Stairway to Excellence

Cohesion Policy and the Synergies with the Research and Innovation Funds

Example of Synergies

Innovative therapeutics in Alsace Region through the case of the biotech SME Rhenovia-Pharma

France

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Executive Summary

Alsace has been characterised by an important manufacturing sector that consists mainly of small and medium-sized enterprises, with a high proportion of jobs in production. Despite a low level of R&D investments due to weak business expenditure in R&D, Alsace enjoys a large public research sector and strong scientific potential in specific research areas. As regards pharmaceuticals and biotechnologies, the Alsace Region holds 5% of French patents and is the second highest region in France in terms of the number of enterprises it holds, scientific publications it produces and in its collaboration with industries and researchers. The regional innovation strategy led to the creation of Alsace Innovation, whose mission is assisting companies and help the emergence of innovative.

Type of synergies

- Upstream and downstream activities
- Sequential and parallel funding

S&T field targeted by the synergies

- Medicine, biology

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 programmes’, 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 focused 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

**Alsace Region socio economic context.** Despite a low level of R&D investments due to weak business expenditure in R&D, Alsace enjoys a large public research sector and strong scientific potential in specific research areas. As regards pharmaceuticals and biotechnologies, the Alsace Region holds 5% of French patents and is the second highest region in France in terms of the number of enterprises it hosts scientific publications it produces and in its collaboration with industries and researchers. It gathers 10% of French employment in the sector and 15% of R&D workers. The field of biotechnologies, therapeutics and medical treatments also represents an important area of specialisation for the Region.

**The Alsace Smart specialisation strategy.** The innovation potential is reinforced by the Regional Innovation Strategy designed in 2009 defined by the state and the Alsace Region to promote innovation in Alsace territory. The Regional innovation strategy has been completed by the smart specialisation strategy published in 2014.

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2 Regional Innovation Monitor - Directorate-General Enterprise and Industry -2012
Regional research capabilities are mainly oriented towards basic research, and predominate in the chemistry, life sciences and physics sectors. The University of Strasbourg ranked 16th in the Shanghai list (2013) in the field of chemistry, also appears in the fields of life science, mathematics and physics³.

**Governance of Research and innovation in the Region.** The regional innovation strategy led to the creation of Alsace Innovation, whose mission is assisting companies and help the emergence of innovative projects as well as the creation of structuring organisation as *Conectus Alsace* which aims to favour technology transfer.

At strategic level, the regional innovation governance system is based on a State /Regional Authority partnership which is a common characteristic of the French regions. The Strategic Committee for Innovation involves the Regional Council services (including the EU fund management service) and the regional based State services, the National Innovation Agency (BPI France) and the Regional Innovation Agency (Alsace innovation). This committee discusses and validates the orientation and strategy, the supporting programmes and can also order evaluation and impact assessment studies.

**Implementation of synergies at regional level.** Alsace Region is hosting the cluster *Alsace Biovalley*. *Alsace Biovalley* is one the 71 competitiveness clusters launched in France since 2004. A competitiveness cluster brings together large and small firms, research laboratories and higher education organisations all working together in to develop synergies and cooperative efforts. Other partners outside the region may be brought in, such as public authorities, either local or national, as well as firms providing business services for instance.

More concretely, Alsace Biovalley is a non-profit organisation aiming at being a one-stop contact for R&D projects and business development in Health sector for companies, researchers, academic institutes and economic partners. As the entry point is sectoral (Health/biotech theme) the cluster is an important key player in the building of synergies of funding acting as an interface between all public funding (EU, regional and national) and also private funding (Banks, Venture capital public etc.)

### 3. IMPLEMENTATION

Rhenovia Pharma⁴ is an R&D pharmaceutical and biotechnology SME dedicated to global healthcare in the field of central and peripheral nervous system (C&PNS).

The company has been founded in 2007 by an international team highly committed to find new solutions to treat Alzheimer’s disease (AD) and other diseases of the central nervous system (CNS). The company is defining itself as a one stop shop biotech company performing studies, providing services, establishing alliances based (i) on unique biosimulators and computer assisted biological mechanistic approaches, (ii) on internal expertizes in drug discovery, pharmacology, chemistry and medicinal chemistry, as well as information technologies and biophysics (iii) on services complemented, strengthened and supported by appropriate and most useful experimental approaches via our own dedicated industrial, CRO and academic partners.

At present Rhenovia Pharma is mainly financed by revenues of private and public contracts and backed by the shareholders (founders and directors, and business angels) and employs permanently less than 20 persons in 2015. As most of the Biotech companies, the company remains highly dependent of public support to develop its R&D.


⁴ [http://www.rhenovia.com](http://www.rhenovia.com)
With a limited human resource capacity, the company is benefiting of a large spectrum of existing public aids at regional, national and European level to support different type of activities or equipment (development of a simulation platforms, training, research activities etc.) and developed expertise in various Research and innovation programmes (EUROSTARS, EU FP, Rapid programme from French Armament directorate, Innovation challenge from French Ministry of Economy).

In terms of research activities, the company develops in parallel products related to (i) biosimulation and (ii) drug and Trans-dermal therapy delivery through “smart” patch (see following figure). These two main activities may address different markets but they are linked and complement each other (e.g.: the biosimulation platform\(^5\) is used to predict the effect the patch on the organism). For instance, the FP7 project MOD ENP TOX launched in 2013 complements the EUROSTARS project finished in 2011. These projects are using the biosimulation platform co-funded by Structural funds (ERDF) in 2010.

In order to facilitate the access to the market its products, Rhenovia-Pharma won in 2014 the step of Innovation 2030\(^6\), the worldwide innovation challenge launched by the French Ministry of economy, to identify and provide support for the growth of both French and foreign entrepreneurs whose innovation projects have significant implications for the French economy.

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.

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\(^6\) [http://www.entreprises.gouv.fr/node/168519](http://www.entreprises.gouv.fr/node/168519)
Figure 1  Projects supported public funding in the two main activities of the company since 2008

**ERDF Project:** Development of a biosimulation platform (2010, Total cost: 390 K€; ERDF funding 56 K€)

**FP7 Project 1:** MOD ENP TOX Application of Biosimulation (2013-2015, 1.4 M€)

**National Project 1:** Project selected by the Cluster Alsace Biovalley and funded by the Ministry of Economy RHENEPI Development of a biosimulation platform for epileptic crisis to identify and test new therapies

**National Project 2:** RAPID programme on dual technologies RHETOX Development of a biosimulation platform to analyse the impact of neurotoxins on brain function and antidotes (2011-2014, 1.1 M€)

**EUROSTARS programme:** ALTHERAS Development of a new medical treatment tool (2008-2011, 913 K€)

**FP7 Project 2:** SELFMEM Application of filtration technology (2009-2012, 5.2 M€)

**National Project 3:** French Worldwide Innovation Challenge SMARTT e-Patch New electronic transdermal patch (2014-?, 200 K€+?)

**Added value / Complementarities created by the synergies**

- The research strategy of Rhenovia Pharma is partly implemented through a combination of public supports (regional, national and European).
- There is some overlapping between programmes along the value chain starting from research infrastructure and equipment until the commercialisation of a product or a service by the company.
- Direct subsidies provided by programme such as the framework programme are preferred to other form of support.
- Despite 5 unsuccessful proposals submitted to Horizon 2020 representing a costly investment for the company, there were some (unexpected) spillovers by the creation of new networks of partners. These networks of research partners seem to last in the time in spite of absence of immediate public support.

**Mechanisms facilitating the synergies**

- The company is informed regularly about the various possibilities of funding by the biotech cluster Alsace Biovalley. The non-profit association supporting the cluster can also act as...
intermediary between the company and organisation abroad. Alsace Biovalley has engaged a long lasting cooperation with the biotech Canadian cluster CQDM.

- The innovation agency Alsace innovation and the H2020 national contact point are providing useful information about funding opportunities. The innovation agency has a pragmatic approach in terms companies targeted. According to the company, the agency has developed a ‘toolbox’ and identifies the most appropriate source of funding corresponding to the activity and objectives of the company.
- More and more public support is provided for biotech activities, the company dedicates resources to monitor new funding opportunities.
- Complementing direct research support, Rhenovia Pharma is benefiting from research tax credit and has obtained from the French Ministry of higher education and Research the agreement that recognizes its ability to carry R&D studies that are eligible to tax credit for other companies (research provider label).
- In order to train potential future employees to its own need, Rhenovia is welcoming two Phd students benefiting from public support CIFRE\(^7\) allowing Phd students to write their thesis part time in academic laboratory and part time in enterprises.
- To inform on the potential collaboration and external sources of funding, Rhenovia is using Newsletters sent by the cluster or other expeditors.

**Main problems encountered in implementing the synergies**

- In spite of the funding possibility offered by the public-private partnership (PPP) IMI\(^8\) (innovative medicine initiative), Rhenovia does not participate to the call for projects launched by the initiative because of too complicated rules.

**Suggestions to improve the synergies**

- A more tailored service could be provided by the public support (e.g. assistance to proposals writing, IPR assistance)
- Eligible costs and funding thresholds are not the same among programmes. This creates an important loss of time and this prevents to focus only on scientific aspects of a project.

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\(^7\) [http://www.anrt.asso.fr/fr/espace_cifre/pdf/plaquette_cifre_en.pdf](http://www.anrt.asso.fr/fr/espace_cifre/pdf/plaquette_cifre_en.pdf)

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 Example of the use of various sources of funding between 2008 and 2015**

- **National Project 1**: Project selected by the Cluster Alsace Biovalley and funded by the Ministry of Economy: project RHENEPI
  Development of a biosimulation platform for epileptic crisis to identify and test new therapies (2010-2013, 2.5 M€)

- **National Project 2**: RAPID programme on dual technologies: Project RHETOX
  Development of a biosimulation platform to analyse the impact of neurotoxins on brain function antidotes (2011-2014, Total cost 1.1 M€)

- **EUREKA/EUROSTARS programme**: Project ALTHERAS
  Development of a new medical treatment tool (2008-2011, 913 K€)

- **FP/H2020**
  1. **Project SELFMEM**
     Application of filtration technology (2009-2012, 5.2 M€)
  2. **Project MOD ENP TOX**
     Application of biosimulation (2013-2015, 1.4 M€)

- **ERDF Project**: Development of a biosimulation platform (2008-2010, Total cost: 390 K€ ERDF funding 56 K€)

- **National PhD support (CIFRE mechanism)**

- **National Project 3**: French Worldwide Innovation Challenge: Project SMARTT e-Patch
  New electronic transdermal patch (2014-?, 200 K€+ ?)

**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

**EUREKA/EUROSTARS project: ALTHERAS - ALZHEIMER Transdermal Therapeutic Systems**
- Funding scheme: Eureka/Eurostars
- Budget: total cost 913 070 €
- Time frame of the project: 2008-2011
- Project reference: [https://www.eurostars-eureka.eu/content/eurostars-alttheras-project](https://www.eurostars-eureka.eu/content/eurostars-alttheras-project)
- Main objectives and type of costs covered: The objective of this project is to develop a transdermal therapeutic system (TTS) by implementing a rate-controlled systemic drug delivery mechanism to enable significant improvement in the individual medication of Alzheimer patients.
- Participants: 2, RHENOVIA PHARMA (France-Alsace)- Portmann Instruments (Switzerland)

**ERDF funded project (if applicable): Development of a biosimulation platform**
- Budget: 392 300 € (ERDF: 56 920 €)
- Time frame of the funded project: 2008-2010
- Main objectives and type of costs covered: Development of a biosimulation platform to analyse the impact of medicines on physiologic parameters. Keep competitive advantage and seize the opportunities to take in the domain of Alzheimer disease.

**FP7 PROJECT 1: SELFMEM**
- funding scheme: FP7/Nanosciences, Nanotechnologies, Materials and new Production Technologies
- Budget: Total cost: 5 209 774 €- Total FP7 contribution: 3 599 734 €
- Time frame of the project: 01/09/2009- 31/08/2012
- Main objectives and type of costs covered: The aim of SELFMEM is to develop innovation in the field of nanoporous membranes. This will be achieved by taking advantage of the self-assembly properties of block copolymers leading to highly porous membranes with adjustable, regular-sized pores of tail.
- Participants: 14, coordinated by HELMHOLTZ-ZENTRUM GEESTHACHT ZENTRUM FUR MATERIAL- UND KUSTENFORSCHUNG GMBH (Germany) and RHENOVIA PHARMA (France- Alsace) as partner

**National funding (FUI) for projects selected by competitiveness Clusters : RHENEPI**
- funding scheme: cluster label giving the possibility to the project to be funded by a national funding (Fond unique interministèriel)
- Budget: Total cost : 2.5 M€
- Time frame of the project: 2010- 2013
- Main objectives and type of costs covered: Development of a biosimulation platform for epileptic crisis to identify and test new therapies. The funding allows the recruitment of 6 researchers and engineers.
- Participants: 4
National Programme on dual-use technologies RAPID project: RHETOX

- funding scheme: RAPID programme (Support Regime for Dual Innovation in SMEs) supported by the French directorate for armament and Ministry of economy
- Budget: Total cost: 1.15 M€ - Total contribution: 850 000 €
- Time frame of the project: 2011-2013
- Main objectives and type of costs covered: The goal of the project is to broaden Rhenovia’s biosimulation platform to include the evaluation of the effects of exposure to neurotoxic chemical agents on the nervous system, and involves a partnership with the French Army’s Biomedical Research Institute
- Participants: RHENOVIA PHARMA, Institut de Recherche Biomédicale des Armées (IRBA)

FP7 PROJECT 2: MOD-ENP-TOX

- funding scheme: FP7/Nanosciences, Nanotechnologies, Materials and new Production Technologies
- Budget: Total cost: 1 385 240 € - Total FP7 contribution: 1 000 000 €
- Time frame of the project: 01/01/2013 - 31/12/2015
- Main objectives and type of costs covered: MOD-ENP-TOX project is a multidisciplinary project aiming to accomplish the following objectives: (i) to develop a novel and rational "Modelling Assay Platform (MAP)" which can be used as a « Risk Indicator » tool to predict the toxicity of metal-based NP
- Participants: 4, coordinated by ATHOLIEKE UNIVERSITEIT LEUVEN (Belgium) and RHENOVIA PHARMA (France-Alsace) as partner

International innovation Challenge (stage 1) (national funding): SMARTT e-Patch

- funding scheme: International innovation challenge implemented by the French Ministry of economy
- Budget: Total contribution: 200 000 € (stage 1)
- Time frame of the project: 2015-?
- Main objectives and type of costs covered: the SMARTT e-Patch is a transdermal patch which allows the controlled administration of up to seven medicinal products through the use of an inbuilt electronic system programmed by the treating physician. The world market for the transdermal administration of medicinal products is valued at USD 31.5 billion (EUR 22.8 billion) for 2015 with an annual Growth of around 8%.
- Participants: RHENOVIA PHARMA