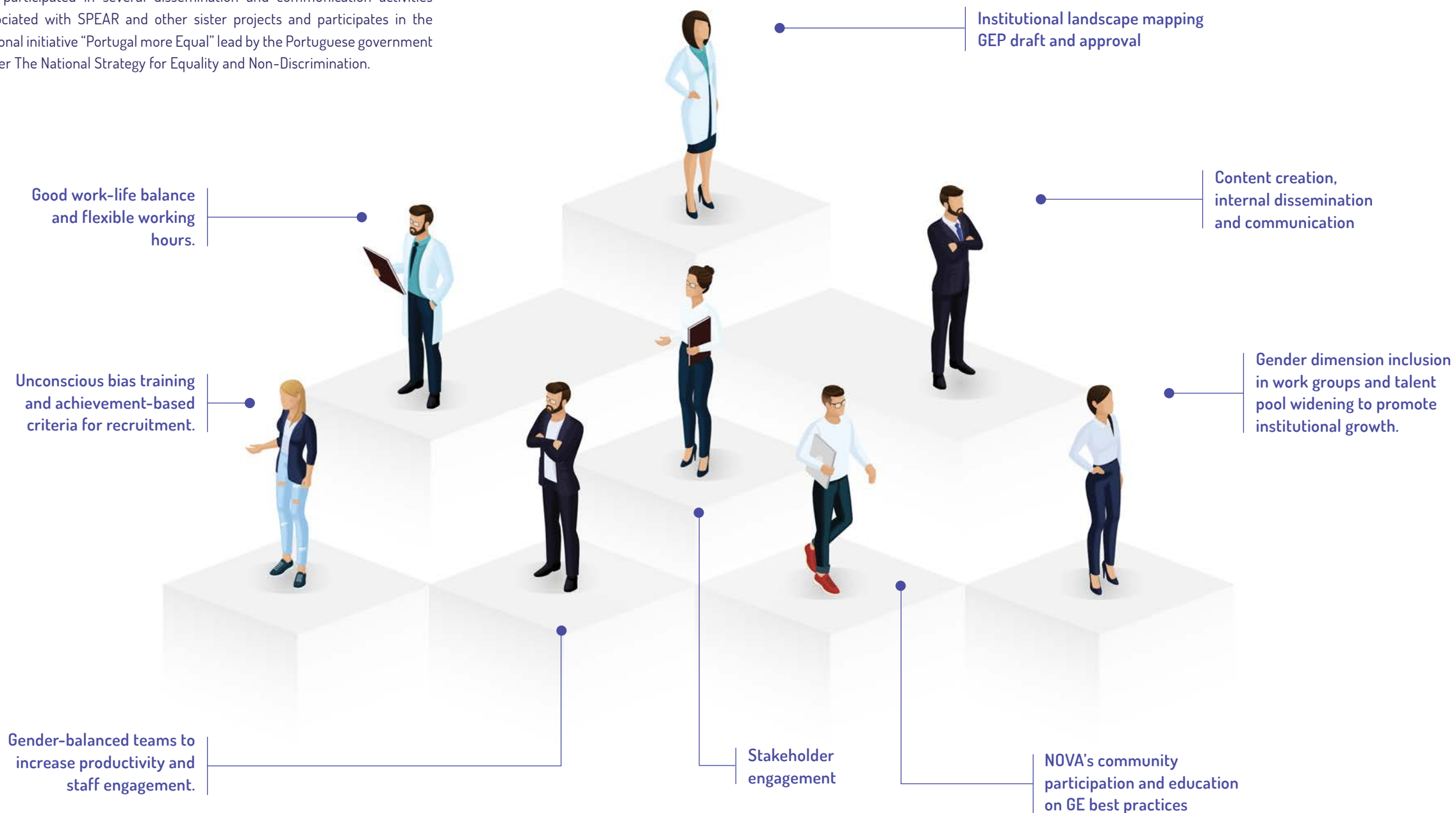


## 2020 A YEAR IN REVIEW TOWARDS GENDER EQUALITY

NOVA's commitment towards Gender Equality has been standing out and NOVA has been ranked in the TOP 5 in multiple International Rankings. NOVA's recent achievements place NOVA among the leading Institutions in Portugal in terms of Gender Equality and Equal Opportunities. NOVA has participated in several dissemination and communication activities associated with SPEAR and other sister projects and participates in the national initiative "Portugal more Equal" lead by the Portuguese government under The National Strategy for Equality and Non-Discrimination.



#TeamNOVA  
#EqualityGoals  
#GenderEquality  
#GenderDimension  
#EqualOpportunities  
#NOVAsupportGE



# 11

## DOCENHANCE PROJECT

### > NAME

ENHANCING SKILLS INTELLIGENCE AND INTEGRATION INTO EXISTING PHD PROGRAMMES BY PROVIDING

### > ACRONYM

DOCENHANCE

### > COORDINATOR AT NOVA

Patrícia Rosado Pinto

### > FUNDING



This project has received funding from the European's Union H2020 Research and Innovation Programme under Grant Agreement No 872483

### > CONTACTS

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### > WEBSITE

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## DocEnhance

### TRANSFERABLE SKILLS TRAINING THROUGH AN OPEN ONLINE PLATFORM

DocEnhance is a European project, funded under the Horizon 2020 program of the European Commission. The project builds on a large consortium, integrating several stakeholders from the academic and non-academic sectors and aims at improving PhD graduates' integration in the non-academic sector EU-wide.

An external Advisory Board and the Industry Reference Group represent the major stakeholders and end users of the project outputs and their involvement is ensured through a co-creation approach that includes project evaluation and validation. The presence of an African project partner and member university of the World University Network represents an external overview of non-European countries.

All project outputs will be freely available through an online platform. This platform will function as:

- a network of academic and non-academic institutions for cooperation and information sharing;
- an access point for researchers in all career stages to Open Educational Resources (courses, guidelines, reports, studies) created by the project;
- a capacity building tool for educational institutions, allowing them to access, customise and exploit the resources locally and adopt modernised PhD skills training.

### CONCEPT

Responding to the need of bridging the skills gap between research employment in academia and beyond, the DocEnhance project aims to develop and integrate transferable skills training into PhD education in Europe, as these skills facilitate the transition into employment, regardless of the scientific field and chosen career path.

DocEnhance aims to enhance transferable skills intelligence and integration into existing PhD programs by:

- involving the non-academic sector in developing a more employment and innovation-oriented curriculum for PhD programs,
- facilitating work-based learning and business-education partnerships through developing
- PhD courses, and
- tracking of PhD graduate career paths.

The major outputs of the project are a recommended transferable skills curriculum for PhD programs, a novel course concept and material, and an open-access career tracking survey.

### PILLARS OF ACTION

To reach out and include the wider community in the co-creation process, an anonymous online questionnaire is being developed and implemented to gather input from a broader spectrum of stakeholders. The overall aim is to set up and run a career-tracking survey of PhD graduates among partner universities, to expose crucial skills gaps and career paths, and to create good practice recommendations for career tracking and alumni networking.

DocEnhance will also create three transferable skills pilot courses. The DocEnhance course concept is structured upon three interlinking learning modules, fostering Open Education, Interdisciplinarity and Mobility (see scheme).

### ORGANIZATION

Pilot courses will be piloted among several European partner universities during the project for proof-of-concept. The courses will focus on "Data Stewardship", "Supervision" and "Career Management & Entrepreneurship":

The course on Data stewardship is organized around ten thematic elements that include individual steps of the research data management lifecycle from data collection through the data storage, sharing, and publishing to data search and re-use. A chapter on preparing a data management plan will also be incorporated. The FAIR (Findable, Accessible, Interoperable and Reusable) data principles will be emphasized.

The course on Supervision will entail:

- Identifying and embed pedagogical, practical and up-to-date skills in supervision (e.g. roles, responsibilities, communication, mental health issues, project management, diversity, and equal treatment),
- Knowing how to implement them in context (e.g. legal issues, relations to national research funding bodies, educational and disciplinary-based practices, and understanding of non-academic organizations and career development).
- Mastering up-to-date research skills elements (e.g. open science, data management, entrepreneurship, supervision in teams),
- Discovering peer supervision
- Adapting supervision practices to the changes in the working life.

The course on Career management and entrepreneurship has three main building blocks: Competence (set of knowledge, skills and attitudes), Value creation (from humans' activity to generation of value for someone), and Being entrepreneurial (looking at things from different perspectives).

NOVA Doctoral School is responsible for the implementation of the pilot course in Career management and entrepreneurship, along with Tampere University.

All project outputs (courses, guidelines, reports, studies) will be freely available online at the DocEnhance Platform. This platform will also allow contributions from users aiming at improving the platform's functionality. The DocEnhance platform will promote a dynamic European network between academic and non-academic partners for cooperation and information sharing.

### > PARTNER INSTITUTIONS

The Arctic University of Norway;

ALL Digital AISBL, Belgium;

University of Chemistry and Technology, Prague, Czech Republic;

Tampere University, Finland;

European Science Foundation, France;

Tree of Science, France;

Technical University of Munich Graduate School Germany;

University of Ghana, Ghana;

Aristotle University of Thessaloniki, Greece;

European University Foundation, Luxembourg;

Maastricht University, Netherlands;

The Confederation of Norwegian Enterprise, Norway;

NOVA University Lisbon, Portugal;

Matej Bel University, Slovakia;

Fundación Universidad- Empresa, Spain;

University of Alcalá, Spain;

Karlstad University, Sweden;

InnoxEXC GmbH, Switzerland;

The Adecco Group, Switzerland.

### > WORK PACKAGES ORGANIZATION:

WP1 – Skills investigation and intelligence

WP2 – Course concept and design

WP3 – Implementation of pilot courses

WP4 – Evaluation

WP5 – The DocEnhance Platform

WP6 – Communication, dissemination and exploitation

WP7 – Project coordination and management

WP8 – Ethics requirements



# 12

## T-FACTOR PROJECT

### > ACRONYM

T-FACTOR

### > COORDINATOR

ANCI Toscana

### > FUNDING



This project has received funding from the European's Union H2020 Research and Innovation Programme under Grant Agreement No 868887.

### > CONTACTS

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### > WEBSITE

[www.t-factor.eu](http://www.t-factor.eu)



T-Factor is an EU research project for meanwhile spaces and temporary urbanism. T-Factor's mission is to boost radical new approaches to urban regeneration, focusing on the key role that meanwhile spaces can play in unleashing inclusive, sustainable and thriving urban areas.

Ultimately promoting future-facing urban hubs through culture and creativity-led strategies of transformative time in unused buildings and land in EU cities.

NOVA is participating as a pilot with the regeneration project of the Presidium of Trafaria, future Institute of Art and Technology.

### CONCEPT

The concept of urban regeneration includes efforts to reverse declining city physical structures and economies by identifying needs and challenges, and engaging all stakeholders and delivering tailored projects for sustainable new communities. The EU-funded T-Factor project questions the waiting time in urban regeneration. This is the time between an intervention request and its implementation to prove how culture, creative collaboration and stakeholder engagement can release vigorous urban centers of inclusive urban (re)generation, social innovation and business. The project considers early-stage regenerations in the historical centers of Amsterdam, Bilbao, Kaunas, Lisbon/Trafaria, London and Milan, and provides their public-private partnerships with a special ecosystem of capacity building for extensively new city-making projects.

### PILLARS OF ACTION

The project results are expected to contribute to:

- Reversing trends of abandonment and neglect of historic heritage in urban areas and landscapes;
- New and tested blueprints for the socially and economically viable regeneration of European historic urban areas and cultural landscapes, with enhanced well-being and quality of life, social cohesion and integration;
- Boosting heritage and culture-relevant innovation, creativity, entrepreneurship and light 'reindustrialization' of historic urban areas and cultural landscapes;
- Cross-sector collaboration, creation of job opportunities and skills in cultural and creative sectors and innovative manufacturing linked to historic heritage.

The requalification of Trafaria is part of the development strategy outlined by the Almada City Council, which aims to promote economic development, boost cultural activities and stimulate a new strategy for the requalification of the entire public space. The regeneration initiative aims to turn Trafaria into a hub of arts, culture, and creativity, which sees the settlement of the Institute of Art & Technology at Trafaria (IAT) as the main catalyzer of new higher education, applied

research and enterprise opportunities with an international outlook, yet with a strong focus on the creation of positive social and economic impacts over the area and its current inhabitants. Key activities envisaged during the regeneration and as part of the T-Factor project are:

### DIGITAL MEDIA FESTIVAL

Activity related to the Digital Media Program (FCT + FCSH) organized by students and faculty, involving external artists, guests and the general public.

### WEB OF STORIES

Platform for documenting community narratives and knowledge. It will provide support for multiple projects related with the community.

### DIGITAL DOCUMENTATION AND VIRTUAL VISIT TO FORTE DA TRAFARIA AND THE AREA UNDER TRANSFORMATION

While the building and the area is about to be transformed this project will provide a detailed 3D reconstruction of the environment and how it changes over time.

### WORKSHOPS ON CREATIVE PROGRAMMING

It will combine hands on development and DIY component building. Possible themes include artistic approaches involving building sensors for pollution prevention/information, monitor sound levels, or sea water parameters.

### POSTDOC SCHOLARSHIP

This resource will carry out a project to explore the development of Trafaria's communities living heritage which is constituted by fishermen and Luso-African minorities. Part of this project will be Community Activation through a bottom-up museum.

### CRITICAL FUTURES PROGRAM AND SEMINARS

Critical Futures is a four-year-long series of seminars and workshops in synergy with the Trafaria Biennial and the FCSH Ph.D. Program on Art Studies.

### SHORT COURSES

Open to the general public in partnership with Casa da Cerca in Almada covering diversified topics such as Art & Activism; Artistic practices & Post-Colonialism narratives; The public space in Portuguese Cinema; Art & Technology; Digital video essays.

### WALKSCAPES CYCLE

Starting from the notion of "walkscapes" by Francesco Careri (2002), which proposes walking as an aesthetic practice and corresponding to an activity of questioning the built landscape, this cycle intends to develop several paths/hikes in Trafaria.

Workshop: Construction of a Geodesic Measuring Tower

Resorting to construction materials of ephemeral nature, conducted by a geodesic engineer, the workshop would aim to delimit an actual territory serving an imaginary purpose while addressing the pressing issue of mobility and belonging.

### WORKSHOP: THE INTERACTIONS BETWEEN LIVE PERFORMANCES AND THEIR RESPECTIVE DIGITAL RENDERINGS

Make the experience of recreating, on video, a dance, and theater work, trying to find innovative languages for the necessary relationship between pre-existing art and the intervention of technology.

### HACKATHON ON INTERSECTIONS BETWEEN INTANGIBLE DIGITAL HERITAGE AND NEW MEDIA

Demos of the ongoing projects by FCT computer science students, involving a final competition where the jury will be the local community.

### > PARTNER INSTITUTIONS

#### CONSORTIUM PARTNERS

ANCI TOSCANA ASSOCIAZIONE

LAMA DEVELOPMENT AND COOPERATION  
AGENCY SOCIETA COOPERATIVA

PLUSVALUE

THE UNIVERSITY OF THE ARTS LONDON

POLITECNICO DI MILANO

Espacio Open

LAND Italia

FUNDACION TECNALIA RESEARCH &  
INNOVATION

AALBORG UNIVERSITET

Futuribile

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STICHTING WAAG SOCIETY

KAUNO TECHNOLOGIJOS UNIVERSITETAS

FUNDACIO PER A LA UNIVERSITAT OBERTA  
DE CATALUNYA

BILBAO EKINTZA

KAUNO MIESTO SAVIVALDYBES  
ADMINISTRACIJA

TECHNISCHE UNIVERSITAT DORTMUND

STADT DORTMUND

I-PROPELLER NV

CITY OF LODZ

LONDON BOROUGH OF CAMDEN

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UNIVERSITA DEGLI STUDI DI MILANO

TONGJI UNIVERSITY

#### LOCAL PARTNERS

NOVA (FCSH & FCT)

Câmara Municipal de Almada

Artica

Plux

Pavilhão do Conhecimento

EDA

DocsKingdom

Associação Maumaus

TerraTreme

Ar.Co

### > ORGANIZATION T-Factor is organized around 10 Work Packages:

WP1 - Ethics requirements

WP2 - Insights, Learning and Requirements for  
transformative waiting time

WP3 - IT Infrastructure

WP4 - Transformation Agency

WP5 - Pilots

WP6 - Transformation Labs (T-Labs)

WP7 - Monitoring, Evaluation and Impact Assessment

WP8 - Outreach, Dissemination & Exploitation

WP9 - Coordination and Management

WP10 - Data Management and Ethics

# 13

## INTERVIEW

## ANTÓNIO FERRARI

UNITED NATIONS PUBLIC  
INFORMATION OFFICER  
FOR PORTUGAL

António Ferrari (born 17 September 1982) is a Portuguese Public Information Officer currently working in the United Nations Regional Information Center in Brussels. He joined the UN in 2017 where has also served as a Multimedia Producer and as Associated Spokesperson for the Secretary-General in New York. Between 2013 and 2015 he worked as the Press Advisor for the Minister of Economy of Portugal. He was a journalist for nine years, covering economic and political affairs in RTP (2005-2006) and TVI (2006-2013).

## 13 INTERVIEW

## ANTÓNIO FERRARI

● In 2015, the heads of state and governments of the 193 UN Member States signed the 2030 Agenda, during the United Nations Summit on Sustainable Development. More than five years later, what progress has been made towards achieving the 17 Sustainable Development Goals (SDG) established by Agenda 2030?

● The Sustainable Development Goals are a universal call to action to end poverty, protect the planet and improve the lives and prospects of everyone, everywhere. The 17 Goals were adopted by all UN Member States in 2015, as part of the 2030 Agenda for Sustainable Development which set out a 15-year plan to achieve the Goals.

Today, progress is being made in many places, but, overall, action to meet the Goals is not yet advancing at the speed or scale required. With less than ten years left to achieve the Sustainable Development Goals, world leaders at the SDG Summit in September 2019 called for a Decade of Action and delivery for sustainable development, and pledged to mobilize financing, enhance national implementation and strengthen institutions to achieve the Goals by the target date of 2030, leaving no one behind.

The UN Secretary-General, António Guterres, called on all sectors of society to mobilize for a decade of action on three levels: global action to secure greater leadership, more resources and smarter solutions for the Sustainable Development Goals; local action embedding the needed transitions in the policies, budgets, institutions and regulatory frameworks of governments, cities and local authorities; and people action, including by youth, civil society, the media, the private sector, unions, academia and other stakeholders, to generate an unstoppable movement pushing for the required transformations. At the core of the 2020-2030 decade, in the context of a global pandemic, is the need for action to tackle growing poverty, empower women and girls, and address the climate emergency.

More people around the world are living better lives compared to just a decade ago. More people have access to better healthcare, decent work, and education than ever before. But the global pandemic is now exacerbating inequalities and can jeopardize all the gains.

● How academia as a sector can support the Decade of Action on the SDGs, particularly in the new era of COVID-19?

● Academia is one of the UN's key allies to accelerate the implementation of the 2030 Sustainable Development Agenda. Any university can join the United Nations Academic Impact (UNAI), an initiative that aligns institutions of higher education with the United Nations in supporting and contributing to the realization of UN's goals and mandates, including the promotion and protection of human rights, access to education, sustainability and conflict resolution.

Since 2010, UNAI has created a vibrant and diverse network of students, academics, scientists, researchers, think tanks, institutions of higher education, continuing education and educational associations. There are over 1400 member institutions in more than 147 countries that reach over 25 million people in the education and research sectors

NOVA University, along with all Portuguese Universities, are playing a major role to be part of this change, promoting solutions, changing mentalities and providing innovation and knowledge that will help international community in this big and complex process of healing the planet and leaving no one behind.

United Nations Regional Information  
Centre for Western Europe



around the world representing a global diversity of regions and a thematic wealth of disciplines.

The work of these institutions is vital to achieving the Sustainable Development Goals as they serve as incubators of new ideas and solutions to the many global challenges we face. United Nations Academic Impact provides the integral link to these stakeholders to ensure that the international community harnesses the energy and innovation of young people and the research community in service to humanity. Organized by hubs, Universities can work hand in hand with the UN in several different topics such as addressing poverty, capacity building, education for all, global citizenship, among many others.

● Do you believe pandemic gives us a chance to address pre-existing inequalities through evidence-based policy?

● Absolutely. COVID-19 virus poses many risks and challenges to all of us but the pandemic is exposing and exploiting inequalities of all kinds, including gender inequality, access to healthcare and vaccination, poverty, human rights and education.

Just to give an example, the COVID-19 pandemic has created the largest disruption to education in history and prolonged school closures could further entrench inequalities in access to learning. The UN estimates that the pandemic has affected more than one billion students worldwide. This and many other inequalities that were now exposed and exacerbated by the pandemic need an urgent attention by the academic world.

It is now time to start the recovery but as UN Secretary-General, António Guterres, often points out "the current crisis is an unprecedented wake-up call" and "we need to turn the recovery into a real opportunity to do things right for the future." To do so, the United Nations is devising a blueprint for a healthier planet and society that leaves no one behind. Actions are being taken across the United Nations system to ensure a more resilient future. The Secretary-General has presented an initiative for the recovery, six climate-related actions, that need the support and commitment of science and the academia to be successfully

implemented. The work of all academics and researchers is crucial to back decision-making process in the coming years.

● NOVA is one of the universities committed to the SDGs. How important is the universities commitment to 2030 Agenda? What does it represent for Portuguese society?

● Universities have a unique and critical role in helping the world achieve the Sustainable Development Goals through their research, teaching, operations and community leadership. The knowledge and know how produced by the Academia is also crucial to help Member-States and other relevant stakeholders in the decision-making process. In 2012, the UN launched the Higher Education Sustainability Initiative (HESI) that gathers commitments from over 300 universities from around the world providing higher education institutions with a unique interface between higher education, science, and policy-making.

Portugal is no exception. It is very important that all relevant stakeholders are engaged and committed to this mission and Portuguese civil society has been showing a strong commitment and a growing engagement with the 2030 Agenda.

● How is Portugal tackling the SDGs and fighting climate change?

● Portugal has been a very active Member-State tackling the SDGs and fighting climate change. The country was one of the first to present its National Voluntary Review on the implementation of the 2030 Agenda and the National Statistics Institute (INE) has been monitoring the progress made to accomplish the 2030 Agenda, providing relevant data of the evolution in all SDGs. The country has been a strong advocate for the objectives to promote peaceful and inclusive societies, eradicating all forms of discrimination and gender-based violence, preserving the seas and oceans and managing resources in a sustainable manner. Portugal is also a very active voice in all climate related processes, bilaterally or within the European Union, such as the Paris Agreement or the Green Deal. ■ ■ ■ António Ferrari



# 14

## SANTANDER- NOVA COLLABORATIVE RESEARCH AWARD



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## SANTANDER-NOVA COLLABORATIVE RESEARCH AWARD 2020

NOVA University Lisbon and Banco Santander started a partnership 13 years ago to distinguish pioneering research projects developed by young researchers from NOVA, involving at least two different academic units of the University.

It was therefore in this context that the Santander-NOVA Collaborative Research Award was created. Since then, the distinction has been awarded annually, on a rotating basis, either in the areas of Life Sciences, Exact Sciences and Engineering or Social Sciences and Humanities.

However, unlike other years, The Santander-NOVA Collaborative Research Award 2019-2020 had not one, but two winners in its 13th Edition. One of the distinguished projects was IntelArt Project - "Artificial Intelligence: Effects on work and employment in Portugal" by researchers Nuno Boavida, from the NOVA School of Social Sciences and Humanities in collaboration with António Brandão Moniz, from NOVA School of Science and Technology. The project IntelArt will study how Artificial Intelligence (AI) might affect work organization, employment and industrial relations systems in the next decade in several

European countries. The results of the project will be useful not only for companies, but also to trigger the discussion about the effects of automation.

The other award-winning project was the Com @Rehab Project - "Communication for interactive rehabilitation in virtual reality" by researchers Maria Micaela Fonseca, from NOVA School of Science and Technology, Rute Costa, from NOVA School of Social Sciences and Humanities and Ana Rita Londral, from NOVA Medical School. By developing and optimizing a rehabilitation programme, based on a Virtual Reality system customized according to the patient's clinical needs, the team aims to support the management of therapeutic activities directed to post-COVID patients by making it more effective.

The Award was delivered to the two winning teams by the Head of Santander Universidades Portugal, Sofia Frère, and by the Rector of NOVA, João Sââgua, during the third edition of the University's science meeting, NOVA Science Day 2020, held in September. ■ ■ ■



# 15

## NOVA SCIENCE DAY 2020

### 15

## NOVA SCIENCE DAY 2020

### SUSTAINABILITY

In September 2020, NOVA University Lisbon hosted the third edition of the NOVA Science Day. The event was dedicated to Sustainability and the Sustainable Development Goals (SDGs) established by the United Nations. The Rector of NOVA, João Sàágua, opened the event stressing that “sustainability is the main challenge of the 21st century”. He added that it is necessary to “meet the needs of the present without compromising the future of new generations”, which was in line with the Minister of Science, Technology and Higher Education, Manuel Heitor, intervention.

During the morning, the meeting was also marked by several remarkable presentations from: the Public Information Officer of the United Nations in Portugal, António Ferrari; the Director of the Calouste Gulbenkian Foundation, Carlos Moedas; the European Research Council (ERC) representative in the area of Engineering and Physical Sciences, Martin Penny; and also the President of the National Innovation Agency (ANI), Eduardo Maldonado, who took the opportunity to comment on the new European ecological pact, the Green Deal.

As in previous editions, the Santander-NOVA Collaborative Research Award 2019/2020 was also announced, with two winners this time.

In the afternoon, nine NOVA researchers presented several interdisciplinary projects developed within the scope of the Sustainable Development Goals. Confidence was the feeling that dominated the presentations, even though everyone stressed the new challenges – and the negative repercussions – of the pandemic of COVID-19.

The Vice-Rector for Internationalization, João Amaro de Matos, addressed NOVA’s positioning in the international rankings and also the NOVA 4 the Globe platform. In his turn, Vice-Rector for Health, José Fragata, dedicated his talk to the various initiatives carried out by NOVA in the fight against the pandemic.

The end of the afternoon was marked by the launch of a book on photovoltaic energy, by Elvira Fortunato, Rodrigo Martins and Hugo Águas. Elvira Fortunato, who is also the Vice-Rector responsible for the NOVA Research, closed the session.

Given the restrictions imposed by the pandemic, the third edition of the event was broadcast live on the NOVA’s YouTube channel for the entire academic and scientific community, from the auditorium of the Rectory. ■ ■ ■





# SUSTAINABILITY AT INCM

**INCM – Imprensa Nacional - Casa da Moeda – (The Portuguese Mint and Official Printing Office) is the result of the merger in 1972 of the National Mint (Casa da Moeda), the oldest manufacturing facility of the Portuguese State working continuously since at least the late 13<sup>th</sup> century, with the Official Printing Office (previously named Imprensa Régia) that, since its foundation more than 250 years ago, was already printing passports, laws and other official documents.**

Sustainability at INCM is not, therefore, a new concept. It is a robust mark of its history, deriving from a **great capacity to adjust to its environment and to constantly strive to give a relevant contribution to the country's evolution by fulfilling the commitments gradually entrusted to it by the Portuguese State.**

While remaining faithful to its mission and to its own values, the company has been able to reinvent itself over the centuries, always looking to the future. Today, INCM is present in the daily lives of Portuguese citizens and on the international market, through the development of high security solutions with strong technological incorporation, particularly in the context of identification and travel documents and product authentication seals.

Sustainability in INCM is hence, above all, the **responsibility assumed by a multi-centennial institution in order to preserve its historical legacy and to put it at the service of the next generations**, while respecting the present needs of its different stakeholders and partners and of the country.

The way how INCM interprets and acts to fulfill this strategic sustainability goal has evolved over time, even though the nature and values of the company have always given it a sense of public service and commitment towards society.

The path that INCM intends to follow in this three-year period keeps as its basic requirements the company's **financial economic sustainability**, the **respect for environmental and social values** towards all its stakeholders and, in particular, **towards its employees**, preserving also **culture as a privileged dimension** for its action, since it is closely connected to its mission.

The strategy adopted for sustainability at INCM level is based on the **7 strategic guidelines** established for the company and on the **17 Sustainable Development Goals (SDGs)**, supported by the mechanisms already available for the **involvement of stakeholders** and the governance of society, including through a **Sustainability Committee**.

The implementation of actions that constitute the Agenda for Sustainability at INCM is developed primarily in the following action goals:

- › Open Innovation
- › Equality and Diversity
- › Health and Well Being
- › Promotion and Defense of the Portuguese Language
- › Social responsibility and
- › Environmental Evolution and Efficiency.

## OPEN INNOVATION

Open Innovation aims at creating initiatives to promote the development of innovative, sustainable products with impact on society through the involvement of the Scientific Community as a stakeholder. This activity is based on an **innovative network composed of universities, research centers and startups**, which currently involve more than 70 researchers, together with collaborations resulting from collaborative laboratories and from internal idea banks.

This commitment is currently reflected in an **innovation award (IN3+ Prize) which represents an annual investment of one million euros**, with a huge impact on the company's digital transformation, but also on the innovation network itself and on society through an intellectual property share model.

## EQUALITY AND DIVERSITY

Ensuring the incorporation into the values and practices of INCM of the principles of Equality and Diversity is also one of the pillars of sustainability, promoted through the **creation of conditions in the workplace and in society that encourage equal opportunities, recognising and valuing diversity and an inclusive environment**.

In this plan, we highlight the multiple initiatives inherent to the implementation of its Gender Equality Plan, the will to make sure Professional Life is reconciled with Family and Personal Life, and awareness-raising on Diversity and Unconscious Bias and Stereotypes.

## HEALTH AND WELLNESS

The development and participation in initiatives aimed at **ensuring access to quality health and the promotion of well-being for all, at all ages**, is another sustainability pillar with special impact on workers and their families, including retired persons. This includes the management and provision of a health care network, the promotion of sports and healthy eating, prevention and awareness-raising campaigns, among many other actions.

## PROMOTION AND SAFEGUARD OF THE PORTUGUESE LANGUAGE

The intervention in the field of Culture is anchored in the mission of INCM and its historical legacy, involving the **programming and implementation of the company's cultural responsibility activities**, having as guiding principle the **promotion of Portuguese language and culture**.

This action plan, with strong recognition and impact on society, includes the editing of works that are essential to Portuguese culture and language, the preservation of the National Mint Museum (Museu Casa da Moeda), the Historical Archive and the National Press Library, as well as a diverse set of initiatives to encourage the arts and literature, and to disseminate the language and works of Portuguese culture.

## SOCIAL RESPONSIBILITY

The commitment to promote **an ethics based on the company's values and a culture of support and active involvement in the community** is regarded in INCM's Agenda for Sustainability under a Social Responsibility approach.

In order to fulfill this goal, INCM is committed to promote and develop corporate volunteering actions that may be able to **involve its employees, their families, the company's pensioners and partners in initiatives with impact on the community, promoting common well-being**.

## ENVIRONMENTAL EVOLUTION AND EFFICIENCY

Finally, INCM's Sustainability Agenda includes a wide range of environmental initiatives, namely with regard to the **conscious consumption of resources, waste management and the development of products with as little environmental impact as possible**.

In this context, we highlight the incorporation of recyclable/biodegradable raw materials into its products, the reuse and recovery of waste and manufacturing waste, and the development of cross-sectional policies and systems of sustainable procurement and of technical resource management. INCM's contribution to reducing the environmental impact is also made on a collective level, in particular through the accession to the Lisbon Business Mobility Pact and the Lisbon Green Capital 2020 initiative, which include actions, for example, to electrify its automobile fleet and to promote the use of solar energy.

The fulfilment of the Sustainable Development Goals, as stated in that Declaration, "requires global action by governments, businesses and the civil society to eradicate poverty and to create a life with dignity and opportunities for all, within the limits of the planet". That is why we are sure that it is crucial for **each of us to take part in this process and to assume its responsibility**.



# NOVA SCIENCE 2020

Ana Machado@LAQV-REQUIMTE



[www.unl.pt](http://www.unl.pt)



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