Portuguese Roadmap of Research Infrastructures – 2020 Update

Fundação para a Ciência e a Tecnologia

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Foreword
by the
Minister of Science,
Technology and
Higher Education,
Manuel Heitor

No âmbito do apoio às infraestruturas científicas e de investigação de interesse estratégico nacional, que visam apoiar e estimular a atividade científica e tecnológica de qualidade, reconhecida internacionalmente, a Fundação para a Ciência e a Tecnologia, I.P. (FCT) criou o Roteiro Nacional das Infraestruturas de Investigação de Interesse Estratégico.

Privilegiando a excelência, a cooperação e a internacionalização, o Roteiro vem promover o reforço das infraestruturas científicas e de investigação baseadas no conhecimento e na capacidade de prestação de serviços à comunidade em diversas áreas, designadamente de âmbito social, científico, educacional, empresarial e industrial.

Com efeito, as infraestruturas científicas e de investigação são entendidas como plataformas, recursos e serviços associados que as comunidades científicas utilizam para desenvolver atividades de investigação e desenvolvimento em áreas científicas específicas, em todas as áreas do conhecimento. Elas incluem equipamento científico de grande porte, conjuntos de instrumentos científicos, coleções e outros recursos baseados no conhecimento, arquivos e dados científicos, sistemas computacionais e de programação, redes de comunicação que promovam o acesso aberto digital, bem como outras infraestruturas de natureza única essenciais para estimular a excelência nas atividades de investigação e desenvolvimento.

Com este objetivo, a FCT coordenou o processo de avaliação que conduziu ao primeiro Roteiro Nacional de Infraestruturas de Investigação de Interesse Estratégico, para 2014-2020, tendo resultado na identificação de 40 infraestruturas de investigação distintas, assim como na criação de uma base de dados de infraestruturas de investigação em Portugal, incluindo as áreas temáticas de Ciências Sociais e Humanidades, Ciências Físicas e Engenharias, Ciências do Ambiente, Ciências Médicas e Biológicas, Materiais e Estruturas Analíticas, Energia, e Infraestruturas digitais.

O processo de criação, implementação, apoio e evolução das infraestruturas científicas e de investigação do Roteiro deve ter em conta um mapeamento detalhado e dinâmico das necessidades, ofertas e lacunas existentes nas diferentes áreas científicas, no pressuposto de que as infraestruturas científicas e de investigação devem assegurar os meios necessários à realização de investigação de elevada qualidade e internacionalmente competitiva, alinhadas com a evolução das prioridades nacionais e do Plano Nacional de Reformas (PNR), assim como do Fórum Estratégico Europeu para as Infraestruturas de Investigação (ESFRI, em inglês), criado em 2002. Deve estar ainda particularmente articulado com a evolução do Programa Quadro de Investigação e Inovação da Comissão Europeia e programas relacionados.

Neste âmbito, a evolução das infraestruturas científicas e de investigação do Roteiro requer a sua articulação contínua com a prioridade nacional assumida de forma crescente no quadro das políticas públicas em relação à promoção das atividades de investigação e desenvolvimento (I&D), de inovação e de transformação digital, assim como à sua inserção no contexto europeu, a qual é crucial para o futuro dos portugueses.

Neste sentido, a atualização do Roteiro agora concluída, considera:

i) novas infraestruturas científicas e de investigação de interesse estratégico, que integram projetos enquadrados na política de incentivo à criação e ao reforço de capacidades e de competências e que potenciam a interligação e complementaridade com infraestruturas de investigação já incluídas no Roteiro;

ii) a publicação do Decreto-Lei 63/2019 que prevê a atualização do Roteiro baseada nas necessidades, ofertas e lacunas existentes nas diferentes áreas científicas, segundo as melhores práticas internacionais e tendo em conta as prioridades nacionais inscritas no Plano Nacional de Reformas (PNR) e a evolução do Programa-Quadro Europeu de Investigação e Inovação.

É ainda neste contexto que o sucesso da crescente participação portuguesa no atual Programa-Quadro (P-Q) Europeu de Investigação e Inovação (I&I) relativo ao período 2014-2020, "Horizonte 2020", e a ambição de reforçar e tentar duplicar a participação de Portugal no próximo P-Q Europeu de I&I (i.e. o futuro 9.º P-Q Europeu para I&I, denominado "Horizonte Europa") e programas afins relevantes para as atividades de investigação, inovação e digital em Portugal (o Programa Europeu para o Espaço, e os programas "Europa Digital" e "Interligar Europa", entre outros), exige a atualização dinâmica e continua da lista e do tipo das infraestruturas científicas e de investigação do Roteiro no âmbito do próximo quadro financeiro plurianual da União Europeia que decorrerá entre 2021-2027.

Within the scope of support for scientific and research infrastructures of national strategic interest, which aims to sustain and stimulate scientific and technological activity with high and internationally recognized quality, the Foundation for Science and Technology (FCT) created the *National Roadmap for Research Infrastructures of Strategic Interest*.

Privileging excellence, cooperation and internationalization, the Roadmap promotes the strengthening of scientific and research infrastructures based on knowledge and on the ability to provide services to the community in several areas, namely at social, scientific, educational, business and industrial levels.

Indeed, scientific and research infrastructures are understood as platforms, resources and associated services, which scientific communities use to carry on research and development activities in specific scientific themes in all areas of knowledge. They include large scientific equipment, sets of scientific instruments, collections and other knowledge-based resources, scientific files and data, computer and programming systems, communication networks that promote open digital access, as well as other targeted infrastructures and of an unique nature essential for encourage excellence in research and development activities.

With this objective, FCT coordinated the evaluation process that led to the first *National Roadmap for Research Infrastructures of Strategic Interest*, for 2014-2020, resulting in a framework set of 40 different infrastructures, as well as the creation of a database for research infrastructures in Portugal, that include the thematic areas of Social Sciences and Humanities, Physical Sciences and Engineering, Environmental Sciences, Medical and Biological Sciences, Analytical Materials and Structures, Energy, and Digital infrastructures.

The process of creation, implementation, support and development of the research infrastructures of the *Roadmap* must take into account a detailed and dynamic mapping of needs, offers and gaps in the different scientific areas, on the assumption that the research infrastructures must ensure the necessary means to carry out and support high quality and internationally competitive research, in line with the evolution of national priorities and the National Reform Plan (PNR), as well as with the European Strategic Forum for Research Infrastructures (ESFRI), created in 2002. This process must also be particularly linked to the evolution of the European Commission's Framework Program for Research and Innovation and related programs.

In this context, the evolution of the scientific and research infrastructures of the *Roadmap* requires a continuous articulation with the national priority that is increasingly assumed in the framework of public policies in relation to the promotion of research and development (R&D), innovation and digital transformation activities, as well as its insertion in the European context, which is crucial for the future of the Portuguese R&D.

In this sense, the update of the *Roadmap*, now completed, considers:

i) new scientific and research infrastructures of strategic interest, which integrate projects within the policy of encouraging the creation and strengthening of capacities and skills, and which enhance interconnection and complementarity with research infrastructures already included in the *Roadmap*;

ii) the Decree-Law nº. 63/2019, enabling a Roadmap update based on the needs, offers and gaps in the different scientific areas, according to the best international practices, and taking into account the national priorities included in the National Reform Plan (PNR) and the evolution of the European Research and Innovation Framework Program.

It is also in this context that the success of the growing Portuguese participation in the current European Research and Innovation Framework Program (FP for R&I) for the period 2014-2020, "Horizon 2020", and the ambition to reinforce and try to double Portugal's participation in the next European FP for R&I (i.e. the 9th European FP for R&I, "Horizon Europe") and related programs relevant to research, innovation and digital activities in Portugal (the "European Program for Space", and the programs "Digital Europe" and "Connecting Europe", among others) requires the dynamic and continuous updating of the list and type of scientific and research infrastructures in the Roadmap within the framework of the European Union's next multiannual financial framework which will run between 2021-2027.

Foreword
by the President of the Foundation for Science and Technology – FCT, Helena Pereira

The institutional strengthening of research consortia and platforms accompanies the growth and maturity of the Research and Innovation System by structuring the knowledge creation environment and enabling the shared use of infrastructures and facilities. Research Infrastructures are central to build dedicated frameworks that gather equipment, facilities, specialised resources and competencies in a specific field, with a crosscutting approach regarding institutional affiliations and an objective of enlarging their scientific outreach potential. They are therefore strategic to develop and support objective oriented R&I and a backbone to national and international knowledge communities.

Research Infrastructures are part of the Portuguese science and technology system, as defined by the legal framework established by the Decree Law 63/2019. Their role in knowledge creation and dissemination is embodied in their objectives of making available to the scientific community resources and services, namely large equipment and set of research instruments, collections and other knowledge resources, archives and scientific data, computational and programming systems, and communication networks. FCT is responsible for giving information on the national network of research infrastructures as well as for their update, by providing a comprehensive Roadmap of Research Infrastructures. The international scope of the activity is also foreseen and FCT is specifically endorsed with promoting their integration in European networks.

The European Strategy Forum on Research Infrastructures, ESFRI, aims at going beyond the fragmentation of individual policies and resources, and at taking Europe to the forefront of science, technology and innovation by supporting research infrastructures in all fields and facilitating their use and development, in a framework of sustainability and shared open science. The Roadmap 2018, the Strategy Report on Research Infrastructures, updates on the 37 ESFRI Landmarks and the 18 ESFRI Projects and is the most recent information.

In Portugal, the first National Roadmap of Research Infrastructures of strategic relevance for 2014-2020 included 40 research infrastructures in seven thematic areas: Social Sciences and Humanities, Biological and Medical Sciences, Energy, Environment, Material and Analytical Facilities, Physical Sciences and Engineering, and e-Infrastructures. This National Roadmap is updated here with the inclusion of 16 new research infrastructures that were considered of strategic relevance and covering needs in different areas of scientific and societal importance. The Roadmap 2020 Update was preceded by an internal and external maturity analysis of the research infrastructures, and therefore reflects its results and recommendations.

The Research Infrastructures are central to the strategy of FCT of consolidating a structured research ecosystem that will allow scientific and innovative endeavours in a broad participative and cross-organizational process and as a player in our knowledge-based societal development. The effective participation in relevant international networks, and namely in the ESFRI community, is a goal for the Portuguese Research Infrastructures that FCT will endorse. The inclusion of a research infrastructure in the Portuguese 2020 Roadmap of Research Infrastructures is therefore a recognition of this valued role in our Science and Technology System, and brings in the underlying commitment to develop sustainability, the adoption of data management and open science policies as well as the effective opening to different users.

The vision of FCT is that the Research Infrastructures are key contributors to the growth of the R&I system and a catalyst to improve its outputs both at scientific and innovative levels. Together with the R&D units and other science and innovation institutions, the Research Infrastructures will contribute to increase the relevance of a knowledge and science evidence based approach in our society.

Executive Summary

Research Infrastructures (RIs) are structural elements for Research and Innovation at the regional, national and international levels. RIs promote research excellence by providing access to state-of-the-art facilities, equipment and technology, as well as comprehensive databases and other resources. In the last decade, countries in the European Research Area have been publishing and updating their Roadmaps of National RIs, following the lead of the European Strategy Forum on Research Infrastructures (ESFRI), which published the first Roadmap of pan-European RIs in 2006.

The Portuguese Roadmap of Research Infrastructures of Strategic Relevance (RNIE in Portuguese) was first published by the Foundation for Science and Technology (FCT) to cover the period 2014-2020. A total of 40 RIs were included in different areas covering Energy, Environment, Medical and Biological Sciences, Physical Sciences and Engineering, Materials and Analytical Facilities, Social Sciences and Humanities, together with Digital infrastructures/e-RIs. A multi-year funding of 143.8 M€, supported by European Regional Development funds (68.6%) and National funds (31.4%), was approved in 2017, leading to considerable improvement in terms of equipment, physical infrastructures and human resources.

Recognition of evolving strategic approaches, knowledge gaps and societal needs led to the inclusion in the National Roadmap of 16 new Research Infrastructures in 2019-2020. The Portuguese Roadmap now includes 56 RIs in six thematic domains: Energy (4 RIs), Environment (7 RIs), Health and Food (20 RIs), Physical Sciences and Engineering (14 RIs), Social and Cultural Innovation (7 RIs) and Digital infrastructures (4 RIs).

A maturity evaluation of the Research Infrastructures included in the National Roadmap was launched by FCT by the end of 2019, coordinated by the Monitoring Committee for RIs, with 31 independent experts from the scientific community, who evaluated their state of development and issued recommendations.

This 2020 Update of the National Roadmap of Research Infrastructures summarizes their development and gives detailed information on each of the 56 RIs, namely regarding the institutional partnership, description, activities and impact. A majority of the RIs in the National Roadmap (68%) are aligned with or associated to an ESFRI Roadmap Infrastructure or other European Organizations/Initiatives in the respective area. These international connections are also detailed in this Roadmap.

With this 2020 Update, the National Roadmap of Research Infrastructures converges with the national R&I ecosystem, the priorities of the National Reforms Plan and the public policies for Research and Innovation, namely regarding Space, Health, the Atlantic and Digital Skills. As part of the National Science and Technology System, and given their nature and goals, Research Infrastructures are key players to promote excellence, knowledge transfer and internationalization of Portuguese research, in a framework of Open Science and citizen Science, therefore contributing for a knowledge-based society.

Introduction 01

Research Infrastructures are essential actors in the national and regional ecosystems that foster Research and Innovation (R&I). The continuous evolution of R&I is linked to a growing need of state-of-the-art, open access Research Infrastructures (RIs) that enable access to equipment, services, including the digital networks that support researchers in all science domains, and knowledge-based resources: from scientific collections to chemical libraries, from virtual databases to microbiological resources.

RIs play a wide variety of roles. They are hubs to promote research excellence and training of researchers, jointly addressing major societal problems and supporting science dissemination, while increasing efficiency and reducing operation costs for the national R&I system as a whole. National RIs play a pivotal role in the internationalization efforts of researchers by being part of pan-European RIs, such as those in the ESFRI (European Strategy Forum on Research Infrastructures) Roadmap, and also of Consortia of wider geography. This is why RIs are part of the backbone of the European Research Area.

The European rationale for the creation of large international single-sited or distributed RIs in an articulated and strategically aligned way led to the creation of ESFRI in 2002, which developed the first European Roadmap in 2006 and subsequently its updates in 2008, 2010, 2016 and 2018. Since the 2006 ESFRI Roadmap, many European countries have developed National Roadmaps taking into account the priorities defined in the ESFRI Roadmaps.

The first step towards a National Roadmap of Research Infrastructures of Strategic Relevance was to clearly define what a RI should be. In alignment with the ESFRI definition, a RI was defined in the first Portuguese National Roadmap (2014) as an organizational system used by the scientific community to conduct top-level research and innovation in their respective fields. It may include large scientific equipment or sets of scientific instruments, collections and other knowledge-based resources, data files and scientific data, computational and programming systems, communication networks that promote digital open access, as well as other infrastructures of a unique nature that are essential to achieve excellence in research. RIs may be single-sited or distributed as organized resource networks, either physical or entirely virtual/digital.

National and European RIs should have a clear plan to achieve, or have already achieved, the following goals, among others:

- Professional management that guarantees the implementation of an action plan and the accomplishment of the specific aims therein defined, with an efficient and transparent internal management of resources;
- Capacity to relate with, and provide services to, the scientific, educational, business and industrial communities;
- A clear, well defined and widely advertised policy of conditions for access by researchers that are external to the infrastructure, both national and international, which should be written into the aims and action plan of the RI.

A National RIs Roadmap should chart the existing infrastructures, frame them in a national, regional and international context, and on that basis design an action plan for their implementation. While each RI has its own specific goals, they are part of a broader ecosystem that helps to structure and shape the national R&I system, as well as to ensure its consolidation and resilience. **Table 1 summarizes the ecosystem of RIs in the National Roadmap as it stands in May 2020.**

The assessment of the scientific component, the strategic interest (considering the national and regional smart specialization strategies) and also the international dimension of each RI or RI proposal was considered essential to create in 2014 the first Portuguese Roadmap of RIs of strategic relevance (RNIE 2014-2020).

The RNIE has as main objectives:

- To act as a reference document on a national scale, aiming to guide and prioritize national and regional investments, safeguarding future infrastructures of strategic relevance, fostering their ability for international insertion, and thereby increasing the capacity for Research and Innovation, both nationally and regionally;
- To provide the Portuguese scientific community with the tools and resources that will contribute to improve the quality of science produced in Portugal, ensuring its international competitiveness;
- To contribute to increase the participation of the Portuguese R&I community in the different pillars and thematic areas of Horizon 2020 and, in the future, of Horizon Europe;
- To generate brain-gain and contribute to train young talent through easy access to the different infrastructures;
- To generate momentum for innovation and creation of value through top-level research and by facilitating the creation of spin-offs, as well as providing services to industry.

The present document is the first update of the National Roadmap of Research Infrastructures of Strategic Relevance initially published in 2014, that integrates in the Roadmap new National RIs created between April 2019 and May 2020.

As described in Section 3, since 2019 a new mechanism of governmental initiative is in place for the integration of new RIs in the National Roadmap. The current document updates the 2014 National Roadmap, including 16 new National RIs integrated since April 2019. Currently, the Portuguese Roadmap of RIs of Strategic Relevance (RNIE) includes a total of 56 RIs, across six thematic areas (similar to those of the 2018 ESFRI Roadmap):

a) Energy – 4 RIs;

b) Environment – 7 RIs;

c) Health and Food – 20 RIs;

d) Physical Sciences and Engineering – 14 RIs;

e) Social and Cultural Innovation – 7 RIs;

f) Digital Infrastructures – 4 RIs.

The Foundation for Science and Technology (FCT), which is the main public funding Agency in Portugal for science and technology, oversees the implementation of the RIs of the National Roadmap. For this purpose, and also for delivering recommendations to the RIs, FCT constituted for the first time in 2014 a RI Monitoring Committee that includes a relevant number of members of the national scientific community. The list of current members of the Monitoring Committee, appointed in 2019, is presented in Annex I of this Roadmap. This Committee was responsible for the 2019 exercise of RI maturity evaluation, as described in Section 4.

FCT was one of the 7 Agencies that launched in 2016 the first Call for funding of RIs in the National Roadmap in the framework of "Portugal 2020", the multi-annual program for application of European Structural and Investment Funds. Together with a second, more specific, Call in 2017, a total of 39 out of the 40 RIs that integrated the Roadmap in 2014 have been awarded a total funding of 143.8 million euros. The current funding cycle of RIs (2017-2021) is described in more detail in Section 2.

The 56 RIs in the Portuguese Roadmap have the potential to be, or to become in the near future, national and international reference hubs, in many cases in close coordination with the respective European infrastructures, notably those included in the ESFRI Roadmap. Of the 56 infrastructures included in the RNIE, 38 infrastructures (68%) are, or plan to be, linked either to an ESFRI Roadmap RI (29 RIs, 52%) or to other European or International Research Consortia/Organization(s) (9 RIs, 16%).

In section 5, each of the current 56 RIs in the National Roadmap is described, including its participating institutions, main activities, expected impact and the amount of public investment for each RI in the period 2017 to 2021, when applicable.

This Roadmap aims to implement, or continue to implement, the RIs herein listed, as to allow researchers, national and regional funding managers and science policy-makers to work together to promote excellent research environments, identify gaps and nurture future paths. The Roadmap is also a tool for facilitating the international integration of Portuguese teams, providing a key instrument to influence high-level Research and Innovation strategies, as Europe strives to implement a European Research Area.

TABLE 1

DOMAIN	ACRONYM	NAME	TYPE	COORDINATING INSTITUTION	ROADMAP ENTRY (YEAR)	RESPECTIVE ESFRI RI, OWCRI, JPI, JU OR IRO [1]
ENERGY	**BBRI**	**Biomass and Bioenergy Research Infrastructure**	Distributed	Laboratório Nacional de Energia e Geologia, I.P. (LNEG)	2014	n.a.
	INIESC	**National Research Infrastructure in Solar Energy Concentration**	Distributed	Universidade de Évora (UEvora)	2014	EU-SOLARIS
	NZEB_LAB	**Research Infrastructure on Integration of Solar Energy Systems in Buildings**	Single-Sited	Laboratório Nacional de Energia e Geologia, I.P. (LNEG)	2014	n.a.
	SGEVL	**Smart grids and electric vehicles laboratory**	Single-Sited	Instituto de Engenharia de Sistemas e Computadores, Tecnologia e Ciência (INESC TEC)	2014	n.a.
ENVIRONMENT	**AIR Centre**	**Atlantic International Research Centre**	Distributed	Associação para o Desenvolvimento do Atlantic International Research Centre (AD AIR Centre)	2019	AIR Centre
	C4G	**Collaboratory for Geosciences**	Distributed	Universidade da Beira Interior (UBI)	2014	EPOS ERIC
	COASTNET	**Portuguese Coastal Monitoring Network**	Distributed	Faculdade de Ciências da Universidade de Lisboa (FCUL)	2014	DANUBIUS-RI, ETN
	EMBRC.PT	**European Marine Biological Resource Centre - Portugal**	Distributed	Centro de Ciências do Mar do Algarve (CCMAR)	2014	EMBRC ERIC
	EMSO-PT	**European Multidisciplinary Seafloor and Water Column Observatory - Portugal**	Distributed	Instituto Português do Mar e da Atmosfera, I.P. (IPMA)	2014	EMSO ERIC
	FhP - AWAM	**Fraunhofer Portugal Research Center for Agriculture and Water Management**	Distributed	Associação Fraunhofer Portugal Research (FhP)	2019	Fraunhofer Association
	PORBIOTA	**Portuguese E-Infrastructure for Information and Research on Biodiversity**	Distributed	Instituto de Ciências, Tecnologias e Agroambiente da Universidade do Porto (ICETA)	2014	LifeWatch ERIC, ICOS ERIC, eLTER RI
HEALTH & FOOD	**BIN**	**National Brain Imaging Network - Core Infrastructure**	Single-Sited	Universidade de Coimbra (UC)	2014	EuroBioImaging ERIC
	Biobanco.pt	**National Biobanks Infrastructure**	Distributed	Instituto de Medicina Molecular João Lobo Antunes (iMM)	2019	BBMRI ERIC
	Biodata.pt	**BioData.pt | ELIXIR PT - Portuguese Distributed Infrastructure for Biological Data**	Virtual	Fundação Calouste Gulbenkian - Instituto Gulbenkian de Ciência (FCG-IGC)	2014	ELIXIR
	CONGENTO	**Consortium for Genetically tractable Organisms**	Distributed	Fundação D. Anna de Sommer Champalimaud e Dr. Carlos Montez Champalimaud (FC)	2014	Infrafrontier
	CryoEM-PT	**National Advanced Electron Microscopy Network for Health and Life Sciences**	Distributed	Laboratório Ibérico Internacional de Nanotecnologia (INL)	2019	n.a.
	FOODCHAIN-PT	**International Food Chain Alliance – Portugal**	Distributed	Universidade de Trás-os-Montes e Alto Douro (UTAD)	2019	Fraunhofer Food Chain Management Alliance
	GenomePortugal	**National Facility for Genome Sequencing and Analysis**	Distributed	Universidade de Aveiro (UA)	2014	n.a.
	MIA-Portugal	**Multidisciplinary Institute of Ageing**	Single-Sited	Universidade de Coimbra (UC)	2019	EIT Health KIC
	PPBI	**Portuguese Platform of BioImaging**	Distributed	Instituto de Biologia Molecular e Celular - Instituto de Investigação e Inovação em Saúde (IBMC/i3S)	2014	EuroBioImaging ERIC

TABLE 1 (cont)

DOMAIN	ACRONYM	NAME	TYPE	COORDINATING INSTITUTION	ROADMAP ENTRY (YEAR)	RESPECTIVE ESFRI RI, OWCRI, JPI, JU OR IRO [1]
HEALTH & FOOD	**ProtoTera**	**The Portuguese Network of Infrastructures for Proton Therapy and Advanced Technologies for Cancer Prevention and Treatment**	Distributed	Grupo Hospitalar Instituto Português de Oncologia (GHIPO)	2019	n.a.
	PtCAC	**Portuguese Network of Clinical Academic Centers**	Distributed	Conselho Nacional dos Centros Académicos Clínicos (CNCAC)	2020	n.a.
	PtCRIN	**Portuguese Clinical Research Infrastructure Network**	Distributed	Faculdade de Ciências Médicas da Universidade Nova de Lisboa (NMS/FCM-UNL)	2020	ECRIN ERIC
	Pt-mBRCN/MIRRI-PT	**Portuguese microBiological Resources Center Network / Microbial Resource Research Infrastructure – Portugal**	Distributed	Universidade do Minho (UM)	2020	MIRRI
	PT-OPENSCREEN	**PT-OPENSCREEN: National Infrastructure for Chemical Biology and Genetics**	Distributed	Instituto de Investigação e Inovação em Saúde (i3S)	2020	EU-OPENSCREEN ERIC
	RNCCC	**National Network of Comprehensive Cancer Centres**	Distributed	Instituto Português de Oncologia do Porto Francisco Gentil, E.P.E. (IPO Porto)	2019	Cancer Core Europe
	RNEM	**Portuguese Mass Spectrometry Network**	Distributed	Faculdade de Ciências da Universidade de Lisboa (FCUL)	2014	INSTRUCT ERIC
	TERM RES-Hub	**Tissue Engineering and Regenerative Medicine**	Distributed	Universidade do Minho (UM)	2014	n.a.
	TRIS-HCP	**Translational and Clinical Research Infrastructures Specialisation Platform - Health Cluster Portugal**	Virtual	Health Cluster Portugal - Associação do Pólo de Competitividade da Saúde (HCP)	2014	n.a.
	VIASEF	**In Vivo Arthropod Security Facility**	Single-Sited	Instituto de Higiene e Medicina Tropical, Universidade Nova de Lisboa (NOVA-IHMT)	2014	n.a.
	ViraVector	**Viral Vectors for Gene Transfer Core Facility**	Single-Sited	Universidade de Coimbra (UC)	2014	EATRIS ERIC
PHYSICAL SCIENCES & ENGINEERING	**CECOLAB**	**Associação CECOLAB - Collaborative Laboratory Towards Circular Economy**	Single-Sited	BLC3 Evolution, Lda	2019	n.a.
	ENGAGE SKA	**ENAbling Green E-science for Square Kilometer Array**	Distributed	Instituto de Telecomunicações (IT)	2014	SKA
	ESTHER	**European Shock Tube for High-Enthalpy Research**	Single-Sited	Instituto Superior Técnico (IST/UL)	2019	ESA
	LLPT	**LASERLAB-Portugal**	Distributed	Associação do Instituto Superior Técnico para a Investigação e Desenvolvimento (IST-ID)	2014	ELI ERIC, EuPRAXIA
	Micro&NanoFabs@PT	**Network of Micro and Nano Fabrication Research Facilities in Portugal**	Distributed	Laboratório Ibérico Internacional de Nanotecnologia (INL)	2014	n.a.
	NECL	**Network of Extreme Conditions Laboratories**	Distributed	Universidade do Porto (UP)	2014	n.a.
	ORCIP	**Optical Radio Convergence Infrastructure for Communications and Power Delivering**	Distributed	Instituto de Telecomunicações (IT)	2014	n.a.

TABLE 1 (cont.)

DOMAIN	ACRONYM	NAME	TYPE	COORDINATING INSTITUTION	ROADMAP ENTRY (YEAR)	RESPECTIVE ESFRI RI, OWCRI, JPI, JU OR IRO [1]
PHYSICAL SCIENCES & ENGINEERING	**PAMI**	**Portuguese Additive Manufacturing Initiative**	Distributed	Instituto Politécnico de Leiria (IP Leiria)	2014	n.a.
	Portugal Space	**Portuguese Space Agency**	Single-Sited	Portuguese Space Agency (PTSpace)	2019	ESA, EST
	PTNMR	**Portuguese Nuclear Magnetic Resonance Network**	Distributed	Associação para a Inovação e Desenvolvimento da FCT NOVA (NOVA.ID.FCT)	2014	INSTRUCT ERIC
	RBCog-Lab	**Robotics, Brain and Cognition Laboratory**	Single-Sited	Associação do Instituto Superior Técnico para a Investigação e Desenvolvimento (IST-ID)	2014	n.a.
	TEC4SEA	**Modular Platform for Research, Test and Validation of Technologies supporting a Sustainable Blue Economy**	Distributed	Instituto de Engenharia de Sistemas e Computadores, Tecnologia e Ciência (INESC TEC)	2014	Euro-Argo ERIC
	TEMA	**Centre for Mechanical Technology and Automation**	Single-Sited	Universidade de Aveiro (UA)	2014	n.a.
	Windscanner.PT	**Windscanner Portugal**	Distributed	Universidade do Porto (UP)	2014	Windscanner.EU
SOCIAL & CULTURAL INNOVATION	**CCD**	**Digital Creativity Center**	Single-Sited	Universidade Católica Portuguesa (UCP)	2014	n.a.
	DataLab	**Social Sciences DataLab**	Distributed	Nova School of Business & Economics (Nova SBE/UNL)	2014	SHARE ERIC
	E-RIHS.PT	**Portuguese Research Infrastructure on Heritage Science**	Distributed	Universidade de Évora (UEvora)	2014	E-RIHS
	PASSDA	**Production and Archive of Social Science Data**	Distributed	Instituto de Ciências Sociais (ICS/UL)	2014	ESS ERIC, CESSDA ERIC
	PORTULAN CLARIN	**Research Infrastructure for the Science and Technology of Language**	Virtual	Faculdade de Ciências da Universidade de Lisboa (FCUL)	2014	CLARIN ERIC
	PRISC	**Portuguese Research Infrastructure for Scientific Collections**	Distributed	Universidade de Lisboa (UL)	2014	DiSSCo
	ROSSIO	**Social Sciences, Arts and Humanities**	Distributed	Faculdade de Ciências Sociais e Humanas da Universidade Nova de Lisboa (NOVA FCSH)	2014	DARIAH ERIC
DIGITAL INFRA-STRUCTURES	**INCD**	**Portuguese National Distributed Computing Infrastructure**	Virtual	Associação INCD - Infraestrutura Nacional de Computação Distribuída	2014	EGI
	RCTS	**Science, Technology and Society Network**	Distributed	Fundação para a Ciência e a Tecnologia I.P. - Unidade de Computação Científica Nacional (FCT|FCCN)	2014	GÉANT
	RNCA	**National Advanced Computing Network**	Virtual	Fundação para a Ciência e a Tecnologia I.P. - Unidade de Computação Científica Nacional (FCT|FCCN)	2019	EuroHPC, RICA
	UC-LCA	**Laboratory for Advanced Computing**	Single-Sited	Universidade de Coimbra (UC)	2014	PRACE

1 *Alignment with ESFRI Roadmap RIs or other World-class Research Infrastructures (OWCRI), with EU Joint Programming Initiatives (JPI) or Joint Undertakings (JU) and with International R&I Organizations (IRO)*

Funding of RIs integrated in the National Roadmap in 2014

02

Since the creation of the National Roadmap in 2014, two Calls were launched under the "Portugal 2020"' Scientific and Technological Research Support System, to fund 39 Research Infrastructures (RIs) from the National Roadmap, which were therefore pre-qualified to submit an application: in 2016, the Call/Notice No. 01/SAICT/2016 through the Regional Programmes of Portugal Continental and the Thematic Operational Programme (COMPETE 2020), and in 2017, the Call/Notice No. 01/SAICT/2017 to fund one remaining Infrastructure from the Roadmap through the Regional Programmes of LISBOA 2020 and ALGARVE 2020 and the Thematic Operational Programme COMPETE 2020.

The funding of the National RIs is framed in the Investment Priority (IP) 1.1 mentioned in Article 101(1) of the Specific Regulation on Competitiveness and Internationalisation (SRCI) under the Scientific and Technological Research Support System. One of the specific objectives of IP 1.1. is to increase the scientific production internationally recognised in strategic areas aligned with the R&I Strategy for Smart Specialisation (RIS3), from a national and regional multilevel perspective. It is also meant to strengthen the technical and scientific capacity of high-impact Research Infrastructures included in the National Roadmap, including their integration in European RIs, notably those in the ESFRI Roadmap, and other R&D networks, therefore enabling National RIs to solidify themselves as a strategic pillar in the development of research of excellence at national and international levels.

The total amount of public investment for the period 2017-2021 allocated to the 39 RIs that applied for funding (one of the RIs from the 2014 Roadmap, TRIS-HCP, decided not to apply) as a result of the two mentioned Calls/Notices is 143.8 Million euros (M€) of which 98.6 M€ were financed by the European Regional Development Fund (ERDF), granted through COMPETE 2020 and the Regional Operational Programmes of NORTE 2020, CENTRO 2020, LISBOA 2020, ALENTEJO 2020 and ALGARVE 2020. The national counterpart is mainly provided by the State Budget allocated to FCT, with an average contribution of 31% (variable between 15% and 60%), in the total amount of 44.1 M€.

The eligible investment is limited to the following categories, as provided for in the SRCI, in its current writing:

i) construction or adaptation of physical infrastructures (up to 25% of the supported investment);

ii) acquisition of scientific and technical instruments and equipment;

iii) human resources considered indispensable for the implementation and development of the infrastructure (up to 40% of the supported investment).

The funding for each of the 39 RIs from the National Roadmap currently supported by the ERDF and also State Budget/FCT funds can be found in the page of the respective RI under section 5. The ERDF funding for the 39 currently RI Projects was initially limited to 36 months, but this rule was update in 2018 to allow a one-year extension (without any additional funding).

Inclusion of new RIs in the National Roadmap in 2019/2020

03

The evolution of the National Roadmap of Research Infrastructures (RIs) of Strategic Interest requires its continuous articulation with the national priorities increasingly assumed in the framework of public policies regarding the promotion of Research and Development (R&D), Innovation and Digital Transformation activities, as well as its insertion in the European context.

The Decree-Law No. 63/2019, of May 16, established that the inclusion of new RIs in the National Roadmap can be promoted by governmental initiative. This allows the inclusion of new RIs that participate in Research & Innovation networks/ecosystems framed by public policies to encourage the creation and strengthening of specific capacities and skills and enhance interconnection and complementarity with RIs already included in the Roadmap, as well as European and International strategies and initiatives. The integration of new RIs in the National Roadmap is formalized through Orders from the member of the Government responsible for the Science and Technology sector, after hearing the R&D institutions, and taking into account the recommendations from the FCT 2030 Thematic R&I Agendas, elaborated by the respective national R&I communities. Additionally, in the last FCT Evaluation of the National R&D Units by external panels of international experts, an exercise which takes place every five years, R&D Units were asked to identify the European RIs or other European or International R&D Organizations or Networks to which they are already associated to, or intend to be associated in the 2020-2023 period.

The success of Portugal's increasing participation in the European Framework Programme for Research and Innovation, «Horizon 2020» (2014-2020), and the ambition to strengthen and double Portugal's participation in the next European R&I Framework Programme «Horizon Europe» (9thFP) and related programmes relevant for research, innovation and digital activities in Portugal (i.e. the European Space Programme, the «Digital Europe» and «Interconnecting Europe» programmes, among others) have determined the need to update the National Roadmap of RIs of Strategic Relevance (RNIE in Portuguese), through the integration of new RIs.

Considering: i) the reports of the working groups promoted in recent years in the context of the FCT activity, either through the 2030 Thematic R&I Agendas or in the framework of the multiannual exercise of Evaluation of the National R&D Units, and ii) in conjunction with the national priorities included in the National Reforms Plan (NRP/PNR in Portuguese), 16 new Research Infrastructures have been included in the National Roadmap between April of 2019 and May of 2020 as a result of the following Orders of the Minister of Science, Technology and Higher Education: No. 4157/2019 of April 1, No. 7557/2019 of August 2, No. 4958/2020 of April 17 and No. 5220/2020 of May 5.

The 16 newly integrated RIs, as well as the National thematic legislation setting priorities for the respective R&I domain and the European RIs/Organizations that they are aligned with, or are already part of, are listed in Annex II.

In Section 5 detailed information on these recently integrated RIs can be found, as well as for the RIs integrated in 2014, organized by the 6 main domains of the Roadmap: Energy, Environment, Health and Food, Physical Sciences and Engineering, Social and Cultural Innovation and Digital Infrastructures.

The 2019 maturity evaluation of the National Research Infrastructures

04

To meet the evolving needs of a highly competitive Research & Innovation community, it is necessary to regularly monitor the pace of implementation of each Research Infrastructure (RI)'s action plans. Close monitoring will be essential for evaluating the progress achieved by the different National Roadmap RIs, notably considering the public funds invested in them. A Monitoring Committee was assigned by FCT to this purpose, after publication of the first National Roadmap, in accordance with the Regulation for the establishment of the National Roadmap of RIs of Strategic Relevance (Regulation n. 327/2013).

The Monitoring Committee is currently chaired by the President of FCT and includes 31 Portuguese experts from the national scientific community that are representative of the six main thematic domains of the Roadmap[1]. The composition of the current RI Monitoring Committee can be consulted in Annex I of this Roadmap.

The Committee is mandated to monitor, evaluate and guide implementation and development of the Roadmap, including:

a) Monitoring the implementation of the Research Infrastructures in the National Roadmap, namely through a maturity evaluation process;

b) Support the strategic orientation of FCT policy on National RIs;

c) Promote and facilitate the development of synergies on an interregional and inter-sectorial level in the scope of national RIs;

d) Facilitate and promote links and synergies with the ESFRI Roadmap;

e) Analyze the impact of existing RIs and identify gaps in the different scientific domains.

The Monitoring Committee for Research Infrastructures nominated in 2014 was responsible for a first maturity evaluation of the 40 RIs integrated in the National Roadmap which took place in 2015. This evaluation was based on the ESFRI implementation evaluation of the pan-European RIs and resulted in recommendations that were transmitted to the RIs regarding their implementation in the subsequent years.

New RIs were integrated in the National Roadmap in 2019, between April and August, and again in April and May of 2020. This integration of new RIs in the Roadmap, together with the fact that the 2017-2021 funding period for RIs was entering its second half and that the mandate of the initial Committee had expired, led to the decision by the FCT Direction of nominating a new Monitoring Committee for RIs.

The 2019 maturity evaluation of National RIs, coordinated by the FCT Monitoring Committee for RIs, included a total of 55 RIs: the 40 RIs integrated in the National Roadmap in 2014, the 12 RIs integrated in 2019, and also the 3 RIs integrated in the Roadmap in April 2020. The RI PtCAC, integrated in the Roadmap in May 2020, has its own specialized evaluation process, as defined in the Decree law n.61/2018. FCT and the Portuguese Agency for Clinical Research and Biomedical Innovation (AICIB) are currently constituting the panel of national and international independent experts that will evaluate the Clinical Academic Centers. This evaluation will take approximately one year and will include site visits.

The 2019 maturity evaluation of RIs, which enlarged the number of evaluation criteria compared to the similar process in 2015, had the following phases:

i) Online survey directed at the RIs (mid--October to mid-November 2019);

ii) Individual reviews by members of the Monitoring Committee, plus external reviewers as needed (mid-November 2019 to mid-January 2020);

iii) Meeting of the members of the Committee responsible for coordinating each of the six domains of the Roadmap[1] (15 January 2020);

iv) Submission of consensus reports by the domain Coordinators (mid-February 2020);

v) Validation of the consensus reports by the Board of Directors of FCT (3 March 2020).

The dates indicated above refer to the evaluation of the 52 RIs in the Roadmap as of October 2019. The first 3 RIs integrated in the Roadmap in 2020 were included in the maturity evaluation only in January 2020, and therefore had a different schedule.

The evaluation criteria included 9 areas related to RI implementation[2]: context analysis; governance and legal structure; articulation with users and other stakeholders; human resources policy; strategies for access, data usage and data management; scientific impact; strategies for dissemination and socio-economic impact; risk analysis and mitigation; and sustainability and alignment with public policies and societal challenges. The online survey for the RIs was organized according to these 9 areas, and updated information regarding the associated

1 *Energy, Environment, Health and Food, Physical Sciences and Engineering, Social and Cultural Innovation and Digital Infrastructures*

2 *Described in the Guide for reviewers of the maturity evaluation process, which is available in Portuguese only*

entities/nodes, the services provided and the RI Coordination staff was also asked.

A scale of 4 levels of maturity was considered for each of the 9 criteria as well as for the overall classification: Low, Average, High and Very High. A vast majority of RIs (43 RIs, or 83% of the total) received an overall grade of High (46%) or Average (37%), while 6 RIs (12%) were graded as Very High.

Besides the classifications for each evaluation criteria and the overall classification, the Monitoring Committee included in the final Report for each RI a set of recommendations regarding the main implementation weaknesses. Some of the most frequent recommendations from the Committee were:

a) Clarification of the governance structure and its higher adequateness to the RI's objectives;

b) Clearer identification of relevant stakeholders and of the strategy for their engagement;

c) More detailed policies for access and for data management;

d) More information available on the RIs' websites, especially on services and access policies;

e) Enhanced professionalization of human resources;

f) Presentation in future evaluations and in the respective websites of quantitative Key Performance Indicators;

g) More detailed risk analysis and risk mitigation policies/measures;

h) Definition of strategies for financial sustainability, if possible in the form of a Business Plan.

The RIs in the National Roadmap – 2020 Update

05

5.1 Energy

The European Union is still heavily dependent on energy imports, especially fossil fuels. It is in this context that the EU has created SET-PLAN, the European Strategic Energy Technology Plan, which established an Energy technology policy for Europe. The Energy Research Infrastructures (RIs) integrated in this Roadmap are fully in line with the main goal and raison d'être of SET-PLAN, which focus on accelerating the development of cost-effective, low carbon technologies.

Energy RIs play a central role as part of an integrated approach/vision for structural change towards a green economic recovery, based on efficient energy systems, all over Europe. At the forefront of multidisciplinary research and in close contact with industrial partners, these technologies are core instruments for the rise of smart cities.

The Energy RIs in this Roadmap focus on biomass and bioenergy, solar energy and electric grids and vehicles.

BBRI, the Biomass and Bioenergy Research Infrastructure, a single-sited RI

INIESC, the National Research Infrastructure for Solar Energy Concentration, a distributed RI and national node of its counterpart in the ESFRI Roadmap RI, EU-SOLARIS

NZEB_LAB, the Research Infrastructure on Integration of Solar Energy Systems in Buildings, a distributed RI

SGEVL, the Smart Grid and Electric Vehicle Laboratory, a single-sited RI

BBRI
Biomass and Bioenergy Research Infrastructure

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
www.lneg.pt/iedt/projectos/520

RI COORDINATOR
Francisco Manuel Ferreira Gírio (LNEG)

INSTITUTIONAL PARTNER(S)/NODE(S)
Laboratório Nacional de Energia e Geologia, I.P. (LNEG); Universidade do Minho (UM).

FUNDING FOR 2017-2021
Total Public Investment
1,779,119 €
ERDF
871,339 €
National Public Funds (FCT)
907,780 €

DESCRIPTION

BBRI, a national research infrastructure on Biomass & Bioenergy, has its activities focused on biomass - biochemical and thermochemical conversions - to obtain advanced biofuels (gaseous and liquids), chemicals and biomaterials. BBRI will act as the interface between knowledge and applications in support of a bio-based economy, aiming at: i) R&D activities, for generating knowledge; ii) Formation, for improving skills of human resources, including technological and analytical services; iii) Public Dissemination. BBRI is aligned with the biomass conversion technology value chains of current ETIP-Bioenergy and the SET-Plan IWG Action #8-Bioenergy and renewable fuels for sustainable transport as well as in the BBI JU (Bio-based industries joint undertaken).

ACTIVITIES

BBRI R&D activities are based on the following research platforms: Biochemical Platform for Biomass Conversion; Microalgae for Bioenergy and Bioeconomy; Chemical and Thermochemical Platform for Biomass Conversion; Analytical Sciences for Biofuels; Bioenergy Sustainability; and Molecular Biotechnology for Advanced Biofuels.
BBRI offers a wide variety of services, such as the access to the Biomass Deconstruction Laboratory; Cell Factories and Enzymes Laboratory; Microbial Culture Collection for Biofuels production and Biomass Conversion; Pilot Downstream and Process Laboratory; Microalgal Biotechnology Laboratory and Culture Collection; Gasification Laboratory; Pyrolysis Laboratory; Laboratory of Biofuels and Environment (LBA). Technical consulting on Biogas Technology and on Sustainability Assessment; certification of Biofuels Sustainability in Portugal (ECS); auditing of Environment and Biofuels Analytical Laboratories and Thermogravimetric Analysis.

IMPACT

BBRI aims at the development of bioenergy technologies, promotion of research excellence and training of new professionals on sustainable bioenergy. BBRI contributes for the excellence of research in Portugal in the field of Biomass and Bioenergy, aligned with the SRIA-Strategic Research and Innovation Agenda of of the Joint Program on Bioenergy from the European Energy Research Alliance (founded in 2010).
In addition, BBRI offers technical and R&D activities to the scientific community and industry. The quality of the services provided are leveraged on more than 25 years of experience of the LNEG and UM teams, in R&D for new bioenergy technologies (lab and pilot scales) and on technical analytical capabilities that include access to laboratory and equipment facilities, scientific consultancy, analytical services and biofuels certification.
The training activities are directed towards professionals working in the Biomass and Bioenergy markets and Master and PhD students aiming at increasing the number of Bioenergy expert professionals in Portugal and EU.
The Dissemination activities promotes the BBRI R&D work, the offer of training activities and analytical services, and also aimed to increase the public awareness on the technological achievements in the field of advanced biofuels, biomass and bioenergy towards the benefits for the Society.
BBRI-LNEG Node is also partner of a European RI consortium (BRISK II).
Within the EERA-Bioenergy, LNEG is the European coordinator of the subrogram on Biochemical Processing of Biomass to nextGeneration Biofuels and Bioproducts.

INIESC
National Research Infrastructure in Solar Energy Concentration

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
www.catedraer.uevora.pt/sobre/iniesc

RI COORDINATOR
Pedro Horta (UE)

INSTITUTIONAL PARTNER(S)/NODE(S)
Universidade de Évora (UEvora); Laboratório Nacional de Energia e Geologia, I.P. (LNEG).

FUNDING FOR 2017-2021
Total Public Investment
3,096,702 €
ERDF
2,229,196 €
National Public Funds (FCT)
867,505 €

DESCRIPTION

Aiming at the development of research promoting a wider contribution of solar energy in the decarbonization of different economic sectors – e.g. power generation, transportation, energy system, industrial processes – INIESC activities encompass the development of medium and high temperature collector and storage technologies and systems, demonstration of their applications in fields as e.g. water treatment, process heat, thermoelectric generation, solar fuels or materials for energy, promoting technology transfer to industry after a holistic approach to the product development process: concept design, application, market, competitiveness.

ACTIVITIES

INIESC activities are based on a physical infrastructure distributed in two poles: Évora, aiming the development and testing of solar concentration technologies and on the demonstration of medium (MT) and high temperature (HT) applications; and Lisbon, aiming at the development of materials for MT/HT applications, durability studies, system and component simulations and demonstration of MT/HT applications.
The infrastructure enables a wide range of activities which include: modeling and simulation, solar concentrators testing, the use of Molten Salts as Heat Transfer and Heat Storage media, research on solar materials, solar fuels, or development of line and point-focus concentrator technologies.
The services provided by INIESC include product development, engineering consultancy, solar resource data and forecasting, optical and thermal characterization of collector components, prototype testing, materials characterization and studies, technical training and capacity building.

IMPACT

Aware of the scientific challenges and opportunities it gathers, the main objective of INIESC lies on the development of solar concentrating technologies and their applications in the medium (150ºC – 400ºC) and high (400ºC – 1500ºC) temperature ranges, enabling the exploitation of solar energy resources in a wide range of economic sectors and applications: e.g. power generation, solar fuels, industrial process heat, water treatment and high temperature materials synthesis or testing.
INIESC infrastructure, encompassing a two-axis tracker testing bench enabling the thermal and optical test of full-scale solar concentrator modules, a 3.6 MWth experimental CSP plant based on the use of Molten Salts as Heat Transfer and Heat Storage media, a 100 kWth experimental reactor for solar chemistry activities, high temperature materials and durability/degradation characterization laboratories, stands as the reference Research Infrastructure for Solar Concentration related research in Portugal.
Basing its philosophy on a strong technology transfer component, INIESC gathers the conditions to offer both to industry and other R&D partners the suitable infrastructural support for conceptual development and experimental testing of solar concentrators as well as on the assessment and demonstration of their current or innovative applications.
Contributing to the enhancement of the national competencies in fields such as Concentrated Solar Power (CSP), medium and high temperature energy storage, process heat, solar chemistry and materials testing, including the development of related components (heliostats, primary and secondary reflectors, absorbers and reactors), software and engineering solutions, INIESC stands as a fundamental asset in the training of students, engineers and researchers in these fields.

NZEB_LAB
Research Infrastructure on Integration of Solar Energy Systems in Buildings

TYPE
Single-Sited

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
http://nzeblab.lneg.pt

RI COORDINATOR
Helder Jose Perdigão Gonçalves (LNEG)

INSTITUTIONAL PARTNER(S)/NODE(S)
Laboratório Nacional de Energia e Geologia, I.P. (LNEG).

FUNDING FOR 2017-2021
Total Public Investment
861,279 €
ERDF
344,512 €
National Public Funds (FCT)
516,768 €

DESCRIPTION

NZEB_LAB Research Infrastructure sets up and consolidates a Research Laboratory Infrastructure in the domain of the Building Integration of Solar Energy and Net Zero Energy Buildings (NZEB) to serve the National and European Industrial and Research Community to the goal of accelerate the integration of new systems and components in buildings in order to achieve the NZEB concept. Through the research developed by NZEB_LAB, the RI strategy aims to develop and promote optimal pathways for achieving zero energy buildings standards, widespread adoption of optimized NZEB energy design and operation concepts suited to Portuguese climatic conditions and construction practices, in association with industrial partners.

ACTIVITIES

NZEB offers a wide variety of solutions and services, structured in three main actions: i) Coordination, Consolidation and Dissemination and Training Activities; ii) Research activities such as experimental and numerical investigation of new applications, solar energy innovative systems); iii) providing support to industry, academy and large Solar Energy Systems users, through the means of providing access and services (testing of solar energy integrated systems in laboratory and real building - usage of SOLAR XXI, nearly Zero Energy Living Lab).

IMPACT

In relation to enabling a more coordinated development of the research infrastructures, the existing infrastructure operators in the area of Solar Energy Systems (SES) towards NZEB are participating with the aim of improving the scientific capability of their installations in a coordinated manner, to ensure technological leadership at the national level. To this end, two aims of the Research Activities are critical: Improving the future analytical and experimental services offered "more quickly and more accurately" and developing further synergies between the futures partners based on complementary capabilities. The user access programme will enable academic research teams and/or SMEs who cannot always make use of these high scientific level infrastructures to access world-leading research facilities, based on the excellence of their projects. This will also strengthen the links between academic and technological research, speeding up the innovation process. At the same time, it is anticipated that the user access requests and survey of user needs, in some cases, will highlight gaps in NZEB_LAB services and infrastructures. These inputs will be important indicators for prioritizing the further development needs. Through the training activities, this proposal will offer an 'open-door' policy that will be a benefit for the host facilities, as many times the visiting scientists provide new ideas for solar energy systems integration and NZEB research. Moreover, MsC and PhD students will enhance their experience by being in contact with multi-disciplinary projects and teams in a multicultural environment. This will open more job opportunities for them, as their background will be more in line with the needs of the industry and top research teams.

SGEVL
Smart Grid and Electric Vehicles Laboratory

TYPE
Single-Sited

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
http://sgevl.inesctec.pt

RI COORDINATOR
João Abel Peças Lopes (INESCTEC)

INSTITUTIONAL PARTNER(S)/NODE(S)
Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência (INESCTEC/FEUP).

FUNDING FOR 2017-2021
Total Public Investment
821,868 €
ERDF
698,588 €
National Public Funds (FCT)
123,280 €

DESCRIPTION

The SGEVL constitutes a physical space integrating systems and equipment designed to support the development and testing of solutions and pre-industrial prototypes, promoting active and intelligent management of electric grids, in scenarios with progressive integration of distributed energy resources and electric vehicles.

ACTIVITIES

SGEVL offers a wide variety of services, including supported research and development, prototyping and advanced testing.

IMPACT

New advancements on the state of the art of ICT and Power Systems that will leverage the development of a solid and mature Smart Grid concept. Innovative solutions are expected to be obtained via: 1) Consolidation of Smart Grid reference architectures; 2) Conceptualization of new hardware a software management solutions; 3) Development of research and experimental activities for low voltage distribution grids; 4) Development of pre- prototypes of power electronic converters for microgeneration applications, EV chargers and small scale distributed energy storage units to be used at the low voltage distribution grids and LV prosumers.
The laboratory infrastructure will provide an important socio- economic contribution to the objectives of R&D reinforcement through: increase in know-how and advanced services in strategic areas of the green economy; inter- actions and networking activities; providing a test-bed to be used by industrial manufacturers and system operators to integrate and manage distributed energy resources (distributed generation mainly from renewable power sources, active demand side management and storage units – stationary and mobile when related with electric vehicles).

5.2 Environment

Environmental Sciences address major challenges such as the sustainable use of natural resources, preventing pollution and mitigation of natural hazards. Research in this field is inherently based on international collaboration and requires a high level of interoperability between a wide range of Research Infrastructures (RIs), addressing complex systems and human interaction.

The RIs in this Roadmap focus on biodiversity, agriculture and water management, geosciences, monitoring of coastal ecosystems and long-term monitoring of environmental processes. These RIs provide extremely relevant support to environmental research, education and training by clustering and networking existing and future facilities at the national level.

The RIs in the Environmental Sciences are fully aligned with the Portuguese strategies for smart specialisation, both at regional and national levels. They will also play a key role within Horizon Europe.

Air Centre, the Atlantic International Research Centre, a distributed RI and multi-stakeholder international network based on the Portuguese Archipelago of Azores

C4G, the Collaboratory for Geosciences, a distributed RI, national node of the ESFRI Roadmap RI European Plate Observing System (EPOS ERIC – European Research Infrastructure Consortium)

CoastNet, the Portuguese Coastal Monitoring Network, a distributed RI

EMBRC.PT, the European Marine Biological Resource Centre Portugal, is a distributed RI and the national node of the ESFRI Roadmap RI with the same name (EMBRC ERIC)

EMSO-PT, the European Multidisciplinary Seafloor and Water Column Observatory Portugal, is a distributed RI and the national node of the ESFRI Roadmap RI with the same name (EMSO ERIC)

FhP-AWAN, the Fraunhofer Portugal Research Center for Agriculture and Water Management, a distributed RI

PORBIOTA, the Portuguese E-Infrastructure for Information and Research on Biodiversity, is a distributed RI connected to LIFEWATCH ERIC, its European counterpart and ESFRI Roadmap RI

AIR Centre
Atlantic International Research Centre

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2019

WEBSITE
https://aircentre.org

RI COORDINATOR
Miguel Belló Mora (AIR Centre)

INSTITUTIONAL PARTNER(S)/NODE(S)
Associação para o Desenvolvimento do Atlantic International Research Centre (AD AIR Centre); Fundação para a Ciência e a Tecnologia (FCT); Fundo Regional para a Ciência e Tecnologia, Região Autónoma dos Açores (FRCT); Instituto Hidrográfico (IH); Universidade dos Açores (UAç); Agência Espacial Portuguesa (PT Space); Laboratório Colaborativo do Atlântico (Colab +Atlântico); Laboratório Colaborativo em Transformação Digital (Dtx); Centro de Engenharia e Desenvolvimento de Produto (CEiiA); International Nanotechnology Laboratory (INL); Parque de Ciência e Tecnologia da Ilha Terceira (TERINOV); Fórum Oceano; Ciência Viva; Instituto de Ciência e Inovação para a Bio-Sustentabilidade da Universidade do Minho (IB-S/UM); Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência (INESC TEC)/ Universidade do Porto (UP); Marine, Environment & Technology Center (MARETEC)/Instituto Superior Técnico (IST/UL).

FUNDING FOR 2017-2021
n.a.

DESCRIPTION

The AIR Centre is an international distributed scientific network, it promotes and implements the R&D agenda of the intergovernmental initiative Atlantic Interactions. This initiative fosters knowledge-driven solutions and job creation addressing regional and national priorities and global challenges that require interdisciplinary research and innovation through international cooperation. Our mission is to identify, provide and promote activities, projects and programs in alignment with the UN SDGs, the Decade of Ocean Science for Sustainable Development, the Paris Agreement and the Sendai Framework for Disaster Risk Reduction.

ACTIVITIES

The AIR Centre promotes an integrative approach to space, climate, ocean and energy in the Atlantic, supported by emerging technological innovations and advances in data science, by means of cooperation through several activities, namely:
- Stakeholder engagement to promote innovation and capacity building in the climate, ocean, energy and space sector and to create opportunities in R&D collaborations and innovation among different bodies within and between the academic and the private sectors;
- Facilitate access to advanced computing facilities and data science;
- Earth Observation Lab, integrates an ESA_Lab@azores, as well as, GEO Blue Planet thematic and regional node, and GEO MBON Secretariat;
- Knowledge For All, to foster training and scientific culture and promote citizen science projects and space and ocean literacy;
- Innovation HUbs@AIR Center, a network of innovation, development and research facilities for a sustainable economy and creation of more and better jobs.

IMPACT

The AIR Center has managed to establish a wide network of contacts and numerous partnerships with public and private entities, both national and foreign, as well as participating in consortia of cutting-edge innovation and technology projects. Our mission through building and expanding a distributed and collaborative network at the level of research, development and innovation, we have achieved the following:
- Organization of 5 High Level Conferences (Azores, Portugal; Santa Catarina, Brazil; Praia, Cape Verde; Las Palmas, Spain), in which we had government representatives from several Atlantic countries (Angola, South Africa, United States of America, Ghana, Nigeria, Argentina, United Kingdom, São Tomé and Principe, Senegal, among others) and several international organizations, such as the European Union, the United Nations, the European Space Agency and the African Development Bank. These events promote discussions and new collaborations by bringing together high-level representatives, international scientific research community and industry partners from the Atlantic region.
- Memorandum of Understanding and Letters of Intent with more than 20 institutions, researchers and specialists, both national and international for a common scientific agenda aligned with national and global priorities.
- Organization of more than 20 workshops and meetings in several countries in the Atlantic, which resulted in new collaborations and consortia for joint projects;
- Participation in more than 30 consortia of projects submitted to national and international tenders, namely INTERREG, H2020 and JPI, among others.

C4G
Collaboratory for Geosciences

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
www.c4g-pt.eu

RI COORDINATOR
Rui Manuel da Silva Fernandes (UBI)

INSTITUTIONAL PARTNER(S)/NODE(S)
Universidade da Beira Interior (UBI); Direção-Geral do Território (DGT); Faculdade de Ciências da Universidade de Lisboa (FC/UL); Faculdade de Ciências da Universidade do Porto (FCUP); Faculdade de Engenharia da Universidade do Porto (FEUP); Instituto de Engenharia de Sistemas e Computadores do Porto (INESC Porto); Instituto Português do Mar e da Atmosfera (IPMA); Instituto Superior de Engenharia de Lisboa (ISEL/IPL); Instituto Superior Técnico (IST/UL); Laboratório Nacional de Energia e Geologia (LNEG); Universidade de Aveiro (UA); Universidade de Coimbra (UC); Universidade de Évora (UE); Universidade de Lisboa (UL); Instituto de Geografia e Ordenamento do Território (IGOT/UL); Associação RAEGE (Rede Atlântica de Estações Geodinâmicas e Espaciais) Açores (A-RAEGE-Az).

FUNDING FOR 2017-2021
Total Public Investment
2,427,691 €
ERDF
1,606,042 €
National Public Funds (FCT)
821,649 €

DESCRIPTION

The Collaboratory for Geosciences (C4G) is a distributed Research Infrastructure that promotes networking of researchers and sharing of equipment, data, collections and tools in Solid Earth Sciences. C4G comprises disciplines of geology, hydrogeology, geochemistry, geodesy, geophysics, geomechanics, geoinformatics and geomathematics. It provides services in the crosscutting areas of georesources, natural and anthropogenic hazards and the environment, for the Portuguese territory, both onshore and offshore. C4G is the representative of Portugal in EPOS (European Plate Observing System), now legally implemented as an ERIC (European Research Infrastructure Consortium), where Portugal is one of the initial signatory countries.

ACTIVITIES

C4G offers access to a wide variety of services related to the Geosciences, including seismic data and networks, geophysical exploration, laboratories of rock physics and geomechanics, geodetic data and networks (including gravity data), geochemical and mineralogical laboratories, magnetic data and observatories, geological data and laboratories, geomathematics, remote sensing and paleomagnetism laboratories.

IMPACT

C4G creates the conditions for scientific, technical, industrial and public administration professionals to answer key questions on georesources, natural hazards, environment and fundamental socio-environmental energy science. C4G provides the backbone infrastructure to advance the understanding of solid Earth processes across time and length scales, and specialized disciplines. It contributes to the understanding of the Portuguese Continental shelf in what regards geological resources, natural hazards, and habitat mapping, with emphasis on the study of the main seismogenic-tsunamigenic zone of the Atlantic Europe (the Gibraltar- Gloria Fault Zone), the understanding of the structure of the Azores plateau or the quantification of methane hydrate deposits in the Gulf of Cadiz, among other topics of marine geology is also a major focus of the C4G consortium. By organizing a vast network of resources and making them available in a more organized way to academia and the research community in general, C4G has a positive impact on advanced training and research excellence, boosting the national capacity to integrate H2020 initiatives.
Topics of expertise within C4G with direct impact on society include: environmental impacts and remediation, detection and monitoring of contaminated areas, CO_2 storage, exploration-exploitation-benefiting of mineral resources (both ores and industrial raw materials), evaluation of mineral reserves, development of innovative tools in hydrocarbon exploration and reservoir modelling, evaluation and exploration of other georesources, such as geothermal energy and shale gas, seismic monitoring, assessment and mapping of natural hazards and risks, monitoring of space weather conditions, installation and maintenance of geodetic GNSS networks (several in Africa) and development and setup of e-infrastructures.

COASTNET
Portuguese Coastal Monitoring Network

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
www.coastnet.pt

RI COORDINATOR
José Lino Costa (MARE, FC/UL)

INSTITUTIONAL PARTNER(S)/NODE(S)
MARE – Marine and Environmental Sciences Centre; Faculty of Sciences, University of Lisbon (MARE/UL), University of Évora (UE); Field laboratories: Laboratório Marítimo da Guia (MARE-UL) and Laboratório de Ciências do Mar (MARE-UE).

FUNDING FOR 2017-2021
Total Public Investment
865,688 €
ERDF
487,594 €
National Public Funds (FCT)
378,094 €

DESCRIPTION

CoastNet (https://coastnet.pt/) is focused on monitoring coastal ecosystems through relevant chemical, physical and biological parameters, which are available in the infrastructure's geoportal (http://geoportal.coastnet.pt). This information allows a better understanding of their functioning through the assessment of long-term trends and spatial-temporal variability. Gathering such scientific knowledge is expected to improve socio-economic activities, such as fishing and aquaculture, as well as the conservation of ETP (endangered, threatened and protected) species.

ACTIVITIES

The Portuguese Coastal Monitoring Network (CoastNet) includes four main lines of action: (i) a Coastal Remote Sensing System, providing a range of Earth Observation innovative products for the Portuguese coast; (ii) an Environmental and Biological Monitoring System, providing autonomous and continuous measurements of environmental and biological variables; (iii) the Portuguese Tracking Network, collecting data on animal movements through arrays of biotelemetry acoustic receivers; and (iv) a geoportal which integrates and processes real time and historical data, and provides them in open access. CoastNet offers access to a wide variety of services related to coastal monitoring, including research and innovation, advanced training, consultancy, laboratory support and databases and biological collections.

IMPACT

CoastNet responds to the emerging need for a network of observatories that continuously provide important physical, chemical and biological coastal measurements that contribute for the assessment of both long-term trends and spatial variability. The innovative nature of this infrastructure relies on the capacity to monitor environmental and biological components of coastal aquatic systems autonomously, displaying and providing the whole dataset in near real time, and also allowing the integration of different types of information. All the information obtained is available to the scientific community, administration and general public through an integrated platform, the CoastNet Geoportal. The scientific production regarding these crucial coastal ecosystems is expected to increase not only in quantity, but also their relevance for the scientific community assessed by an increase in the impact factor of the publications and their number of citations. Furthermore, long-term continuous datasets give support to the integration of this research infrastructure in international networks and projects covering a wide array of scientific themes. The major socio-economic benefits of CoastNet are related with the goods and services provided by coastal ecosystems, mainly in the context of the implementation of the EU Water Framework Directive and Marine Strategy Framework Directive. These benefits include: Provisioning, Regulating and maintenance and Cultural services, including fisheries and aquaculture, drinking and bathing water quality, maintenance of marine biodiversity, preservation of cultural heritage and recreation assurance. CoastNet constitutes an attractive European and global research pole for many researchers in marine related areas and support private companies working in the marine environment.

EMBRC.PT
European Marine Biological Resource Centre – Portugal

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
www.embrc.pt

RI COORDINATOR
Adelino Vicente Mendonça Canário (CCMAR/UAlg)

INSTITUTIONAL PARTNER(S)/NODE(S)
Centro de Ciências do Mar, Universidade do Algarve (CCMAR/UAlg); Instituto do Mar, Universidade dos Açores (IMAR/UAç); Algoteca de Coimbra, Universidade de Coimbra (ACOI/UC); Centro Interdisciplinar de Investigação Marinha e Ambiental, Universidade do Porto (CIIMAR/UP).

FUNDING FOR 2017-2021
Total Public Investment
9,622,266 €
ERDF
6,286,921 €
National Public Funds (FCT)
3,335,345 €

DESCRIPTION

EMBRC.PT allows researchers of any nationality (academics and from companies) to study marine biodiversity in its habitat, in tanks and in the laboratory with the latest technologies. It is the national node of the European infrastructure with the same name and it is expected that the foreseen increased scientific activity will potentiate the development of technologies and products, with a positive impact on the regional and national economies.

ACTIVITIES

EMBRC.PT provides services in marine sciences: access to marine ecosystems and biodiversity, microorganism collections and model organisms, mesocosms facilities, research vessels and smaller boats, scientific diving, "omics", bioinformatics and chemistry platforms. Facilities include also a variety of aquaria facilities, general laboratories, outdoor experimental facilities, shallow water hydrothermal vents and marine observatories for long term observations. EMBRC.PT provides training for users and potential users as well as technology transfer to industry through technology demonstrations.

IMPACT

The RI is the national node of the European Marine Biological Resource Centre ERIC (EMBRC). The recent investments provided increased capacity and technological attractiveness, contributing to attract funding and users. Actions are being taken to support RI scientists to capture European funding. Some EMBRC.PT nodes are located in regions with low average statistics on R&D spending, infrastructures and personnel, and a low number of high-tech companies. This high-level service infrastructure creates unprecedented opportunities for students from several disciplines – chemistry, pharmacology, biotechnology, marine biology, etc. The fact that the RI has high visibility and receives a constant stream of international scientists is stimulating and acts as a beacon to attract the best students and scientists. The main contributions for the beneficiaries include value transferred to users through provision of services, revenues from users of the RI, economic value of new startups and spin-offs expected to be created as a consequence of the RI and other sources of revenue, namely services' provision. Revenues deriving from the production of intellectual property rights, commercialization of new products and instruments, organization of scientific events, and the economic value of the outcomes of scientific research. Additionally, expected results may include important societal benefits from the promotion of R&D, the discovery of new health treatments or medicines, innovation, job creation and increased economic activity, considering the four national nodes of EMBRC.PT.

EMSO-PT
European Multidisciplinary Seafloor and Water Column Observatory - Portugal

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
http://emso-pt.pt

RI COORDINATOR
Jorge Miguel Alberto de Miranda (IPMA)

INSTITUTIONAL PARTNER(S)/NODE(S)
Instituto Português do Mar e da Atmosfera, I. P. (IPMA); Universidade do Porto (UP); Universidade de Aveiro (UA); Universidade dos Açores (UA); Univer- sidade de Évora (UE); Instituto Superior Técnico (IST/UL); Faculdade de Ciências da Universidade de Lisboa (FCUL); Instituto Superior de Engenharia do Porto (ISEP); Estrutura de Missão para a Extensão da Plataforma Continental (EMEPC); Instituto de Engenharia de Sistemas e Computadores, Tecnologia e Ciência (INESCTEC); Centro Interdisciplinar de Investigação Marinha e Ambiental (CIIMAR); Instituto do Mar (IMAR); Centro de Ciências do Mar, Universidade do Algarve (CCMAR); Centro de Investigação Tecnológica do Algarve (CINTAL); Agência Regional para o Desenvolvimento da Investigação, Tecnologia e Inovação (ARDITI); Centro de Engenharia e Desenvolvimento (CEiiA); Universidade da Beira Interior (UBI).

FUNDING FOR 2017-2021
Total Public Investment
9,018,838 €
ERDF
5,271,377 €
National Public Funds (FCT)
3,747,461 €

DESCRIPTION

EMSO is a large-scale European Research Infrastructure (RI). It is a network of fixed point, deep sea multidisciplinary observatories, with the scientific objective of real-time, long-term monitoring of environmental processes related to the interaction between the geosphere, biosphere and hydrosphere. It is a geographically distributed infrastructure located at key sites in European waters, spanning the northern and easterrn Atlantic, across the Mediterranean and up to the Black Sea. Portuguese participation is focused on the Azores and Cadiz nodes. EMSO is coordinated with similar initiatives in the US, Canada and Japan.

ACTIVITIES

EMSO-PT offers access to a wide variety of services related to the seafloor observation, including long-term data series, field opera- tions support, advanced technical on-job training, and consultancy in deep seafloor exploration. This infrastructure will also provide the scientific community with access to experiments in the seafloor, specific ocean instruments, laboratory facilities, deep sea collections and deep sea surveys.

IMPACT

EMSO Portugal integrates the ESFRI Roadmap RI EMSO, which coordinates and facilitates access to open ocean fixed point observatory infrastructures. It will be the point of contact for observatory initiatives in other parts of the world. Members are open to host visiting scientists, engineers and technicians for collaborations with those directly involved in EMSO activities in their laboratories. EMSO will also integrate research, training, and information/dissemination activities on ocean observatories around the European waters.
EMSO Portugal will benefit from this framework. The country has a large responsibility on the scientific exploration of its deep sea platform, and there are a number of small research teams that have developed specific skills in some areas of deep sea research. Nevertheless, international cooperation and sharing of experiences are of paramount importance to train the next generation of researchers.
Other impacts include various learning effects, scientific and technological innovation, net- working opportunities, better deep sea management, and the availability of a critical mass of scientists and engineers.
The economic return in the long term in all the regions of observa- tory sites or cyber department facilities, as estimated on the basis of previous experience, indicates that over 70% of the operation costs (personnel, supplies, utilities) could end up in the local economy.
EMSO will deliver deep-ocean observation services to government agencies and industry in Europe and will com- pete with the USA, Canada, Japan and India to deliver services to Africa and the Asia/ Pacific Region.

FHP - AWAM
Fraunhofer Portugal Research Center for Agriculture and Water Management

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2019

WEBSITE
www.fraunhofer.pt

RI COORDINATOR
Gottlieb Basch (UE)

INSTITUTIONAL PARTNER(S)/NODE(S)
Associação Fraunhofer Portugal Research (FhP); Universidade de Trás-os-Montes e Alto Douro (UTAD); Universidade de Évora (UE).

FUNDING FOR 2017-2021
n.a.

DESCRIPTION

Fraunhofer Portugal AWAM center is a new RI built to promote R&D and innovation in the fields of precision agriculture, water management and advanced agroindustrial processing systems. Fraunhofer AWAM focuses on companies as partners, thus promoting and developing applied research activities in an international context. Therefore, with direct utility to private and public institutions and a wide benefit to society.

ACTIVITIES

Fraunhofer AWAM will provide applied research activities in the following areas:
– Development, demonstration and application of process technologies with focus on separation processes, sensor technology and energy.
– Integration of digitalization and development of automated and partially self-regulating systems.
Demonstrations will be carried out through prototyping and field experiments.
– Process development and applications based upon environmental sustainability, ecosystem preservation and services with a circular economy approach.

IMPACT

Considering the challenges that global agriculture is facing due to climate change and overpopulation, research and innovation in the areas of smart farming systems and water management are, more than ever, extremely relevant. New high-tech approaches are essential to ensure food supply in terms of quantity and quality, optimize sustainability and environmental compatibility of farming, and strengthen the competitiveness of European farmers.
Water availability is an important issue in this context, which is closely connected to wastewater treatment and water recycling in all parts of society. The main goal is the development and application of new process technologies based on comprehensive data analysis and modeling, in order to establish a close loop of nutrients, water and energy regionally and nationally.
Fraunhofer AWAM will work closely with farms and industrial partners in Portugal to develop materials, components and technologies up to a technological readiness level 6-7 (prototype in application). This will be the basis for a technological transfer and broad application, which has the potential to help reinforce the competitive strength of industrial partners, thus resulting in job creation and economic growth.
The research infrastructure will hire a limited number of human resources, creating opportunities for qualified researchers in the North and Alentejo areas. Furthermore, the number and impact of scientific publications as well as the number of PhD, MSc and BSc thesis will be substantially reinforced.

PORBIOTA
Portuguese E-Infrastructure for Information and Research on Biodiversity

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
www.porbiota.pt

RI COORDINATOR
Nuno Ferrand de Almeida (ICETA/CIBIO-InBIO)

INSTITUTIONAL PARTNER(S)/NODE(S)
Instituto de Ciências, Tecnologias e Agroambiente da Universidade do Porto, Centro de Investigação em Biodiversidade e Recursos Genéticos, Rede de Investigação em Biodiversidade e Biologia Evolutiva (ICETA/CIBIO-InBIO); Instituto Politécnico de Viana do Castelo (IPVC); Centro de Estudos do Ambiente e do Mar da Universidade de Aveiro (CESAM-UA); Centro de Ciências do Mar e Ambiente, Universidade de Coimbra (MARE-UC); Centro de Estudos Florestais, Instituto Superior Agronomia da Universidade de Lisboa (CEF-ISAUL); Centro de Investigação em Agronomia, Alimentos, Ambiente e Paisagem, Instituto Superior Agronomia da Universidade de Lisboa (LEAF-ISAUL); Centro de Ecologia, Evolução e Alterações Ambientais, Faculdade de Ciências da Universidade de Lisboa (cE3c-FCUL); Museu Nacional de História Natural e da Ciência da Universidade de Lisboa (MUHNAC-UL); Museu da Ciência da Universidade de Coimbra (MC-UC); Museu de História Natural e da Ciência da Universidade do Porto (MHNC-UP); Instituto da Conservação da Natureza e das Florestas, I. P. (ICNF, I. P.); Sociedade Portuguesa de Ecologia (SPECO); Fundação Gaspar Frutuoso.

FUNDING FOR 2017-2021
Total Public Investment
5,268,749 €
ERDF
3,358,728 €
National Public Funds (FCT)
1,910,021 €

DESCRIPTION

PORBIOTA is the Portuguese distributed e-infrastructure targeted at mobilising, organising and disseminating biodiversity and environmental data, providing a platform that connects academia, the public administration and the civil society. It fosters a national agenda for biodiversity and ecosystems research, making available high-quality knowledge needed to meet societal challenges regarding environmental protection and sustainability. The consortium PORBIOTA includes top national research centres, natural history museums and is engaged with several ESFRI projects and landmarks like LifeWatch-ERIC, eLTER-RI, ICOS-ERIC, DISSCo, and with GBIF.

ACTIVITIES

PORBIOTA (www.porbiota.pt) offers access to a wide variety of services related to biodiversity, ranging from biodiversity and environmental data resources to computational and analytical tools for research and policy implementation and evaluation.
More specifically, PORBIOTA provides an online platform with biodiversity data collected either in Portugal or worldwide by Portuguese institutions, DNA barcodes for animal and plant species occurring in Portugal, species identification based on morphological and molecular tools and capacity enhancement training. In addition, PORBIOTA offers ecosystem identification services and access to four Long Term Ecological Research Sites and Platforms, as well as to greenhouse gases and ancillary data from specific ecosystems.

IMPACT

By promoting digitization, aggregation and dissemination of data on biodiversity and Portuguese ecosystems, PORBIOTA is contributing very significantly to the advancement of scientific knowledge in biodiversity, ecosystems functions and ecosystem services and to raise the international impact of Portuguese research in these fields. PORBIOTA also disseminates publications by Portuguese institutions, enhancing notoriety and leveraging research work at national and international levels.
Also, PORBIOTA is contributing to promote integrative taxonomy and build up knowledge of national biodiversity, comprising the description of new species both for science and at a national level. The use of molecular methodologies is promoting highly competitive cutting-edge areas, such as metabarcoding and environmental metagenomics. Access to the LTER network and green house gases measurements stations are also enhancing scientific production in critical areas such as global climate change. In all these fields, scientific production is linked to advanced training of human resources. The growing scientific impact is also evidenced by the growing success in international applications with participation and even leadership from the consortium institutions, as well as by participation in projects through LifeWatch-ERIC, eLTER-RI and DISSCo.
PORBIOTA is also fostering applied research, contributing to a more rapid improvement of policy implementation and evaluation by national and regional administration agencies (e.g. SMART specialization), and supporting such institutions to comply with international obligations, strategies and initiatives, promoting open access strategy and FAIR principles of data sharing. The distributed and evolving development of PORBIOTA is facilitating its replication elsewhere. This represents a major boost for Portuguese science and technology development, namely in the field of natural sciences, biodiversity and associated ecosystems awareness.

5.3
Health & Food

Health and Food Research Infrastructures (RIs) play a key role in addressing many of the societal challenges Europe is facing. They are taking on an increasingly multidimensional nature, supporting diverse disciplines and providing services to promote research that will answer pressing and essential issues for the prevention, diagnosis and development of therapies for diseases affecting the global population, such as the novel SARS-CoV-2 virus. Also, the food value chain, food safety, quality and traceability are core areas of applied research, sometimes in close cooperation with the medical and pharmaceutical Industries.

Some of these RIs are more focused on the development of innovative methodologies and technologies, which will pave the way to a new level of well-being.

The health and food sciences RIs in the present roadmap integrate and network nodes and research sites that cover a wide range of objectives and disciplines: from the study of molecules to tissues and biospheres, prevention to prediction of diseases, clinical trials, research and services in the area of food productive chains, from basic to applied research. They encompass facilities, technologies and frontier scientific knowledge.

BIN, the National Brain Imaging Network, a single-sited RI which is part of the national node of the ESFRI Roadmap RI EuroBioImaging ERIC – Research Infrastructure for Imaging Technologies in Biological and Biomedical Sciences

Biobanco.pt, the National Biobanks Infrastructure, a distributed RI

BioData.pt, the Portuguese Biological Data Network, a virtual RI, is the national node of the ESFRI Roadmap RI ELIXIR – European life-sciences Infrastructure for biological Information

CONGENTO, the Consortium for Genetically Tractable Organisms, a distributed RI associated to the ESFRI Roadmap RI INFRAFONTIER – The European Infrastructure for Phenotyping and Archiving of Model Mammalian Genomes

CryoEM-PT, the National Advanced Electron Microscopy Network for Health and Life Sciences, a distributed RI

FOODCHAIN-PT, the International Food Chain Alliance – Portugal, a distributed RI, is part of Fraunhofer Food Chain Management Alliance

GenomePortugal, the National Facility for Genome Sequencing and Analysis, a distributed RI

MIA – Portugal, the Multidisciplinary Institute of Ageing, a single-sited RI

PPBI, the Portuguese Platform of BioImaging, a national distributed RI of imaging technologies in biological and biomedical sciences, which is, together with BIN, the national node of Euro-BioImaging ERIC

Prototera, the Portuguese Network of Infrastructures for Proton Therapy and Advanced Technologies for Cancer Prevention and Treatment, a distributed RI

PtCAC, the Portuguese Network of Clinical Academic Centers, a distributed RI

PtCRIN, Portuguese Clinical Research Infrastructure Network, a distributed RI, is the national node of ECRIN ERIC – European Clinical Research Infrastructures Network, an ESFRI Roadmap RI

PtmBRCN, Portuguese microBiological Resources Center Network, a distributed RI, is the national node of MIRRI – Microbial Resource Research Infrastructure, an ESFRI Roadmap RI coordinated by Portugal

PT-OPENSCREEN, the National Infrastructure for Chemical Biology and Genetics, a distributed RI, which will be the national node of EU-OPENSCREEN – European Infrastructure of Open Screening Platforms for Chemical Biology

RNEM, the Portuguese Mass Spectrometry Network, a distributed RI which partnered with PTNMR, the Portuguese Nuclear Magnetic Resonance Network, to participate in INSTRUCT ERIC, the European RI for Structural Biology

RNCCC, the National Network of Comprehensive Cancer Centres, a distributed RI, includes the Porto Comprehensive Cancer Centres (PCCC), recognized by the Organisation of European Cancer Institutes (OECI) and part of "Cancer Core Europe"

TERM RES-Hub, the Tissue Engineering and Regenerative Medicine Research Infrastructure, a distributed RI

TRIS-HCP, the Translational and Clinical Research Infrastructure Specialisation Plat form - Health Cluster Portugal, a virtual RI

VIASEF, the In Vivo Arthropod Security Facility, a single-sited RI

ViraVector, the Viral Vectors for Gene Transfer Core Facility, a single-sited RI

BIN
National Brain Imaging Network – Core Infrastructure

TYPE
Single-Sited

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
www.uc.pt/en/brainimaging

RI COORDINATOR
Miguel de Sá e Sousa de Castelo Branco (ICNAS, CIBIT/UC)

INSTITUTIONAL PARTNER(S)/NODE(S)
Instituto de Ciências Nucleares Aplicadas à Saúde - Universidade de Coimbra (ICNAS,CIBIT/UC). Scientific partnerhips with 5 National Universities and Research Centers.

FUNDING FOR 2017-2021
Total Public Investment
6,489,211 €
ERDF
5,515,829 €
National Public Funds (FCT)
229,532 €
National Funds (Coordinating institution)
743,850 €

DESCRIPTION

The Brain Imaging Network focuses on basic, translational and clinical neuroscience by designing new molecular probes for human imaging of structure, chemistry and function, with a focus on the human brain.
Recently a preclinical facility combining the same imaging modalities in animals models was added (PET/MRI).

ACTIVITIES

BIN provides access to a wide variety of services in imaging, including human an animal brain imaging, high density EEG/ERP, simultaneous EEG/fMRI, human PET brain imaging in particular using 11C and 18F compounds, and multiorgan imaging in chronic diseases affecting the brain and other organs.
This infrastructure also offers radiopharmaceutical production, data analysis and archiving, advanced training (in data analysis and data acquisition), psychophysiological studies, and animal imaging in translational research studies using MR and other modalities.
BIN offers advanced courses in experimental design and data analysis; advanced lab courses in biosignal acquisition including multimodal techniques and user driven tutorships in experimental design, data acquisition and analysis (on a continuous basis, two tutors available full time) and supervision of PhD and Master students. It also fosters scientific interchange through Symposia and Scientific Meetings.

IMPACT

BIN has had very strong scientific impact, with ERC, Marie Curie and Consortium grants, R&D knowledge transfer, World Patent with revenues, partnerships with the pharmaceutical industry, equipment suppliers and industrial partners. With the collaboration of CIBIT, ICNAS is working on the development of new radiolabelled molecules for basic and clinical research and also services to the local pharmaceutical companies regarding pre-clinical testing of new, candidate drugs.
The BIN RI has hosted the works of important Prizes (Pfizer, Obstbaum, FLAD) and proven ability to study large cohorts of healthy volunteers and patients (in neuroimaging/phenotyping projects on neurodegenerative diseases), with probes for imaging of structure, chemistry and function in the living human brain. Multimodal studies in basic and clinical neuroscience help unravel molecular mechanisms of disease as well as to develop novel diagnostic imaging biomarkers to better define and detect early disease processes and test new therapies. We focus on MR and PET based imaging probes based on Dopamine, GABA and Glutamate, related to developmental, ageing, neurological and psychiatric diseases.
Based on human and animal imaging, BIN aims to implement a novel data-mining biomedical facility that will have enormous impact in the development of novel diagnostic tools and therapeutical targets.
BIN and its research plan are recognized by the EU as an integral part of "European Innovation Partnership on Active and Healthy Ageing (EIP-AHA)". BIN represents the national Medical Imaging Branch in EuroBioImaging, and also participates in ECRIN and EATRIS. The sustainability plan allowed entering a market of radiotracer distribution that is worth 5 million in Portugal and allows for self-sustainability.
BIN aims to keep academic, R&D and spin-off activities with the already established national RIs and industrial partners, expecting to maintain all current R&D contracts and WIP packages with the main companies, and extend them.

BIOBANCO.PT
National Biobanks Infrastructure

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2019

WEBSITE
http://biobanco.pt

RI COORDINATOR
Sérgio Dias (iMM/FMUL)

INSTITUTIONAL PARTNER(S)/NODE(S)
Instituto de Medicina Molecular (iMM/FMUL); Universidade de Aveiro (UA); Centro Hospitalar da Universidade de Coimbra (CHUC); Instituto Nacional de Saúde Doutor Ricardo Jorge (INSA); NOVA Medical School - Universidade NOVA de Lisboa (NMS|FCM); Fundação D. Anna de Sommer Champalimaud e Dr. Carlos Montez Champalimaud (FC); Hospital de Santo Espírito da Ilha Terceira(HSEIT); Instituto de Patologia e Imunologia Molecular da Universidade do Porto (IPATIMUP); Instituto Saúde Pública da Universidade do Porto (ISPUP); Instituto de Higiene e Medicina Tropical (IHMT); Universidade do Minho (UM).

FUNDING FOR 2017-2021
n.a.

DESCRIPTION

Biobanco.pt is a unique platform in the National research infrastructure framework, that supports research projects focused in a large spectrum of human diseases. It currently harbours thousands of samples with the correspondent clinical information. This platform is a joint effort from national institutions to promote the standardization of biobanking procedures and also to promote the sharing of existing resources and expertise to improve capacities.
Biobanco.pt will certainly contribute to increase the international competitiveness and the excellency of national biomedical research.

ACTIVITIES

Biobanco.pt aims promote national and international collaborative research projects using human samples, and the respective detailed clinical information. This networks encloses population based biobanks, clinical and multispecialty biobanks. The samples stored are essentially from patients that were including in research projects approved by local ethics committees.
Biobanco.pt commits to provide access to high quality samples collections and associated data to the scientific community and promotes the standardization in all aspects of biobanking activities, high-quality processing and storage facilities. This national scientific infrastructure will create unique opportunities to integrate national researchers in worldwide consortia including academic or pharmaceutical industry research, acting synergistically for the development of national science and economy.

IMPACT

Biobanco.pt aims to establish a high quality public service for the benefit of the national and international scientific community allowing easy access to high quality biological samples and associated clinical data. A wide range of on-demand laboratorial services will be available, to allow detailed and thourough samples characterization. We count on the accumulated experience of the IMM team, who have already successfully established and managed their biobank for more than 9 years. Each of the remaining partners are committed, at the institutional level, to establish their local biobanking facilities and have identified the Node Coordinators to integrate Biobanco.pt. All partners are active in biomedical research, integrating many of the most prestigious research institutions of the country. Biobanco.pt represents a unique and privileged platform to promote joint collaborations between academia and pharmaceutical industry, providing new scientific opportunities but also fostering fruitfull collaborations.
This RI represents a unique opportunity for several reasons:
1. Sharing and establishing common national biobanking SOPs, cooperation and centralized coordination are crucial for integrating major international research consortia.
2. This infrastructure will allow Portugal and its biomedical research tissue, to engage in the international networks of Biobanking at a relatively early stage of its development, thus providing opportunities for future growth and development.
3. An active cooperation between clinicians and basic researchers is a key aspect of biomedical research; Biobanco.pt is an effective and efficacious networking node who will provide all the necessary support for Institutions interested in engaging in Biomedical research activities.
4. Optimization of costs and efficiency. A unique harmonized structure will have lower costs and much larger reach than many small and isolated biobanks.

Biodata.pt
Biodata.pt – Portuguese Biological Data Network

TYPE
Virtual

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
www.biodata.pt

RI COORDINATOR
José Pereira Leal (FCG-IGC)

INSTITUTIONAL PARTNER(S)/NODE(S)
Fundação Calouste Gulbenkian – Instituto Gulbenkian de Ciência (FCG-IGC); Associação do Instituto Superior Técnico para a Investigação e Desenvolvimento - Instituto de Bioengenharia e Biociências (IST-ID); Associação Portuguesa de Bioindústrias (P-Bio); Centro de Biotecnologia Agrícola e Agro-Alimentar do Alentejo (CEBAL), Centro de Ciências do Mar (CCMAR); Fundação D. Anna de Sommer Champalimaud e Dr. Carlos Montez Champalimaud (FC); Instituto de Biologia Experimental e Tecnológica (IBET); Instituto de Biologia Molecular e Celular (IBMC/UP); Instituto de Engenharia de Sistemas e Computadores, Investigação e Desenvolvimento (INESC-ID); Instituto superior Técnico (IST/UL); Universidade do Minho (UM); Universidade Nova de Lisboa - Instituto de Tecnologia Química e Biológica António Xavier (ITQB-NOVA).

FUNDING FOR 2017-2021
Total Public Investment
2,728,292 €
ERDF
1,267,285 €
National Public Funds (FCT)
1,461,007 €

DESCRIPTION

BioData.pt is a distributed virtual infrastructure that aims to add value to biological data so that it can be maximally useful for academic researchers and industry. 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

BioData.pt offers a wide variety of services related to biological data, ranging from data management to bioinformatics analysis, including tailored computing resources, consultancy and training services.
BioData.pt is a relevant instrument to support those scientific discoveries within the scientific community, by fostering good data management practices and providing the tools and computational resources for data analysis.
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 is training more than 100 students every year in bioinformatics and data management. It is also delivering seminars in data management to MSc and PhD students.

IMPACT

The field of biotechnology is being adopted at a rapid pace by industries: sustainable bio-based processes in the chemical industry, the discovery of biopharmaceutical products by Pharma, the adoption of organisms and enzymes in different steps of the processes in diverse industries such as pulp and paper or textile industries. BioData.pt is expected to have a major impact on companies in Portugal that rely on biological data in a variety of fields, by providing platforms for data management and access to curated datasets, as well as use-friendly biological models or analysis tools. Especially well adapted for small companies, BioData.pt will have a service access model based on cloud technology, with low capital expenses and start up investments. 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. The collaboration with the Industry Program at the EMBL-EBI, in the organization of industry-specific training and networking workshops, national and international, represents a way of bridging the academic centers and the needs of SMEs, introducing and strengthening them in new technical capabilities.

CONGENTO
Consortium for Genetically tractable Organisms

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
www.congento.org

RI COORDINATOR
Henrique Veiga-Fernandes (FC)

INSTITUTIONAL PARTNER(S)/NODE(S)
Fundação D. Anna de Sommer Champalimaud e Dr. Carlos Montez Champalimaud (FC); NOVA Medical School (NMS|UNL); Fundação Calouste Gulbenkian (FCG); Instituto de Medicina Molecular João Lobo Antunes (IMM).

FUNDING FOR 2017-2021
Total Public Investment
3,508,029 €
ERDF
1,403,212 €
National Public Funds (FCT)
2,104,817 €

DESCRIPTION

The advent of model organisms where genetic manipulations became standard procedures revolutionised biomedical research. Among these organisms, fruitflies (Drosophila melanogaster), zebrafish (Danio rerio), and mice (Mus musculus) have been the most widely used. Aiming at supporting research in these organisms, CONGENTO is a unique infrastructure that integrates the expertise in these three animal models in one research supporting facility, for the benefit of the national scientific ecosystem.

ACTIVITIES

CONGENTO provides access to a wide variety of services related to model organisms, including maintenance and breeding of animal lines, hosting scientific projects, generation of new transgenic animal lines, cryopreservation, or drug screenings. Complementary services in areas such as molecular biology, cell culture (including CRISPR gene editing) and histopathology, are also part of the portfolio of this RI. To improve the quality and diversity of the services offered, CONGENTO activities also encompass a strong effort on technological development (e.g. state-of-the-art gene editing).
The consortium also offers diverse opportunities for education and training in Laboratory Animal Sciences.

IMPACT

By combining expertise across the 3 main model species in biomedical research, CONGENTO enables the Portuguese research to rise to a stronger position in attracting funding and top researchers. Simultaneously, CONGENTO promotes the access of new users - from national and international Academia and Industry - to the infrastructure services, facilitating biomedical research.
The consortium also contributes to education and training at several levels, along three types of activities: courses, workshops and continuous formation. PhD and MSc students also profit from the RI resources for their advanced training.
CONGENTO has a strong focus in new technology development and implementation. Results of this effort are published in international Journals, impacting on the development of other animal facilities worldwide. Given the area of research, discoveries made by users of CONGENTO participate in raising health and wellbeing of human kind.
CONGENTO relies on highly-qualified Human Resources, creating new work positions and providing training opportunities. Administrative staff, technicians, and post-docs involved in CONGENTO have the opportunity to develop attractive CVs, enhancing their competitiveness at a European level for the next step in their careers, while improving the quality of the infrastructure.
While providing highly-specialized services to for-profit private institutions and actively seeking for new collaborations, CONGENTO helps to raise the success and visibility of (mainly) Portuguese biotechnology companies. Suppliers of goods and services critical to the operation of the RI are also positively impacted by its activities.
By operating as a distributed infrastructure, building on the existing resources of four leader Institutions in biomedical sciences in Portugal, CONGENTO benefits and capitalizes from the investments made previously in each Institution and from a strategic economy of scale that ultimately decreases the costs of national research.

CRYOEM-PT
National Advanced Electron Microscopy Network for Health and Life Sciences

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2019

WEBSITE
https://www.itqb.unl.pt/cryoem-pt

RI COORDINATOR
Paulo Ferreira (INL)

INSTITUTIONAL PARTNER(S)/NODE(S)
International Iberian Laboratory of Nanotechnology (INL); Universidade do Minho (UM); Instituto de Investigação e Inovação em Saúde (I3S); Universidade de Coimbra (UC); Instituto de Tecnologia Química e Biológica António Xavier (ITQB NOVA); Instituto Gulbenkian de Ciência (IGC); Universidade da Beira Interior (UBI); Instituto de Medicina Molecular João Lobo Antunes (iMM); Instituto de Ciências Agrárias e Ambientais Mediterrânicas da Universidade de Évora (ICAAM); Centro de Ciências do Mar da Universidade do Algarve (CCMAR).

FUNDING FOR 2017-2021
n.a.

DESCRIPTION

CryoEM-PT is aimed to be equipped with a state-of-the-art cryoelectron microscope dedicated to Research and Development in Health and Life Sciences in Portugal. It will bring the most advanced technologies to the National Academic and Industrial Sectors, bridging a widening gap and enriching the national R&D potential. When fully operational, the network will allow both Industrial and Academic Portuguese Researchers to carry out studies leading to innovative new therapies against cancer, neurodegenerative diseases and others, and facilitate their access to the European CryoEM Centers through INSTRUCT-ERIC.

ACTIVITIES

CryoEM-PT is still in its implementation stage and the activities are focused around equipment configurations and the search for funding opportunities. Considering the present levels of institutional funding in the National Scientific and Technological System funding, the start-up budget of ca. 5.8 M€ is totally out of reach by CryoEM-PT's partner institutions.
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.

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 Immunethep 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 INSTRUCT-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 and engagement with artists through INL's Scale.travels program (scaletravels.inl.int).

FOODCHAIN-PT
International Food Chain Alliance – Portugal

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2019

WEBSITE
https://foodallianz.utad.pt

RI COORDINATOR
Emídio Ferreira dos Santos Gomes

INSTITUTIONAL PARTNER(S)/NODE(S)
Universidade de Trás-os-Montes e Alto Douro (UTAD); Instituto Nacional de Investigação Agrária e Veterinária – Estação Zootécnica Nacional, Santarém (INIAV).

FUNDING FOR 2017-2021
n.a.

DESCRIPTION

The International Food Chain Alliance – Portugal will be focused on the food value chain -from primary production to trade and consumers. The Feed and Food safety, quality and traceability are the core areas of applied research, in close cooperation with the compound feed industry but also with the medical, pharmaceutical and cosmetics industries. Encourage innovation by the market with demonstrations of EU demands; stimulate institutional relations between national and international companies and R&D entities and to incorporate the new technologies generated; identify, support and promote the dissemination and transfer of scientific and technological knowledge.

ACTIVITIES

Research and services in the area of whole feed and livestock productive chains. Development of studies on trends in meat consumption, covering on the short, medium and long term, focus on the European and non-EU consumer markets and different type of meat. Comply more strictly with current legislation on food safety domain. Development of compound feeds that meet the requirements of the European market. Characterize and obtain raw materials that are used in animal feed in a sustainable manner, to improving the efficiency of nutrient use. Promotion of the use of alternative protein sources and by-products from food sources. Promotion of the concept of sustainable protein and precision feed, maximizing the quantity of nutrients absorbed by animals through the feed they take in. Improve resources management to reduce food waste and greenhouse gas emissions, while keeping in mind the concept of the circular economy. Advanced training of R&D resources.

IMPACT

The European livestock production is strongly dependent on protein rich feed resources that are imported and/or that can be used for human consumption directly. In the long run, this is not sustainable. In the face of growing food security uncertainty, there is a need for new initiatives in Europe. In this context, the EU, in particular though the H2020 programme, has financed projects that look to improve sustainability and capacity of the meat sector but also to look for innovative, high quality, protein-rich food crops, to ameliorate human health, the environment and biodiversity. This infrastructure aims to tackle European and national societal challenges related with the feed industry, such as: a) promoting sustainable food security; b) delivering diverse and healthy food; c) increasing resource efficiency and environmental performance of food systems from primary production to consumers; and d) reducing greenhouse gas emissions and emissions of air pollutants from land use and food production taking into account main drivers such as inputs and consumption patterns. UTAD FOOD ALLIANZ will strengthen the knowledge regarding trends in meat consumption, expecting to help the sector prepare and adapt for changes, while fostering knowledge and innovation at the level of the feed chain. The infrastructure will be contributing to discuss and created important dossiers for the future of the Sector, in close liaison with the European Feed Manufacturers' Federation. Contribute to a knowledge-based economy through the provision of services to companies, which can strengthen their competitiveness in the sector, and through the development of national and international collaborative projects involving companies with specific experience and knowledge.

GENOMEPORTUGAL
National Facility for Genome Sequencing and Analysis

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
www.genomept.pt

RI COORDINATOR
Manuel António da Silva Santos (UA)

INSTITUTIONAL PARTNER(S)/NODE(S)
Universidade de Aveiro (UA); UCgenomics - Universidade de Coimbra (UC); Biocant; Instituto de Patologia e Imunologia Molecular, Universidade do Porto (IPATIMUP/UP); Instituto de Biologia Molecular e Celular, Universidade do Porto (IBMC/UP); InBIO, Rede de Investigação em Biodiversidade e Biologia Evolutiva; Centro de Biologia Molecular e Ambiental, Universidade do Minho (CBMA/UM); Instituto Gulbenkian de Ciência (IGC/FCG); Instituto de Medicina Molecular, Universidade de Lisboa (IMM/UL); Instituto Nacional de Saúde Dr. Ricardo Jorge (INSARJ); Centre for Biomedical Research, Universidade do Algarve (CBMR/UAlg).

FUNDING FOR 2017-2021
Total Public Investment
3,977,729 €
ERDF
2,975,352 €
National Public Funds (FCT)
1,002,377 €

DESCRIPTION

GenomePT is a distributed genome sequencing and analysis RI for basic/applied genome research and advanced services, that potentiate the participation of Portuguese scientists in national and international genome projects, and promotes genome research in health, drug discovery, environment, marine and freshwater resources, agro food biotechnology and green chemistry. GenomePT congregates researchers and technical personnel from several national research centers with technological capacity and expertise to sequence and analyze complex genomes.

IMPACT

GenomePT is boosting the development of Precision Medicine and the Bioeconomy by providing advanced services and technical support to the National Health Service (SNS), startups and SMEs. Indeed, the sequencing of human genomes and exomes is essential to improve life quality, while the sequencing of organisms of national economical relevance is fundamental to map, characterize and manage Portuguese natural resources. GenomePT also promotes academic-industrial partnerships and plays a crucial role in the training of highly qualified human resources, ensuring that Portugal has a highly qualified work force in the fields of in genome sequencing and analysis.

ACTIVITIES

GenomePT provides services in whole genome sequencing (WGS), exome sequencing (WES), genome bisulphite sequencing (methyl-seq), chromatin immunoprecipitation sequencing (ChIP-seq), direct methylation mapping, sanger sequencing, fragment analysis by capillary electrophoresis, Multiplex Ligation-dependent probe amplification (MLPA), Methylation-specific MLPA (MS-MLPA), metagenome sequencing, DNA microarrays, whole transcriptome sequencing (RNA-seq), small RNA sequencing, bacterial transcriptomics, microRNA microarrays, cytogenetics arrays (array-CGH), Real-time PCR, digital PCR and Single Cell Analysis. This RI is equipped with Illumina iSeq, MiniSeq, MiSeq, NextSeq, Ion Torrent Ion PGM, Ion Proton, S5, MinION, GridION, Illumina and Agilent array platforms and also offers bioinformatic analysis of raw and processed data, as well as training in genome bioinformatics.

MIA-PORTUGAL
Multidisciplinary Institute of Ageing

TYPE
Single-sited

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2019

WEBSITE
Under construction

RI COORDINATOR
Rodrigo Cunha (UC)

INSTITUTIONAL PARTNER(S)/NODE(S)
Universidade de Coimbra (UC); Instituto Pedro Nunes (IPN).

FUNDING FOR 2017-2021
n.a.

DESCRIPTION

MIA-Portugal is a multi-disciplinary research institute within the University of Coimbra with national and international partners, focusing on the study of the biological and molecular bases of ageing to mitigate all chronic diseases associated with ageing and to promote active and healthy ageing. The underlying goal is not to increase lifespan but to bolster health span on ageing. MIA-Portugal will host 8 research groups mingled with other research groups at UC, who will occupy a new research building (UCBiomed).

ACTIVITIES

MIA-Portugal aims to tackle the problem of the ageing trap, resulting from the increase life span coupled to the increased number of elderlies with associated chronic disorders, such as diabetes, Alzheimer, cardiovascular diseases, osteoporosis or cancer, which are currently managed in an individual basis. The activities of MIA-Portugal will include: the generation of new knowledge from basic research on the biology of ageing, pre-clinical studies by using experimental models to study drugs' effects on ageing and age-related disorders, clinical trials to test the safety and efficacy of anti-ageing strategies in elderly patients, quantification of novel biomarkers of ageing and susceptibility/evolution of age-related disorders, advanced training of the next generation of research scientists and entrepreneurs, lifelong training to up-date health professionals on the managing of elderly individuals.

IMPACT

MIA-Portugal will settle and promote research of excellence focused on the molecular bases of ageing at the University of Coimbra, through the construction and organization of a new integrative research building (Biomed), the hiring of more than 30 researchers of excellence and the network organization with other research institutes within the University of Coimbra. MIA-Portugal will generate new knowledge from basic research on the biology of ageing supporting clinical and translational efforts. MIA-Portugal will also support high-level training of PhD and postdoctoral researchers, as a node in the international network of ageing and age-related areas. Apart from training and generation of new knowledge, MIA-Portugal will support science-based innovation and business incubation, led by Instituto Pedro Nunes, and will stimulate translational clinical efforts in partnership with the University Hospital and societal outreach in collaboration with Ageing@Coimbra.

PPBI
Portuguese Platform of BioImaging

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
www.ppbi.pt

RI COORDINATOR
Paula Maria Sampaio Fonseca (IBMC/I3S)

INSTITUTIONAL PARTNER(S)/NODE(S)
Instituto de Biologia Molecular e Celular (IBMC/i3S), CNC - Centro de Neurociências e Biologia Celular (CNC), Fundação Calouste Gulbenkian (IGC), Universidade do Minho (ICVS/3B's/UM), INL - International Iberian Nanotechnology Laboratory (INL), Instituto Nacional de Engenharia Biomédica (INEB/i3S), Instituto de Patologia e Imunologia Molecular (IPATIMUP/ i3S), Universidade de Aveiro (iBiMed/UA), Universidade de Coimbra (UC), Universidade da Beira Interior (CICS/UBI), Instituto de Medicina Molecular Dr. João Lobo Antunes (IMM), Faculdade de Ciências da Universidade de Lisboa (FCUL), Universidade Nova de Lisboa (ITQB NOVA & CEDOC NMS/UNL), Fundação D. Anna de Sommer Champalimaud e Dr. Carlos Montez Champalimaud (CF), Instituto Superior Técnico (CQFM & C2TN/IST), Universidade do Algarve (UC), Faculdade de Medicina da Universidade do Porto (FM/UP)

FUNDING FOR 2017-2021
Total Public Investment
5,152,587 €
ERDF
3,334,075 €
National Public Funds (FCT)
1,818,512 €

DESCRIPTION

The PPBI - Portuguese Platform of Bioimaging is a research infrastructure constituted as a nationwide consortium of biomedical & biological sciences Research Institutes and Universities in Portugal. The 18 nodes of PPBI integrate highly qualified experts focused on providing access to advanced bioimaging resources and expertise (from nano to mesoscopy), including analysis of bioimage data. All PPBI Nodes are open to researchers from academia, R&D institutes and industry, boosting both basic and applied research towards high-impact R&D. Likewise, PPBI contributes to integrate Portugal in the European bioimaging landscape and to attract international researchers.

ACTIVITIES

The PPBI main activities are:
1) to provide open access to a broad range of imaging technologies including: widefield and confocal light microscopy, electron microscopy, light-sheet microscopy, super-resolution microscopy, high-throughput imaging, intravital multiphoton imaging, optical projection tomography, and micro-computer tomography;
2) to support bioimage analysis by providing dedicated software, access to high-performance computation and temporary image data storage;
3) consulting on project planning, and development of outstanding technology;
4) to establish operation standards and best practices procedures to be implemented among PPBI Nodes;
5) to organize advanced training courses and workshops, including the SPAOM congress (http://spaom.eu);
6) to promote outreach actions to high schools and the general public, as visits to Nodes and the activities of annual "MicroDay".
The entry point to access the PPBI infrastructure is the website at https://ppbi.pt.

IMPACT

The PPBI aims to share bioimaging resources and expertise to support basic research of excellence and its translation into applied science and technological applications. Understanding health and disease mechanisms in humans requires in-deep knowledge of the molecular and cellular processes underlying the physiological and anatomical modifications. This knowledge can only be attained with the application of ground-breaking imaging technologies, which are revolutionizing biology and medicine by allowing researchers to visualize the molecular processes of life, and consequently, uncovering essential aspects of human diseases.
This RI offers a complete set of services focused on advanced microscopy techniques and image data analysis appealing to academia, research institutes, biotech startups and industry with consequent impact in R&D and innovation. Furthermore, PPBI boosts a bridge for translational medicine by supporting basic and applied research in life sciences with focus on cell and developmental biology, neuroscience, oncobiology, immunology, microbiology, infection and regenerative medicine.
By developing and integrating the Nodes in Braga, Aveiro, Covilhã and Faro, and by strengthening advanced Nodes in Porto, Coimbra, and Lisbon, PPBI is enhancing the national cohesion. Also, it has a positive impact on the employment of highly skilled PhD. and Ms. scientists and attraction of researchers of excellence.
Connections with the European congeners (e.g. Spanish Network of Optical Microscopy or GermanBioimaging) and participation of PPBI staff on EU COST actions and ERASMUS+ initiatives, in the area of Bioimaging, increases the exchange of know-how and strength the capacity of PPBI staff to support international research projects of excellence.
PPBI is candidate to become a national biological node of the Euro-BioImaging ERIC, a European RI for biological and biomedical imaging recognized by the European Strategy Forum on Research Infrastructures (ESFRI).

ProtoTera
The Portuguese Network of Infrastructures for Proton Therapy and Advanced Technologies for Cancer Prevention and Treatment

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2019

WEBSITE
Not available

RI COORDINATOR
José Joaquim Gonçalves Marques (IST/UL)

INSTITUTIONAL PARTNER(S)/NODE(S)
Grupo Hospitalar Instituto Português Oncologia (GHIPO); Instituto Superior Técnico (IST/UL); Instituto de Ciências Nucleares Aplicadas à Saúde (ICNAS/ UC); Laboratório de Instrumentação e Física Experimental de Partículas (LIP).

FUNDING FOR 2017-2021
n.a.

DESCRIPTION

ProtoTera will promote and develop a national network for research, education and treatment of cancer using advanced technologies, such as proton therapy. In the initial phase, it will coordinate the construction of two operational nodes in Lisbon and Coimbra, with a 250 MeV proton accelerator coupled to 2 treatment rooms and 1 research room in Lisbon, plus a 70 MeV accelerator for the treatment of ocular melanoma and theranostic radioisotope production in Coimbra. Proton therapy is rapidly spreading throughout the healthcare systems worldwide and was already included in the 2015 revision of the National Radiotherapy Network.

ACTIVITIES

The main lines of action are:
– Planning and development of the infrastructures to implement the network for cancer treatment with protons.
– Development of an education and training network aimed for healthcare professionals (physicians, medical physicists, radiotherapy technicians), engineers and researchers with the support of international reference partners.
– Development and coordination of an international PhD program for medical and non-medical specialists (physicians, medical physicists, engineers) with the support of international partners to build-up the required skills for the research and treatment programs.
– Promotion of medical and non-medical research and innovation agendas associated with the infrastructures
– Screening of referred and recruited patients, confirmation of diagnosis, planning and treatment follow up.
– Clinical and Translational Research.

IMPACT

The incidence of cancer in Portugal has been increasing by about 3% per year, with more than 50 thousand new cases per year. It is the second leading cause of death, after cardiovascular disease, but the leading cause of premature mortality. It is crucial to improve cancer treatment to reduce by 1/3 the premature mortality due to chronic non-communicable diseases (Sustainable Development Goal 3).
Proton therapy is an advanced form of radiation therapy that allows the treatment of multiple types of cancer, with fewer side effects than conventional radiotherapy. The technology allows minimal damage to healthy tissue surrounding tumor, improving the quality of life and increasing the long-term progression-free survival rates. This emergent technology is especially important for treating cancer in children as it decreases the chance of harming healthy growing tissues. In the first phase, it is expected that it will be possible to treat around 700 patients per year, selected according to best practices.
Proton therapy was developed in experimental particle physics laboratories, such as the European Organization for Nuclear Research (CERN) and has been implemented in major clinical and cancer research centers worldwide. Several important research lines include: toxicity, organ mobility, improvement in dose distribution, in vivo dosimetry and dose estimation. At the same time basic research, imaging and data computing technologies are core to the success of the infrastructure. Also, radiobiology is an important research axis, namely, in hadron irradiation evaluation, hypofractionation, radio-resistant tumors and radio-immunotherapy.
Activities with good fertilization prospects will also be developed such as the development of imaging techniques and equipment, radiation detectors and studies of radiation effects on electronic devices.
Scientific institutions and companies will have access to infrastructure, based on scientific merit of research proposals to be evaluated by an independent committee.

PtCAC
Portuguese Network of Clinical Academic Centers

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2020

WEBSITE
Under construction

RI COORDINATOR
Manuel Sobrinho Simões (FMUP)

INSTITUTIONAL PARTNER(S)/NODE(S)
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., Universidade de Coimbra; 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., Faculdade de Medicina da Universidade de Lisboa, Instituto de Medicina Molecular; Centro Clínico Académico — Braga (2CA.Braga): Universidade do Minho, a 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., Faculdade de Ciências Médicas da Universidade Nova de Lisboa; Centro Universitário de Medicina FMUP – CHSJ (CUME), Centro Hospitalar de São João, E. P. E., Universidade do Porto (Faculdade de Medicina).

FUNDING FOR 2017-2021
n.a.

DESCRIPTION

The Portuguese Network of Clinical Academic Centers (PtCAC), coordinated by the National Council of Clinical Academic Centers, aims to promote and support the activities developed by the eight clinical academic centers, enhancing their inter-institutional cooperation in terms of assistance, teaching and research. Therefore, PtCAC, strategically intends to reinforce scientific qualification and development in the health field, through an increasing collaboration between hospital centers, universities and research units, in order to contribute to the advancement of biomedical research and health improvement.

ACTIVITIES

Within the scope of the activities developed by the PtCAC network, stands out the promotion of the production and dissemination of knowledge in the health system, through the articulation between differentiated health professionals, students and researchers; the modernization and qualification of health education in all its dimensions, namely through the development of academic training programs in medicine, biomedical sciences and health; the promotion of measures aimed at attracting resources for the development of the centers' activities, as well as the rationalization and maximization of human, financial and technological resources made available to its members. In addition, the PtCAC aims to implement innovative programs and strategic partnerships that enable to strengthen international cooperation in the area of health, clinical research and biomedical innovation. All of these activities are carried out with a common purpose, the achievement of health gains at the national level.

IMPACT

The vision of PtCAC is to become one of the main contributors to the improvement of the population's health and well-being, through the excellence work carried out by its clinical academic centers. Based on the pillars of quality, efficiency and innovation, PtCAC intends to contribute to the training of highly qualified and differentiated professionals, from academic laboratories to clinical practice, as well as to an improvement in the community health. Within the scope of its strategic plan, it is worth mentioning its technological capacity at the scientific level, reflected by the quality of the researchers, teachers and clinical staff belonging to the different clinical academic centers of PtCAC. Moreover, PtCAC is essential in terms of fundraising and support for clinical academic centers, in order to ensure that the basic and clinical research, as well as health activities developed by them are carried out in the best possible way.
Additionally, through the development of collaborative actions involving hospital centers, universities and research centers, it aims to contribute to the provision of high quality health care, such as the development of innovative integrated care based on a growing articulation between primary, hospital, continued and palliative care.
In this way, the activities developed and coordinated by the PtCAC network have a crucial impact on society, both at an educational and scientific level, as well as in terms of healthcare provision, at national and international levels.

PtCRIN
Portuguese Clinical Research Infrastructure Network

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2020

WEBSITE
www.ptcrin.pt

RI COORDINATOR
Maria Emília Carreira Saraiva Monteiro (NMS/UNL)

INSTITUTIONAL PARTNER(S)/NODE(S)
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 (2CA-Braga); 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).

FUNDING FOR 2017-2021
n.a.

DESCRIPTION

PtCRIN aims to improve clinical research by promoting a more efficient implementation of multinational investigator initiated clinical trials. These trials provide the highest level of evidence to support the use of health technologies (drugs, cell therapies, devices, etc) but require specific infrastructures - clinical trial units (CTUs) that manage the whole study from the design, regulatory approvals, monitoring, publication, etc. PtCRIN created a network of academic CTUs that provide services at a not-for-profit rates to public sponsors and SMEs. The integration in ECRIN-ERIC ensures multinational collaboration and high standards for CTUs.

ACTIVITIES

PtCRIN is a consortium of 10 national R&D institutions that host academic CTUs providing general or specific (statistics, informatics) services for clinical studies.
PtCRIN activities include: Consulting (open access) in preparation and implementation of national and multinational clinical research projects; eg: scientific, regulatory and ethical requirements, etc; Operational support in implementation and conduction of national and multinational clinical trials; Internationalization of Portuguese clinical investigators through participation in multinational projects and integration in working groups Assistance for access to national and European funding (work packages related to the management of the clinical trial); Development of harmonized international tools and national metrics; Data Centre Certification of CTUs by ECRIN; Training in operations and Certification in ICH-GCPs; Dissemination and cooperation with other networks (EATRIS) and organizations (SPMS, APAH, EUPATI).

IMPACT

PtCRIN fosters the production of high level of evidence, through clinical experimental studies (trials), to accelerate the approval of innovative health technologies (drugs, cell therapies, devices, food, behavior) and to support clinicians and decision makers in the adoption of a therapeutic decision that are more safe and cost effective.
By mission, PtCRIN is a national high qualified human resources infrastructure and is implementing a new profession (clinical research manager) and jobs for PhD holders in biomedical sciences with interests in more applied research and management skills. This will be particularly definitive for the development of academic clinical centers because clinical research managers are pivotal in the integration between health care units, research institutions and medical schools.
PtCRIN activities bring together all relevant stakeholders (scientific societies, authorities, hospital administrators, etc) in clinical research to facilitate awareness, harmonization and international visibility.
PtCRIN generates new opportunities for clinical research investigators to coordinate European projects and be involved in multinational ones (coordination and support actions, research and innovation actions); improve the number of publications with Portuguese clinical investigators; increase the attractiveness of health care units to be included in the development phase of new health technologies sponsored by international companies.
Finally, the support given by PtCRIN CTUs to SMEs at not-for--profit rates facilitates its development and sustainability.

Pt-mBRCN/MIRRI-PT
PtmBRCN – Portuguese microBiological Resources Center Network

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2020

WEBSITE
www.mbrcn.pt

RI COORDINATOR
Nelson Lima (MUM, CEB/UM)

INSTITUTIONAL PARTNER(S)/NODE(S)
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, UCIBIO/Unidade de Ciências Biomoleculares Aplicadas, Universidade Nova de Lisboa (UCIBIO/UNL, Co-Coordinator entity); Biotropical Resources, GHTM-IHMT/Global Health and Tropical Medicine, Institute of Hygiene e Tropical Medicine, Universidade Nova de Lisboa (IHMT/UNL); Instituto Nacional de Investigação Agrária e Veterinária, I.P., State Laboratory of the Ministry of Agriculture, Forests and Rural Development (INIAV).

FUNDING FOR 2017-2021
n.a.

DESCRIPTION

Pt-mBRCN is a national network of microbial culture collections covering different taxonomic groups and federating microbial taxonomic experts to provide microbial resources for the advancement of biotechnology, human health, and research and development in Life Sciences. Pt-mBRCN aims for a better-managed national microbial resources which will lead to further discoveries in all areas of the life sciences including healthcare and innovative solutions and products for bioindustries.

ACTIVITIES

- Provide microbial strains including archaea, eubacteria (including cyanobacteria), yeasts,
filamentous fungi, and micro-algae;
- Provide data and metadata associated to the strains;
- Microbial identification/classification covering different taxonomic groups;
- Provide ex-situ long-term preservation of microbial cultures used in scientific publications (vouchers for publishers), references strains, industrial strains, etc.;
- Provide support on microbial diversity data management;
- Access to microbial active compounds; screening new bioactive compound and analyses of secondary metabolites;
- Consultancy on an advanced experimental strategy involving microorganisms (e.g., plant disease biocontrol, food microbiology and fermentations, fast and cost-effective clinical isolate identifications, etc.);
- Consultancy on legal aspects, such as on biosecurity and access and benefits sharing under the Nagoya Protocol and EU regulation;
- Provide training and education advanced and tailored courses.

IMPACT

The current high throughput technologies available allow screening in a fast and sound way thousands of microorganisms, their own metabolic activities or bioactive compounds to an unprecedented scale. The bioindustry claims for culture collections huge sets of strains in different taxa or from specific origins or ecological niches. The strong fragmentation of biological resources and related information did not allow answer accurately, or in due time, to the industrial or other user-community's needs. Pt-mBRCN wishes change this situation at national level and with the MIRRI at European level. Long-term preservation of the microbial resources has been the core business of culture collections, but operate with quality management system, under a legal framework, and guarantee that the strains make available are the highest quality for the users turn these collections closer to the more advanced concept of mBRC. Operating under the same QC and provide data for the e-catalogue the impact for the science and technology will increase in several times of magnitude. The collections will be able to accept deposits of type/key/unique strains to preserve and make them available for the next generations avoiding the current scenario that near 99% of bacteria used in scientific publications are not available for the science and for the society anymore. Aligned with this strategy the new INFRADEV-3 IS_MIRRI21 project, coordinated by MUM-UMinho, addressed similar concerns and defined actions to change the situation. Finally, Portugal (MUM-UMinho) hosts the European headquarters of MIRRI.

PT-OPENSCREEN
PT-OPENSCREEN: National Infrastructure for Chemical Biology and Genetics

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2020

WEBSITE
pt-openscreen.pt

RI COORDINATOR
Antonio Pombinho (i3S)

INSTITUTIONAL PARTNER(S)/NODE(S)
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).

FUNDING FOR 2017-2021
n.a.

DESCRIPTION

PT-OPENSCREEN 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-OPENSCREEN aims to provide high quality candidate compounds to clinics.

ACTIVITIES

PT-OPENSCREEN is a nationwide network of chemistry and biology institutes providing compound synthesis and cell and biochemical assays for chemical and genetic screening, compound optimisation and follow-up activity studies. It 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 OPENSCREEN, accessing the European Chemical Biology Library. Ultimately, the mission of PT OPENSCREEN is to identify new molecular probes/tools for research and new potential therapeutics.

IMPACT

Although Europe has seen a dynamic development of chemical biology in past few years, programs for this highly multidisciplinary science in universities and research institutions are considerably delayed in Portugal. There is no public or private institution with the required conditions (i.e. infrastructure/technology and know-how) for early stages drug discovery in the country, that will benefit from emergence of a strong infrastructure for chemical biology and instrumentation for high throughput screening. The technology to be used in the project will contribute to the competitiveness of PT-OPENSCREEN Partner Institutions, as well as their users, while the entire society will benefit in the long term. PT-OPENSCREEN 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-OPENSCREEN 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-OPENSCREEN, and the chemical biology knowledge base of the PT-OPENSCREEN, 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.

RNCCC
National Network of Comprehensive Cancer Centres

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2019

WEBSITE
www.ipoporto.pt/eu-profissional/investigacao/p-ccc

RI COORDINATOR
Rui Manuel Ferreira Henrique (IPO Porto)

INSTITUTIONAL PARTNER(S)/NODE(S)
Instituto Português de Oncologia do Porto Francisco Gentil, E.P.E. (IPO Porto); Instituto de Investigação e Inovação em Saúde (i3S).

FUNDING FOR 2017-2021
n.a.

DESCRIPTION

P.CCC was formed between IPO Porto and i3S and has the general aim to improve cancer prevention, diagnosis and treatment innovation by integrating excellent basic, translational and clinical research. The project is built around the "From Bed to Bench and Back" (B3) concept. "Bed" represents the daily contact of IPO Porto with the needs of cancer patients. These needs drive basic research development by i3S, with the aim of finding solutions in the form of better cancer screening, diagnosis, biomarker development and clinical trials. Thus, the patient returns ("Back") to the clinical trials developed in the Clinical Research Unit of P.CCC.

ACTIVITIES

The National Network of Comprehensive Cancer Centers was created in 2019 and is in its implementation phase. The objectives of the Network are in line with the capacities already installed at P.CCC, allowing the enactment of Precision Medicine, including the development of: 1) Biomarkers for the surveillance of cancer patients and their families at risk 2) New diagnostic and prognostic methodologies 3) New therapeutic strategies based on nanotechnology 4) Experimental models (in vivo, in vitro, animal-based) to perform preclinical research and predict disease response to therapy ; 5) early clinical trials for new drugs or repositioning of drugs already available for other therapeutic indications. To boost the B3 concept of translational research, project and research allocation should be planned in a methodical way. Mechanisms need to be set in place to involve basic researchers and clinicians in the translational process, as well as incentives and a facilitation structure.

IMPACT

The scientific impact of the network is already evidenced by an increase in the total number of publications and grants involving both partner institutions, and will increase significantly considering the opportunities to develop additional integrated projects. Because i3S has already a support structure for the management of issues related to intellectual property, knowledge transfer and exploitation is facilitated. Furthermore, the number of start-ups and spin-offs that contribute to the dissemination of technology and scientific knowledge is also expected to grow. The population aging process observed in Europe and with particular sharpness in Portugal implies an increase in a set of related pathologies, among which Cancer stands out. Thus, all measures aimed at reducing the negative impact of this situation, from primary and secondary prevention, development and personalization of therapeutic approaches and follow-up models more suited to new lifestyles, are important from a societal point of view. The answer to these challenges can only be given through organized structures like the RNCCC that can articulate research and development activities with assistance and promote excellence through networking with similar reference structures at European level. This will contribute to decrease patient anxiety and increase quality of life. Furthermore, complementing research with health economic analyses will help define which interventions are more cost effective, mitigating the ever increasing financial strain upon the healthcare system. Considering the already flourishing training and educational activities of the network members, which includes cooperation in several study cycles of the University of Porto, an increase in the number of training opportunities for young researchers and health professionals is clearly envisaged. To accomplish all this, a multi-year strategic and operational plan will be developed, and its monitoring should be ensured.

RNEM
Portuguese Mass Spectrometry Network

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
http://rnem.fc.ul.pt

RI COORDINATOR
Maria Helena Ferreira da Silva Florêncio (FC/UL)

INSTITUTIONAL PARTNER(S)/NODE(S)
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/UNL); 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).

FUNDING FOR 2017-2021
Total Public Investment
3,194,900 €
ERDF
1,916,353 €
National Public Funds (FCT)
1,278,547 €

DESCRIPTION

The Portuguese Mass Spectrometry Network is the reference infrastructure representing Portugal in the fields of Mass Spectrometry, Proteomics and Metabolomics. It is a major service provider for academia, industry and Governmental Agencies, playing a pivotal role in training and consulting activities.

ACTIVITIES

RNEM offers access to a wide variety of services in mass spectrometry, proteomics, and metabolomics, including protein identification and quantification, analysis of protein post-translational modifications, top-down proteomics, structural mass spectrometry, untargeted metabolome analysis, analysis and characterization of natural products and organic molecules, gas-phase ion chemistry, inductively coupled plasma mass spectrometry and sample preparation. This infrastructure also provides consultancy in MS-based technology.

IMPACT

RNEM was intentionally designed as a research and support infra- structure to provide scientific services and as 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 the access to analytical services and the advertisement of the network´s activities. Our strategy bared its fruits through a very high scientific impact in publications (>125/year), thesis (>10 PhD and >10 MSc per year) and funding, most notably in European projects, including the European Human Biomonitoring Initiative (EHBMI, SC1-PM-05-2016) funded with 10 million EUR, the GENetic diversity exploitation for Innovative macro-ALGal biorefinery (GENIALG, H2020 GA: 727892) with a total of 12.2 million EUR, and the European Network of Fourier-Transform Ion-Cyclotron-Resonance Mass Spectrometry Centers (EU FT-ICR MS, H2020 GA: 731077) with 5 million EUR. Moreover, RNEM capacitated and enhanced the capabilities of strategic Portuguese Government agencies like INIAV, ASAE, The Portuguese Army and The Portuguese Criminal Police.
For the next six years RNEM will reinforce its great potential for highly qualified direct employment (>100highly qualified jobs per region created so far). Structure determination and compound identification in complex matrices is out of reach for many industries and can be provided by RNEM, increasing its competitiveness and effectiveness. This may lead to a desirable employment increase and give birth to spin-off companies, contributing to national and local development. Depending on its resources, 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.

TERM RES-Hub
Tissue Engineering and Regenerative Medicine Infrastructure

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
https://icvs3bs.pt/icvs3bs

RI COORDINATOR
Rui Luís Gonçalves dos Reis (UM)

INSTITUTIONAL PARTNER(S)/NODE(S)
Laboratório Associado (ICVS/3B's/UM); European Institute of Excellence on Tissue Engineering and Regenerative Medicine, EXPERTISSUES; Association for the Advancement of Tissue Engineering and Cell based Technologies & Therapies (A4TEC).

FUNDING FOR 2017-2021
Total Public Investment
10,799,974 €
ERDF
9,179,978 €
National Public Funds (FCT)
1,619,996 €

DESCRIPTION

The TERM RES-Hub distributed Infrastructure is composed by the PT Associate Lab. ICVS/3B's (from the University of Minho), the European Institute for Excellence in Tissue Engineering and Regenerative Medicine (EEIG) and A4TEC, which already provide laboratories with extensive resources and high interest to the scientific and business community focused on the development of research in Tissue Engineering and Regenerative Medicine (TERM), going from materials synthesis, to materials processing routes, stem cells isolation and differentiation, and in vitro and in vivo biological testing.
The TERM RES-Hub' scientific objectives lie at the frontiers of knowledge in the fields of health science and technology, medical sciences, regenerative medicine and tissue engineering, biomaterials science and technology and nanomedicine.

ACTIVITIES

TERM RES-Hub provides access to a wide variety of services related to tissue engineering and regenerative medicine, including high quality technical and consulting services in the fields of regenerative medicine and medical devices. This infrastructure also offers materials synthesis and processing, physicochemical characterization and biological testing of medical devices and tissue engineered products.

IMPACT

The TERM RES-Hub will integrate health sciences research and cutting edge technologies for the development of new clinically useful therapies and tissue regeneration strategies. For that purpose, the TERM RES-Hub will adopt highly multidisciplinary methodologies in order to advance the present knowledge on selected areas of Tissue Engineering and Regenerative Medicine, Nanomedicine, Biomedical Engineering and Biomaterials Science and Technology, aiming to develop new and sophisticated interventions to prevailing health problems, including advanced diagnosis methods and therapies.
The TERM RES-Hub will provide research and training activities to a vast audience, including undergraduate and postgraduate students and health professionals.
ICVS/3B's (AvePark campus) know-how and core facilities have been made available to help strengthen the dialogue between academia and industry, thus helping to generate new ideas and products, in different sectors of the Portuguese economy. Efforts will be made to promote the increase in patenting, licensing, outsourcing and implementation of R&D projects in cooperation with established companies, start-ups, spin-offs and health institutions. Consulting, contract research and other services (e.g. advanced analytical techniques, in vitro and in vivo biological tests, materials development, specialised diagnostic services) will be made available to external companies, research institutes, health institutions or other public and private organisations.

TRIS-HCP
Translational and Clinical Research Infrastructures Specialisation Platform – Health Cluster Portugal

TYPE
Virtual

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
http://healthportugal.com/tris-hcp

RI COORDINATOR
Patrícia Patrício (HCP)

INSTITUTIONAL PARTNER(S)/NODE(S)
Health Cluster Portugal - Associação do Pólo de Competitividade da Saúde (HCP).

FUNDING FOR 2017-2021
n.a.
(the RI chose not to apply to the 2016 Call for funding – Notice 01/SAICT/2016)

DESCRIPTION

TRIS-HCP is a virtual organisational system within the Health Cluster Portugal (HCP) that brings together many of the most prominent Portuguese R&D institutions, hospitals and academic medical centres, and their respective facilities, resources, services and expertise in the areas of translational and clinical research, making them more accessible to other researchers and companies.

ACTIVITIES

TRIS-HCP offers access to a wide variety of services related to translational and clinical research, including search and access to R&D service centres, R&D partnership opportunities and technology offers, professional and technical training, and networking and matchmaking initiatives.

IMPACT

The TRIS-HCP RI promotes the coordination between the actors of translational and clinical research in Portugal, according to a logic of an integrated network, oriented towards strategic areas and articulated with existing complementary networks, thus mitigating the dispersion/fragmentation of resources and capacities. By articulating resources, otherwise fragmented, synergies are fostered and duplications are avoided – hence rationalizing the investment in common interest resources –, and the access by the scientific and business communities is improved – thus optimizing the use of the resources.
TRIS-HCP contributes to the valorisation and internationalization of Portugal's translational and clinical research, thus boosting the performance and competitiveness of the entire health value chain.
Expected impacts include:
a) increased turnover and exports in high added value areas;
b) attraction of foreign invest- ment and creation of companies, including high-tech start-ups;
c) creation of qualified jobs, including researchers/PhDs in companies;
d) better access to healthcare and innovative therapies through clinical trials, etc.
In terms of training, TRIS-HCP pays special attention to complementary skills – e.g., project management, legal/regulatory affairs, quality and GxP, intellectual property and technology transfer – in order to make highly-qualified human resources, including PhDs, even more "attractive" to companies, which can have an impact on the number of PhDs in companies and on retaining talents in Portugal.

VIASEF
In Vivo Arthropod Security Facility

TYPE
Single-Sited

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
http://viasef.ihmt.unl.pt

RI COORDINATOR
Carla A. Sousa (NOVA-IHMT)

INSTITUTIONAL PARTNER(S)/NODE(S)
NOVA-Institute of Hygiene and Tropical Medicine (NOVA-IHMT).

FUNDING FOR 2017-2021
Total Public Investment
821,683 €
ERDF
328,673 €
National Public Funds (FCT)
493,010 €

DESCRIPTION

VIASEF is an Arthropod-Containment-Level 3 (ACL-3) infrastructure. This infrastructure offers to European and CPLP (Community of Portuguese Language Speaking Countries) countries, to the scientific community and industry, the possibility to develop in vivo studies with autochthonous (e.g. sandflies), invasive (e.g. Aedes aegyti), exotic (e.g. tsé-tsé flies) or transgenic arthropod vectors. It also allows, in conjunction with other existing facilities (a licensed animal house and a biobank), the establishment of transmission cycles of vector-borne human pathogens, including those classified as biohazard level 3.

ACTIVITIES

This research facility with ACL-2 and 3 insectaries and associated laboratories (including a BSL-3 lab) provides access to a wide variety of services. Autochthonous, exotic (invasive and non-invasive), and transgenic arthropod species vectors of human and veterinary diseases are available for research and for commercial purposes, through the supply of dead or alive specimens or its parts (e.g. salivary glands). Standardized assays to test insecticides, biocides or repellents, and experiments with specific protocols to study key behavioral traits (e.g. host choice) at all arthropods stages can be accessed by both private and public sectors. Experimental infections in arthropods with vector-borne human pathogens and the establishment of specific pathogen's lifecycles, including field isolates and genetically modified pathogens is offered by this infrastructure as well as insectaries and laboratories for rent, with or without technical support.

IMPACT

VIASEF has improved research conditions of NOVA-IHMT and other national institutions, allowing to carry-out projects demanding in vivo tests of vector-borne human pathogens which so far were not possible due to the lack of proper infrastructures. These include in vivo assays for the study of vector competence determinants, as well as the study of new pharmacological products. This has greatly strengthen the capacity for attracting national and international research funding.
The facility also supports advanced training actions of national or international researchers and post-doctoral fellows. VIASEF serves as a basis to improve mobility and science exchange programs that NOVA-IHMT is currently involved in, particularly with countries from sub-Saharan Africa, and South America. It also supports training under the scope of UNESCO's International Reference Centre for Research and Advanced Training, hosted at NOVA-IHMT.
VIASEF already has well-established partnerships with industry and with national and international, public and private institutions. On-going partnerships involve mosquito bioassays for testing the efficacy of products under development such as new bioinsecticides, novel impregnation methods of textiles with repellents and light-activated surfaces for delayed release of insecticides/repellents. In VIASEF is also possible to rear and handle invasive mosquito species such as Aedes aegypti and Aedes albopictus and transgenic arthropods strains. VIASEF allows the study of interactions between Leishmania and its vectors, thus promoting the Portuguese research competitiveness in the field of sandflies-borne diseases.
The work developed within the framework of the infrastructure and its partnerships contribute to achieve the Sustainable Development Goals (SDG) by reducing diseases such as malaria or dengue, thus, having a socioeconomic impact in low-income countries (SDG1), and improving health by reducing the burden of Vector Borne Diseases, globally (SDG3).

ViraVector
Viral Vectors for Gene Transfer Core Facility

TYPE
Single-Sited

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
www.uc.pt/iii/ViraVector

RI COORDINATOR
Luís Fernando Morgado Pereira Almeida (CNC/UC)

INSTITUTIONAL PARTNER(S)/NODE(S)
CNC - Center for Neuroscience and Cell Biology, University of Coimbra (CNC/UC).

FUNDING FOR 2017-2021
Total Public Investment
1.557,908 €
ERDF
1.324,222 €
National Public Funds (FCT)
109,122 €
National Funds (Coordinating institution)
124,564€

DESCRIPTION

The ViraVector infrastructure provides the national (and international) research community with a facility for "on demand" production of viral vectors to perform gene transfer in cell and animal models, assisting investigators in engineering custom viral vectors and offering training to safely manipulate them, thus contributing to reinforce the cutting-edge scientific production of Portuguese groups within the life sciences and biotechnology domains.

ACTIVITIES

ViraVector provides services of production and support to experimentation with viral vectors. Its primary purpose is to make viral vectors accessible "on demand" to the Portuguese scientific community and other interested parties. It is intended to be a full service facility open to the research that, in addition to viral vector production, also assists investigators in engineering custom viral vectors and provides training to safely manipulate them and perform gene transfer in cell and animal models.
Currently the facility comprises cloning, production in HEK 293T cells and tittering of single-stranded and self-complementary AAVs, VSV-G pseudotyped lentiviral vectors and gamma-retroviruses (MLV). It also offers cloning of custom-made viral vector and other plasmids. It features modern BSL2+ laboratories, completed with top-of-the-line equipment and operated by dedicated highly skilled personnel with expertise in key techniques of viral vector engineering, packaging and gene transfer. ViraVector also handles experimentation in cell culture as well as in rodent models of disease, such as in models of brain disorders for which state of the art equipments, facilities and technical expertise are available.

IMPACT

Viral vectors are currently the most used technology for gene transfer in the context of gene (molecular) therapy. The market for gene therapy medicinal products is now in growing expansion, prompting for an intensification of research efforts in the field and an increasing demand for viral vectors. ViraVector is thus expected to leverage research excellence and competitiveness in the biomedical areas of gene transfer applicability, and foster economic development opportunities nationwide, notably in the CENTRO region that hosts 1/3 of the biotech companies in Portugal.
The facility being located in the premises of the University of Coimbra, it is instrumental in post-graduate training within several PhD and Master programmes in which the team that coordinates the infrastructure is engaged, whose members have a long-standing experience in this line of research at CNC. Examples are the CNC-coordinated Doctoral Programme in Experimental Biology and Biomedicine (BEB), which features courses like "Gene and Cell therapy of CNS", "Advanced Therapies" and "Drug Development" organized by the research groups supporting the infrastructure, or the Masters in Pharmaceutical Biotechnology.
ViraVector produces and provides ready to use research-grade viral vectors and titers adequate for in vitro and in vivo applications, experiments or non-clinical studies. In complement, it offers target engagement and proof of concept in pre-clinical models of disease as well as guidance in viral vector plasmid design and viral vector selection and in the choice of the user-envisaged strategy. The facility is, in fact, at the core of CNC recent integration into the EATRIS-ERIC for participation in the Biomarker and the Advanced Therapy Medicinal Products (ATMP) platforms of that European infrastructure network. It will thus contribute to place its users (academic and industrial alike) in the vanguard of this biotechnology-based health-drive field.

5.4 Physical Sciences & Engineering

Research Infrastructures (RIs) play an increasingly important role in scientific and technological development in the Physical Sciences and Engineering.

This field of research is characterized by a strong technological capacity and for providing the Portuguese scientific community with access to a wide range of RIs, promoting both basic and applied scientific development.

The close links of many of these RIs with national and international engineering industries is an important indicator of the role they play and will continue to play in the national Research and Innovation system.

This domain now includes the only National RI in the area of Materials and Analytical Facilities (PTNMR). That area is no longer an autonomous domain of the Roadmap, in accordance to the most recent ESFRI Roadmap (2018).

CECOLAB, a Collaborative Laboratory Towards Circular Economy, a single-sited RI

EngageSKA, Enabling Green E-Science for SKA - Square Kilometer Array. Engage SKA has been delivering the national contribution to SKA, the world's largest radio telescope. The Portuguese Science Minister signed the SKA Observatory Convention on March 2019

ESTHER, European Shock Tube for High-Enthalpy Research, a single-sited RI

LLPT, Laserlab Portugal, a distributed RI

Micro&NanoFabs@PT, the Network of Micro- and Nano-Fabrication Research Facilities in Portugal, a distributed RI

NECL, the Network of Extreme Conditions Laboratories, a distributed RI

ORCIP, the Optical Radio Convergence Infrastructure for Communications and Power Delivering, a distributed RI

PAMI, the Portuguese Additive Manufacturing Initiative, a distributed RI

PTNMR, the Portuguese Nuclear Magnetic Resonance Network, a distributed RI. It is responsible, together with RNEM, the Portuguese Mass Spectrometry Network, for the Portuguese participation in INSTRUCT ERIC, the European RI for Structural Biology

Portugal Space, the Portuguese Space Agency (PTSpace), is responsible for the implementation of the national strategy 'Portugal Space 2030'

RBCog-Lab, the Robotics, Brain and Cognition Laboratory, a single-sited RI

TEC4SEA, the Modular Platform for Research, Test and Validation of Technologies supporting a Sustainable Blue Economy, a distributed RI

TEMA, the Centre for Mechanical Technology and Automation, a single-sited RI

Windscanner.PT, the Portuguese Windscanner Facility, a distributed RI, member of the ESFRI RI with the same name

CECOLAB
Associação CECOLAB – Collaborative Laboratory Towards Circular Economy

TYPE
Single-Sited

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2019

WEBSITE
www.eco-lab.pt

RI COORDINATOR
João Miguel dos Santos Almeida Nunes (CECOLAB)

INSTITUTIONAL PARTNER(S)/NODE(S)
BLC3 Evolution, Lda (Entidade coordenadora); Aquitex – Acabamentos Quimicos e Têxteis, S.A.; Lipor; Mota Engil Engenharia e Construção, S.A.; TMG – Tecidos para Vestuário e Decoração, S.A. (TMG); RAIZ – Instituto de Investigação da Floresta e do Papel, Navigator Group (RAIZ); Laboratório Nacional de Energia e Geologia (LNEG); Instituto de Soldadura e Qualidade (ISQ); Universidade de Aveiro (UA); Universidade Católica Portuguesa (UCP); Universidade de Coimbra (UC); Universidade do Minho (UM); Universidade Nova de Lisboa (UNL); Universidade do Porto (UP).

FUNDING FOR 2017-2021
n.a.

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 three technologic platforms (P1 - Industrial Biotechnology; P2 - Sustainable Separations Process and Green Chemistry; P3 - Ecodesign). CECOLAB provides high quality innovation management consulting capacities and services, scale up TRL4 to 9, advices and knowledge transfer to market, adding value and enabling economic growth at all levels. CECOLAB is recognized as research and scientific infrastructure with strategic national interest in field of Circular Economy (order nº 4157/2019).

ACTIVITIES

The main activities in the field of Circular Economy are:
(1) R&D+i: support the economic fabric as a response towards circular economy challenges, with the development of R&D+i activities oriented towards market needs (TRL4 to TRL9);
(2) International: high level Portuguese representation; international reference for knowledge development, response capacity and solution implementation; and strengthen the position in terms of fund raising and attraction of international investment, as well as the in international relevant networks;
(3) Market services support: provide advanced training for the human resources, in order to capacitate the economic tissue;
(4) Response framework for: a Portuguese (Minister Council Resolution, n.º 190-A/2017) and European plan for Circular Economy; and for the Environment Challenges;
(5) Increase the synergies between different entities (industrial symbioses); and
(6) Support activities: Life Cycle/Sustainability; Society, Market, and Consumption; Intelligence Resource Use.

IMPACT

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 move from a non-sustainable model of development scenario of "take, make and dispose", towards a restorative and regenerative sustainable model of development. CECOLAB will contribute to:
1) Develop knowledge and advanced technology to boost commercial concepts for international market, contributing to the implementation of cascade use principle and to decrease energy and carbon intensity of the economic metabolism;
2) increase the value of the abandoned territory, with the perspective to create new market pathways at international level and enhance the natural resources, but also, reduce the external dependence;
3) increase the efficiency of the Portuguese economic metabolism by using the generated mass flows (forest, agroindustry, urban, water, manufacturing);
4) increase innovation and efficiency in value chain systems of key sectors of the Portuguese economy (agroforestry and urban), 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;
5) to mobilize key stakeholders around a common strategy and to increase capacity, competitiveness and critical mass to internationalized compete for highly-competitive funding programs and international investments; and
6) to reduce regulatory, cultural and technological obstacles that currently make it impossible to have a more efficient economy, in particular with a strong response to the servitization (already explained in before sections).

ENGAGE SKA
ENAbling Green E-science for Square Kilometer Array

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
https://engageska-portugal.pt

RI COORDINATOR
Domingos da Silva Barbosa (IT Aveiro)

INSTITUTIONAL PARTNER(S)/NODE(S)
Instituto de Telecomunicações de Aveiro (IT Aveiro/IT); Universidade de Aveiro (UA); Faculdade de Ciências da Universidade do Porto (FC/UP); Universidade de Coimbra (UC); Universidade de Évora (UE); Instituto Politécnico de Beja (IPBeja); Associação RAEGE Açores (A-RAEGE-Az).

FUNDING FOR 2017-2021
Total Public Investment
3,864,138 €
ERDF
3,284,518 €
National Public Funds (FCT)
579,621 €

DESCRIPTION

ENGAGE SKA implements an action plan coupling frontier research and technological development in close collaboration with the Portu- guese industry, promoting the participation of Portugal in the Square Kilometer Array, the largest radio telescope of the XXI century, to be installed in Southern Africa and Australia. This platform will stimulate technological development by bringing together advanced training and ICT, Renewable Energy and Space innovation, including the testing of prototypes on national soil.

ACTIVITIES

ENGAGE SKA offers a wide variety of activities, such as advanced training in radio astronomy, radio frequency and core Information technologies for radioastronomy, training in several domains of astro-physics, characterization and testing facilities with inclusion of Green (Solar) technologies, Aperture Array technologies optimiza- tion, solar observations (radio and optical), astronomy software development and E.Science, Cloud Computing and Data Storage.

IMPACT

ENGAGE-SKA main scientific objectives are closely coupled to the SKA project. On the national level, ENGAGE SKA aims to promote and capacitate national research on front-line scientific and technological problems faced by the academic and industrial community via the use and development of both current radio-astronomy infrastructures using sensor technology prototypes like the SKA Aperture Arrays (AA) that will be tested as well in Portugal and the use of stat-of-the-art related ICT infrastructures.
Bringing part of the SKA construction development and test to Portugal will have a significant and positive impact at the National/ Regional ICT and Energy industry by promoting innovation, technology and know-how transfer to industry. The infrastructure will have impact in many stakeholders in the Big Data, Sustainable Energy Systems, Environmental sensor applications (Forest & water management) at diverse. It is also developing assets in the space sector by building synergistic capacity for space debris monitoring using radioastronomical infrastructures and techniques.
ENGAGE SKA will : support National and International Agencies in the Construction Phase of the SKA; Foster Science Presence and Human Capacitation; Maximize the non-astronomy industry opportunities from SKA, including Big Data / ICT trends, Sustainable Energy systems etc; Provide an industry-led catalyst for informing national strategy regarding Big Data, Energy and Environmental sensors; Develop example of industry consortia-building value chain (Research - Innovation - Market); Develop a long term vision of activities aligned with the United Nations Sustainable Development Goals and maximize value for society.

ESTHER
European Shock Tube for High-Enthalpy Research

TYPE
Single-sited

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2019

WEBSITE
www.ipfn.tecnico.ulisboa.pt/nprime/hpl/facilities.html

RI COORDINATOR
Mário Lino da Silva

INSTITUTIONAL PARTNER(S)/NODE(S)
Instituto Superior Técnico (IST/UL).

FUNDING FOR 2017-2021
n.a.

DESCRIPTION

The ESTHER (European Shock-Tube for High Enthalpy Research) shock-tube is a research facility for the support of planetary exploration missions. The facility faithfully reproduces the aerothermal environment surrounding a spacecraft as it enters the upper layers of a planetary atmosphere at hypersonic speeds. This allows estimating the heat fluxes withstanded by such spacecrafts, helping design their thermal protections. The facility has been funded by several contracts awarded by the European Space Agency.

ACTIVITIES

ESTHER is capable of producing shock-waves which travel at very high speeds in different gas mixtures (4-14km/s in most gases, up to 18km/s in lighter H2/He gases representative of Gas and Icy Giants). This is achieved through a laser-ignited, combustion driver (H2/He/O2 mixture), which reaches pressures up to 600bar. A diaphragm ruptures and a fast shock-wave propagates in the test gas. The shockwave is imaged with sampling rates up to 100MHz, and light is collected by several fast spectoscopy setups in the Vaccum Ultraviolet, Visible, and Infrared ranges. The collected light provides information on the thermodynamics and radiative heat fluxes from this atmospheric entry plasma. This information is then compared against synthetic data produced by the CFD and radiative codes maintained by IPFN, allowing the improvement of aerothermal database and the lowering of engineeing models uncertainties.

IMPACT

The ESTHER shock-tube is one of the key facilities available around Europe which enable access to Space. By harnessing the physics and technologies related to the descent phase of a Space mission, we contribute to Europe's independence in this domain. This facility also has a significant relevance in the broader domain of plasma physics science and technology, as it complements other facilities that provide fundamental knowledge on nonequilibrium processes in plasmas. The more "exotic" atmospheric entry plasmas, excited through sockwaves (instead of lasers or electromagnetic fields), are studied at both experimental and theoretical/numerical levels, since both expertise is present in-house. This allows the Hypersonic Plasmas Laboratory; HPL – which hosts the ESTHER shock-tube – to be internationally recognised as one of the leading institutions in this domain, and several collaborations with other groups from spacefaring countries (most notably the US) are underway, both on experimental and theoretical topics. Lastly, HPL also has a net positive impact at the national level, specifically regarding the nascent Portuguese Space industry, as it provides support for mission-planning and testing of novel technologies related to Spacecraft entry technologies. Plans for developing plasma sources capable of reaching high enthalpies are currently underway, and should on a mid-term allow the laboratory to provide services regarding the testing of novel materials in extremely high temperatures up to 5,000K, characteristic of atmospheric entry plasmas. This will foster new developments of thermal protection systems, further enabling the competitiveness of national industries at the European and World level.

LLPT
LASERLAB-Portugal

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
www.ipfn.tecnico.ulisboa.pt/llpt

RI COORDINATOR
Gonçalo Figueira (IPFN/IST/UL)

INSTITUTIONAL PARTNER(S)/NODE(S)
Instituto de Plasmas e Fusão Nuclear do Instituto Superior Técnico (IPFN/IST/UL); Universidade de Coimbra (UC).

FUNDING FOR 2017-2021
Total Public Investment
2,859,600 €
ERDF
1,982,726 €
National Public Funds (FCT)
876,875 €

DESCRIPTION

Laserlab-Portugal is a distributed research infrastructure providing state-of-the-art laser systems to the scientific and industrial communities. The Lisbon node is specialised in very high power pulsed lasers for the study of the properties of matter at very high light intensities. The Coimbra node specialises in photochemistry, photobiology and photomedicine. This capability covers a vast amount of laser parameters with application in physics, chemistry, materials, biology, medicine and other fields. LLPT is a member of Laserlab-Europe, participating in several access, joint research and networking activities.

ACTIVITIES

LLPT offers access to a wide variety of services: access to laser systems and to modelling tools for laser-matter interactions; accompanied access to femtosecond transient absorption with UV/VIS/NIR detection, to picosecond single photon counting, to nanosecond photoacoustic calorimetry, to photochemistry in matrices and to phototherapy and photodiagnostics and to chemical imaging facilities, besides giving access to users of Laserlab-Europe, including the training of young researchers.

IMPACT

Laserlab-Portugal will, through its Lisbon node, extend its laser capability through two additional laser sources: a high-energy, high repetition rate diode pumped amplifier, and a few-cycle mid-infrared laser. These will allow the development of a state-of-the- art high harmonic generation source at keV energies and a high photon number source at 10 nm. Other expected impacts include the optimization of plasma channels by field ionization for plasma acceleration, advanced gas cells for wakefield acceleration, the development of a test facility for advanced plasma sources/targets, and new imaging techniques e.g. attosecond holography, for the recording of multi-colored XUV holograms, relevant for biology/chemistry processes. With complementary capabilities, its Coimbra node, aims to maintain leadership in time-resolved photoacoustics (leading the technique to ps resolution and tomography), and in matrix isolation photochemistry and solid-state hot vibrational chemistry; attain international recognition in ultrafast transient absorption spectroscopy; become a reference laboratory for time-correlated single photon counting, fluorescence up-conversion, and chemical imaging (IR, Raman) techniques for applications in materials and biological sciences; and make a strategic investment in time resolved infrared spectroscopy, as a way to follow in real time ultrafast chemical processes involving bond-breaking/ bond forming reactions, conformational isomerizations, and their associated mechanisms of intramolecular energy relaxation/ redistribution.

Micro&NanoFabs@PT
Network of Micro and Nano Fabrication Research Facilities in Portugal

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
https://micronanofabs.inl.int

RI COORDINATOR
Paulo Jorge Peixeiro de Freitas (INL)

INSTITUTIONAL PARTNER(S)/NODE(S)
Laboratório Ibérico Internacional de Nanotecnologia (INL); Instituto de Engenharia de Sistemas e Computadores - Microssistemas e Nanotecnologias (INESC MN/INESC/IST/UL); Center for MicroElectroMechanics Systems, Universidade do Minho (CMEMS/UM).

FUNDING FOR 2017-2021
Total Public Investment
6,033,529 €
ERDF
4,088,099 €
National Public Funds (FCT)
1,945,430 €

DESCRIPTION

The main goals of the Network of Micro and Nanofabrication Research Facilities in Portugal are to share access to micro-nanofabrication and design tools with the research community and with companies, and to increase competitiveness in the current strategic areas linked to the ap- plication of micro and nanotechnologies in the medical, agro-food, environmental, electronics/ energy, automotive and defense/aerospace fields.

ACTIVITIES

Micro&NanoFabs@PT offers a wide variety of services and facilities, such as micro and nano device fabrication; spintronics; MEMS fabrication; packaging; IC design; electron microscopy, imaging and spectroscopy instrumentation and techniques; structural, surface and interface analysis; central bio laboratories; central nanochemistry laboratories; solar dell device characterization laboratory; magnetics laboratories; biosensor and microfluidic laboratories; RF characterization; energy harvesting laboratory.

IMPACT

The Portuguese community working on Nanosciences and Nanotechnologies (both academic and industrial) is already benefit- ing from the existent micro and nanofabrication infrastructures using occasionally services offered by the major centres now in the Micro&NanoFabs@PT initiative. Micro and nanofabricated devices are at the heart of cutting-edge technologies in electronics, bio- technology, pharmacy and medi- cine, and environment and food monitoring. Nanostructures are also widely used in the nanomedicine, food and environmental control domains. Micro&NanoFabs@ PT represents a unique opportunity to further open the facilities for national labs and companies, increasing the access to tools not available elsewhere, leading to an overall boost of these research areas, and globally of Portugal in the European context.
Micro&NanoFabs@PT, through INL and INESC MN, has a well- established and well-documented offer of micro and nanofabrication and also nanocharacterization services, which can also involve consulting to external entities. These can be:
a) academic groups requiring fabrication services;
b) start-up companies whose products involve microfabri- cated devices;
c) established companies;
d) state laboratories involved, e.g., in environmental monitoring;
e) the military.
This infrastructure network provides prototyping and even fabrication of limited series of products. CMEMS-UM complements these offers with design, simulation, prototyping and characterization of devices.
Miniaturized devices, structures and systems are central to modern technology. The ability to micro and nanofabricate these devices requires important investments in equipment and human resources. The Micro&NanoFabs@PT state of art infrastructure network offers services and access policies to external users. This infra- structure network will allow a large ecosystem of Portuguese and international researchers to become familiar and work with advanced miniaturized devices.
Micro&NanoFabs@PT aims to be one of the leading European cen- tres for advanced training, intel- lectual property generation, and technology transfer in micro and nanofabrication processes, min- iaturized and integrated devices, and nanostructure fabrication.

NECL
Network of Extreme Conditions Laboratories

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
www.necl.pt

RI COORDINATOR
João Pedro Araújo (FC/UP)

INSTITUTIONAL PARTNER(S)/NODE(S)
Faculdade de Ciências, Universidade do Porto (FC/UP), Instituto Superior Técnico (IST/UL); Faculdade de Ciências da Universidade de Lisboa (FC/UL).

FUNDING FOR 2017-2021
Total Public Investment
3,543,639 €
ERDF
2,729,786 €
National Public Funds (FCT)
813,853 €

DESCRIPTION

NECL comprises the laboratories in Portugal that have relevant equip- ment for the study and characterisation of advanced materials under extreme conditions, namely temperature (low and high temperatures), intense magnetic fields (static and pulsed), pressure, ultrafast dynamics (sub-femtosecond), amongst others. The different experimental facilities in the three poles are managed in a coordinated way in order to provide specialised services to industry, and maximise their use in different fields of research, with emphasis on studies of quantum, multifunctional and nanostructured materials having applications in electronics and nanotechnology.

ACTIVITIES

NECL offers a wide variety of services, such as local probe structure and lattice dynamics measurements; thermo-physical property measurements; ultrafast spectroscopy of spin dynamics measurements; Service of He collection and liquefaction; electrical transport and magneto trans- port measurements; magnetic characterization and Mössbauer spectroscopy.

IMPACT

The NECL Laboratories have been playing a strategic role in the development of low temperature and high magnetic fields physical studies at the national level. They are now enhanced by a management as a coordinated network, making possible and supporting the scientific research in various fields, requiring extreme conditions such as low temperatures, high magnetic fields and high pressures. Access to specialized experiments of cross-cutting importance in different areas of materials characterization, materials science and condensed matter research will be provided to the general scien- tific community, enlarging the utilization of these techniques to other Portuguese researchers working in different scientific domains.
The NECL Laboratories contribute in various fields of research, with a clear mission of supporting the research activity in various fields of research with industrial and economic impact and emphasis on advanced materials studies, increasing the competitiveness and allowing access to specialized experiments by a larger community in Portugal.
The infrastructure is instrumental in the development and dissemi- nation to industry of technical knowledge in cryogenics. The expertise in this field has gained accrued interest and dimension among specialised SMEs, which call for technical support and trained personnel that only the infrastructure technical team can provide.
The different poles of the network will have specific in- dustrial impacts at regional level providing Key Enabling Technologies, relevant to problem solving of local industrial partners.

ORCIP
Optical Radio Convergence Infrastructure for Communications and Power Delivering

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
http://orcip.pt

RI COORDINATOR
Paulo Miguel Nepomuceno Pereira Monteiro (IT Aveiro)

INSTITUTIONAL PARTNER(S)/NODE(S)
Instituto de Telecomunicações de Aveiro (IT Aveiro/IT); Instituto de Telecomunicações de Coimbra (IT Coimbra/IT); Instituto de Telecomunicações da Covilhã (IT Covilhã/IT).

FUNDING FOR 2017-2021
Total Public Investment
1,449,701 €
ERDF
1,232,246 €
National Public Funds (FCT)
217,455 €

DESCRIPTION

ORCIP is an open infrastructure that allows the scientific community and industry to test, characterise and certify the existing and future optical and radio systems.
This allows research units and companies to pursue activities centred on innovation and knowledge, freeing them of the expenditure required for the acquisition of expensive equipment.
The infrastructure will be an instrument to lower the entry barrier of SMEs into innovation activities for next-generation telecommunications.

ACTIVITIES

ORCIP offers a wide variety of services, such as access to a testbed infrastructure for next generation fixed and wireless communications and wireless power transmission.
The infrastructure also offers simulation tools, FPGA development and the most advanced test and measurement equipment for communication systems.
When fully deployed, ORCIP will include physical testbeds, remotely accessible, for next-generation radio and optical access solutions. A multiplicity of platforms will be available that include technologies for sub-6GHz and millimetre wave frequencies including wireless power transmission and ultra-reliable and low-latency communications.
ORCIP also offers training courses tailored to the industry, modules to be integrated into the curriculum of academic courses both at the undergraduate and graduate levels.

IMPACT

ORCIP has impact in research and education both at the undergraduate and graduate levels as well as industry training.
Currently, 30 researchers and 18 PhD students are using the ORCIP infrastructure for their research, while at the undergraduate level ORCIP is supporting the work of several master students. Additionally the number of indirect users has been increasing due to the establishment of consulting projects with the industry.
The formalization of this type of contracts also allows the ORCIP infrastructure to capitalize on the high investment made in equipment, thus contributing to a gradual process of financial self-sustainability in the long term.
ORCIP is contributing to the number of publications and projects coming from research directly related to the infrastructure development.
The infrastructure also contributes to lowering the entry barrier of regional and national SMEs in research and innovation activities through the availability of a powerful testbed remotely accessible with capacity to cover device to application testing, overcoming significant capital expenses for SMEs in equipment and providing continuity in the innovation chain. (For more information https://orcip.pt/).

PAMI
Portuguese Additive Manufacturing Initiative

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
pami.ipleiria.pt

RI COORDINATOR
Nuno Manuel Fernandes Alves (IPL)

INSTITUTIONAL PARTNER(S)/NODE(S)
Instituto Politécnico de Leiria (IP Leiria); Instituto Pedro Nunes (IPN); Universidade de Coimbra (UC); Instituto de Sistemas e Robótica (ISR/UC), Centro de Neurociências e Biologia Celular (CNC/UC); Centro Tecnológico da Indústria de Moldes, Ferramentas Especiais e Plásticos (CENTIMFE).

FUNDING FOR 2017-2021
Total Public Investment
960,500 €
ERDF
816,425 €
National Public Funds (FCT)
144,075 €

DESCRIPTION

PAMI focus on the development and exploitation of layer-by-layer manufacturing technology to develop high-value personalised products, materials and processes, moving from bench side to the society, believing that we are in the cusp of the 4th Industrial Revolution (4th IR), which is likely to fundamentally alter the way we work, live and relate to one another. It aims to respond to a crucial competitiveness challenge and threat to future property, thus closing the gap between R&D activities and the development of technological innovations in manufacturing.

ACTIVITIES

PAMI offers a wide variety of services that create and support industry/academic partnerships and skill a new generation of work force who can take up the emerging challenges in additive manufacturing (AM) and related areas, known as direct digital manufacturing (DDM), both in academia and industry.
All nodes of PAMI are aligned with the following activity lines:
• Fostering novel research areas and interdisciplinary fields;
• To encourage and support in creation of products and spin-offs;
• To provide educational services and prepare a new generation of human resources;
• To provide DDM services to external entities.

IMPACT

This infrastructure aims to accelerate innovation in DDM research through a close relation with industry, stimulating the convergence of physical, digital and biological sciences, which is bring about profound changes in the way we design products and produce them, be they may be from metal, ceramics, polymers, biological materials or composites.
A high impact on academia/industry related training programmes has been achieved, including one DDM technical programme and two DDM advanced training programmes (International Master and academia/industry PhD programme), as well the implementation of a training factory and an advanced mechatronics laboratory for DDM . It is well aligned to the needs of the 4th IR, in terms of preparing and skilling a new generation of human resources who can take up the emerging challenges in the world.
This enables an answer to a key bottleneck of the national research and innovation system, the integration of highly qualified human resources in the private sector, thereby boosting the innovation and competitiveness capacity. Through a close alignment with the regional and national smart specialization strategies, PAMI will also continue contributing to the development of spin-offs and new commercial products of high value-added. It is thus expected to raise the capacity of both national public research teams and private companies acting in this domain to success fully participate in international research projects and promote the internationalization of the national manufacturing research and industry.

Portugal Space
Portuguese Space Agency

TYPE
Single-sited

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2019

WEBSITE
www.ptspace.pt

RI COORDINATOR
Chiara Manfletti (PTSpace)

INSTITUTIONAL PARTNER(S)/NODE(S)
Portuguese Space Agency (PTSpace).

FUNDING FOR 2017-2021
n.a.

DESCRIPTION

Portugal Space is an agency to be primarily considered as an instrument of the Portuguese government, to implement the national strategy 'Portugal Space 2030', in order to make Portugal a place of space-related innovation, based on scientific excellence and competitive industrial capabilities, generating high level jobs, inspiring young generations and positioning Portugal as a significant contributor of progress in the world, with a particular action on emerging forms of the "New Space".

ACTIVITIES

The main tasks to be performed by the agency Portugal Space are as follows:
Contribute to promote and implement the Portuguese space policy and strategy – Portugal Space 2030;
Contribute to promote and implement the Portuguese space policy and strategy – Portugal Space 2030;
Serve as Portugal's gateway to space for space and non-space actors in Portugal, in Europe and worldwide;
Propose updates to the Portuguese space policy and strategy;
Promote space and contribute to Portugal's capacity building.

IMPACT

To growth the national space sector, with emphasis on "New Space", promoting new firms and a modern entrepreneurial context, creating 100 new high qualified jobs in the space sector;
To promote an adequate promotion of spectrum management, technology transfer and regulatory frameworks for the responsible use of space;
To create a new and emerging context for national-European interactions in the area of "new Space" for Europe with a close interaction with the European Space Agency (ESA) and as ESA_Hub,
Active engagement of Portuguese stakeholders in European programs, particularly in research and innovation, space, defence and the digital;
Articulation with the Atlantic International Research Centre in a way to foster "Atlantic interactions" through an adequate integration of space technologies in a range of space and non-space themes and applications;
To foster new markets for the "New Space" promoting the Azores International Satellite Launch Program;
To stimulate new joint ventures for cooperation with Africa and African space-related initiatives, with special focus on Earth observation issues and outreach activities, including the potential development of initiatives towards "Space for Education – Education for Space".

PTNMR
Portuguese Nuclear Magnetic Resonance Network

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
http://ptnmr.dq.ua.pt

RI COORDINATOR
Eurico José da Silva Cabrita (FCT/NOVA)

INSTITUTIONAL PARTNER(S)/NODE(S)
Faculdade de Ciências e Tecnologia da Universidade Nova de Lisboa (FCT/NOVA); Universidade do Minho (UM); Universidade do Porto (UP); Universidade de Aveiro (UA); Universidade de Coimbra (UC); Universidade da Beira Interior (UBI); Instituto Superior Técnico (IST/UL); Instituto de Tecnologia Química e Biológica António Xavier (ITQB/NOVA); Universidade da Madeira (UMa).

FUNDING FOR 2017-2021
Total Public Investment
6,843,554 €
ERDF
4,630,606 €
National Public Funds (FCT)
2,105,938 €
National Funds (Consortium institution)
107,010 €

DESCRIPTION

PTNMR provides coordinated access to a national platform of equipment, resources, services and skills in Nuclear Magnetic Resonance (NMR) for participating institutions and the scientific community, from both national and international R&D industry and academia. The main goal is 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 of training and R&D initiatives.

ACTIVITIES

PTNMR offers a wide variety of services, spanning from routine analysis for structure elucidation (small molecules and proteins) in solution or solid state, to advanced applications (e.g. Structure activity relationship by NMR, NMR Metabolomics, HRMAS, NMR relaxometry, microimaging by NMR, Rheo-NMR, NMR Diffusometry). PTNMR also provides consulting services and support to advanced training.

IMPACT

PTNMR Network has been supporting 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 work in multiple areas of knowledge and most are conducted in Research Institutes and Faculties targeting real local problems; more than 200 scientific publications/year are supported by routine analytical services of PTNMR. Access to PTNMR equipment is crucial to increase the success rate of national researchers in European projects as participation in ITN-MSCA, H2020 projects and grants from the European Research Council. Thus, the excellence of the PTNMR supported research is a key factor to the success of policies aimed at promoting leading industries in emergent areas of Life Sciences, Materials, Nanotechnologies and Nanosciences. PTNMR support to training activities guarantee a continuous tutorship at the graduate and postgraduate levels and enhance opportunities for collaborative research, nationally and internationally. Through PTNMR, researchers, PhD, MSc and BSc students have contact with experts and cutting-edge capabilities, contributing at a significant level to increase their level of expertise and employability. PTNMR directly supports a FCT PhD Program (PD00065/2013). PTNMR is also associated with INSTRUCT-ERIC a pan-European Research Infrastructure in Structural Biology.
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 Portuguese chemical industry is mainly formed by small companies specialised in the production of specific products that cannot afford large equipment such as an NMR spectrometer, but for whom the type of analytical and consulting service provided by PTNMR is essential. The PTNMR network provides support both in the quality control of raw materials and product identification, which are crucial to maintain the competitiveness of these companies in the global market.

RBCog-Lab
Robotics, Brain and Cognition Laboratory

TYPE
Single-Sited

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
http://vislab.isr.ist.utl.pt/rbcog-lab

RI COORDINATOR
José Alberto Rosado Santos-Victor (IST/UL)

INSTITUTIONAL PARTNER(S)/NODE(S)
Instituto Superior Técnico (IST/UL).

FUNDING FOR 2017-2021
Total Public Investment
318,763 €
ERDF
127,505 €
National Public Funds (FCT)
191,258 €

DESCRIPTION

RBCog-Lab is a unique infrastructure aiming to integrate multidisciplinary findings from neuroscience, developmental psychology, cognitive science, perception and machine learning to design methods and representations based on embodied learning and self-exploration. This will allow the development of advanced perception capabilities, thus providing robots with the ability to learn and improve skills through experience and interaction with the environment, with the potential of reaching human-like skills in terms of dexterity and adaptability.

ACTIVITIES

RBCog-Lab offers a wide variety of services to the research community, such as access to:
(i) Robotic platforms for different research and applications areas: the iCub humanoid platform for embodied learning and self-exploration, the Vizzy Social robot for social interaction and assistive robotics for older people, the Baxter platform for collaborative robotics in industry, the Kinova arm for fine manipulation and grasping, and human-like robotic hands for dexterous manipulation;
(ii) Special equipment for human motion capture, eye-trackers, and VR equipment.
Other services include the support to the use of specialized equipment, organization of summer schools and training, science fairs, public school demonstrations, media reporting events, training and robotic platform support, and international relations activities.

IMPACT

RBCog-Lab supports an increasing number of co-advised students, with a target of 20 PhD students starting their research in 5 years. RBCog-Lab attracts the visits of many external delegations and about 20 schools per year, each with 30-40 students who visit the lab, see demos and listen to a presentation of the on-going research activities. The state of the art technology of all the robotic platforms attracts not only to researchers from different research areas but also a more mainstream audience, e.g. the President of the EU parliament, the Israeli Minister of Science, Rectors of International Universities, or Members of Parliament from different countries.
The number of publications in peer-reviewed conferences and journals is expected to increase with the introduction of new users using the platforms, aiming for 200 peer-reviewed publications in the next 5 years. We target 5 funded projects in the next 5 years. Funded projects such as (H2020) Acticipate, (CMU-Portugal) Augmented Human Assistance, and (CMU-Portugal) IntelligentCare have already benefited from RBCog-Lab equipment. Several joint Ph.D. theses of programmes IST-EPFL and Portugal-CMU have extensively used the RBCog-Lab equipment to produce successful results.
While the RBCog-Lab research plan addresses long-term research goals, there will be a number of results with foreseeable impact in several application domains. This has happened in the past where the research team involved in RBCog-Lab has spawned a number of start-up companies with new products and services in the area of computer vision and medical equipment.
Additionally, RBCog-Lab has fostered interaction with industry, concerning advanced robotics and HRI. Some of these initiatives have led to the involvement of industry in some of the doctoral research or contractualized projects.
As RBCog-Lab integrates the only iCub humanoid robot in Portugal, it is an enabler for participation in international research initiatives in the area of cognitive robotics.

TEC4SEA
Modular Platform for Research, Test and Validation of Technologies supporting a Sustainable Blue Economy

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
www.tec4sea.com

RI COORDINATOR
Paulo Manuel Dinis Mónica de Oliveira (INESC TEC)

INSTITUTIONAL PARTNER(S)/NODE(S)
Instituto de Engenharia de Sistemas e Computadores, Tecnologia e Ciência (INESC TEC), and Centro de Investigação Tecnológica do Algarve (CINTAL).

FUNDING FOR 2017-2021
Total Public Investment
5,395,860 €
ERDF
4,464,706 €
National Public Funds (FCT)
931,154 €

DESCRIPTION

TEC4SEA is a platform designed to support multidisciplinary research, development, and test of marine robotics, telecommunications, and sensing technologies for operation in oceanic environments. It is open to both the R&D community and the industrial sector, thus providing the equipment, expertise, and logistics needed to support those communities in developing, evaluating, and validating technological solutions designed for maritime environments, thus fostering and advancing the blue economy.

ACTIVITIES

TEC4SEA has three main objectives: supporting the R&D community, supporting the industrial sector, and pushing the technological envelope in developing technology for maritime environments, by making available facilities, resources, and know-how to economic agents and researchers. It has a wide diversity of laboratories and resources, from autonomous robotics to optical sensors and materials, maritime communications, and underwater acoustics.
TEC4SEA is a vertically integrated infrastructure; its expertise and resources range from pure conceptual research to field deployment missions, with strong industrial and logistic competences in prototype production. It can thus support researchers in all phases of technology development, from conception and theoretical analysis to prototype development, field deployment, and technology validation.

IMPACT

From the point of view of scientific production, the platform is expected to have led, after the first three-year funding period, to 80 journal publications, 7 patents, and 36 prototypes. Furthermore, it will have conducted 10 Technical and Advanced training in multidisciplinary areas, fostered the establishment of new partnerships with key universities and companies, attracted top-quality human resources, and supported 25 PhD programs. The integration of TEC4SEA RI with infrastructures at the European level is already in progress, with the integration of its MARBED component in the context of the Fed4FIRE federation of testbeds. The integration in the EURO-ARGO ESFRI Roadmap Research Infra-structure is also being considered.
By supporting the external R&D and industrial communities with the multidisciplinary, expensive, and hard to acquire assets and skills necessary for expedite and successful maritime equipment development, the TEC4SEA research infrastructure is an important asset to strengthen the capabilities of the emerging sea cluster (Cluster do Mar), increasing synergies and creating stronger consortia to act in the global market.
The existence of a common infrastructure, accessible by research institutions, companies, and technology end users, not only reduces development costs, but also decreases the time to market of new ideas and concepts. This is particularly relevant for SMEs, which usually cannot afford to have their own test facilities or a complete set of the required advanced skills.

TEMA
Centre for Mechanical Technology and Automation

TYPE
Single-Sited

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
www.ua.pt/tema

RI COORDINATOR
António Manuel de Bastos Pereira (UA)

INSTITUTIONAL PARTNER(S)/NODE(S)
Universidade de Aveiro (UA).

FUNDING FOR 2017-2021
Total Public Investment
1,202,881 €
ERDF
1,022,449 €
National Public Funds (FCT)
180,432 €

DESCRIPTION

The study and development of new materials and new processing techniques allows for more efficient and sustainable use of resources. TEMA helps companies to transform knowledge into products, processes and services. TEMA develops projects in the areas of mechanical engineering, materials, bioengineering and nanotechnology, e. g., the analysis on sheet metal formability of the third generation advanced high strength steels, new therapy for spinal cord injury repair using innovative stimulated nanoengineered scaffolds, or the energy storage using a novel battery technology.

ACTIVITIES

TEMA offers a wide variety of services, such as access to its facility, e. g., mechanical technology, nanotechnology, CVD, biomechanics, mechanical testing and welding laboratories, among athers. Researchers can, in a single facility, make Innovation, technological development & technology transfer to society on New computational tools, New materials & Engineering systems, Innovative products, Improved & innovative manufacturing technologies, Prototypes & equipment design, Nanoengineering applications. Consulting, training and services on Material characterization (macro-, micro- and nano-scale), Mechanical testing, Molding technology, Industrial automation, Energy systems & fluid mechanics; Impacts on transportation systems, Life cycle assessment, and Optimization of manufacturing are our specialities.

IMPACT

Grounded on its human capital and their competences, TEMA is focused on relevant societal challenges aiming to contribute to a sustainable industry (specially SMEs) and to the wellbeing of people, translated into two main mobilizing areas: Sustainable Manufacturing Solutions and Technologies for the Wellbeing.
Sustainable Manufacturing Solutions is focused on the development and innovation on manufacturing engineering and technologies, with subsequent industrial applications. It is intended to increase productivity, improve products quality and reduce waste in production processes. The strategy on Technologies for the Wellbeing aims to increase the quality of life of society by means of engineering systems, focusing on people and their needs. TEMA has been contributing to solve several challenges by means of high-level research and development made in its facility on: (i) new products based on both traditional and nanoengineering technologies; (ii) computational and experimental tools to enhance quality, minimize costs, reduce raw materials and energy requirements; and (iii) new and optimized technologies for increased effectiveness in terms of energy requirements and production schedules.

Windscanner.PT
Windscanner Portugal

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
www.windscanner.eu

RI COORDINATOR
José Manuel Laginha Mestre da Palma (FEUP)

INSTITUTIONAL PARTNER(S)/NODE(S)
Faculdade de Engenharia da Universidade do Porto (FEUP); Instituto de Engenharia de Sistemas e Computadores, Tecnologia e Ciência (INESC TEC); Instituto de Ciência e Inovação em Engenharia Mecânica e Engenharia Industrial (INEGI); Instituto Português do Mar e da Atmosfera (IPMA); Laboratório Nacional de Engenharia e Geologia (LNEG); Instituto Politécnico de Bragança (IPB); Faculdade de Ciências da Universidade de Lisboa (FCUL); Laboratório Nacional de Engenharia Civil (LNEC).

FUNDING FOR 2017-2021
Total Public Investment
867,286 €
ERDF
572,206 €
National Public Funds (FCT)
295,080 €

DESCRIPTION

The Windscanner Portugal project proposed to be the national node of the ESFRI Windscanner.eu project (nº 312372, FP7-INFRASTRUCTURES-2012-1), which grouped 8 institutions from 6 countries. The continuity of the ESFRI project and the establishment of a European ERIC infrastructure required registration on the respective national infrastructure roadmaps for the 6 participating countries. Windscanner.eu went no further than the preparatory phase, the ESFRI consortium disbanded and the consortium was committed to survive using national funding, without giving up seeking European funding under programs other than ESFRI.

ACTIVITIES

At the date of the Windscanner Portugal application (October 2013), one of the main objectives of this project (perhaps the largest) was the acquisition of equipment for use in the campaign in Serra do Perdigão (May 1 to June 15, 2017), an unfeasible initiative because of the timetable for the implementation of this financing program. Since then, we have been looking for additional funding and alternative uses, which has only happened recently. On this date (March 2020), international public tenders for the acquisition of two laser units for FEUP and IPMA are taking place, to be delivered in the next 120 days. With the purchase of this equipment, the financial execution of about 90% of the project will be completed. Most of the activities carried out were to disseminate the Windscanner technology, following our participation in the Perdigão campaign (See Bulletin of the American Meteorological Society, 2019, May).

IMPACT

The last impact of this project, resulting from the commitment among participants in the ESFRI project, was the approval of a new European project (LIKE - LIdar Knowledge Europe, nº: 858358, H2020-MSCA-ITN-2019, 10 Universities from 5 countries plus 17 companies), now in the Marie Curie program for the training of 15 doctorates, one of which is national. Many other activities for the dissemination of technology were developed, following our participation in the NEWA project (New European Wind Atlas). The most significant impact of the project is to be expected, after the acquisition of the laser units, currently underway.

5.5
Social & Cultural Innovation

Over the past two decades, the emergence of new survey and information technologies has been redefining research in Social Sciences and Humanities, demanding increasingly sophisticated Data Infrastructures, software tools and collaborative patterns. This allows new opportunities for preserving and exploring both already established and new data collections and archives. New avenues of research have been opened by this increasingly pervasive technological paradigm.

Research Infrastructures (RIs) for Social and Cultural Innovation cover key strategic areas: databases, accessibility and heritage. These are clearly convergent with smart specialisation patterns, particularly in their potential for social innovation and regional growth, namely in their multiple proposals for citizen capacitation, open access to historical information and social data and outreach. In this respect, it is important to further pursue the process of dissemination as heritage itself.

All RIs in this thematic area make provisions for investment in technological development as a carrier for the broader technological and societal issues addressed by the Social and Cultural Innovation field, both in frontier research and core domains of social sciences and humanities.

These RIs are very important for the international success of Portuguese researchers, as they will promote the integration of national teams in successful and well established networks and open up opportunities for Portugal to influence and set the future Research Agenda in others.

CCD, the Digital Creativity Center, a single-sited RI

Datalab, the Social Sciences Data Lab, a distributed RI, which supports SHARE – Survey of Health, Ageing and Retirement in Europe, an established ERIC and ESFRI Roadmap RI

E-RIHS.PT is the Portuguese Research Infrastructure on Heritage Science, a distributed RI, which is the national node of E-RIHS, an ESFRI Roadmap RI

PASSDA, Production and Archive of Social Science Data, is a distributed RI and the national node of ESS – European Social Survey, an established ERIC

PORTULAN CLARIN, the Research Infrastructure for the Science and Technology of Language, is the national node of the CLARIN European Research Infrastructure Consortium (ERIC)

PRISC, the Portuguese Research Infrastructure of Scientific Collections, a distributed RI

ROSSIO, the Social Sciences Arts and Humanities RI, a distributed RI, and national node of DARIAH ERIC – Digital Research Infrastructure for the Arts and Humanities

CCD
Digital Creativity Center

TYPE
Single-Sited

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
http://artes.ucp.pt/ccd/index.html

RI COORDINATOR
André Miguel Passos Baltazar (UCP)

INSTITUTIONAL PARTNER(S)/NODE(S)
Universidade Católica Portuguesa (UCP).

FUNDING FOR 2017-2021
Total Public Investment
220,072 €
ERDF
187,061 €
National Public Funds (FCT)
33,011 €

DESCRIPTION

The Digital Creativity Center (CCD), is a center of competence and creative excellence with an infrastructure equipped with cutting edge technology in the areas of Digital and Interactive Arts, Computer Music, Sound Design, Cinema and Audiovisual arts and Computer Animation.
CCD has enabled and continues to provide an unique environment and support facilities for the development of an increasing number of academic, artistic and enterprise research projects events production.
CCD has enabled and continues to provide a unique environment and support facilities for the development of an increasing number of audiovisual events productions besides the academic, artistic or business research projects.

ACTIVITIES

The CCD offers specialized services, such as Motion Capture (MoCap) sessions, sound and music recording/ design and postproduction, video recording and post-production, digital and Interactive arts consulting and project development, event production and organization. These involve CCD researchers and technicians, any necessary facilities and equipment, as well as any required custom hardware or software development, depending on the specificities of each project.
CCD has an annual Artistic Residencies program for developing research and artistic work in the areas it supports. These foster knowledge transfer and contemporary creation. All Residencies culminate with a public presentation/exhibition, promoting thus the engagement and connection with the Cultural and Artistic Community in the northern region of Portugal.
CCD is also directly involved in Research, currently supporting ongoing PhD thesis and several research projects for Research Center as CITAR-UCP.

IMPACT

The CCD provides unique and state-of-the-art facilities, including the latest digital technologies, equipment, studios and labs, which together with a team of skilled and certified technicians that provide all the required maintenance and support, creates the necessary conditions for the development of cutting edge research at an international level in its areas of activity. The activity of the CCD is closely aligned with the priority and thematic national and regional plans (e.g. the Regional Action Plan, specifically the thematic areas focused on the Digital Growth in the Northern Region, and Culture, Fashion Design and Creativity). CCD has as its main mission the proactive participation in the transfer of knowledge and technology to the creative sector, including the collaboration and articulation with many other entities and community projects (regional or national).
The infrastructure works in close relationship with UCP – School of Arts and its Research Centre in Science and Technology of the Arts, therefore its activity is well aligned with these partnerships. In addition to specific projects (usually developed with external entities), CCD provides the infrastructure for these two partners and actively participates in the production of events such as: the reception of international conferences of excellence, artistic residencies and exhibitions, an annual Summer School in Cinema. In addition, it presents an advanced training program in the area of digital media and promotes annually, to the academic, cultural and public community, a cycle of open classes in its main auditorium (recently equipped with a Digital Cinema Package projection system and Surround Sound).

DataLab
Social Sciences DataLab

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
http://datalab.novasbe.pt

RI COORDINATOR
Luís Miguel Rainho Catela Nunes (Nova SBE/UNL)

INSTITUTIONAL PARTNER(S)/NODE(S)
Nova School of Business & Economics (Nova SBE/UNL); Universidade do Minho (UM).

FUNDING FOR 2017-2021
Total Public Investment
2,139,599 €
ERDF
1,249,160 €
National Public Funds (FCT)
890,439 €

DESCRIPTION

The Social Sciences DataLab provides access to the most complete set of databases that are essential for conducting advanced research in the Social Sciences. DataLab offers fundamental bibliographic and statistical databases in the areas of Economics, Finance, and Management.
In association with several public institutions, DataLab offers the research community access to unique large datasets with micro-data. DataLab also supports the SHARE-ERIC project, providing comparable data on ageing in Europe.

ACTIVITIES

The main service of the DataLab is to provide free access to the most complete set of databases for research in the Social Sciences.
Almost all of the resources are available onsite for DataLab visi- tors. SHARE data is distributed online through a dedicated data centre. DataLab also supports public and private institutions by providing an infrastructure where they can make their data available to the scientific com- munity. 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.

IMPACT

The DataLab provides access to the fundamental databases required by Social Sciences researchers. The unique micro-datasets provide opportunities for cutting-edge research in many areas (e.g. education, entrepreneurship, innovation, business structure, and finance). DataLab supports doctoral and masters programmes in Economics, Finance, and Management. The use of specialised databases by students in their dissertations will contribute to an increased knowledge on relevant economic, social, and managerial issues.
SHARE also offers innovative research opportunities in health, ageing, and retirement, from a multidisciplinary perspective, for students and researchers in Demography, Sociology, Epide- miology, and Economics.
The participation of the Data-Lab in the SHARE international network will contribute to launch further international cooperation in major research projects.
The SHARE data provides improved knowledge on the situation and needs of elderly population in Europe, from regional, national, and international perspectives.
Databases on financial data (e.g. JStor, Statista and WARC) are also major sources for understanding capital markets (e.g. the ability of firms to access financing, invest, and create jobs). For the first time, researchers will have access to micro-data covering several years, on schools, teachers, and students. These will contribute to study alternative metrics and indicators to monitor the perfor-mance of schools, as well as to analyse the impacts of alternate policy measures, educational options, financing decisions, and government systems, at different levels.
The Quadros de Pessoal database allows a better understanding and design of different policies for the labor market.

ERIHS.PT
Portuguese Research Infrastructure on Heritage Science

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
www.e-rihs.pt

RI COORDINATOR
António José Estevão Grande Candeias (UE)

INSTITUTIONAL PARTNER(S)/NODE(S)
Universidade de Évora (UE); Direção-Geral do Património Cultural (DGPC); Laboratório Nacional de Engenharia Civil (LNEC).

FUNDING FOR 2017-2021
Total Public Investment
1,176,956 €
ERDF
735,768 €
National Public Funds (FCT)
441,188 €

DESCRIPTION

ERIHS.pt is the Portuguese national node of E-RIHS, the European Research Infrastructure for Heritage Science. ERIHS.pt is a knowledge-based scientific and technical infrastructure in the broad field of Heritage Science. ERIHS.pt offers to other researchers free access to its analytical resources and knowledge, supports the supervision of research and promotes knowledge diffusion through advanced and technical training, conferences and similar actions. ERIHS.pt aims at a strong competitive position, not only in the national but also in the international context.

ACTIVITIES

Access to laboratory equipment; Integrated studies of cultural heritage including museum objects, architectonic/integrated art, and archaeological remains; technical and advanced training; access to sample banks and scientific databases; development of novel materials and solutions for heritage safeguard. Access is granted through 3 distinct platforms: i) a FixLab made up of state-of art immovable laboratory equipment for chemical, biological and physical characterisation; ii) a MoLab, constituted mostly by a non-invasive instrumental mobile laboratory; iii) an ArchLab with archives and written resources. Access is granted under the joint research actions and, directly to external researchers, through open calls to which all may ask for support to their own projects. Diffusion is done through publication, supervision of research projects and organization of actions and events.

IMPACT

For the first time in Portugal, ERIHS.pt makes available a world-class network of state-of-art analytical facilities and know-how to all researchers in cultural heritage, providing access, support and services to the wider community of scientific researchers, universities, museums and other centers of knowledge. The RI supports the scientific community in conducting top-level research in the cultural heritage field, ranging from art history to the issues posed by the degradation of ancient artefacts and to the overall heritage conservation.
The importance of Cultural Heritage (CH) for the development of Portugal is widely acknowledged. Therefore, the creation of an open infrastructure dedicated to integrated research in material heritage (ERIHS.pt) has important national/regional consequences, namely:
• Recognition of CH as a driver of cultural activities, including tourism, and a way towards local sustainable economic development;
• Support to other research groups and interdisciplinary work with researchers from related areas such as social sciences, humanities and arts;
• Development of studies aimed at identifying the best rehabilitation or conservation-restoration practices and development of novel, improved and marketable products;
• Support for conservation and heritage professionals through training, counseling and analytical services;
• Reinforcement of skilled human resources in heritage science through advanced training;
• Promotion of heritage safeguard and valorization through knowledge transfer and outreach activities.

PASSDA
Production and Archive of Social Science Data

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
http://passda.pt

RI COORDINATOR
Pedro C. Magalhães (ICS/UL)

INSTITUTIONAL PARTNER(S)/NODE(S)
Instituto de Ciências Sociais (ICS/UL); Centro de Estudos Sociais (CES/UC); Instituto Superior de Ciências Sociais e Políticas (ISCSP/UL); Lisbon School of Economics and Management (ISEG/UL); ISCTE - Instituto Universitário de Lisboa (ISCTE-IUL).

FUNDING FOR 2017-2021
Total Public Investment
817,898 €
ERDF
327,159 €
National Public Funds (FCT)
490,739 €

DESCRIPTION

This infrastructure (PASSDA) aims at the production, analysis and archiving of data in the context of national and international projects in the domain of the social sciences. PASSDA is the national node of the European Social Survey (ESS-ERIC) and associated member of the Consortium of European Social Science Data Archives (CESSDA). It is also responsible for the Portuguese Election Study, part of the Comparative Study of Electoral Systems (CSES), an international collaborative research program.

ACTIVITIES

PASSDA provides data collection, data analysis, dissemination of research findings, training in advanced methods of data analysis for the social sciences, supervision of all stages of data collection, archive of databases and metadata, sharing information and data across research community, and support for researchers in data searching.

IMPACT

Public attitudes matter in democratic societies. They reflect citizens' beliefs, desires, fears and preferences. They are difficult to measure and they cannot be gleaned from media opinion polls, which tend to give momentary glimpses of opinion formation and change. But long-term changes in the population's attitudes, values and political preferences are as important to governance and social analysis as are shifts in a country's demographic profile, economic outlook, behaviour patterns and cultural norms. The participation of Portugal in some of the most important international research networks allows a deep and wide knowledge of the Portuguese society in a comparative and longitudinal perspective.
With PASSDA, Portuguese social scientists benefit from a wide and strong infrastructure promoting methodological cross-fertilisation and enhancing interdisciplinarity (e.g. sociology, social psychology, political science, economy, demography, geography). By establishing an Open Access Social Science Data Archive, PASSDA contributes to the creation of active citizenship and greater transparency of decision-making processes, particularly in the processes of public policy evaluation. XLAB, a laboratory facility, allows all partners to conduct experimental studies and training.

PORTULAN CLARIN
Research Infrastructure for the Science and Technology of Language

TYPE
Virtual

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
https://portulanclarin.net

RI COORDINATOR
António Manuel Horta Branco (FC/UL)

INSTITUTIONAL PARTNER(S)/NODE(S)
Faculdade de Ciências da Universidade de Lisboa (FC/UL); Faculdade de Letras da Universidade de Lisboa (FL/UL); Universidade de Évora (UE).

FUNDING FOR 2017-2021
Total Public Investment
1,885,798 €
ERDF
970,364 €
National Public Funds (FCT)
915,434 €

DESCRIPTION

The mission of PORTULAN CLARIN is to support researchers, innovators, citizen scientists, students, language professionals and users in general whose activities resort to research results from the Science and Technology of Language by means of the distribution of scientific resources, the supplying of technological support, the provision of consultancy, and the fostering of scientific dissemination.
It supports activities in all scientific and cultural domains with special relevance to those that are more directly concerned with language — whether as their immediate subject, or as an instrumental mean to address their topics —, including among others, the areas of Humanities, Arts and Social Sciences, Artificial Intelligence, Computation and Cognitive Sciences, Healthcare, Language teaching and promotion, Cultural creativity, Cultural heritage, etc..

ACTIVITIES

PORTULAN CLARIN supports the distribution and reuse of scientific resources by providing their archiving and digital preservation, their inventory, online research applications, online language processing services, web services for language processing, expert technical support (help desk) and advice on licensing of scientific resources. It fosters Open Science practices by supporting its users in making their results and resources accessible to all sectors of an inquiring society.

IMPACT

PORTULAN CLARIN serves research, development or innovation related to language and to the handling of language data, in all kinds of modalities – spoken, written, multimodal, etc. –, in all kinds of representations – audio, text, video, neuro-activity records, etc. –, and in all kinds of roles - symbolic object, instrument of communication, reflex of mental activity, cognitive skill to be enhanced, skill to be trained in second language acquisition, carrier of content and knowledge, element of cultural identity, or natural way of interaction with appliances and artificial agents. An array of socio-economic sectors benefit from it, ranging from the education sector related to language learning and second language skills certification, to cultural and creative industries, and including other sectors such as localization, translation and interpreting, for instance. A sector more intensively engaged in innovation confluent with the research supported by this infrastructure is the ICT sector, at large, and the Human Language Technology sector, in particular.
PORTULAN CLARIN ensures the preservation and fostering of the scientific heritage regarding the Portuguese language, supporting the preservation, promotion, distribution, sharing and reuse of language resources for this language, including text collections, lexicons, processing tools, etc. It represents an asset of utmost importance for the technological development of the Portuguese language and to its preparation for the digital age, contributing to ensure the citizenship of its speakers in the information society.

PRISC
Portuguese Research Infrastructure for Scientific Collections

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
www.prisc.pt

RI COORDINATOR
Marta C. Lourenço (UL)

INSTITUTIONAL PARTNER(S)/NODE(S)
Universidade de Lisboa, through its Museu Nacional de História Natural e da Ciência (MUHNAC-UL); Universidade do Porto, through its Museu de História Natural e da Ciência (MHNC-UP), and Universidade de Coimbra through its Museu de Ciência (MCUC) and Jardim Botânico (JBUC).

FUNDING FOR 2017-2021
Total Public Investment
5,932,122 €
ERDF
4,105,457 €
National Public Funds (FCT)
1,826,665 €

DESCRIPTION

PRISC is a distributed physical infrastructure aimed at fostering full and open access of all Portuguese scientific collections and associated documentation for the benefit of research, education and culture. PRISC brings together expertise and resources to transform a heterogeneous and dispersed landscape into a coherent and sustainable national infrastructure of high-standard, well-preserved and accessible scientific collections, valuable in a wide range of cross-disciplinary fields.
PRISC is a founding member of DiSSCo - Distributed System of Scientific Collections, integrated in the 2018 ESFRI Roadmap.

ACTIVITIES

PRISC is the only national infrastructure addressing a major challenge of R&D systems. A considerable proportion of scientific collections generated by R&D is largely put aside after research is completed. Most R&D institutions have no expertise or space to provide these collections with high standard preservation and make them accessible, resulting in their inaccessibility, the disaggregation of information about them and eventually loss. Museums can offer these collections new lives for research and education, science communication, economy and industry. Committed to the FAIR and open access principles, PRISC directly supports a broad range of stakeholders through its services – In Situ and Remote Access, Storage Space, Conservation anchored in six specialized laboratories, Consulting, Training, and Outreach. PRISC's priorities include the mobilization of its nodes' 5.5 million objects, as well as the empowerment of other museums in Portugal to become service providers.

IMPACT

PRISC is a broadband multi-disciplinary research infrastructure serving both the research community and society at large, impacting a vast range of disciplines in the sciences, arts and humanities.
There is increasing interest from the R&D community, the economy and industry and the wider public in scientific collections. These include high quality documented objects in various disciplines, like anthropology, archaeology, life and earth sciences, astronomy, history of science and medicine, engineering and agriculture.
Scientific collections have already shown their chief relevance to address major societal issues, from infectious diseases and climate change to social inclusion, new pharmaceuticals, creative industries, tourism, and scientific literacy, among many others.
At the European scale they are now a priority as the infrastructure DiSSCo, involving 115 organizations (mostly museums) from 21 countries, has been considered of high interest for the long-term needs of the European research communities and included in the 2018 ESFRI Roadmap.
As a member of DiSSCo, PRISC benefits from the unique opportunity to raise awareness towards the importance of Portuguese scientific collections on a global scale.
PRISC gives major emphasis to the training of professionals and researchers, students and young entrepreneurs, upgrading organizations' workforces and enhancing their capacity building, endorsing high-value innovation and new business models.
PRISC is strongly engaged with the Europe 2020 strategy. The values of decentralization, openness, simplicity and 'do more with less' that lay at its core, combined with a commitment to knowledge and innovation-based SMART growth, guide PRISC's strong regional strategic and operational approach. PRISC fosters direct knowledge transfer to the economy, particularly SMEs in areas like conservation and restoration, museum consulting, exhibition architecture, design and development, historical gardens conservation, among many others.

ROSSIO
Social Sciences, Arts and Humanities

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
http://rossio.fcsh.unl.pt

RI COORDINATOR
Amélia Aguiar Andrade (NOVA FCSH)

INSTITUTIONAL PARTNER(S)/NODE(S)
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).

FUNDING FOR 2017-2021
Total Public Investment
4,864,951 €
ERDF
1,945,980 €
National Public Funds (FCT)
2,918,970 €

DESCRIPTION

ROSSIO is a Portuguese reference infrastructure, a platform for dissemination of digital content (https://rossio.fcsh.unl.pt/) that provides a distinctive set of sources and resources for Social Sciences, Arts and Humanities (SSAH). ROSSIO mission is to aggregate, organize, connect, contextualize, enrich and disclose resources scattered in educational and cultural institutions. Through an open and free platform, ROSSIO makes available resources and services to be used in cultural and creative industries, stimulating new teaching methods, promoting research development and the internationalization of Portuguese scientific production.

ACTIVITIES

ROSSIO will provide open access to SSAH digital contents, metadata and contextualization information; digital resources aggregation, organization, connection and contextualization; specialised user support to researchers and doctoral students; SSAH activities dissemination services; access to a Virtual Research Environment, a package of tools for researchers to communicate, collaborate, save and visualise documents and other content; education and training activities; innovation interface to bridge the research infrastructure with cultural and creative industries; networks with other European Research Infrastructures.

IMPACT

ROSSIO aims to create a gateway to meet demand for SSAH open access contents, providing a critical mass of digital objects and scientific production, and thereby stimulating and fostering the development of top-quality research. ROSSIO also aims to build a sustainable network of content providers, strengthening partnerships between academic and non-academic institutions into a platform that significantly improves the conditions to produce and disseminate scientific knowledge. ROSSIO will ensure the organisation, interrelation, contextualisation and scientific accreditation of millions of digital objects delivered by diverse academic and non-academic, state and civil society, institutions, and will improve content discovery and use by enhancing metadata through innovative methods.
The ROSSIO partners NOVA FCSH (with their 14 research units and NOVA's Repository), CML – AML, CPMC, DGLAB (with the Portuguese Archive Network), DGPC (with the Portuguese Museums Network and the Cultural Heritage Network), FCG and TNDM II, with its associate content providers Arquivo.pt, Arquivo de Ciência e Tecnologia da FCT and Instituto Nacional de Estatística will deliver an immense stock of resources that are not only invaluable for research in SSAH but also portray the richness and diversity of Portuguese history, society and cultural heritage.
As a research infrastructure for SSAH, a crucial impact of ROSSIO will be the consolidation of Portugal's identity, sense of belonging and citizenship among the users of the RI, whether they be researchers, teachers, students or citizens. Such an impact of ROSSIO, more than measured in quantitative terms, can be exemplified in qualitative terms taking into account that its consortium concentrates the main national collections that support Portuguese heritage and cultural memory, in text, image or sound, allowing to assert itself as a powerful vehicle for Portuguese community cohesion, internally or in its diaspora.

5.6 Digital Infrastructures

Digital Infrastructures focus on Information and communications technology (ICT)-based infrastructures and services that support and promote a broad range of scientific disciplines.

These services are usually provided more efficiently, economically and with higher quality in an aggregated, large scale and cross-cutting format, instead of through small silos for each application that may need such infrastructural services. Examples of such services are network advanced connectivity, storage services (bigdata), computing services, transverse databases, common telematics services, datacentre facilities and others.

Digital Infrastructures are contributing significantly to the Portuguese smart specialisation policy within the "Portugal 2020" structural funds programme, particularly regarding the first strategic priority which is to develop an economy based on knowledge and innovation. In today's society, which is increasingly more dependent on information technology, it is difficult to generate knowledge and innovation without a solid foundation of integrated E-infrastructures.

ICT, by definition, is a support activity and today all areas of knowledge may benefit from a collection of ICT services, be it to exchange a few emails and files or to perform highly complex and resource-demanding number crunching operations. As such, Digital infrastructures are common to all other thematic areas and support each user community according to its needs.

INCD, the National Distributed Computing Infrastructure, a virtual RI

RCTS, the Science, Technology and Society Network, a single-sited RI, is the National Research and Education Network (NREN)

RNCA, the National Advanced Computing Network, a virtual RI, is part of the Iberian Advanced Computing Network

UC-LCA, the Laboratory for Advanced Computing, a single-sited RI, is connected to the ESFRI Roadmap RI PRACE – Partnership for Advanced Computing in Europe

INCD
Portuguese National Distributed Computing Infrastructure

TYPE
Virtual

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
www.incd.pt

RI COORDINATOR
Jorge Humberto Lúcio Oliveira Gomes (LIP)

INSTITUTIONAL PARTNER(S)/NODE(S)
Associação INCD; Laboratório de Instrumentação e Física Experimental de Partículas (LIP); Laboratório Nacional de Engenharia Civil (LNEC).

FUNDING FOR 2017-2021
Total Public Investment
2,742,246 €
ERDF
1,565,415 €
National Public Funds (FCT)
1,176,831 €

DESCRIPTION

INCD provides computing and data-oriented services aimed to support leading edge research in all scientific domains. INCD offers a comprehensive portfolio of services that includes among others: cloud computing, high throughput computing and high performance computing. INCD services are federated with other European and international digital infrastructures.

ACTIVITIES

INCD provides a rich set of scientific computing and data-oriented services that encompasses cloud computing, high throughput computing and high performance computing, among others. These services are complemented by state-of-the-art data storage systems. The INCD services can be both directly used or combined to provide higher level services tailored to the needs of the research communities. The infrastructure can be used for occasional processing or to provide long-term services, including scientific portals and virtual research environments. The INCD services are federated with other European digital infrastructures such as EGI and IBERGRID, making them suitable to support international research activities where data and compute resources must to be shared across locations and organizations. INCD also participates in the European Open Science Cloud (EOSC) delivering capacity and supporting thematic services.

IMPACT

INCD aims to be an open digital infrastructure of reference, enabling computing and data intensive research across all scientific domains.
Through INCD's computing and data capabilities, the researchers can further develop their research and innovation activities and strengthen their competitiveness.
INCD is establishing centres in several regions of Portugal. They are located at academic and research organizations promoting synergies, facilitating a close collaboration with the user communities, and fostering the development of skills and competences. INCD computing and data services are delivered through its operational centres that also provide generic support.
In addition development of new services, specialized support, technical training and consulting are provided by the support centres.
The INCD centres also provide employment opportunities, and contribute to the training of skilled personnel in scientific computing, and data related technologies.
Together with the technical training, this will promote the dissemination of knowledge and adoption of advanced computing both in science and industry, thus contributing to the economic and scientific development.
The INCD infrastructure can be used by individual researchers, research groups, research performing organizations and research infrastructures, for their own activities or to support their participation in scientific and innovation projects.
The INCD infrastructure can also support research, innovation and engineering activities both in the private and public sectors, supporting economic growth and the public interest.
Through its liaison with EGI, IBERGRID, EOSC, WLCG and other international e-infrastructures, INCD is in a privileged position to support participation in international projects and collaborations where distributed data access and processing are required.
As a generic digital infrastructure, the impact of INCD will be mainly felt through the results of the supported projects and activities.

RCTS
Science, Technology and Society Network

TYPE
Distributed

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
www.fccn.pt/institucional/rcts

RI COORDINATOR
João Nuno Urbano Ferreira (FCT|FCCN)

INSTITUTIONAL PARTNER(S)/NODE(S)
Fundação para a Ciência e a Tecnologia I.P. - Unidade de Computação Científica Nacional (FCT|FCCN).

FUNDING FOR 2017-2021
Total Public Investment
17,243,185 €
ERDF
13,013,585 €
National Public Funds (FCT)
4,229,600 €

DESCRIPTION

The Science, Technology and Society Network (RCTS) is the Portuguese National Research and Education Network (NREN). A dedicated high-performance network intended to serve researchers with greater demands, teachers and students, acting as a platform for advanced communications services and applications.
RCTS interconnects with other research and higher education networks through GÉANT. It provides a privileged collaboration channel for Portuguese researchers to access foreign research infrastructures, data sets and services.
RCTS is managed by FCCN, a FCT unit dedicated to horizontal research digital infrastructures.

ACTIVITIES

RCTS offers researchers, teachers and students a high-performance digital infrastructure to support projects on a national and international level. The services provided by RCTS are organized in the following pillars:
– Connectivity services, ranging from Internet access, virtual private networks, point-to-point links, and Voice over IP to wi-fi roaming (EduRoam).
– Computing services, focused in providing housing and generic computing services.
– Collaboration services, covering videoconferencing, video streaming and other media services.
– Knowledge services, encompassing open access, open data and distance learning.
– Security services, including incident handling team, digital certificates and authentication-authorization federation.
– Innovation, with several projects in emerging technologies, related with digital infrastructures and advanced services.

IMPACT

RCTS, as a national academic network, is included in the group of the oldest and most inclusive research infrastructures. Academic networks are considered essential infrastructure for all other infrastructures. Without the network, researchers had to travel physically to specific locations to carry out their experiments, limiting collaboration and distance work.
Academic networks are fundamental infrastructures for the advancement and acceleration of practically all knowledge creation processes. It is through networks like RCTS that geographically dispersed communities can work together, without having to move or physically send documents or data. It is the academic networks that make possible the digitalization of science, in all its phases, from the research of existing knowledge (Ex: B-On), through the submission of projects online, the realization of these projects and the publication of results. In the field of higher education, the connectivity provided by RCTS is a fundamental tool for learning, as it places all connected entities on an equal footing, linked to the global scientific and academic world. In terms of impact, the service of the RCAAP Network, of national publications in open access, which, with more than 10 years of operation, currently covers 129 Institutions with Repository, 76 national scientific journals and 475,000 aggregated documents.
The RCTS portfolio of services operates at all levels where research and teaching processes can be developed, from the most basic levels of information transmission, through storage in data centers, processing, availability and archive.
RCTS has been following the most recent developments in terms of research data management, especially with regard to the infrastructure supporting its management.
We emphasize the expansion of network coverage and transmission capacity in order to ensure that all connected entities can handle large volumes of data between themselves and with their international counterparts.

RNCA
National Advanced Computing Network

TYPE
Virtual

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2019

WEBSITE
www.rnca.fccn.pt

RI COORDINATOR
João Nuno Urbano Ferreira (FCT|FCCN)

INSTITUTIONAL PARTNER(S)/NODE(S)
Fundação para a Ciência e a Tecnologia I.P. - Unidade de Computação Científica Nacional (FCT|FCCN); Universidade do Minho (UM).

FUNDING FOR 2017-2021
n.a.

DESCRIPTION

The National Advanced Computing Network (RNCA) offers advanced computing services to research and innovation communities. Created in 2018 as part of the Portuguese digital competence's initiative INCoDe.2030, was integrated in the National Research Infrastructures Roadmap in 2019, as the Portuguese counterpart of the future Iberian Network for Advanced Computing, agreed between Portugal and Spain. The main operational centre of RNCA is the Minho Advanced Computing Centre (MACC). RNCA is responsible for implementing EuroHPC infrastructure projects in Portugal, namely the acquisition, hosting and operation of a petascale supercomputer.

ACTIVITIES

RNCA is an infrastructure under dynamic development that has a set of planned activities. To strengthen its structure, capacitation and internal cooperation amongst operational and competence/visualization centres. To establish annual communication and training plans. To develop an access policy for RNCA resources. To execute public calls to allow competitive access to advanced computing resources. To collaborate, internationally, with EuroHPC/PRACE resources. To develop the projects to establish in Portugal an HPC competence centre in European context. To apply for national and international funding. To collaborate with the Spanish Supercomputing Network to create the Iberian Advanced Computing Network. To promote international partnerships. To sponsor Green Supercomputing. To promote the use of RNCA resources in industry and public administration and to acquire new supercomputing resources. Strategic partnerships were made with the Barcelona Supercomputing Centre and the Texas Advanced Computing Centre.

IMPACT

RNCA, through its main operational centre, MACC, will substantially increase national capacity in advanced computing, especially in HPC (high performance computing) in all scientific domains for research, innovation and public administration areas.
With that increase it will be possible to satisfy diverse needs, such as (i) support numerical modelling and visualization, crucial for scientific discovery and innovation processes in industry; (ii) support big data volume analysis by making use of modern artificial intelligence and deep learning techniques; (iii) provide an answer for the need of HPC in telematic services in scientific and technological areas, and public administrations in general.
RNCA, through MACC, will also serve as a research center in computer sciences, especially in the management and operation of computer architectures of emergent and next generation, such as ARM technology applied to supercomputing. In this perspective, RNCA will place Portugal in the vanguard of technological advancements that will come through soon, such as the European microprocessors or quantum computing technology.
Through RNCA, science and innovation will make major achievements, something not possible without RNCA current and future resources. Advanced computing is now a tool, more essential than ever, in science and innovation of excellence. RNCA is, in this perspective, an initiative that removes barriers and gaps from science and technology in Portugal.

UC-LCA
Laboratory for Advanced Computing

TYPE
Single-Sited

YEAR OF ENTRY IN THE NATIONAL ROADMAP
2014

WEBSITE
www.uc.pt/lca

RI COORDINATOR
Pedro Almeida Vieira Alberto (UC)

INSTITUTIONAL PARTNER(S)/NODE(S)
Universidade de Coimbra (UC).

FUNDING FOR 2017-2021
Total Public Investment
1,398,908 €
ERDF
1,189,072 €
National Public Funds (FCT)
209,836 €

DESCRIPTION

UC-LCA provides High Performance Computing (HPC) services to the very broad range of scientific fields which rely on heavy computational simulations. Because of the recent convergence between data and HPC, UC-LCA aims also to support those scientific fields that require intense data processing, like Genomics, bioimaging and Artificial Intelligence. It offers support to specialized training in HPC techniques and methods as well as on the effective use of the RI by its users. It seeks cooperation with small and medium enterprises that need HPC services to improve their business. UC-LCA is the national node of the European HPC infrastructure PRACE – Partnership for Advanced Computing in Europe.

ACTIVITIES

Provision of CPU time and storage through scientific projects, following the international practice for a Computer Centre on providing CPU time and Storage. User support in installing and using HPC applications and associated libraries and tools. Training in HPC systems and software, through workshops on parallel computing, sessions for users to learn about the software environment of the existing clusters. Engaging in international collaborations, in particular with Spanish computer centers and also with other pan-European organizations like PRACE. Participation in the European calls for CPU time managed by PRACE.

IMPACT

Since it began its operations, UC-LCA has support around 200 users and their research. The rate of published papers has increased in recent years and is expected to continue to grow because of new scientific fields that need HPC. HPC is now recognized by the European Commission as a strategic technology for scientific and economic competitiveness. The recent realization that HPC is crucial for massive data processing adds to its importance for advancing science and technology. UC-LCA, through investment in new equipment and hiring qualified human resources, aims to address those challenges, both for scientific research and for companies that need this technology to be competitive in the global stage. In particular, new workflows associated with AI and data processing for biosciences will be implemented, associated with an increased storage capacity and persistent tape storage.

ANNEX I
Composition of the FCT Research Infrastructures Monitoring Committee

COMPOSITION OF THE FCT RESEARCH INFRASTRUCTURES MONITORING COMMITTEE (2019 – 2022)

COORDINATION	
Helena Pereira (President)	President of the Board of Directors of FCT
Isabel Vitorino	Director, Department for R&D Units of FCT

FCT TECHNICAL MEMBERS	
Andréia Feijão	Departament for R&D Units
Daniel Carapau	Departament for R&D Units
Marta Abrantes	Departament of International Relations
Joana Pinheiro	Departament of International Relations

NATIONAL SCIENTIFIC EXPERTS		
ENERGY	**Manuel Gameiro da Silva** (Domain Coordinator)	Universidade de Coimbra (Dep. Eng. Mecânica)
	Adélio Mendes	Universidade do Porto (Faculdade de Engenharia)
ENVIRONMENT	**Eduardo Rosa*** (Domain Coordinator)	Universidade de Trás-os-Montes e Alto Douro (CITAB)
	Teresa Ferreira* (Domain Co-Coordinator)	Universidade de Lisboa (ISA)
	Ana Colaço*	Universidade dos Açores (Okeanos)
	Cristina Máguas	Universidade de Lisboa (Faculdade de Ciências)
	João Fonseca	Universidade de Lisboa (IST)
HEALTH AND FOOD	**Isabel Rocha** (Domain Coordinator)	Universidade Nova de Lisboa (ITQB)
	Luís Taborda Barata* (Domain Co-Coordinator)	Universidade da Beira Interior (Dep. Ciências Médicas)
	António Jacinto	Universidade Nova de Lisboa (CEDOC, FCM)
	Beatriz Lima	Universidade de Lisboa (Faculdade de Farmácia)
	Henrique Barros	Universidade do Porto (ISPUP), President of the National Health Council
	Patrícia Maciel	Universidade do Minho (ICVS)
	Raquel Seruca	Universidade do Porto (I3S)
PHYSICAL SCIENCES AND ENGINEERING (includes the former "Materials and Analytical Facilities" domain)	**Maria Rute André*** (Domain Coordinator)	Universidade de Aveiro (CICECO)
	Paulo Lourenço (Domain Co-Coordinator)	Universidade do Minho (Dep. Engenharia Civil)
	Ana Maria Tomé	Universidade de Aveiro (Dep. Eletrónica, Telecomunicações e Informática)
	Álvaro Cunha*	Universidade do Porto (Faculdade de Engenharia)
	Carlos Mota Soares**	Universidade de Lisboa (IST)
	Elvira Fortunato*	Universidade Nova de Lisboa (FCT)
	José Paulo Mota**	Universidade Nova de Lisboa (FCT)
	Luís Filipe Santos	Universidade de Lisboa (IST)
	Nuno Borges Carvalho	Universidade de Aveiro (Dep. Eletrónica, Telecomunicações e Informática)
SOCIAL AND CULTURAL INNOVATION	**Maria Raquel Freire*** (Domain Coordinator)	Universidade de Coimbra (CES)
	Maria Isabel Dias (Domain Co-Coordinator)	Universidade do Porto (Faculdade de Letras)
	André Freire**	ISCTE
	Delfim Leão	Universidade de Coimbra (Faculdade de Letras)
	Fernanda Ribeiro	Universidade do Porto (Faculdade de Letras)
DIGITAL INFRASTRUCTURES	**José Borbinha** (Domain Coordinator)	Universidade de Lisboa (IST)
	Pedro Teixeira Pinto (Domain Co-Coordinator)	Universidade de Trás-os-Montes e Alto Douro (Escola de Ciências e Tecnologia)
	Fernando M. A. Silva	Universidade do Porto (Faculdade de Ciências)

* IS ALSO A MEMBER OF ONE OF THE FOUR FCT SCIENTIFIC COUNCILS
** DID NOT PARTICIPATE IN THE 2019 MATURITY EVALUATION OF THE NATIONAL RIS

EXTERNAL REVIEWERS RECRUITED FOR THE 2019 MATURITY EVALUATION OF THE NATIONAL RIS

ENERGY	**Carla Silva**	Universidade de Lisboa (Faculdade de Ciências)
HEALTH AND FOOD	**André Albergaria**	Universidade do Porto (I3S)
	Fátima Cardoso	Fundação Champallimaud
	Helena Canhão	Universidade Nova de Lisboa (CEDOC, FCM)
	Miguel Prudêncio	Universidade de Lisboa (IMM)
PHYSICAL SCIENCES AND ENGINEERING	**Zita Martins**	Universidade de Lisboa (IST)
SOCIAL AND CULTURAL INNOVATION	**Ana Romão**	Universidade Nova de Lisboa (FCSH), Academia Militar

ANNEX II
The 16 new RIs in the National Roadmap

The 16 new Research Infrastructures (RIs) in the National Roadmap, the associated Public Policies/legislation and their alignment with ESFRI Roadmap RIs or other World-class Research Infrastructures, with European Union Joint Programming Initiatives or Joint Undertakings, and with International R&I Organizations

ORDER OF THE MINISTER OF SCIENCE, TECHNOLOGY AND HIGHER EDUCATION	RESEARCH INFRASTRUCTURE	RESPECTIVE DECREES / PUBLIC POLICIES	ALIGNMENT WITH ESFRI RIS, OWCRIS, JPIS, JUS AND IROS
NO. 4157/2019	**RNCCC – National Network of Comprehensive Cancer Centres**	NA	Cancer Core Europe
	ProtoTera – The Portuguese Network of Infrastructures for Proton Therapy and Advanced Technologies for Cancer Prevention and Treatment	Resolution of the Council of Ministers (RCM) n. 28/2018	NA
	AIR Centre – Atlantic International Research Centre	RCM n. 29/2018	AIR Centre
	RNCA – National Advanced Computing Network	RCM n. 26/2018 ("Incode 2030")	EuroHPC
	FOODCHAIN-PT – International Food Chain Alliance - Portugal	RCM n. 24/2018	Fraunhofer Association
	FhP-AWAM – Fraunhofer Portugal Research Center for Agriculture and Water Management	RCM n. 24/2018	Fraunhofer Association
	CECOLAB – Collaborative Laboratory Towards Circular Economy	RCM n. 190-A/2017	NA
	Portugal Space – Portuguese Space Agency	RCM n. 30/2018 and RCM n. 55/2019	ESA, ESO, SKA
NO. 7557/2019	**CryoEM-PT – National Advanced Electron Microscopy Network for Health and Life Sciences**	NA	EuroBioImaging ERIC
	ESTHER – European Shock Tube for High-Enthalpy Research	NA	ESA
	MIA-Portugal – Multidisciplinary Institute of Ageing	NA	JPND
	Biobanco.pt – National Biobanks Infrastructure	NA	BBMRI ERIC
NO. 4958/2020	**PtCRIN – Portuguese Clinical Research Infrastructure Network**	RCM n. 27/2018	ECRIN ERIC
	PtmBRCN/MIRRI-PT – Portuguese microBiological Resources Center Network	NA	MIRRI (coordination)
	PT-OPENSCREEN – National Infrastructure for Chemical Biology and Genetics	NA	EU-OPENSCREEN ERIC
NO. 5220/2020	**PtCAC – Portuguese Network of Clinical Academic Centers**	RCM n. 27/2018, DL n. 61/2018	NA

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REPÚBLICA
PORTUGUESA
CIÊNCIA, TECNOLOGIA
E ENSINO SUPERIOR


PORTUGAL
2020


COMPETE
2020


NORTE
2020


CENTRO
2020


Lisb@20


ALENTEJO
2020


CRESC
ALGARVE
2020