Stairway to Excellence
Cohesion Policy and the Synergies with the Research and Innovation Funds

Example of Synergies

Ruđer Bošković Institute (RBI)

Croatia

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EXECUTIVE SUMMARY

The case study outlines upstream sequential type of synergies developed at the Ruđer Bošković Institute in Zagreb, Croatia in the research area of biomedicine. The IPA project „Creation of research related infrastructure for Translational Medicine and Applied Genomics“ enabled initiation of a complex research programme which would provide cross-functional and project-oriented alignment of resources and expertise along the value chain leading towards an innovative product in the field of biomedicine. The research expertise and equipment, as well as project management capacities obtained in that project facilitated the development of the much larger FP7 REGPOT project („Enhancement of the Innovation Potential in SEE through new Molecular Solutions in Research and Development“). In particular, the newly acquired infrastructure for custom microarray production and analysis represented a major leap for capabilities towards applied biomedical research. These capabilities will be strongly expanded by the REGPOT project, which will create new opportunities for synergies with different SF, H2020 and other projects. The resulting project pipeline will enable elucidation of molecular processes in health and disease from different angles using a variety of molecular approaches, and thus increase innovation potential in order to contribute to new avenues of molecular biosciences research. The whole process contributes to the flagship project of the RBI, Open Scientific Infrastructural Platforms for Innovative Applications in Economy and Society (O-ZIP), which entails development of several scientific and technological platforms, in which the RBI has a demonstrated comparative advantage (biomedicine, advanced technologies and materials, marine and environmental research, ICT).

Type of synergies
- Upstream activities
- Sequential funding

S&T field targeted by the synergies
- Biotechnology
- Health

The views expressed are purely those of the author and may not in any circumstances be regarded as stating an official position of the European Commission.
1. Introduction

The case presented in the following sections is one of the examples of synergies provided by the ‘Stairway to Excellence’ project in which different sources of funding have been combined to amplify the R&I investments and their impact on the economy and wider society.

As described in the guide ‘Enabling synergies between European Structural and Investment Funds, Horizon 2020 and other research, innovation and competitiveness-related Union programmes1’, synergies can be achieved through:

- Sequential (or successive) funding that use funds in separate projects built on each other;
- Parallel funding that use funds in separate projects complementing each other;
- Simultaneous/cumulative funding that brings together Horizon2020 and ESIF funds in the same project aimed at achieving greater impact;
- Alternative funding that reorients FP7/Horizon 2020 projects that were positively evaluated, shortlisted, but not funded given the limited budget, towards Structural Funds impact.

The combination of sources of funding is used to address two types of activities:

- Upstream activities build the appropriate capacities to perform research. They can be capacity building in physical capital (construction or improvement of research infrastructures, purchasing equipment, (including IT equipment and connections, data storage capacities), innovation infrastructures (LivingLabs, FabLabs, Design factories, etc.) and social capital (assistance for building networks, clusters and consortia).
- Downstream activities are focussed towards the market and the creation of economic value. They can be applied to research, development and demonstration activities, technology transfer and adoption; technology and innovation audits to identify potential demand for RDI results; proof-of-concept funding; pilot lines for first production; and pre-commercial procurement projects. There can also be activities to support the improvement of the innovation eco-system in a territory.

2. Context

The Instrument for Pre-accession Assistance (IPA)2 project enabled initiation of a complex research programme which would provide cross-functional and project-oriented alignment of resources and expertise along the value chain leading towards an innovative product in the field of biomedicine.

The Action “Creation of research related infrastructure for Translational Medicine and Applied Genomic’ is implemented through a Science and Innovation Investment Fund (SIIF), on the important tools within IPA, at the Ruđer Bošković Institute.

The action provides an opportunity to enhance capacities and capabilities at Ruđer Bošković Institute and beyond, and to step up to the next level of modern research and innovation. The combination between Know-How, expertise and cutting-edge technology will support new partnerships between research entities, clinics, academia, and industry for future European collaborative research.

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2 Instrument for Pre-accession Assistance (IPA) was an instrument similar to SF, which was implemented in Croatia prior to EU accession.
3. Implementation

Figure 1 maps the project chronologically, the research activities of the organisation and the type of funding. It aims to give a picture of relations between projects revealing planned or unplanned dependencies (synergies) between projects and their source of funding.

Figure 1: Diagram of chronology of the main projects involved in synergies

IPA Project 1: Creation of research related infrastructure for Translational Medicine and Applied Genomics (IRB Transmed), 2010-2012 (€0.49m)

FP7 Project 1: FP7 REGPOT 2012-2013-1: Enhancement of the Innovation Potential in SEE through New Molecular Solutions in Research and Development (InnoMol), 2013-2016 (€5.31m)

Added value / complementarities created by the synergies
The IPA project provided a PhD fellowship, experience on up-to-date equipment, as well as strengthened the exposure to the international research community. Despite a relatively brief duration (18 months) and low budget (€0.49m), five ISI publications were created. Moreover, the project enhanced capabilities for research and technology commercialisation. The research expertise and equipment, as well as project management capacities obtained in the IPA project facilitated the development of the much larger REGPOT project. In particular, the newly acquired infrastructure for custom microarray production and analysis represented a major leap for capabilities towards applied biomedical research. These capabilities will be strongly expanded by the REGPOT project, which entailed further expansion of up-to-date research equipment, hiring of new researchers (some of whom were attracted from abroad), and enabled partnerships with 35 research organisations and one SME across Europe. Effective implementation and the results obtained within the current REGPOT project sets RBI on the path of research and innovation excellence, which would create new opportunities for synergies with different SF/ESIF, H2020 and other projects. The resulting project pipeline will enable elucidation of molecular processes in health and disease from different angles using a variety of molecular approaches, and thus increase innovation potential in order to contribute to new avenues of molecular biosciences research.

Mechanisms facilitating the synergies
The synergies have mostly developed through the initiative of the RBI research team and management. The initial IPA project enabled capacity building and some research infrastructure, which were utilised to develop the larger REGPOT project. No external mechanisms facilitated the synergies has played a major role.
Main problems encountered in implementing the synergies
The main problem was a lack of experience in implementing the synergies by combining IPA/SF funding with FP7 funding.

Suggestions to improve the synergies
Much stronger synergies will be enabled once the key infrastructure project of the RBI, Open Scientific Infrastructural Platforms for Innovative Applications in Economy and Society (O-ZIP) is implemented. The O-ZIP project entails development of several scientific and technological platforms, in which the RBI has a demonstrated comparative advantage (biomedicine, advanced technologies and materials, marine and environmental research and ICT). The project has been included in the Competitiveness and Cohesion Operational Programme 2014-2020. Simultaneously, RBI is developing and implementing a portfolio of complementary projects (including two recently launched ERA Chair grants). This combination of research excellence, high quality research infrastructure and efficient project management will enable strong synergies in the future. The policy-makers in Croatia could contribute to that process by alignment of SF projects with successful (or at least highly evaluated) H2020 projects, in terms of call deadlines, the eligibility and evaluation criteria and efficient submission and evaluation of project proposals.

Main motivations in implementing the synergies
The main motivations in implementing the synergies include the need to improve research infrastructure, overcome budgetary limits imposed by national funding bodies, as well as to internationalise research activities and link provide foundations for future research and innovation commercialisation.

Facilitating mechanisms for the take up of the scientific results
- RBI has had a Technology Transfer Office (TTO) company called Ruđer Inovacije, which was originally funded through the Science and Technology Project supported by the World Bank. However, exhaustion of that source of funding led to reduction of activities and there is a need to restructure and give a new strategic direction to Ruđer Inovacije, which is currently being implemented.
- IPR regulations in principle enable collaboration and knowledge transfer, but the concrete terms of such collaboration and knowledge transfer need to be negotiated for each case.

Impact on the regional / national economy
The projects described here have a potential to make an impact on the regional economy, but that process is still in the initial stage. The effects that may be expected in the future include improved scientific reputation, attraction of highly competent research staff, new investments into R&D and science-industry collaboration, and, eventually, job creation through new technology based start-ups and innovation-related projects implemented by existing companies.

Figure 2 aims to position projects according to the activities they cover; from upstream (infrastructures, equipment, research activities) to downstream related activities (innovation, knowledge transfer, access to market).
Figure 2: Diagram of the complementarities of the funds in the knowledge triangle/flow

IPA PROJECT 1:
research facilities;
research activity

FP7 Project 1: FP7 REGPOT 2012-2013-1;
research facilities;
research activity; staff recruitment; twinning; IP development

Research
(Research Infrastructures,
facilities,
Research activity etc)

Training
(Continuous professional
training, PhD fellowships)

Innovation
Knowledge dissemination,
knowledge transfer events,
funding of the KTOs etc.
4. RELATED PROJECTS

Name of the IPA PROJECT: Creation of research related infrastructure for Translational Medicine and Applied Genomics (IRB Transmed)
- Budget: €491,485.24
- Time frame of the IPA funded project: 2010 -2012
- Main objectives and type of costs covered: enhanced capabilities for research and technology commercialisation, development of a new technology platform (microarray facility) for production of affordable DNA and protein microarrays, microarray prototypes, improved clinical screening programme; the main types costs covered include staff and equipment costs, as well as external services, travel, visibility and overhead costs.

Name of the FP PROJECT: Enhancement of the Innovation Potential in SEE through New Molecular Solutions in Research and Development (InnoMol)
- FP funding scheme: FP7 REGPOT 2012-2013-1
- Budget: €4,738,978.00
- Time frame of the FP funded project: 2013 - 2016
- Main objectives and type of costs covered: unlocking and developing emerging excellence at the RBI in molecular biosciences, strengthening the capacities of the RBI researchers to successfully participate H2020 and establishing synergies with relevant EU initiatives, forging science-industry partnerships; the main types costs covered include staff and equipment costs, incoming/outgoing secondments, indirect costs, travel costs, conferences, workshops and visibility costs.

ABBREVIATIONS

AHCY  adenosylhomocysteinase
IPA     Instrument for Pre-accession Assistance
O-ZIP   Open Scientific Infrastructural Platforms for Innovative Applications Economy and Society
RBI     Ruđer Bošković Institute
TTO     Technology Transfer Office
ANNEX I. DETAILED PROJECT INFORMATION

IPA FUNDED PROJECT

Project title: Creation of research related infrastructure for Translational Medicine and Applied Genomics (IRB Transmed)
Weblink: http://ipatransmed.irb.hr/
Beneficiary: Ruđer Bošković Institute (RBI)
Type of institution: PRO
Budget:
- Total Investment: €491,485.24
- EU contribution: €368,613.63
- Other contributors (national sources): €122,871.31
Time frame of the project: 2010-2012

Main project objectives:
The main project objectives included:
- Enhancing research capacities and capabilities
  - Improving capacities related to commercialization activities and technology transfer towards industry
  - Increasing visibility at European and international level
  - Contributing to European expertise and excellence in science and technology

The expected results included:
- New technological platform – first of its kind in Southeast Europe
- Sustainable microarray facility on pay-for-use basis for production of affordable DNA and protein microarrays
- Microarray prototypes
- Increased knowledge and know-how, and improved human potential
- Increased visibility at European and international level
- Improved clinical screening program for detection of new cases of AHCY deficiency based on new technology
- Maintenance of leading position in human AHCY deficiency research worldwide

Specific goals (expected output)
Create research related infrastructure for Translational Medicine and Applied Genomics with a state-of-the-art-environment to support novel high-throughput methods based on microarray-technology for subsequent technology transfer activities, and particularly enabling new instrumentation for custom microarray production and development of new array prototypes in order to enhance research capacities and capabilities and improve capacities related to commercialization activities.
- Job creation: 12 month employment of experts
- Short term PhD fellowships: 6 months
- ISI papers: 5
Collaborative work within the project
The project was implemented in full collaboration with the School of Medicine of the University of Zagreb; R&D activities which were performed there were coordinated by Professor Ivo Barić. That also entailed collaboration with University Hospital Centre Zagreb where Professor Barić and his team perform clinical practice. One out of three project jobs was created at the School of Medicine.

Type of costs covered:
- Research infrastructures, research equipment: approx. €250.000,00
- Consumables: approx. €45.000,00
- Short-term training: €1.600,00
- Salaries: approx. €86.000,00
- PhD fellowships: €16.788,00

Main Results
Operational research facilities:
- Microarray facility on pay-for-use basis for custom production of DNA and protein microarrays:
  - Bioinformatical services (statistical data analysis services for customers, normalization of array data using variance stabilization normalization, statistical analysis of differential binding to arrays performed using linear models and empirical Bayes models)
  - Bioanalyzer services (analysis of Protein purity and integrity, analysis of DNA purity and integrity, analysis of RNA purity and integrity)
  - Bioreactor services (recombinant protein production from hORFeome collection of human genes)

ISI papers:
5 publications with equipment used from IPA project

Difficulties encountered at the stage of drafting the proposal
When it comes to the main difficulties encountered at the stage of drafting the proposal, they were primarily related to the complexity of the administrative paper work. These tasks can often become a burden on the research staff. Although the administrative work was demanding, RBI benefitted from its in-house resources - competent research staff (with experience in elaboration of project proposals) and Office for Projects and International Cooperation (which provided additional support). Other potential difficulties (clarity of application rules and eligibility criteria, changes in rules, procedures and criteria, timing of calls) did not pose a problem.

Concerns regarding the evaluation:
When it comes to the issues related to evaluation, no major concerns have affected the project. The evaluation criteria were reasonably clear and the evaluation procedure was sufficiently transparent. Since the evaluation procedures and criteria were complex, there have been some concerns regarding the efficiency of the whole process. On the other hand, there were no reasons to question the professionalism of evaluators or expect political influences or other external pressures on the evaluation process and the selection of the successful proposals.

Difficulties during the implementation of the project
As for the difficulties related to project implementation, the main challenge was the administrative work. Project implementation is administratively demanding and often required a lot of communication with Central Finance and Contracting Agency. Moreover, Procurement (which was done in accordance with PRAG) has sometimes been challenging. However, given the administrative capacity of the RBI, the support for the administrative work was given to the project team. There were no major issues related to cost eligibility, changes in the regulations and legislations or delay of payments.
Facilitating mechanisms during the draft proposal/implementation

The RBI facilitated proposal development, project application and implementation. The specialised Office for Projects and International Cooperation, which has provided support, was set up in 2006 and gathered substantial experience since then. The researchers involved in drafting the proposal received their regular salaries. No additional external support or assistance with the draft proposals was received.

As for the crucial strengths of the proposal to become successful, the project relied on the previous research experience, but it also opened up new opportunities. It was developed as a stepping stone in the improvement of research infrastructure at the RBI (which will culminate with the O-ZIP project). The project was designed and implemented in partnership and commercialisation potential was also taken into account.

When it comes to the suggestions to policy makers to facilitate the participation in SF, the policy makers should have a strategic approach in which priorities are well defined, rules are clear, and the projects are efficiently evaluated and implemented. Excellent research projects with an international dimension, as well as those which aim towards innovation, business creation and science-industry cooperation should be supported more strongly.

Future R&I performers which develop SF projects should bear in mind that the R&I projects should stem from national and organisational strategies and identified needs and opportunities, rather than be developed opportunistically – e.g. to fit the requirements of specific calls or wishes of specific departments. Each organisation should develop a pipeline/portfolio of project ideas which can be developed further, adjusted to specific calls and implemented over a longer time period. R&I performers from public and private sectors should be more willing to strategically cooperate, pool resources and share risks.

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**FP7 Funded Project**

**Name of the FP project:** Enhancement of the Innovation Potential in SEE through New Molecular Solutions in Research and Development (InnoMol)

**Weblink:** http://www.innomol.eu/

**Project reference:** http://cordis.europa.eu/project/rcn/108708_en.html

**Beneficiary:** Ruđer Bošković Institute (RBI)

**Type of institution:** PRO

**Budget:** €4,738,978 (EU contribution €4,738,978)

**FP funding instrument**
- Funding scheme: CSA-SA - Support actions
- Subprogramme: REGPOT-2012-2013-1 - Any research topic covered by the EU FP7
- Call for proposal: FP7-REGPOT-2012-2013-1

**Time frame of the project:** 2013 - 2016

**Main project objectives**
- Stimulate the realisation of the full research potential of RBI by unlocking and developing emerging excellence in the Molecular Biosciences
- Help RBI to become a dynamic leader in Molecular Bioscience research in South Eastern Europe
- Help to strengthen the capacities of RBI researchers to successfully participate in research activities at the Community level, including FP7 and Horizon 2020
- Contribute to new innovative avenues for R&D in Croatia and the region
- Stimulate the realisation of synergies with European initiatives related to InnoMol such as the European Technology Platforms
- Help to forge strategic partnerships between RBI and appropriate SMEs
- Raise awareness for the use of innovative technology for improved R&D
- Stimulate the realisation of sustainability after project completion

**Specific goals (expected output)**
- Foster a research pipeline at the Ruđer Boskovic Institute (RBI) and facilitate new avenues of innovation and technology for the investigation of relevant diseases.
- Future development of possible diagnostic, preventive and/or therapeutic approaches for the major diseases of the world.
- Enable access to a centre of excellence that can provide the cross-functional and project-oriented alignment of resources and expertise along the value chain leading towards an innovative drug.
- Bring together and reinforce 3 major worlds of life sciences, e.g. medicine, biology, and chemistry to create a productive, state-of-the-art environment that is unique in the region and will bridge the gap between the pre-commercial and commercial phases of R&D, thus enhancing the relevance of the RBI’s position in the European Research Area (ERA).
- Enable inter- and, multidisciplinary research in the field of molecular biosciences with focus on DNA-protein, protein-protein, protein-RNA, DNA-RNA and DNA-DNA interactions

**Collaborative work within the project**
The project entails collaboration with a wide network of 35 HEIs and PROs (mostly from the EU, and one from Israel), as well as an SME which is a pioneer in personalised medicine (Progenika Biopharma SA, headquartered in Bilbao, Spain and Cambridge, MA, USA). The collaboration will involve twinning activities, for which a significant part of the budget (€1m) has been allocated.
Type of costs covered:
- Personnel: €1,755,675
- Research equipment/upgrades/software licenses/consumables: €1,507,896
- Incoming/outgoing secondments: €726,000
- Indirect costs: €309,437
- Travel: €202,970
- Conferences/workshops: €129,000
- Visibility /dissemination activities: €74,300
- Ex-post evaluation: €66,740
- Other: (subcontracting & IP costs): €19,000

Main Results
The main results of the project include operational up-to-date research facilities, publications, attraction / post-doctoral researchers from abroad, international exchange of know-how, as well as organisation of international conferences, workshops and lectures. When it comes to acquisition of equipment, major equipment obtained through the project includes next generation sequencer (NGS), automated NGS library preparation system, confocal microscope, 2D protein purification for downstream mass spectrometry analysis etc. The project involved reintegration of a Croatian national with who finished PhD in Sweden and it also attracted 2 postdoctoral experts from abroad (Spain, UK). Exchange visits amounting to 115.5 person/months in total are organised at 36 partnering organizations throughout Europe. Within the project, 2 conferences have been organised (3rd Croatian Microscopy Congress, April 26 - 29, 2015, in Zadar, Croatia and Epigenomics conference, April 24 – 28, in Dubrovnik, Croatia), as well as 5 workshops (3 of them implemented so far at RBI (Proteomics, April 7-9, 2014; Bioimaging, October 20-22, 2014; Molecular interactions, 1-3 June, 2015). So far, 11 ISI publications were published due on the basis of research activities undertaken within the InnoMol projects. Since the project is still being implemented, other publications will follow.

Difficulties encountered at the stage of proposal drafting
When it comes to the main difficulties encountered at the stage of drafting the proposal, they were primarily related to the complexity of the administrative paper work. These tasks can often become a burden on the research staff, especially given the fact that the most ambitious projects tend to be developed by the most competitive research groups, which both have above-average research productivity and simultaneously cope with a lot of paper work. Although the administrative work was demanding, RBI has competent research staff and Office for Projects and International Cooperation that provided support. Other potential difficulties (clarity of application rules and eligibility criteria, changes in rules, procedures and criteria, timing of calls) did not pose a problem.

Concerns regarding the evaluation:
When it comes to the issues related to evaluation, no major concerns have affected the project. The evaluation criteria were reasonably clear and the evaluation procedure was sufficiently transparent. There was no reason to question the professionalism of evaluators. The RBI staff has experience in drafting proposals and evaluating FP projects and took into consideration potential strengths and weaknesses of the proposal. Due to its competencies, the RBI is relatively less affected by the structural disadvantages of Croatian R&I performers compared to EU15 performers (e.g. R&D underfunding, lack of internationalisation, weak science-industry linkages). Moreover, being aware of the evaluation criteria, the project team designed the project in a way to both take advantage of RBI leading role in Southeast Europe and to establish or strengthen the linkages with a network of top research institutions in Europe.
Difficulties during the implementation of the work:
As for the difficulties related to project implementation, the main challenge was the administrative work. Project implementation is administratively demanding. Procurement has sometimes been challenging. However, given the administrative capacity of the RBI, the support for the administrative work was given to the project team. Work flexibility is a part of organisational culture so there were no obstacles to participation in international meetings and conferences. Although RBI has a strong reputation and a long tradition of receiving incoming foreign researchers, additional efforts are still needed to attract foreign or bring back excellent Croatian PhD / post-doc researchers from abroad. There were no major issues related to cost eligibility or delay of payments.

Facilitating mechanisms during the draft proposal/ project implementation
The RBI facilitated proposal development, project application and implementation. The specialised Office for Projects and International Cooperation, which has provided support, was set up in 2006 and gathered substantial experience since then. The researchers involved in drafting the proposal received their regular salaries. No additional external support or assistance with the draft proposals was received.

Other push – pull factors that may affect the R&I performers in applying/ being successful in FP calls
So far there has been no competition with more easily accessible national opportunities for funding. This was due to limited opportunities related to structural funds, as the main potential source of competition. But in the future some institutions with scarce resources for project development and management may try to focus on SF projects, rather than adopting a balanced approach between SF and H2020, as RBI has been doing.

RBI is well positioned and does not suffer from the lack of awareness. However, for the institutions with less experience and limited linkages with foreign partners, it may be difficult to find appropriate calls for proposals, find new research partners and establish effective collaboration.

As for the qualified professionals and research project managers, these practical skills can only be developed through project work, i.e. it is necessary to obtain a strong project portfolio whose implementation will also contribute to acquisition of skills and experience of the staff.

NCPs can and do provide some support, but the majority of the work has to be done at the institution that develops the project or takes part in it.

There are gaps in the quality of the research base in Croatia, which will limit the participation of some HEIs and PROs in H2020 projects. This can only be tackled in the long term, through reform of these institutions and of the national system of innovation. SF projects can be helpful in this regard.

Disconnection from the international research community (lack of funding for participation in international conferences etc.) is a major issue for many R&I performers with less experience, limited resources and weak linkages with foreign partners. It is often difficult for them to take part in H2020 projects.

Which were the strengths of the proposal to become successful?
The project relied on the previous research experience (including an IPA project), but it also opened up new opportunities, which will also be utilised in the design of future projects (in particular, O-ZIP). The project was designed and implemented in partnership and commercialisation potential was also taken into account. The project team designed the project in a way to both take
advantage of RBI leading role in Southeast Europe and to establish or strengthen the linkages with a network of top research institutions in Europe.

Suggestions to policy makers to facilitate the participation of national R&I performers in H2020
The current focus of HEIs and PROs on SF projects should be used as a leverage to improve capabilities related to H2020 projects and the willingness of HEIs, PROs and businesses to engage in them. This will not only prevent crowding out of H2020 projects (which may be perceived as riskier), but also facilitate synergies. The problems of HEIs and PROs which have insufficient administrative capabilities for project development and implementation should be tackled by appropriate policy measures – e.g. through capacity building or joint project offices.

Advise to R&I performers willing to apply
The projects should stem from strategies and identified needs and opportunities, rather than be developed opportunistically – e.g. to fit the requirements of specific calls or wishes of specific departments. Each organisation should develop a pipeline/portfolio of project ideas which can be developed further, adjusted to specific calls and implemented over a longer time period. R&I performers from public and private sectors should be more willing to strategically cooperate, pool resources and share risks.

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