

# Life science in Oslo – a potential cluster?

## Introduction

This is a paper prepared by Oslo Teknopol for the STRATINC project (May 2004). In the following we will explain our approach to the need of strategic information within life sciences in the Oslo region. We will also give a brief overview on how we work with key players within the life science sector to strengthen and develop a potential cluster.

## **A cluster approach**

The cluster oriented approach on business development in the Oslo region originates from the RITTS (Regional Innovation and Technology Transfer Strategies) process initiated by Oslo Teknopol 1998-2001. The RITTS project involved a series of SWOT analysis in order to define what resources the region actually were in possession of. As a result of the RITTS process a number of business areas and knowledge areas were defined and a series of strategies were outlined.

The main results were:

- the Oslo region has strong clusters within the Maritime/Offshore and Energy sectors
- the Oslo region possesses 50 % of the country's research efforts
- business innovation in the Oslo region is only on the country average
- the Oslo region has strong knowledge centres within several important areas - ICT (potential cluster), energy, life sciences (potential cluster) and maritime sector (mature cluster)
- knowledge centres do only have limited contact with business life
- as an investment alternative, the Oslo region is almost unknown to foreign business decision makers (location and re-location of activities)

The final RITTS report concluded that the region has great potential for increased innovation, but that this potential is hampered by lack of cooperation, lack of financial resources and lack of political focus on dedicated innovation strategies.

During the spring of 2001 Oslo Business Council decided upon a bold vision for the region: *"The Oslo region shall become one of the most innovative regions in Europe within 2010"*. This vision was later adopted by the national government. Oslo Teknopol strives to fulfil this vision in close collaboration with key players within the region, as the vision is integrated as part of our strategy and methodology.

## **The Oslo region in brief**

The Oslo region is a highly developed growth area, made up of City of Oslo and Akershus County Council. Oslo is the geographical and functional centre of the region and the capital of Norway. The region has one million inhabitants, nearly 90 000 companies, and one of the highest purchasing standards (PPS) in the world. As the capital region, it is also the centre of one of the most robust economies in the world and at the top of international ratings for quality of life. The region has a highly educated workforce and more than 40 percent of those with higher education in Norway work and lives in the Oslo region. (For further information please see: [www.oslo.technopole.no](http://www.oslo.technopole.no))

## **Life science in Oslo**

Old industrial structures are declining and there are virtually no traditional industry left in the Oslo region. As a consequence the region is becoming more and more knowledge intensive, which in turn gives a series of implications for future business development strategies. By creating higher value products, putting more knowledge into existing businesses and continue to stimulate development of new knowledge intensive industry, the region can keep up the level of welfare and economic development in the future.

A result of the RITTS process was a focus on four business sectors (and niches within these) as main development areas for future economic growth in the region. In STRATINC Oslo's focus is on life sciences and these sectors need of strategic information to become sustainable and competitive.

### **The life science sector**

The life science sector including the health, medicine and biotechnology industry, is vaguely defined and includes a large collection of different types of companies. If we include all companies that manufacture products or offer services related to human or animal health, the industry comprised around 1 157 companies and employed more than 12 000 people in 2001. Please note that this number is fairly high considering that more strictly defined biotechnology companies constitutes no more than about 70 in total nation-wide.

Knowledge and research within this sector is normally produced in universities and hospitals. A majority of the knowledge institutions within health, biotechnology and medicine are located in the Oslo region and the number of new biotechnology companies is quickly rising, as many of these are materialising in close connection to the R&D institutions in the region. Within life sciences the region has 3 universities, including the University of Oslo, Northern Europe's largest university, the Norwegian School of Veterinary Science and the Agricultural University of Norway. These institutions represent the core of the region's expertise ranging from medicine, health and food safety to marine biotechnology and animal issues. There are five university hospitals connected to the University of Oslo and 11 research institutes and Centres of Excellences in the region. Professional players such as Medinnova, SINTEF/Unimed and the Research Foundation of the Norwegian Radium Hospital have evolved to assist the commercialisation of ideas within the life sciences and two highly developed research parks is also present in the region, offering assistance and facilities for biotech start-ups.

### **Networks and initiatives within the life science sector**

In addition to informal network and job relations between universities and biotech companies, there are three newly established networks within the life science sector in Oslo; MedCoast Scandinavia, Norwegian Bioindustry Association and Biopolis Science Park. The former two networks were initiated in 2002, while the latter was founded this year (2004).

MedCoast Scandinavia was established as a project within the already established Oslo – Gothenburg collaboration. MedCoast Scandinavia aims to establish one of the leading bioregions in Europe where world-class researchers, a well-developed health service and excellent working conditions form an attractive environment for investors within the biotechnological and healthcare sector. MedCoast Scandinavia will create a dynamic network among universities, industry, healthcare and other organisations related to biomedical research and development in Oslo and the neighbouring Swedish region Gothenburg. Functional genomics opens up for a closer Swedish-Norwegian cooperation. The Norwegian FUGE programme and the Swedish SWEGENE programme will collaborate to develop the area into a strong biotech region.

Another network is the Norwegian Bioindustry Association. The association is an independent member organisation with a purpose to promote development of Norwegian biotechnological trade and research. The association has a focus on building a bridge between biotechnological industry and research communities in universities and colleges. The association has a nationwide perspective.

Finally, founded this year was Biopolis Science Park yet another initiative to strengthen growth and development within life sciences. Based on experiences from similar sector developments in Finland, Ireland and England, Biopolis shall establish a creative society where companies and research is located in a collaborative cluster at Aas, just outside Oslo. Core institutions within Biopolis are the Agricultural University of Norway and the BioScience Park at Aas, bringing together both research and start-up companies within life sciences.

All of these initiatives will be crucial in the further development of life sciences in Norway, and Oslo Teknopol has therefore involved representatives of these environments in the STRATINC project.

#### **STRATINC - Oslo**

Through the STRATINC project Oslo Teknopol has been able to gather representatives from networks, research institutions, commercial players and key companies in a local working group (LWG). The aim of the LWG is to suggest strategies related to the challenges met by SMEs and others that are concerned with issues related to life sciences.

Oslo Teknopol has also recently submitted an Interreg IIIB application; BIO Baltic, in close collaboration with networks, research institutions and commercial players in Oslo and other regions in the Baltic Sea area. This initiative was first and foremost taken by representatives of the STRATINC LWG in Oslo. The overall objective of BIO Baltic is to improve the competitiveness and create strong industrial and scientific clusters in the Baltic Sea Region. Careful integration of complementary skills, different regional clusters and technologies will ensure successful collaboration and sharpen the Baltic Sea region's competitive edge towards global markets.

#### **Different regional innovation systems**

The Commission of the European Communities has made a report on competitiveness, "European Competitiveness Report 2003" (Commission of the European Communities 2003) where regions competitiveness and different typologies of regional innovation systems is presented. It is suggested that the STRATINC partners use these typologies to explain their specific sector's focus and development within this sector.

Based on the above characteristics of the life science sector, we will in the following apply Braczyk et al's (1998) different typologies of a regional innovation system on a potential life science cluster in the Oslo region.

### **3. Typology of cluster**

SMEs and other companies are all determined by it's surrounding i.e. customers, competitors, human capital, knowledge infrastructure, institutions, regulation and legislation etc. All these factors constitute a regional innovation system. According to Braczyk et al (1998) there are three main definitions (*Grassroots, Network and Dirigiste*) of a regional innovation system (RIS) and these typologies can be crucial in determining the critical factors for a region's success and further growth. (Braczyk et al (1998) in Commission of the European Communities 2003:136).

Following their definitions, the life science sector in the Oslo region may be seen as a combination of a *Network RIS* and *Dirigiste RIS*:

*"Network RISs can be initiated at several levels: local, regional, federal or governmental. Consequently, funding is more likely to be agreed by banks, firms and government agencies. The research is mixed, aimed at both applied and 'pure' technology with flexible specialisation given the wide range of participants. Dirigiste RISs are more animated from outside and above the region itself, initiated and funded typically by central governments. The research is rather basic or fundamental, to be used in large firms or beyond the region in question. As it is state-run, the level of co-ordination is high and the level of specialisation is also likely to be high."* (Braczyk et al (1998) in Commission of the European Communities 2003:136).

Initiatives and networks within the life science sector appear at both regional and national level, as described in section 2 (networks and initiatives). A majority of the basal research is done at the universities and research institutions in the region, though we do find some in-house research at some specialised biotechnology companies, as well as larger pharmaceutical companies (international subsidiaries). An example of a combined national and regional initiative may illustrate how this sector may be seen as a combination of Braczyk et al's (1998) definitions of a *Dirigiste* and *Network RIS*:

*FUGE is a national plan for research in functional genomics, submitted by a unified Norwegian research community. FUGE entails both a considerable expansion of Norwegian biotechnology research and a nationally coordinated restructuring of the research establishment as a whole. Efforts by representatives of the University of Oslo, and other Norwegian universities, worked to unite forces with similar institutions to purpose a plan to guarantee that Norway can stay abreast of international developments within research in functional genomics. The plan is based on the distribution of responsibilities and establishment of networks at the national level and regional level, the identification and utilization of national advantages, cooperation and design of new models for interaction between universities, research institutions and trade and industry. The plan received funding from the national government in 2001*

*Objectives:*

**Basic biological research.** *FUGE is intended to bring the level of the basic research disciplines underlying functional genomics up to international standards. Furthermore, Norway will work to develop cutting-edge expertise in areas of particularly strategic importance, or in which the country has special advantages.* **Medical research.** *FUGE will help to make it possible for Norwegian health services to utilize the new knowledge and medical products that result from functional genomics, thus ensuring that Norwegian health care remains on a par with top-quality services available elsewhere in the world.* **Marine research.** *FUGE will play a role in establishing the research basis needed to promote further development of the aquaculture industry and optimal utilization of marine resources, as well as to establish a biomarine industrial cluster in Norway. (Functional Genomics – A national plan, 2001).*

It was suggested that a minimum of NOK 300 millions should be allocated from national governments over the next 5 – 10 years, to finance the research in the field of functional genomics. The Research Council of Norway has decided to allocate NOK 81, 3 million yearly to FUGE in 2004 – 2008.

#### **4. Typology of companies within the cluster**

The regional business climate can spur firms to be more innovative and must be seen as a complement to the governance dimension as described in section 3. Braczyk et al (1998)

distinguish between three different business innovation dimensions; *localist, interactive and globalised RISs*. The business life of the life science sector in the Oslo region, as we see it, is closest to Braczyk et al's (1998) characteristics of a *localists RIS*.

*Localist RISs have a few large firms, either indigenous or multinational. The research reach of individual firms is not great but there is a reasonable high degree of association among entrepreneurs and between them and local or regional policy makers.* (Braczyk et al (1998) in Commission of the European Communities 2003:136).

The life science industry in the Oslo region mainly consists of pharmaceutical companies, some specialised biotech companies, a few medical equipment producers and some private hospitals and health institutions. There are relatively few multinational companies represented beyond the level of distribution offices, though i.e. GSK, Astra Zeneca and Amersham Health are subsidiaries of foreign or multinational pharmaceutical groups with substantial in-house research and development. The life science industry is at the forefront of a few specialised research areas such as cancer, immunology and vascular diseases. But we will see more areas of excellences as a growing number of biotechnology companies are materialising in close connection to the research institutions in the region.

There is a reasonable high degree of collaboration among entrepreneurs and between them and regional policy makers. The initiatives of MedCoast, Norwegian Bioindustry Association and Biopolis are examples of networks concerned with the issue of strengthening the relationship between agents of a "Triple Helix", that is R&D-and business community and governmental institutions.

## **5. SMEs needs of strategic information**

SMEs and regions competitiveness is constantly challenged. The need of strategic information and cross-border collaboration is becoming increasingly important, as the race to be a frontier is growing stronger and stronger. Participant in this world-wide race are faced with challenges, though some more intensively than others related to; business climate, public awareness and confidence, leadership and governance, legislation and regulation, performance measurement and information sharing.

The business climate in the Oslo region is changing, and there is a potential conflict between old and new industries. New business structures are faces with challenges such as lack of an essential critical mass and available seed capital. Since the potential life science cluster in Oslo is small, and the *amount* of new investment project is not yet at a comparable international level, the risk involved in life science investments is still very high. Furthermore, we see that even though there are several initiatives to strengthen the relationship between R&D and business community, there is still a long way to go before collaboration and communication is running smoothly between these agents in a cluster.

SMEs in the Oslo region are also faced with challenges related to legislation and regulation. For small and medium sized companies lack of available in-house competence and resources can make it very difficult to approach and work within the European environment of legislation and regulation. Finally, the issue of information sharing may pose a potential challenge for SMEs especially within the life science sector. Confidentiality issues and concerns about protecting discoveries may pose a threat towards the need to share information.

These challenges are only a few examples of the potential problems faced by SMEs. When examining the challenges and the industry more closely it becomes evident that there is a crucial need of strategic information and co-ordination of such information. Business

community, R&D and policy makers would all benefit from an available tool which will allow these agents to share valuable information in a decision-taking perspective.

Today there are only a few tools available, and none of them are satisfactory enough to solve the issue of strategic information, and a major problem related to i.e. existing company databases is that they have a proprietary fundament, in other words are they only available for a few.

Four projects are however underway, all important contributions to improve the available information flow within the life science sector in the Oslo region. Nonetheless is there a need of a coordination of information about the different initiatives taken within the cluster. Oslo Teknopol will strive to fill this role within the regional innovation system, and support the different projects through STRATINC.

Brief descriptions of the projects will follow in section 6.

## **6. Current surveys underway/brief description**

There are currently four major projects in the Oslo region that are mapping/studying the life science cluster from different perspectives and angels:

1. A Scandinavian Biomedical Database:
2. Life Science 2020 (a foresight study)
3. SMEs go Life Sciences
4. Norway Exports - Biotechnology

Through the STRATINC project Oslo Teknopol has connected the actors within these projects to ensure that potential synergies are attended to. A brief presentation of the four follows below.

### **1. A Scandinavian Biomedical Database**

A collaborative initiative between MedCoast Scandinavia ([www.medcoast.org](http://www.medcoast.org)), Medicon Valley Academy, Scanbalt, BRG/Sahlgrenska Science Park, Uppsala Bio, Karolinska Institute and Sweden Bio to create a Scandinavian Biomedical Database.

Vision of the project:

- Improve Information availability
- Stimulate cross border cooperation
- Reduce cost by working together
- Standardisation / Common network standards add new features
- Link the organisations (KI, MVA, Bio Uppsala BioSweden and Scanbalt) closer together
- Add value for members

Database should be based on:

- Existing available information, if possible
- Single registration of data
- Include national information in the Scandinavian region
- Internet access and searchable
- Regional monitoring and updating of information
- Access control for strategic information

#### Project Phases

- Company Database Demo February 2004 for MCS region
- Launch of Company Database at Bio 2004 in San Francisco (June 2004)
- Common system layout for Scandinavian Bio resource database 2004/2005
- Updated data structure and project administration December 2004.

The database will be based on a Medical Subject Heading (MeSH) – index. MeSH was launched by the National Library of Medicine and is a structure standard for indexed databases such as MEDLINE with more than 22 500 Descriptors. The MeSH – index has a hierarchical structure.

### **2. Life Science 2020 (a foresight study)**

"Biotek Norge 2020" (Biotechnology Norway 2020) is an initiative from the Research Council of Norway. The Research Council of Norway is a national strategic body and funding agency for research and innovation activities. The Research Council covers all fields of research and innovation and works together with research institutions as well as the private and public sectors to reach the national financial goals and quality targets set in this area.

"Biotek Norge 2020" will result in a strategic paper on what Norway should aim at within life sciences in the future. First step is an analysis of a comprehensive survey to be finished late fall 2004 (includes companies and institution in the cluster). The report will touch up on issues related to market, niches, special capabilities, international competition and Norway's stand internationally in 2020. Also, key players' role in the future development of the life science cluster will be an important issue in this project.

### **3. SMEs go Life Sciences**

"SMEs go Life Sciences" is targeted to foster the cooperation between companies and research organisations in the area of Life Sciences. It supports the successful participation of Small and Medium Enterprises (SMEs) and SME groupings in the life sciences related areas of the 6th Framework Programme (FP6).

SMEs go Life Sciences' objective is to raise the number and quality of involvement of SMEs and SME groupings in Life Sciences related projects of FP6. This project is also an initiative from The Norwegian Research Council Official start was March 2004.

The Norwegian Research Council has started a comprehensive mapping of SMES within the life science cluster (May 2004).

### **4. Norway Exports - Biotechnology**

Norway Export is a series of publication by Index Publishing, which provides a guide to Norwegian products and services in over 20 industrial sectors. June 2004 they are producing the first issue of exporting companies within the life science sector. In relation to this issue Index Publishing has made a comprehensive mapping and categorizing of companies within medicine, health and biotechnology. More information about this project: [www.nortrade.com](http://www.nortrade.com)

## References/Bibliography

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Research Foundation of the Norwegian Radium Hospital: [www.radforsk.no](http://www.radforsk.no)

SINTEF/Unimed: [www.sintef.no](http://www.sintef.no)

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The Research Council of Norway: [www.forskningsradet.no](http://www.forskningsradet.no)