

BIC Sviluppo Italia Friuli Venezia Giulia (Italy)

Regional Existing & Emerging Cross-Border Biomed Cluster

Table of Contents:

Report on the existing, regional Bio-med Cluster	3
The Biomedicine Cluster in Friuli Venezia Giulia: overview.....	3
Skilled and creative workforce.....	3
Industry Focus.....	3
Research Centers	4
Internationalization and Business Support Organizations (BSOs)	5
Report on the <i>emerging, Cross-border</i> Biomed Cluster	6
Why Extending The Cluster Cross-Border/At Euroregional Level	6
BIC SIFVG activities for supporting cluster internationalization:	6
1. Awareness raising and consensus building	6
2. Test-cases, connecting FVG SMEs with the Slovenian and Austrian BioMed nodes.	7

Report on the existing, regional Bio-med Cluster

The Biomedicine Cluster in Friuli Venezia Giulia: overview

The international profile and the interdisciplinary approach in carrying out advanced research in Life Sciences strategic sectors give the "Biomedicine Cluster of Friuli Venezia Giulia" its distinctive character.

A special feature of the Biomedicine Cluster, which has its nodes of excellence in Trieste, Udine and Aviano, is the network management of research activity, the relationship between the larger national and international centers and the presence of technological convergences.

At the top of European tables for innovation capacity, with a ratio of researchers to total active population of 8.8 /1,000, the Friuli Venezia Giulia region is home to an avant-garde scientific system based on expertise and know-how in fields that range from applied physics to informatics, and from biotechnologies to nanotechnologies.

Skilled and creative workforce

Friuli Venezia Giulia, and Trieste in particular, have a high concentration of personnel involved in R&D, totaling about 7,500.

The Life Sciences sector accounts for over 1,600 researchers, 4,000 students and 650 graduates per year in Biotechnologies, Pharmacy and Medicine.

It is a very international environment, due to the large number of international scientific institutions and the number of researchers that work for them. Over and above those that regularly work in the region, there are 8,500 researchers that every year choose Friuli Venezia Giulia to undertake a period of study or advanced training. Many of these researchers come from developing countries. This is one of the unique characteristics of this environment, which has always valued the sharing of knowledge and progress.

Industry Focus

The constant push towards innovation, which is the hallmark of the companies working in the Biomedicine Cluster of Friuli Venezia Giulia, makes the environment a particularly fertile and dynamic place to develop pharmaceutical, biotech products and diagnostic technologies.

The presence of leading companies, e.g., Bracco Imaging, Biofarma, Eurospital, Alphagenics Diaco Biotechnologies, Italtbs, Bioallergy International, Euroclone, Lay Line Genomics, Actimex; is complemented by a vital network of spin-offs and start-ups, e.g., Transactiva, Eufoton, Neurogenics, AdriaCell, Serichim, and VivaBioCell.

Among the small-size knowledge intensive companies belonging to the regional cluster, Lay Line Genomics, Transactiva and VivaBioCell are performing very well in the interregional science-industry networks.

Specializing in functional Proteomics and Neurogenomics, **Lay Line Genomics** has developed innovative medicines for Alzheimer Disease and provides advanced proprietary technology services for pharmaceutical companies using its own animal model for Alzheimer disease and the PKO (protein knock-out) technology.

VivaBioCell is active in Molecular and Cellular Medicine and Tissue Engineering. Its main products are bone substitutes derived from autologous stem cells derived from a biopsy and

cultured offered in vitro in computer controlled sealed culture chambers where cells can proliferate. The ABSIS tissue substitute, grown on a solid scaffold, designed with the final shape and size according to the needs. The ABGIS tissue substitute, grown on biocompatible granules that can be molded in the final shape at the time of the implant. The company carries out R&D into new products and processes, analysis and control.

Specializing in research and development of therapeutic molecules obtained using recombinant technologies in innovative expression systems, **Transactiva** has developed new products in the sector of Orphan drugs and Metabolic diseases.

Research Centers

R&D activities undertaken in the Biomedicine Cluster of Friuli Venezia Giulia focuses on high potential therapeutic areas: Oncology, Vascular Cardiology, Neurosciences, Hepatology, Rare Diseases, Tissue Engineering and Cell Therapy.

The Cluster is characterized by a heavy concentration of research centers of international note, e.g., ICGEB – International Center for Genetic Engineering and Biotechnologies; ISAS – International Higher School for Advanced Studies; BRAIN - Basic Research And Integrative Neuroscience.

The **International Center for Genetic Engineering and Biotechnology (ICGEB)** has an international network of centers of excellence for research and high-level training in the fields of Biotechnology and Genetics. Research in laboratories located in Trieste centers on Molecular and Proteomic Biology as applied to the DNA metabolism, Human Parasitology as applied to the transcription of HIV-1, Bacteriology and Gene Expression, Immunology Processes, Molecular Pathologies as applied to the study of aberrations connected to the phenomenon of splicing and the onset of cystic fibrosis, Applied Virology focusing on the Human Papilloma, and the study of New Medicines created from Molecular Recombinants. So far, the ICGEB has filed 21 patents with 13 requests for international patents. There are 174 staff working at the Trieste center.

The **International Higher School for Advanced Studies (ISAS)** is one of the largest Italian research centers for post-degree training. The school concentrates on research in Physics, Mathematics, Biology and the Neurosciences. Particular attention is paid to possible practical applications: SISSA has 8 patents, 6 of which have been licensed out for commercial use. SISSA's Molecular Neurobiology Laboratory (LNM) has the aim of integrating the knowledge of the electro-physiological characteristics of Cells and Neural Networks with the analysis of the molecular components through techniques of Functional Genomics. Particular attention is paid to the study of the molecular basis of Neurodegenerative Diseases such as Alzheimer's, Parkinson's and Huntington's Chorea. The aim is to understand their causes and identify therapeutic treatment able to block the degeneration of cells which today is an irreversible process. Proteomic and cDNA Microarray Techniques are used to describe gene profiles and proteic interaction in the various areas of the brain and their alterations in animal and cellular models of human illnesses. The research is undertaken in collaboration with international institutions such as Harvard Medical School in Boston (USA) and RIKEN in Wako (Japan) with financing from Telethon, the European Union and the Giovanni Armenise-Harvard Foundation.

Basic Research And Integrative Neuroscience (BRAIN) is an interdepartmental center of the University of Trieste, which groups together interdisciplinary skills in the Neurosciences field. The center covers integrated study projects aimed at providing a composite picture of various biomedical issues. The center is made up of researchers selected from each department and works in partnership with the DANA Alliance for the Brain. It is active in a wide variety of projects, all connected with the Neurosciences; many of these projects are

coordinated in a synergetic study on Neural Plasticity, approached from the cellular, organ, and system levels. The following research programs are currently being undertaken: Stem Cell Analysis, Cerebral Ageing, Neuronal Typing, Cerebral Visualization using f MRI, memory and learning, and Pre-natal Cerebral Learning.

Internationalization and Business Support Organizations (BSOs)

The strategic value of Life Sciences and Biomedicine in regional government policy is confirmed by the creation of the Technology District into which the Friuli Venezia Giulia regional government and the Ministry of University and Research (MUR) have invested 36 million Euro with the aim of strengthening research (with an expected increase of between 1,500-2,000 researchers over 10 years), and attracting knowledge-intensive business ventures.

The activities of the District are coordinated by CBM, the Consortium for Molecular Biomedicine. Stakeholders of the Consortium are the following research centers, private companies and financial institutions: AREA Science Park, Aviano Centre for Oncological Referral (CRO), LNCIB, Burlo Garofolo IRCCS, ISAS, the Universities of Trieste and Udine, Bracco Imaging, Laboratori Diaco Biomedicali, Eurospital, Instrumentation Laboratory, Transactiva, Bruker Biospin, Italtbs, Onlus Center for the Study of Liver Diseases, Fondazione Callerio Onlus, Assicurazioni Generali, Fondazione Cassa di Risparmio di Trieste, and Friulia.

A whole range of national and regional incentives is available in Friuli Venezia Giulia to facilitate and support the start-up of new businesses, the purchasing or leasing of new manufacturing equipment, the industrial and pre-competitive research, the employment in industrial research, the training of human resources, the expansion of innovative firms through venture capital and participating loans.

Among the financial instruments for supporting knowledge-intensive enterprises, well worth noting is Aladin, the venture capital fund managed by Friulia Holding.

Finally, the creation and development of new knowledge-intensive companies and commercial spin-offs from research are facilitated by the presence and activity of specialised service structures like the Area Science Park, the BIC – Business Innovation Centre of Friuli Venezia Giulia, and Friuli Innovazione.

Report on the *emerging, Cross-border Biomed Cluster*

Why Extending The Cluster Cross-Border/At Euroregional Level

BIC SIFVG is actively working to make the best use of the internalization opportunities provided by the ClusterNet project. BIC Sviluppo Italia Friuli Venezia Giulia is strongly supporting the stakeholders of the regional cluster on biomedicine to extend its reach at cross-border level, involving the whole, so called, "Euro-Region" which encompasses the regions of Friuli Venezia Giulia and Veneto in Italy, Slovenia, Istria-Croatia, Kärnten-Austria (for more details see also: <http://www.euregion.net/>).

Extension at cross-border level of the existing, regional cluster on biomedicine would rely upon the existing, complementary strengths between the two sides of the border that, if are appropriately built upon, at the European and at global scale, will create added value equipping the Slovenian-Italian cross-border region for global competition. Neither side can accomplish this outcome alone, but they can obtain it together.

The foreseen end result for the Slovenia - Italy (and Austria) transborder region is to accelerate its economic development according to the advanced technology cluster development model, extending at the wide EU level, and also towards the EuroRegion, the Balkan countries and other developing nations which have strong ties with this area and were additional human, research and industrial (e.g. Pharma) resources to synergize with are available.

Future activities promoted by BIC SIFVG within the ClusterNet Project, also pursues the attraction of foreign direct investment to the transborder region by incorporating a number of high technology projects and other innovative projects to effectively channel industrial and financial resources.

BIC SIFVG activities for supporting cluster internationalization:

BIC SIFVG activities to support the cross-border development of the biomed cluster include the following:

1. Awareness raising and consensus building

Networking activities between R&D centres and knowledge-based companies along both sides of the border, is by far the most valuable support service provided by SIFVG. Its long-term, in-the-field experience in managing the network of Business Innovation Centres in Friuli Venezia Giulia (established in 1989, +180 innovative start ups supported) is a strong asset and a recognized value-added for entrepreneurs and researchers in Friuli Venezia Giulia, whose social networks are limited geographically and sectorially (science-to-science; entrepreneur-to-entrepreneur with rare cases of cross-fertilization).

In practical terms, BIC SIFVG acts as a "connector" among the high-standing, critical mass of world-class resources resident in the cross-border/Euroregional area: human resources,

scientific, industrial and business assets, infrastructure and networks.
So far, BIC SIFVG helped to establish links among the following actors.

- the Slovenian National Institute of Chemistry and relevant actors in the Slovenian Pharma industry
- the ELETTRA Synchrotron Light Facility and Free Electron Laser¹ located in Trieste (FVG region)
- the University of Trieste (particularly active is the CIMM – Centro Interdipartimentale per la medicina Molecolare)
- the University of Udine;
- the International Centre for Genetic Engineering and Biotechnology;
- the International School for Advanced Studies (SISSA);
- the Centre for Biomolecular Medicine established as an apex organisation within the regional Technology Cluster (see below²);
- hospital clinics performing clinical trials (among all, Ospedale di Cattinara, Trieste, Italy),
- organisations specialised in business incubation and the support of technology based start-up firms as: Inkubator Sezana (Slovenia); Friulia – the regional investment Fund, as well as several service firms and corporate investors that have engaged themselves in the development of the *Cluster* (e.g. Assicurazioni Generali).

2. Test-cases, connecting FVG SMEs with the Slovenian and Austrian BioMed nodes.

Telemedicine and Medical IT have been identified by Clusternet experts as specific sectors on which appears feasible and opportune to intensify networking activities among SMEs and clinical centres, located in the cross bordering areas of Friuli Venezia Giulia, Carinzia and Slovenia.

Two concrete examples of Friuli Venezia Giulia companies to which BIC – Business Innovation Centre of Friuli Venezia Giulia has provided direct support are: ItalTBS and VivaBioCell. Particularly BIC SIFVG helped these companies in searching strategic partners in the neighboring regions of Austria and Slovenia.

ItalTBS is a national leader in Clinical Engineering, Medical IT and Telemedicine. ItalTBS is based in Trieste and is starting to launch its activities abroad. In its branch located in Klagenfurt, Ital TBS employs 50 specialists in integrated hospital medical IT system.

VivaBioCell is a dynamic start up active in Molecular and Cellular Medicine and Tissue Engineering. It is a spin off of Udine university and it has been supported by BIC SIFVG either in business modeling, fundraising (i.e. equity stakes by Friulia, the regional investment fund) and international partners search. The company is particular interesting for large public hospitals for which it can carry out R&D into new products and processes, analysis and control.

Working closely with these companies, BIC SIFVG identified new opportunities for cross border cooperation in the field of **Translational Medicine**, that is a branch of medical research that attempts to more directly connect basic research to patient care. VivaBioCell, with the

¹ The FEL FERMI@ELETTRA is a “Quick Start” R&D project approved by the European Union; project financing has as main contributors the Italian and Regional governments and the European Investment Bank.

² The Framework Agreement between the Italian Ministry for Education, University and Research and the Region Friuli Venezia Giulia for the establishment of a Technology Cluster for Biomolecular Medicine⁵ of Oct. 5, 2004.

assistance of BICFVG, has established its first contacts with the Slovenian Transfusional Institute, Clinical Centre of Ljubljana in order to assess the feasibility of strengthening the cooperation network also in this domain of the healthcare industry.

Establishing operational "links" between high standing/dynamic companies from both sides of the border, is a primary objective for the future project activities carried out by BIC SIFVG. Extending the existing regional biomed cluster at cross-border / Euroregional level implies further scouting activity by BIC SIFVG (1-to-1 meetings, introductory emails, referral phone calls...) to select the most ready and committed R&D centres and/or SMEs. Test cases of biomed cluster companies and/or R&D, which successfully act cross-border, can guarantee a "leverage" effect on the cluster as a whole.