



NCP_WIDE.NET

Benchmarking Report

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INTRODUCTION – AIMS AND SUMMARY

The evaluation of existing Centres of Excellence (FP7 REGPOT, FP6 ToK, FP5 CoE, SF CoE) is an important step to recognizing the aspects that either promote or impair a Centre's odds for successful participation under the Teaming/Twinning actions in the EU Framework Programme for Research and Innovation Horizon 2020.

The Benchmarking report first of all briefly outlines the differences in research and innovation performance in Europe providing the background information and macro-perspectives on the chances and obstacles for Centres of Excellence. In a second step, the potential contribution of the Horizon 2020 programme area "Spreading Excellence and Widening Participation" is outlined. The report presents the analysis of the strengths and weaknesses, opportunities and threats related to Centres of Excellence, and gathers selected success stories of sustainability that may be replicated in or adapted to projects under the Teaming/Twinning instrument. Moreover, special attention is given to the emerging centres of excellence requiring an upgrade in Widening countries.

The Benchmarking Report examines the Centres on four dimensions:



FINANCE ability to attract and mobilise funds,



FAME progress in excellence capacity,



FUS barriers impairing catching-up processes in research and innovation excellence



FRAMEWORK conditions conducive to developing the highest quality standards in research and innovation excellence.

The Report presents a qualitative analysis of the aspects related to the Centre's potential and its further enhancement with a view to the Teaming/Twinning actions and reflects on practical case studies.

THE RESEARCH AND INNOVATION GAP IN EUROPE

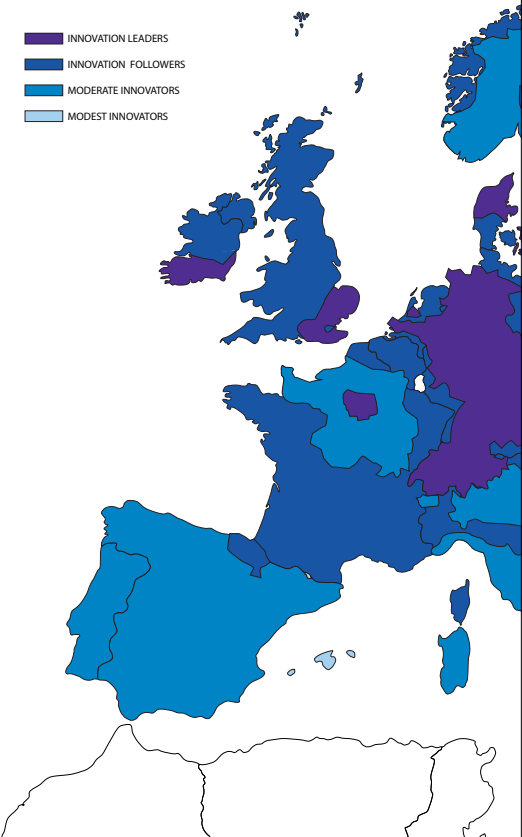
Despite serious efforts by the European Union and the Member States, significant gaps remain among European regions in terms of research and innovation performance (please see the graph 1 Innovation divide). This is due to different levels of economic development and deep structural differences linked to many diverse factors (geography, specific localisation issues, socio-economic and cultural aspects, etc.). The most significant factors of functioning research and innovation systems include, i.a. a mix of strategies, initiatives, and programmes guiding investment choices; principles such as transparency, autonomy, openness and competition in funding research and innovation; support for participation in international research and innovation activities; and a critical amount of research funding.

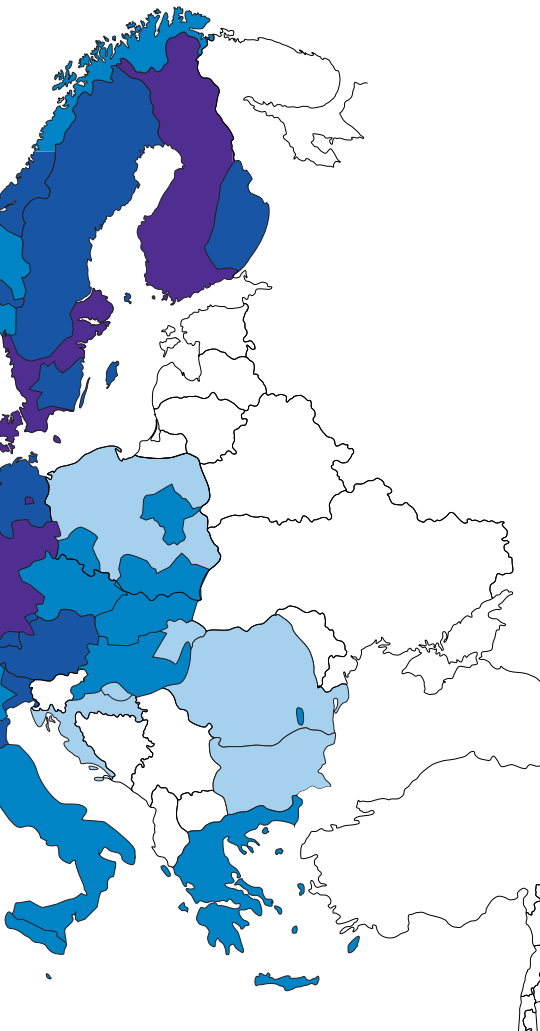
GRAPH 1

Innovation divide.

Source:

Innovation Union Scoreboard 2015





The continuing financial crisis has increased the constraints on public R&D budgets. For the entire EU-28, the ratio of the R&D intensity (R&D investment as a percentage of their GDP) was 2,01% in 2012. It is estimated that out of the EU's 266 regions, only 10,5 % had an R&D intensity above 3%, which remains a target within the Europe 2020 strategy. Taken together, these regions accounted for more than one-third of the EU's R&D expenditure.¹ These figures show significant disparities between central, eastern and southern European countries' regions and the northern and western parts of the EU, termed the "innovation divide". Thus, substantial large-scale and consistent policies are required to help lagging regions in Europe reverse these trends, to identify appropriate strategies conducive to increasing investments and to catalyse structural interventions that would make a difference in European competitiveness.

The EU, in the new financial framework running from 2014 until 2020, is determined to deal with these challenges through promoting the integration of different policies in support of research and innovation, first and foremost the European Structural and Investment Funds (ESIF) and Horizon 2020 – the EU's Framework Programme for Research and Innovation.

- ESIF are an important part of the EU budget (35% or 350 bn euros) and a major source for low R&I performing countries in particular to investing in R&I and in the attractiveness of MS and their regions (incl. digital infrastructure, environment, transport, labour market).
- The differences in research and innovation

performance are also mirrored in the participation to Horizon 2020. Therefore, Horizon 2020 provides tailored support for low-performing EU Member States through "Spreading Excellence and Widening Participation".

SPREADING EXCELLENCE AND WIDENING PARTICIPATION

The Horizon 2020 programme area "Spreading excellence and widening participation" intends to enhance the competitiveness and excellence of research organisations in less-performing countries and regions, called "**Widening**" countries, by dealing with these aforementioned challenges: R&D investments, efficiency and effectiveness of R&D systems and networking.

Thereby, it aims to contribute to tap into the unexploited potential in R&D, especially in "widening" countries (for division into two groups of countries: "widening" and "non-widening" based on the composite indicator please see the graph 2).

Just over 800 million euros are reserved for activities under this part. Among the actions funded are Teaming and Twinning.

¹ EUROSTAT regional yearbook 2015.

"WIDENING" COUNTRIES:

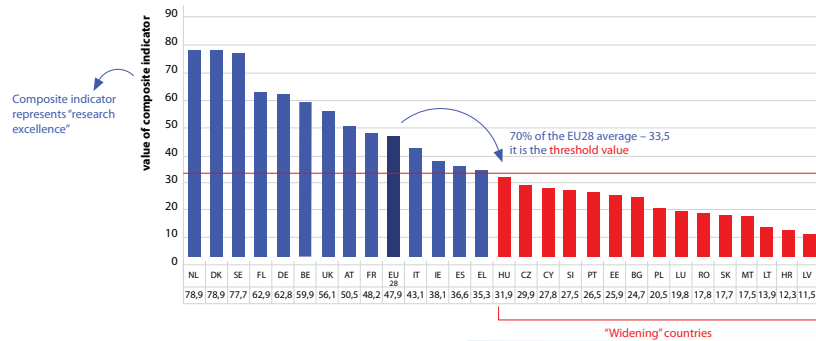
In order to ensure the greatest possible impact through targeting only the lowest performing European countries, and maximising the value of these actions, applicant organization from the following Member States and Associated Countries will be eligible to submit proposals as coordinators:

- Member States: Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Luxembourg, Malta, Poland, Portugal, Romania, Slovakia and Slovenia.

TEAMING aims to support the creation of new (or upgrading of existing) Centres of Excellence in low R&I performing Member States and Associated Countries on the basis of partnerships with internationally leading institutions. All applications for funding must match the recipient country's or region's Smart Specialization Strategies (RIS 3) or an equivalent growth strategy (such as IPA II for associated countries). Following a successful first phase (which takes one year) in which a business plan is developed, significant seed finance of max. 15 million euro may be provided in second phase (with a duration of five to seven years) for initial implementation steps. For implementing the future Center of Excellence, it is essential that national/regional authorities commit financial resources (e.g. resources coming from the European Structural and Investment Funds or Instrument for Pre-accession Assistance (IPA II) funds as appropriate,) in particular regarding investment in infrastructure equipment.

GRAPH 2 Performance in the composite indicator "research excellence".

Source: NCP_WIDE.NET Project



TWINNING aims to exploit the huge potential of networking for excellence through knowledge transfer and, exchange of best practice between research institutions and leading partners.

It is intended to strengthen a specific research field in an emerging institution, by linking a university or research centre in a low-performing country with at least two internationally-leading institutions in Europe for a duration of up to 3 years with a budget of up to 1 million euro. This is underpinned by staff exchanges, expert visits, short-term on-site or virtual training sessions, workshops, joint summer schools and outreach activities. Twinning applicants are encouraged to explain their institution's links with the host location's smart specialisation strategy.





The measures (teaming, twinning) have been designed to complement the activities financed through the European Structural and Investment Funds. Since the budget is limited in the face of these huge structural challenges, it is hoped that the projects financed will become lighthouse examples spreading out to other parts of the EU and inspiring similar activities to be replicated elsewhere. In addition, the challenge is to integrate research and innovation in the context of comprehensive R&I strategies for smart specialisation. Collaborative approaches like Twinning and Teaming of European partners can be an important driver to promote the internationalisation of businesses, technology transfer and to create knowledge-based regional economies and societies. Such partnerships can only be successful when providing benefits, not only for emerging R&I organisations, but also for institutions leading in their field. The latter can gain from such collaborations in many ways, including increased international visibility, enhanced capabilities through joint learning, increased mobility (inwards and outwards) of qualified scientists, and access to new “markets” of knowledge, of science-to-business connections and of research partners in Europe.



WHAT IS A CENTRE OF EXCELLENCE IN A VIEW OF TEAMING /TWINNING?

For the purpose of the analysis, the definition of the Centre of Excellence presented by the European Commission has been adopted.

According to this definition,

“A Centre of Excellence is a structure where RTD is performed of world standard, in terms of measurable scientific production (including training) and/or technological innovation”.

Dimitri Corpakis, Teaming Coordinators’ Day, Brussels

Some key features could be the following:

- A “critical mass” of high-level scientists and/or technology developers;
- A well-identified structure (mostly based on existing structures) having its own research agenda;
- Capability of integrating connected fields and of associating complementary skills;
- Capability of maintaining a high rate of exchange of qualified human resources;
- A dynamic role in the surrounding innovation system (adding value to knowledge);
- High levels of international visibility and scientific and/or industrial connectivity;
- A reasonable stability of funding and operating conditions over time (the basis for investing in people and building partnerships);
- Sources of finance which are not dependent over time only on public funding.

CRITERIA APPLIED IN THE ANALYSIS

The report is based on the **4F model** including major criteria reflecting the strengths, weaknesses, opportunities and threats of a Centre of Excellence, these are: **Finance, Fame, Fuss and Framework**.



FINANCE

One of the main and measurable results of the CoE activity is its stable financial portfolio, including statutory funds as well as ability to attract and generate funds within the region.

The criterion was divided into the following parts including:

- funds attracted from international competitions, i.e. Framework Programmes,
- funds attracted from other financial instruments such as Structural Funds,
- No. of contracts with industry, private R&D

partners and other entities. This reflects the Center's ability to attract funds and to mobilise resources through establishing collaborations with external partners, with special attention to industry focusing on technology transfer.

The sub-criterion:

- Budget gained within FPs indicates the CoE's potential to successfully apply under Horizon 2020 grants due to its research excellence, leading role in the region, international cooperation and experience.
- Budget gained with other financial instruments such as SF reflects not only CoE's ability to attract regional/ national money but mostly its role and involvement in regional smart specialisation strategies. Criterion
- No. of contracts with private partners assesses the CoE's active role in establishing a regional innovation ecosystem. Under the Finance criteria, CoE were asked to indicate the number of grants / contracts and the amount of funds gained.

FAME

The Fame criterion indicates the CoE's capacity, research potential, international attractiveness and visibility and dynamic role in generating new knowledge. It corresponds to the development of innovation, enhancement of human potential, internationalization process as well as the creation of the eco-system. The criterion was divided into following aspects:

- Increase of no. of patents and patents applications – national, European, CPO;
- Increase of no. of applications to industry;
- Increase no. of peer-reviewed publications;
- Increase of staff – no. young researchers and experienced researchers recruited;
- Increase of no. of recruited researchers from abroad;
- No. of PhD programmes;
- CoE self-assessment on success factors, participation in international networks and links to industry.

FRAMEWORK

Framework of the CoE is primarily related to its active role within the ecosystem, networking and governance model fostered within the organisation itself as well as at the regional/ national and international level. It includes :

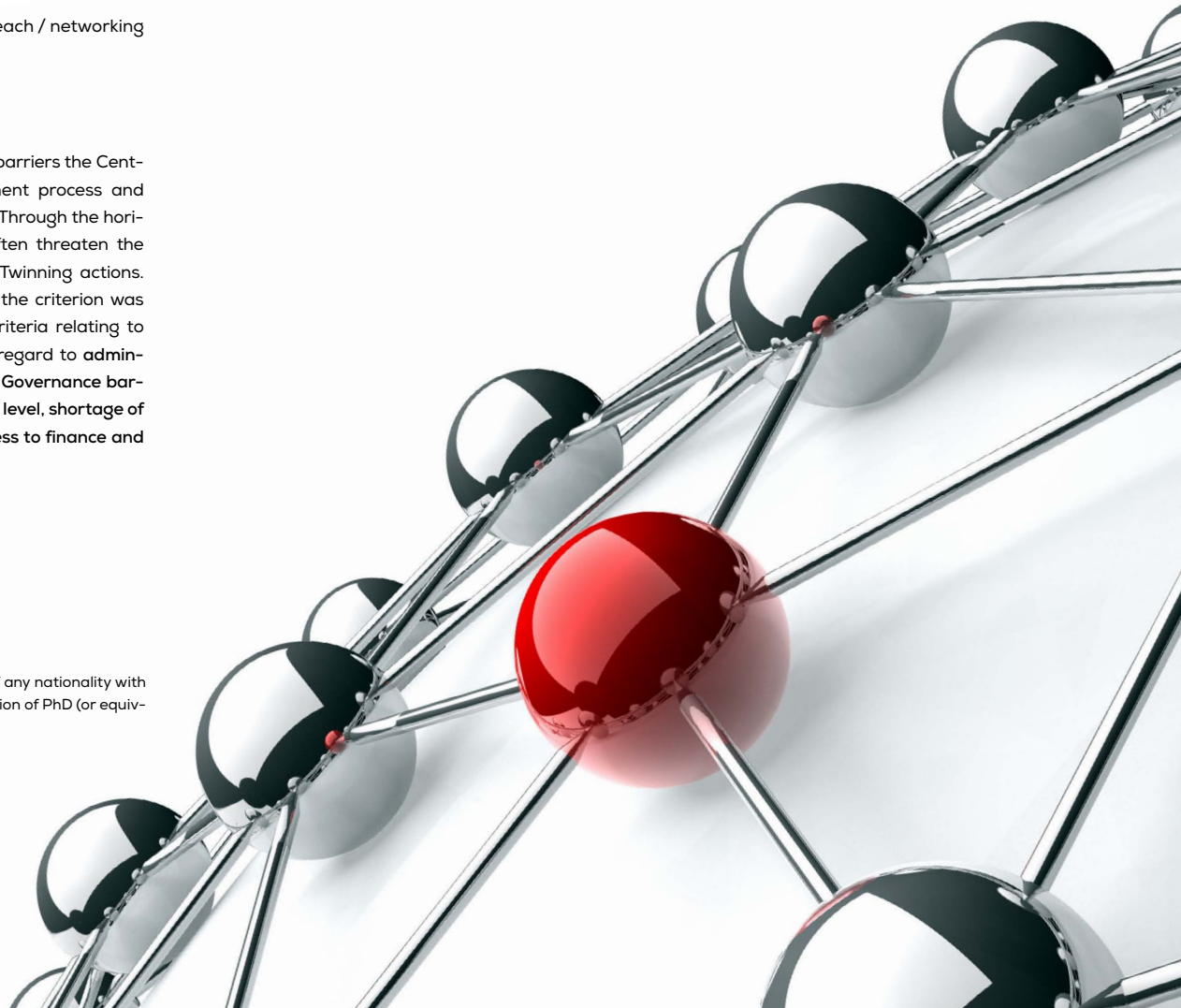
- CoE self-assessment on Institutional arrangements for modernisation and structural change;
- Synergy / coherence / embeddedness of the institutional strategy with / in regional smart specialization strategy, National Research Strategy, EU priorities under Horizon 2020 and ERA;
- Changes in the business model in regard to: rules governing institutional funding allocation, external evaluations of the Centre, introduction of peer-review procedures, IP management strategy, recruitment strategy, researcher education, third party funding

strategy, marketing / outreach / networking strategy.

FUSS

The Fuss criterion relates to the barriers the Centers are facing in the development process and improvement of their capacities. Through the horizontal influence, the barriers often threaten the CoEs participation in Teaming/ Twinning actions. For the purpose of the analysis the criterion was divided into the following sub-criteria relating to the Centers self-assessment in regard to administrative burdens inside the CoE, Governance barriers at the regional and national level, shortage of qualified staff, difficulties in access to finance and other.

¹Young researchers i.e. researchers of any nationality with 2-7 years of experience since completion of PhD (or equivalent degree)



NAME OF THE CENTRE OF EXCELLENCE:

MTA SZTAKI -HUNGARIAN ACADEMY OF SCIENCES

INSTITUTE FOR COMPUTER SCIENCE AND CONTROL

RESEARCH & INNOVATION:

cyber-physical systems (CPS), autonomous land and aerial vehicles, robot-assisted surgery, intelligent buildings, intelligent power grids and intelligent manufacturing.

DESCRIPTION:

The Institute for Computer Science and Control operates since 1964 and is a research institute, governed by the Hungarian Academy of Sciences. Its staff consists of 226 full-time employees, more than 200 with university diploma and more than 90 with scientific degrees.

FINANCE:

The MTA SZTAKI has received 119 grants under **Framework Programs**, 5 from **Structural Funds**, 56 from **National Funding** and 350 from **Industry**.

FAME:

The MTA SZTAKI grows and develops fast with **16 patents** registered already, more than **2000 publications** in thematic journals, employed **40 young** and **49 experienced researchers**. The Institute has many **external relationships** in the field of R&D: it is a member of the (World Wide Web) W3 Consortium, the European Research Consortium of Informatics and Mathematics, and has strong **cooperation** with industry sector in commercial aviation and vehicle industry, production management and informatics or energetics.



FUSS:

Short deadlines in applying for funding, delays in payments and preferences for high budget proposals.

FRAMEWORK:

The MTA SZTAKI further extends the CPS **infrastructure** (3D-internet, control, SmartFactory, cloud computations) to establish the cooperative cyber physical systems research laboratory to reach the target of international Center of Excellence in the field of CPS.

The institutional strategy of SZTAKI is in **synergy** with **the National Szechenyi 2020** Pro-

gramme giving **priority** to the fields of mobility, vehicle industry, informatics and developments of energy and environment protection. The institute also follows S3 (Strategies of Smart Specialization) of Hungary, which is in synergy with the EU priorities of Horizon 2020 and ERA.

SZTAKI's business model includes: EN ISO 9001:2000 certification, PhD programmes' support, close cooperation with media - 40 press releases and had around 130 media appearances in 2014.



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A close-up photograph of a scientist wearing safety goggles and a white lab coat, looking through a white microscope. The background is a soft, out-of-focus laboratory setting. The text is overlaid on the left side of the image.

NAME OF THE CENTRE OF EXCELLENCE:

INTERNATIONAL

INSTITUTE

OF MOLECULAR

AND CELL

BIOLOGY (MCB)

IN WARSAW

RESEARCH & INNOVATION:

fundamental molecular and cell processes; protein studies, molecular biomedicine, models of human diseases, zebrafish facility

DESCRIPTION:

Ranked with the highest score possible by the Polish Ministry of Science and Higher Education, IIMCB is an institute that focuses on molecular and cell biology. The institute has 9 independent research groups. It employs 137 employees and currently has 49 PhD students. After 15 years of operation, the annual budget of the institute was increased 18-fold from the initial €400.000. In 2013, the Institute was awarded the HR Excellence in Research Logo by the European Commission.

FINANCE:

The IIMCB has received 33 grants under **Framework Programs**, 7 from **Structural Funds**, 147 from **National Funding**, 7 from **Industry** and 29 from **Other sources**. Total grant budget: 61,63 mln euro.

FAME:

The IIMCB has 2 **patents** and has filed 12 **patent applications**. The employees of the institute are authors of 652 articles published in thematic journals. There are currently 46 **young** and 44 **experienced researchers** working for the institute, 18 of whom have been recruited abroad. The Institute cooperates among others with: Max Planck Society, European Research Network

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GDRE), Euro-Biolmaging, Palladin Institute of Biochemistry of NAS or Institute of Molecular Biology and Genetics, Kiev. The IIMCB has multiple cooperation agreements with the representatives of the industry, including: Adamed, Celon Pharma, Kucharzyk Biovetcis, Polfa-Tarchomin; has common publication with Fermentas and internship program for PhD students with e.g Adamed, Celon Pharma or Elmiko.

FUSS:

Ambiguous national regulations concerning personal income tax, administrative burden for non-EU researchers and the legalization of their work in Poland, no funding for research consumables (CoE and RegPot).

FRAMEWORK:

Between 2003 and 2015 IIMCB has established: 6 new laboratories, as well as the following new core facilities: Equipment, Zebrafish breeding facility, and Biostructures, BioTech, Scientific Cooperation Unit,

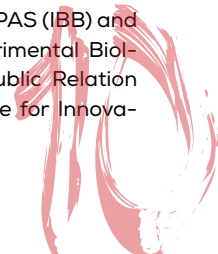
ADDRESS

**4 Księcia Trojdena Street
02-109 Warsaw**



Rules of European Charter and Code, PR Unit. The institutional strategy of IIMCB is in synergy with the Polish National Research Programme, a reference document of the National Smart Specialization and is coherent with EU Horizon2020 in Health to address demographic changes and well-being.

The IIMCB business model components: the highest A+ category obtained during the Ministry of Science and Higher Education evaluation process; IP is managed by IIMCB BioTech-IP Technology Transfer Office, Recruitment strategy is coherent with the European Charter and Code for Researchers – the HR Excellence in Research Logo awarded. IIMCB has a joint doctoral program which is conducted in cooperation with the following institutions: Institute of Biochemistry and Biophysics PAS (IBB) and the Nencki Institute of Experimental Biology PAS; established the Public Relation Unit and BIOCEN- the Centre for Innovative Bioscience Education.



**RESEARCH
& INNOVATION:**

energy efficient buildings

**NAME OF THE CENTRE
OF EXCELLENCE:**

UCEEB

**(UNIVERSITY
CENTRE
FOR ENERGY
EFFICIENT
BUILDINGS)**



DESCRIPTION:

University Centre for Energy Efficient Buildings (UCEEB) is an interdisciplinary academic institute of the Czech Technical University in Prague, whose main objective is to develop technologies to reduce energy consumption and efficient use of resources during renovation and new construction of buildings.

FINANCE:

The UCEEB has received 2 grants under **Framework Programmes**, 2 from **Structural Funds**, 12 from **National Funding**, 108 from **Industry**. Total grant budget: 35,33 mln euro.

FAME:

The UCEEB owns 1 **patent** and has filed 3 **patent applications**. The researchers of the center published 20 articles in thematic journals. The organisation employs 53 **young researchers**, 24 **experienced** ones and 8 **recruited from abroad**. The Centre won several prestigious international and domestic awards, e.g. the 3rd place in the international competition Solar Decathlon 2013 in California for the project AIR House (energy self-sufficient experimental house) and is a member of the European Real Life Learning Lab Alliance. Among the major industrial partners are e.g. Siemens or Honeywell.

FRAMEWORK:

Many activities of UCEEB are closely aligned with the National Priorities of Oriented Research, Experimental Development and Innovations. The research is in accordance with the national priority area Sustainability of energetics and material resources – e.g. the axis “Development of the economically efficient solar energetics”, “Innovation and sustainability of the classical materials” or “Design of modern methods and systems of construction and keeping of the intelligent human settlements with minimum impacts on the environment”. The UCEEB's research mission is to keep up with the Horizon 2020 programme which three main subjects include energy efficient buildings.



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NAME OF THE CENTRE OF EXCELLENCE:

BIOMEDICAL RESEARCH INSTITUTE OF OURENSE -PONTEVEDRA-VIGO (IBI)

RESEARCH & INNOVATION:
BIOMEDICAL RESEARCH



ADDRESS:

**Hospital Alvaro Cunqueiro
Estrada Clara Campoamor
nº 341,36312, Vigo**

DESCRIPTION:

Biomedical Research Institute Ourense-Pontevedra-Vigo (IBI) aims at developing translational biomedical research, relying in the principle that biomedical research must be carried out in contact and collaboration with the health-care system, the teaching system and the research system in order to achieve a harmonic development of biomedical research.

FINANCE:

The IBI has received 5 grants under **Framework Programs**, 3 from **Structural Funds**, 11

from **National Funding** and 51 from **Industry** and 279 from **Other sources**. Total grant budget: 18,83 mln euro.

FAME:

The IBI owns 7 **patents** and has filed 12 **patent applications**; IBI's researchers published 515 articles in thematic journals. The IBI has 507 members (experienced researchers and technicians). Furthermore there are 5 signed memoranda with foreign institutions. The IBI participated in the Technology Transfer Summit (TTS global) initiatives and is a member of the Breast Cancer Association Consor-



tium. The IBI is linked to the industrial sector through the Galician Bioindustry Platform, BIOGA, which joins all Galician biotech and health SMEs and its flagship project BIOCAPS has been disseminated to companies through Spanish and European Platforms, clusters, networks and Innovation Relay Centres, European Networks, ASEBIO.

FUSS:

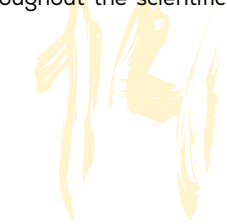
Lack of funds at the regional and national level to unlock its full research and innovation potential, lack of high quality research environment.

FRAMEWORK:

The IBI has recently opened a new process for the inscription of new researchers, which allowed it to grow up to 500 researchers, divided into 8 research areas and 40 research groups. Recently we managed to acquire new state-of-the-art equipment through the BIOCAPS project. The Hospital's strategy is in synergy with the Research Regional, and National Plans, and is also a priority in the FP7 and Horizon2020 programmes.

A new IPR and Innovation strategy has been implemented – first undertaken step was to prepare a benchmarking report on good

practices in technology transfer and innovation of other Biomedical Research centres of excellence across Europe. The PR strategy is well developed – specific personnel is focused on scientific promotion and community management that generate news based on new research results, scientific seminars, etc. and sends this news to the press, as well as puts them in our websites in order to disseminate them throughout the scientific community.



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NAME OF THE CENTRE OF EXCELLENCE:

M-ITI MADEIRA INTERACTIVE TECHNOLOGIES INSTITUTE -ASSOCIAÇÃO

Jan Feb Mar Apr May Jun Jul Aug Sep Oct



Success

Solution

Business Strategy

- Innovation
- Branding
- Solution
- Marketing
- Analysis
- Ideas
- Success
- Management

- Innovation
- Branding
- Solution
- Marketing
- Analysis
- Ideas
- Success
- Management

◎ SOCIAL NETWORK

RESEARCH & INNOVATION:

Human-computer interaction

(HCI)

Nov Dec

DESCRIPTION:

The work of the institute concentrates primarily on innovation in the areas of computer science, human-computer interaction, and entertainment technology. Since 2011, M-ITI has been part of the Laboratory of Robotics and Systems in Engineering and Science (LARSyS), an association of six R&D units representing four universities in Portugal. Its main research field is Human-computer interaction (HCI), computer science, design, and applications ranging from energy, health, tourism, environment to information systems. M-ITI has 10 permanent staff, and 25 faculty members, and a group of associated researchers of about 80 people. The normal yearly turnover is around 1.5 M€.

FINANCE:

The M-ITI has received 3 grants under **Framework Programs**, 6 from **Structural Funds**, 20 from **National Funding**, 25 from **Industry**. Total grant budget: **9,05 mln EUR**.

FAME:

The organisation's researchers published 524 articles in thematic journals. The institute employs 12 **young researchers**, 25 **experienced ones** and 20 **researchers re-**

cruited abroad. Jointly with CMU and University of Madeira, M-ITI offers 3 masters with worldwide success: Master in HCI; MSc in Computer Science and Master in Entertainment Technologies. Total number of students is above 400, all of whom come from 33 different countries. M-ITI conducts industrial projects, with the involvement of its researchers and students. Contracts have been signed with prestige companies such as NOS, ANA Vinci Aeroportos, Critical Software, Empresa de Electricidade da Madeira, SIRAM, Outsystems, CGI, Novabase, Portugal Telecom, COLLAB, Vodafone, Critical Software, MEO.

FUSS:

Periphery aspects of Madeira, bureaucracy complexity, delays in payments, limited local industrial community to partner with, Restrictions imposed by the Ministry of Education on the Faculty's activities, requiring exclusivity.

FRAMEWORK:

M-ITI is a proactive participant in the definition of the local RIS3, leader of ICT panel, and its main activity, HCI, is one of the key areas.

The M-ITI's business model includes: M-ITI's operations are not funded by the Min-

istry of Education as opposed to universities, our organisation is a non-for-profit association, with its own budget. Our recruitment strategy is based on scientific merits only. It is performed at international level, requests are published in global HR portals. The M-ITI's partnerships with international universities (University College London, University of Texas at Austin) lead to excellent work and M-ITI branded publications in highest visibility scientific stages.



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9020-105 Funchal**



NAME OF THE CENTRE OF EXCELLENCE:

LEIBNIZ-INSTITUTE FOR PLASMA SCIENCE AND TECHNOLOGY – INP GREIFSWALD

RESEARCH & INNOVATION:

low temperature
plasmas, their basics and
technical applications

DESCRIPTION:

The Leibniz Institute for Plasma Science and Technology (INP Greifswald) is the largest non-university institute in the field of low temperature plasmas, their basics and technical applications in Europe. In addition to appli-

cation-oriented research, INP promotes the development of plasma-assisted processes and products. The institute carries out research and development from idea to prototype. The topics focus on the needs of the market. At present plasmas for materials and energy as well as for environment and health are the focus of interest. Innovative product ideas of the research of INP are transferred by the spin-offs of the institute.

FINANCE:

Since 2013 the Leibniz-Institute for Plasma Science and Technology – INP Greifswald has

received 1 grant under **Framework Programs**, 12 from **Structural Funds**, 30 from **National Funding** and 6 from **Industry** and 47 from **R&I partners**. Total grant budget: **10,84 mln EUR**.

FAME:

The Institute owns 33 **patents** and has filed 15 **patent applications**; In the framework of the PlasmaShape project 12 **articles were published** in thematic journals, 2 accepted for publication, about 10 in preparation, 12 conference contributions including invited lectures. 6 **researchers** from abroad were

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recruited during the project: 3 **young researchers** and 3 **experienced ones**. The active participation in local and national plasma specialised networks (Plasma Germany, IN-PLAS) as well as international networks (e.g. BalticNet-PlasmaTec) increased the institute's visibility and the number of contacts with partnering institutions.

FUSS:

Shortage of students / PhD students, access to finance.

FRAMEWORK:

The institute was partly involved in the development of the RIS3 of the country Mecklenburg-Vorpommern and national strategy due to its membership in different alliances. Moreover, the institute regularly adjusts its strategy partly according to changes of EU priorities. The INP's business model components: the "Total E-Quality" certificate (successfully implemented gender equality in its personnel and organisation policies); the IP management (instruments are e.g.: installation of a patent board, cooperation with selected patent lawyers, etc.) and Recruitment strategy (instru-

ments are e.g. welcome culture: family friendly arrangements, bilingual documents, support for integration) have been installed since 2013 in the frame of the PlasmaShape project. The Marketing and PR strategy is well developed, and during the last 2 years the INP has increased its visibility remarkably. This is, for instance, displayed in the increasing number of cooperation partners from all over the world.

ADDRESS:

D-17489 Greifswald
Felix-Hausdorff-Strasse 2



A photograph of an irrigation system in a field, overlaid with a red-to-blue gradient. The system consists of several vertical riser pipes with multiple nozzles spraying water in a fan pattern across the field. The field is divided into rows of crops. In the background, there is a fence and a line of trees.

**NAME OF THE CENTRE
OF EXCELLENCE:**

BIOSENSE

**RESEARCH
& INNOVATION:**

ICT for agriculture

DESCRIPTION:

Independent legal entity - Research institute. Research fields include micro and nano electronics, communications and signal processing, remote sensing and GIS, big data analytics, robotics and mechatronics, ecology, agriculture. Staff: 50. Funding: national, industry collaboration, FP7, H2020.

FINANCE:

The BioSense has received 20 grants under **Framework Programs**, 6 from **National Funding**, 4 from **Industry** and 10 from **Other sources**. Total grant budget: **18,7 mln EUR**.

FAME:

The BioSense owns 2 **patents** and has filed 4 **patent applications**; The organisation's researchers have published 154 articles in thematic journals. BioSense employs 22 **young researchers**, 18 **experienced ones** and 8 **researchers recruited from abroad**. The Institute has strong research and human potential - average age of researchers is 33. It possesses most advanced laboratories in the region for sensor design (micro and nano electronics). The BioSense has strong interaction with stakeholders, including PA4ALL - the first Living lab in Serbia and the first in Europe to focus on precision agriculture.

FUSS:

Insufficient branding both for large-scale international collaboration and for attracting excellent researchers; organizational and administrative framework needs to be innovated; underdeveloped research expertise and the lack of critical mass in some research sub-fields.

FRAMEWORK:

The Centre's research focus is very well aligned with the "Strategy of Scientific and Technological Development of the Republic of Serbia 2010-2015", as it directly covers four out of seven national priorities (ICT, Agriculture and food, Environmental protection and countering climate change, and New materials and nanosciences) and RIS3 of Vojvodina Region.

The relevance of BioSense research on the European scale is evidenced by the fact that the Centre has been by far the most successful participant in FP7 from Serbia - 14 FP7 projects (out of which 7 coordinated) bear witness to research and innovation excellence of BioSense Centre, the importance of its research scope, and the level of its existing human and material resources. Its leading role in research and innovation has again been recognized in 2013, when the Centre has been granted over 2.6 million EUR to reinforce its research and in

novation capacity through the FP7 project InnoSense. IP is managed by the IPR unit at BioSense center and Recruitment strategy is aligned with the European Charter and Code for Researchers.



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NAME OF THE CENTRE
OF EXCELLENCE:

CENTER OF EXCELLENCE FOR RESEARCH ON THE STRUCTURE OF MATTER (CERSM)

RESEARCH & INNOVATION:

particle and nuclear physics, related interdisciplinary research, development and testing of corresponding research instrumentation including experimental end-stations, data acquisition components, detectors, sensors and associated electronics

DESCRIPTION:

Informal centre consists of 3 laboratories (particle, nuclear, ion beam physics) within the RBI DEP. Laboratories remain in cooperation since 2010 in numerous joint projects. Their common goal to increase capabilities and capacity in the field of detector development and accelerator applications. Staff: 20+ scientists, 20+ PhD students/postdocs, 5 technicians. Funding sources: IAEA, FP and H2020, national funds. Large investment proposed in RBI proposal for structural funds.

FINANCE:

The CERSM has received 9 grants under **Framework Programs**, 1 from **Structural Funds**, 3 from **National Funding**. Total grant budget: **6,52 mln EUR**.

FAME:

The researchers from the organisation published 624 articles in thematic journals. CERSM employs 21 **young researchers**, 20 **experienced ones** and 7 **recruited researches** from abroad. Memoranda of understanding have been signed with following foreign institutions: Manchester (2 joint H2020 applications), CEA Saclay (1 joint H2020 applications), Elettra (CERIC, 3 joint H2020 applications), JAEA Takasaki (new joint project funded by Japan).

The CERSM cooperates, among others, with CEA Saclay, JAEA Takasaki, Elettra, University of Huelva (Spain), Uni of Aarhus (Denmark) and PSI Switzerland and is involved in EuroFusion, Spirit, Ensar, Euro-GENESIS, CERN networks. Furthermore there is close cooperation with Micron (UK), Japan (diamond detectors) from industry sector. CERSM increases its impact through recently acquired Horizon2020 ERA Chair project, through which 5 additional experts will be hired.

FUSS:

Scientific regulation, budget restrictions for R&D, increased number of graduated students and senior researchers leaving the country.

FRAMEWORK:

The most important activity in modernisation and structural change of the RBI is proposal for structural funds project **O-ZIP - Open scientific infrastructure platforms for innovative applications in the economy and society**. Part of the O-ZIP funding is allocated for this CoE, for new equipment and new laboratory space funded with worth 60 mln euro O-ZIP project; the 2.5 Million Euro ERA Chair project PaRaDeSEC enables the CERSM to establish a Center for detectors, sensors and electronics,

which will support research activities of the CoE through development and testing of research equipment.

RBI will, during 2016, very likely form the "Cross-sector competence centre for advanced technologies", worth around 10 million euro – applications of KET technologies. Such competence centres are an integral component of the Croatian Smart Specialization Strategy, and RBI through it has a direct link with all the main stakeholders in the Croatian industry. This competence centre has been officially declared a Project of National Importance.



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NAME OF THE CENTRE OF EXCELLENCE:

SCHOOL OF HEALTH SCIENCES – UNIVERSITY OF PATRAS

RESEARCH & INNOVATION:

life science

DESCRIPTION:

The field of research of the CoE developed through REGPOT-SEEDRUG project is in molecular and structural biology, advanced light imaging and pharmacology (preclinical evaluation of pharmacologically active compounds). The activities of the SEEDRUG CoE resulted in the establishment of a Greek National Research Infrastructure in the field of Biological

and Medical Sciences (https://ec.europa.eu/research/infrastructures/pdf/gr_roadmap-web_version_final2014.pdf). The above actions will also attract new structural funds from the Regional (Western Greece) and Greek Central Government. New H2020 research applications have already been funded.

FINANCE:

The SEEDRUG consortium members have gained 16 grants within **Framework Programs**, 17 from **Structural Funds**, 12 from

National Funding and 4 from **Industry** and 24 from **Other sources**. Total grant budget: **11,94 mln euro**.

FAME:

The SEEDRUG owns 5 **patents** and has filed 5 patent applications. The researchers of the organisation published 50 articles in thematic journals. Employs 50 **young researchers**, 16 **experienced ones** and 6 **recruited researches from abroad**. Furthermore new Collaborative links established with ~10 institutions and 3 In-

dustrial partners.

The SEEDRUG participates in a number of EU networks, like the Integrated Structural Biology Network (INSTRUCT), the new structural biology consortium and H2020 project (iNEXT), networks in Light Imaging (Bio-Imaging) or other scientific organizations.

FUSS:

Heavy administration work inside the University of Patras (UPAT) SEEDRUG CoE, attempts to communicate results and project outcomes performed by all consortium members. Access to fund raising depends on the initiative of each group and on the joint collaborative efforts of the groups that belong to CoE.

FRAMEWORK:

Governance model is performed as designed and proposed within the REGPOT project. The scientific work and management related with the project was performed by the coordinating/leading team and the UPAT's administration staff. The CoE attempts to address the RIS3 of the Greece Western Region, where the CoE is located. UPAT is a point of reference in Life Sciences, along with National Research Strategy, the SEEDRUG CoE is recognized as a Greek National Facility in Medical and Biological Sciences and builds and participates in new EU consortia submitting research proposal in H2020 priority areas of research.

Business model components: the IP management strategy – its efforts are mainly based on each group's/IP's initiatives; the recruitment strategy for the education of the researchers is developed and provides a number of tools and applications, which include the use of the library resources "on-site" and remotely. Moreover, the Networking strategy involves University units, which are seeking for collaboration opportunities and disseminate collaboration possibilities, express of interest and other calls for research proposals.



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CONCLUSIONS – SUMMARY. LESSONS TO BE LEARNT FOR FUTURE TEAMING /TWINNING CALLS

The Centres of Excellence's potential, as well as their internal and external environment was examined in view of their capacities for successful response to Teaming and Twinning calls. The analysis of the available case studies on CoEs revealed certain structural features and trends in their development which may support the **successful participation** in Widening activities - towards key players within a regional ecosystem and international stakeholders in research and innovation. The study also revealed certain **barriers**, both as Centres' weaknesses and threats impairing significantly a Centre's position in applying for support. The results in regard to the 4F model i.e. Finance, Fame, Framework and Fuss are summarized as follows.

FINANCE

Regarding Finance, both the stable financial portfolio and the ability to attract and generate funds in the region were taken into consideration. The case studies clearly indicated the strengths in the relatively **high ability to obtain regional/national and Framework Programmes funding schemes, such as REGPOT**. This reflects the Centres' capacities to complement statutory funding in order to extend their research agendas and to build links at the international level. Horizon 2020 was occasionally mentioned as an opportunity for diversifying the CoEs'

financial portfolio. However, the benchmarking revealed as one of the most common **weaknesses** among centres **a strong dependency on regional / national funding, that is, more funding obtained in grants than through collaboration with industry or 3rd parties**. This phenomenon might reflect a general feature of financial strategies applied within the Centres focusing rather on R&I funding programmes instead of generation of revenue as a result of a business model implementing commercial cooperation in the ecosystem. It should, however, be underlined that the financial portfolio significantly differs in the case of Centres operating in applied research to those active in basic research.

FAME

Under the Fame criteria, CoE's research potential and capacities, as well as ability to generate new knowledge were assessed. The analysis clearly indicates several trends in the Centres development which are as follows: **emphasis on internationalisation of activities**: i.e.: multinational research staff employed, participation in Framework Programmes, implementation of international PhD Programmes, memoranda of understanding signed with international partners, participation in international networks; **modern research infrastructure**; **improvements in research potential** i.e. increase of



no. of patents/ patent applications (in case of entities operating in the field of applied research), recruitment of international staff, building links with industry, improvement of impact factor in research publications; **multidisciplinarity** in research and innovation activities (e.g. integrating ICT in various societal challenges). It must be stressed that the directions are **in line with the EU environment and strategies** giving priorities to innovation, internationalisation of science and innovation (e.g. increased interactions, funds supporting international collaboration – Widening activities, MSCA etc.) as well as priority to multidisciplinary research. In spite of positive changes, still in case of many centres, **a lack of critical mass with regard to international partners in joint research agendas and the staff** was declared.

FRAMEWORK

Framework reflects the CoE's active role in the ecosystem, ability to effectively establish new, or to join existing networks as well as to adopt a new governance model. The study clearly indicates changes of the governance models, the most common being **an implementation of external evaluation and moving towards fostering interaction with external partners within the ecosystem**. Last but not least, many Centres underlined that their **research and innovation agenda is embedded in regional smart specializa-**

tion strategies and EU strategies. However, in many cases, changes in business model are still insufficient – many Centres are suffering from **lack or weak IP and recruitment strategies**. One of the major obstacles to establish solid links with external partners was the **lack of expertise in promoting technology** transfer through e.g. an in-house technology transfer unit. Selected Centres also stated having **weak branding** which has negative influence on collaboration within the ecosystem.

FUSS

The Fuss criterion reflects barriers in regard to internal and external aspects. As external barriers, the following aspects were often mentioned: **lack of funding** for R&D activities at the regional / national level, **weak governance of R&D** at the national level (e.g. lack of transparency in regional /national funding programmes), **ambiguous legal regulations** and **administrative burdens** as obstacle to internationalisation, and possibly as a consequence of the aforementioned, a relatively low success rate in Horizon 2020. Furthermore, the brain drain of scientists resulted in a lack of young and experienced researchers in certain regions (lack of PhD students as well). Many Centres argued as well that **internal administrative procedures** have a negative impact on their capacities and development. These barriers

have a significant negative influence on the three other groups of criteria i.e. Finance, Fame and Framework, which might significantly limit the Centres capacities to participate in Widening activities.



PRESENTATION OF THE NCP_WIDE.NET PROJECT

The main aim of the NCP_WIDE.NET project is to create a transnational network of National Contact Points (NCPs) for Spreading Excellence and Widening Participation under Horizon 2020 in order to facilitate transnational co-operation between NCPs, with a view to identifying and sharing good practices and raising the general standards of support to program applicants.

Special attention is given to help less experienced NCPs which are requiring the know-how accumulated in other countries and access to wiring resources in the network, through mentoring visits, a learning platform for trans-national activities of the Spreading Excellence and Widening Participation NCPs, and to create a network of NCPs exploiting the synergies of distributed knowledge, collective development and trainings. The focus is put as well on enhancing and equalling the level of expertise, professional services, diminishing disparities

among widening and non-widening countries and increasing participation of less experienced countries in Teaming, Twinning, ERA Chairs and COST projects. Our methodology to meet the previously established goals is simple and includes, in particular:

- transfer of knowledge,
- capacity building,
- of stakeholders satisfaction,
- workshops and trainings addressed to NCP needs expressed during the self-evaluation exercise,
- networking meetings,
- trans-national collaborative events, as well as mentoring visits dedicated to less experienced NCPs.

We are 37 NCPs from the EU and Associated countries who are the NCP.WIDE.NET members. We focus on Widespreading the NCPs' capacity building and exchange of practices, as well as supporting NCP expertise on widespread activities. We enhance NCP collaboration and foster synergies. Lastly, we put an emphasis on dissemination activities regarding the project through the Project Portal, promotion via social media, participation in transnational brokerage events, joint workshops and cooperation with other networks.





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