

**European
Cluster
Days**

CLUSTER AS THE DRIVING POWER OF THE EUROPEAN ECONOMY

18 - 19
March
2015

EUROPEAN PARLIAMENT
Strasbourg 

www.europeanclusterdays.eu



This article is published in the framework of the event organized by France Clusters and its partners “[European Cluster Days: Clusters as the driving power of the european economy](#)”, 18 & 19 March 2015, at the European Parliament (Strasbourg – France).

From collaboration to international strategic partnerships

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Abstract

Strengthening the international competitiveness of European SMEs in the life sciences sector beyond Europe is an essential task in an increasingly globalized environment. This is particularly crucial due to the observed growth effects following successful cross-border venturing, and the demonstrated capacity of SMEs to drive economic development at national, regional, and global levels (European Commission, 2007). Meeting the requirements of the accelerated globalization process, and designing tailor-made internationalization strategies, are crucial goals for sectors such as biotechnological and medical technology sectors, which are by definition global.

With this objective in mind, 4 European bioclusters, Biocat (Catalonia), BioM (Bavaria), bioPmed (Piemonte), Lyonbiopole (Rhône-Alpes), together with the development agency Entreprise Rhône-Alpes International, decided to join their knowledge and skills in the bioXclusters project to reinforce and promote international competitiveness of their SMEs on strategic global markets and to make the innovative European life sciences SME industry more visible. The initiative was co-funded by the EC from January 2012 to January 2014.

Uniting forces and acting as a strong, multifaceted and single partner towards other competitive markets in the world is the bioXclusters leitmotiv. Together, the alliance unites more than 1,700 companies developing their activity mainly in the fields of oncology, personalized medicine, cardiovascular, neurological, infectious, inflammatory and autoimmune diseases. A meta-cluster approach was implemented increasing efficiency of internationalization activities and supplement traditional go-to-market strategies.

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Thus, bioXclusters invited experts from the US, China and Brazil to Europe giving to SMEs useful training on how to enter these markets. 4 fact-finding missions were organized, resulting in 11 agreements and collaborations between European SMEs and business partners of these markets. bioXclusters developed privileged links in the target regions with local sciences parks and cluster organizations, signing 6 Memorandums of Understanding offering key entry points for European SMEs to these markets. The alliance currently expands its activities to new regions, like Japan and North Africa, in order to create links for further win-win collaborations.

More information: <http://bioxclusters.eu/>

The life sciences industry and particularly the healthcare sub-sector, is one of the world's largest and fastest growing industries, and, in Europe and in the world, it represents a significant part of national economies, with implications for public health, economic growth and job creation. However, the current urgent societal challenges require a change in the conventional approach, healthcare model and of the solutions that are used now – this challenge affects all levels of the healthcare value chain.

A number of variables have changed the global and European scenario as we used to know it, influencing also the health-related life sciences sector. The most relevant trends are detailed below.

- Ageing and chronic diseases. The percentage of the world population over sixty years old will double, rising from 7.76% in 2010, to 15.9% in 2020, while, on European level, the phenomenon is even more pronounced, with a clear trend that can already be seen: the percentage of people over seventy has already reached 20%, and the percentage of octogenarians will probably double in the next 15 years. Statistical studies show that 75% of the population over sixty years old are suffering from at least one chronic disease (heart disease, hypertension, diabetes, Alzheimer's, obesity, etc.), while 50% are affected by two or more pathologies.
- Social inclusion. With the rising of life expectancy, more people now reach an age where declining physical and mental health make them dependent on help from others. While most of this social care is currently provided by relatives, the availability of this kind of informal social care by family members is declining, as people are having fewer children, who may also live further away from their elderly parents and be unable to provide care. With the ageing phenomenon and the linked increase in chronic diseases, social inclusion should be reorganized by public authorities in order to face these challenges.

- **Health cost pressure.** In general, health cost pressure is a more and more difficult problem to manage: nowadays the healthcare approach is focused on acute illness treatment based on hospitalization as the most important element. This approach causes, in addition to many inefficiencies, a general increase in costs that is not manageable by the governments anymore. Furthermore, the ageing phenomenon will inevitably lead to an increase in chronic diseases with a consequential rise in healthcare expenditure: statistical studies show in fact that the population over sixty years old uses three to five times more healthcare system services and that spending on chronic diseases accounts for 60% of the total healthcare costs.
- **Economic growth rate.** The 2008 economic world crisis led Europe to stagnation and experts predict first improvements only from 2014 onwards: the recent economic reports of the European Commission (DG ECFIN), with short term economic forecasts, expected another year of recession in the EU in 2013, with -0.1% of real GDP growth rate, and a return of the economic growth only in 2014, with +1.5%. The last economic forecast of the OECD provides similar figures for real GDP growth of European Union countries, with a GDP growth rate of about -0.1% in 2013 and +1.3% in 2014 for the Eurozone.
- **Globalization.** In their way out of the crisis, European economies are moving to increase their trade with global emerging economies. Companies located in different European countries and economic sectors are taking advantage of the growth of emerging markets differently. On the other hand, many companies, and in particular SMEs (that represent over 90% of all European enterprises), are suffering the competition of the new emerging countries. For the life sciences sector, globalisation is seen both as an opportunity and as a challenge to be faced, with new markets but also with new competitors to consider.
- **Structural changes in our economic systems.** In the last decade the global business environment has changed radically, with new economic power actors in place. This results in both challenges and opportunities for European industry: now European companies have to compete with China, Brazil, India and other emerging economies also on high-value products. Technology, ICT and professional skills are becoming increasingly important for international competitiveness. To address these challenges and to remain competitive on the global market, the European Commission's Europe2020 strategy draws a new master plan that is intended to support the European way out from the current situation of crisis by investing in education, research and innovation.

- Brain drain. As a consequence of the economic crisis, many Europeans, and in particular young people with a high level of education and professional skills, decide to emigrate outside of Europe looking for job opportunities. This is true in particular for the research field, where many highly educated researchers decide to leave Europe looking for countries that are investing more in research. , e.g. USA.
- Converging technologies. The term "converging technologies" refers to the synergetic convergence of different fields of science and technology that are all progressing rapidly, like nanotechnology, advanced materials, photonics, ICT and biotechnology, and that can join forces for creating radically new solutions for the health market. If managed appropriately, they can play an important role in the European economic and social development, creating at the same time new innovative products and services, and consequently new market opportunities for European enterprises.

This scenario, create a big opportunity for the development of the European life sciences and healthcare sector, with relevant potential positive consequences for Europe's society and economy. However, the challenges mentioned earlier require drastic changes in the models and the solutions on the economic, industrial and political point of views.

In such framework, in the last 10 years, the cluster phenomenon has been one of the components which "reshaped" the development of the sector. Clusters are groups of specialised enterprises – often small and medium sized enterprises (SMEs) – and other related actors active in a common economic field that cooperate closely together in a particular location. In clustering together, SMEs can be more innovative, create more jobs and accelerate access to new products for patients than they would alone. At world level starting from "traditional" hubs, the geographical concentration of companies and research centers affected both the concentration of risk capital and the capability to develop innovative companies able to bring scientific results to the market.

The European Union started to appreciate such trend some years ago through a two-way approach:

- The creation of platforms with the goal to analyse and disseminate knowledge about clustering (The EU Cluster Portal *The European Cluster Observatory*⁵, the *European Cluster Collaboration Platform (ECCP)*⁶, etc).
- The launch of specific calls and projects able to stimulate excellence⁷ process in cluster management (e.g. *European Cluster Excellence Initiative (ECEI)* of ESCA), to support the growth of operational activities in some specific area such as internationalization⁸ and in stimulating the role of clusters in supporting emerging industries⁹.

The EU Cluster Portal complements also the recent Smart Specialisation approach¹⁰ that is used by regional and national policy-makers to develop, implement and review coherent Research and Innovation Strategies for Smart Specialisation (RIS3).

All activities are based on the Commission Communication for a European Industrial Renaissance (COM (2014) 14)¹¹ that highlighted clusters as being able to facilitate cross-sectorial and cross-border collaboration, helping SMEs to grow and internationalise. Clusters are perceived as a key tool not only to support the growth of a specific sector but also to bring in perspective positive outcomes at economic and social level in all European regions. A good example of such approach is the bioXclusters¹² initiative.

The European project bioXclusters has been launched in 2011 as one of the “world class cluster initiatives” financed by the Direction General Enterprise of the European Commission.

bioXclusters has brought together four leading biotechnology and healthcare clusters (Biocat - Spain, BioM - Germany, bioPmed - Italy, Lyonbiopole - France) with the objective of fostering the internationalisation of the wide and innovative network (more than 1.700 companies) of SMEs in

⁵ http://ec.europa.eu/enterprise/initiatives/cluster/observatory/index_en.htm

⁶ <http://www.clustercollaboration.eu/>

⁷ http://ec.europa.eu/enterprise/initiatives/cluster/excellence/index_en.htm

⁸ http://ec.europa.eu/enterprise/initiatives/cluster/internationalisation/index_en.htm

⁹ http://ec.europa.eu/enterprise/initiatives/cluster/emerging-industries/index_en.htm

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<http://s3platform.jrc.ec.europa.eu/home;jsessionid=KSTyTP3FbQ4YYVqp25GvWQjR1hPLLbJC14yBpLWmTJrwqnSBS1yn!951167080!1406105573662>

¹¹ <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014DC0014&from=EN>

¹² <http://www.bioxclusters.eu>

the participating regions. The project was supported also by the international experience of the ERAI agency (Enterprise Rhône-Alpes International).

The specific objective of the bioXclusters project was to strengthen, through cooperation and resources-sharing, the competitiveness of the clusters' SMEs in the life sciences health sector on the global market, with the four clusters that have already reached a certain level of maturity being the driving force in the process. In this way, the regions Bavaria (Germany), Catalonia (Spain), Piedmont (Italy) and Rhône-Alpes (France) joined their knowledge, skills, best practices and their dynamic life sciences companies (sharing a focus on drug development, healthcare and medical technology), with the goal to achieve critical mass to foster internationalisation activities, increase global visibility and provide better support to companies. The project also benefited from the know-how and the long-standing experience of the ERAI agency (Enterprise Rhône-Alpes International, the key enforcer of the Rhône-Alpes region for its international economic development), which coordinated the project. In this way, the involved clusters joined their knowledge and their dynamic life sciences companies (sharing a focus on personalised healthcare), with the goal to achieve critical mass to foster internationalisation activities of outgoing and incoming nature.

The concept of personalised healthcare is a core element of the bioXclusters initiative. bioXclusters believe that life sciences play a very important role in finding solutions for modern societal challenges and that the European Union has the potential and the ability to back a new paradigm of healthcare based on personalised medicine.

A restricted definition of personalised medicine consists of a new approach to medicine that, through innovative tests and a comprehensive view of individual subgroups of patients, can provide highly customized diagnosis and therapy. Thanks to personalised medicine it is in fact nowadays possible to identify a patient's genetic predisposition to specific pathologies and therefore it allows a preventive and targeted intervention to reduce the risk of acquiring diseases to which a patient is genetically susceptible. Such techniques are already reality today, used to treat diseases such as certain cancers or AIDS, with excellent results.

The revolutionary nature of personalised medicine is not limited to newly evolved diagnostic techniques based on the genetic or physiological characteristics of the individual: in a broader definition, personalised medicine is in fact a new global vision of a healthcare approach encompassing prevention, diagnosis, treatment and monitoring, where the person is considered as a whole system and not just for her/his single health problem. With this new, wider perspective, we

can talk about a new personalised healthcare paradigm that provides for all human health aspects. This new holistic paradigm of health is also defined as “P4 medicine”:

- Personalised: according to the characteristics of an individual subgroup of patients, P4 medicine will be able to identify a personalised medical treatment;
- Predictive: P4 medicine is able to identify what diseases can affect a particular person in the future and how he/she will react to a specific medical treatment;
- Preventive: P4 medicine facilitates a proactive approach to health and medicine, promoting disease prevention and thus shifting the focus of medicine to include the maintenance of health in addition to the treatment of disease;
- Participatory: people will be able to take their decisions based on accurate information, thereby taking responsibility for their own health. The role of society becomes important for the management of the patient at all levels.

This is a new, innovative, revolutionary and holistic approach, adopted also by Big Pharma¹³, that broadens the focus of medical practice, from curing disease to “healthcare” in the literal sense of taking care of the health of a person, aiming at the individual’s wellbeing during his/her whole life: this means that not only the life sciences sector will be involved, but, exploiting the potential of the converging technologies, also other innovative sectors are called upon (such as mechatronics, ICT, robotics), with important positive consequences in terms of economic growth, creation of new high-level skills, and a long-term reduction of healthcare cost.

Today, no country in the world is actually embracing and fully implementing personalised healthcare, as this approach is still relatively new and not applicable to all areas of medicine yet. Therefore, we believe that this is an excellent opportunity for Europe to position itself, embrace the new personalised healthcare paradigm and prepare for meeting the current societal challenges. bioXclusters strategically intends to be protagonist of such strategic perspective at local, European and global level.

Despite the fact that the four participating clusters have already developed international (“out of Europe”) activities and already offer services to their companies, the global health sector is very

¹³ e.g. http://www.roche.com/about/personalised_healthcare.htm

competitive and still a challenging environment for SMEs and start-ups. As a consequence, the full global potential of the overall bioXclusters project objective can be achieved only through an even stronger and focussed cooperation between the clusters. In order to achieve this, strengthen their position and strategy outside Europe and foster international competitiveness, the cluster partners have jointly developed a common internationalisation strategy (Joint Action Strategy - JAS). The design of this common strategy is the last step of a process that has included a deep analysis of each partner's capacities and assets, the valorisation through a shared value network, as well as three pilot actions on three countries of interest (China, Brazil and the United States), using and expanding successful support schemes already implemented in the Rhône-Alpes region, but also bringing in tools already existing in the other partner clusters, in order to evaluate business opportunities for European biotech SMEs. The common internationalisation strategy (JAS) aims to be sustainable and transferable to other world-class health clusters and to other innovative European economic sectors, and can also help the implementation of a common formal framework between clusters and regions involved in the development of sustainable policies and initiatives focused on the internationalisation of single life sciences clusters at a systemic level.

The developed joint international strategy for all clusters involved in the project as been defined, as if they were a unique entity, acting as a "metacluster". As a first step, a deep analysis of each partner's capacities and assets (through a clusters competencies mapping and valorisation through a common value network) was carried out. Then, before the definition of the strategy's steps and tools, it was essential to determine a shared vision and a targeted mission for the partnership. This activity also allowed the identification of common values and goals and a shared value proposition could subsequently be identified. Several internationalisation tools and strategies for clusters and companies were analysed and tested commonly in the course of the project activities, in order to identify the best solutions tailored to the targeted markets and to SME demands. As a result, a list of key performance indicators (KPI) with the most efficient tools tested has been compiled. The different project phases were the keystones for building and refining the common internationalisation strategy. Based on this, partners will now jointly be able to leverage what is already in place, expand the activities and provide added value for the clusters' companies and for the overall competitiveness of the health-oriented life science sector in Europe.

To reach this objective on the global market, the partner clusters have to think and act as a unique entity, or as a "metacluster": with this term, partners mean a trans-regional network of clusters, with a clear common vision and mission, with the main actors sharing the same core values and having a common value proposition. In a metacluster framework, all the different actors have their

specificities and their autonomy, but they share elements of competitiveness (certain services, information, marketing) that are more efficient and effective when implemented together. On this basis, the strategic metacluster level represents a key component of the collaboration. Both at the European level (“internally”) and externally, a joint vision and strategic plan have to be developed, shared and linked to practical goals in order to be effective and pragmatic. Starting from the common and shared vision, specific internationalisation tools and activities have to be defined, tested and implemented further, where economies of scale and of knowledge make the metacluster approach more successful than an independent, autonomous approach. The bioXclusters partners have followed this concept and have defined a shared vision of internationalization, common goals, a series of shared strategic steps and tools to be used, and a related list of key performance indicators. All these different elements are fundamental keystones that have shaped the final Joint Action Strategy. The bioXclusters partners have already tested a pilot set of concrete internationalisation actions and tools in some initial target countries (China, Brazil, United States) in order to validate and improve them and are analysing the outcomes, in order to determine those activities that should be included in a joint metacluster action strategy.

Public stakeholders and regional internationalization agencies, such as ERAI (Entreprise Rhône-Alpes International) in the bioXclusters case, play a strong role in this vision. They have to be considered, and they have to consider themselves, as partners and synergistic organizations in reaching general socio-economic goals. Only through a real common understanding and exploitation of the reciprocal expertise and role will it be possible to implement a metacluster approach. The internationalisation agencies (and similar entities) can, for example, contribute worldwide networks, logistical expertise, sector-independent internationalisation know-how and potentially useful political connections. The clusters, on the other hand, can complement this with the sector-specific knowledge, the close working relationship with their cluster SMEs, up-to-date and practical insight into the SMEs current needs and interests abroad, as well as a global network of experts and contacts in their sector

After the three initial pilot actions on countries of interest (China, Brazil and the United States) were launched, followed by actions in three further relevant geographical areas (North Africa, South Korea and Japan), in the context of the project follow up, the European Strategic Cluster Partnership (ESCP¹⁴) on personalised healthcare aiming to involve also more EU clusters in the initiative.

¹⁴ <http://www.clustercollaboration.eu/escps;jsessionid=CD517F7EC0DD5855633AFE006942523E>

bioXclusters showed a great capability to adapt actions out of Europe to local environment adapting tools and strategy to local needs and opportunities. From traditional participation in fairs to the development and finalisation of memorandums of understanding to coaching of companies to training and coaching actions to non European counterparts. Some key results: 4 fact-finding missions, resulting in 11 agreements and collaborations between European SMEs and business partners of these markets, 6 Memorandums of Understanding of bioXclusters with non European counterparts (science parks and cluster managing companies) 1 training activity performed in North Africa on cluster development and management. An “Handbook of recommendations” on SMEs’ internationalisation through clusters and has been developed and spread across the respective clusters’ communities.

The bioXclusters consortium has developed a unique approach in the life sciences sector; meaning going beyond a collaboration between clusters going towards the construction of a joint internationalisation strategy with shared tools. This smart approach led to a fruitful experience that the consortium needs to nurture and pursue in the next years. in order to unfold its real potential for European SMEs.