UPPSALA BIO

THE LIFE SCIENCE INITIATIVE

Report on strategies, activities and results 2003 – 2006



Uppsala BIO www.uppsalabio.com info@uppsalabio.com
Uppsala Science Park
SE-751 83 Uppsala, Sweden

Innehållsförteckning

Executive Summary **3**
Sammanfattning **5**
Introduction **6**
Uppsala BIO – Vision, strategy and organisation **9**
Strategic features *9*
Organisation *9*
Member organisations Uppsala BIO 10
Equality perspectives in the Uppsala BIO initiative *10*
Overall results **12**
Cluster's competitiveness *12*
The Uppsala BIO initiative *12*
Market-orientated research – Uppsala BIO-X **13**
General strategic considerations *14*
Current Uppsala BIO-X projects *14*
Some results *15*
Stimulating cross-disciplinary research *16*
Future Uppsala BIO-X efforts *16*
Skills and Training **18**
Recruitment from schools to universities *18*
Tailoring university courses to the needs of the employment market *18*
Strategic Education Issues 18
Next generation's managers *19*
Coaching and leadership training for project leaders 19
Training for entrepreneurs 19
Supporting job-seekers with inspiration and information *20*
Career Days 20
The job market and VinnVinn 20
Other methods - workshops etc. *21*
Innovation support **22**
About Uppsala Innovation Centre, UIC *22*
Business Start 23
Business Lab 23
Business Accelerator 23
Some results from 2005-2006 ..... *24*
Communication and visibility **28**
Strategic considerations *28*
Activities carried out *30*
Comments on activities and results *30*
General and transverse comments on the Uppsala BIO process **32**
Regional leadership *32*
Contacts generated from the new partners *32*
Increased co-operation between life science companies in Uppsala *32*
A node for Uppsala's life science sector *33*
Co-operation on the national level *33*
European/International role and co-operation *33*
Interactive research **34**
The interactive research team *34*
Some results *34*
The surveys 34
Indicators 35
Partner and coach to the Uppsala BIO process 36
Quantitative analyses 36
Learning from interactive research – some reflections from the interactive research team in the context of Uppsala BIO and CIND *36*

Appendices

App. 1 Participating Actors in the Uppsala BIO Initiative
App. 2 Economic Report Uppsala BIO 2003 – 2006
App. 3 *Investigating the Uppsala Biotech Cluster*, Teigland, Lindqvist, Malmberg & Waxell, CIND Research Paper 2004:1
App. 4 *Följeforskning i och kring processen Uppsala BIO – Årsrapport 2004* Hallencreutz; Lundequist; Malmberg and Teigland, CIND Research Paper 2005:1
App. 5 *Survey Results from the 2006 Uppsala Biotech Cluster Survey* - Presentation to the Uppsala BIO Steering Committee and STUNS May 2006
App. 6 *Uppsala BIO – the Life Science Initiative - Experiences of and Reflections on Starting a Regional Competitiveness Initiative*, Teigland; Hallencreutz and Lundequist, forthcoming in R. MacGregor (Ed.) Small Business Clustering Technologies: Applications in Marketing, Management, IT and Economics, London: Idea Group Inc.
App 7 *Seeing Eye to Eye: How do Public and Private Sector Views of a Biotech Cluster and its Cluster Initiative Differ?*, Teigland & Lindqvist, forthcoming in European Planning Studies

Executive Summary

With the vision of becoming recognized as one of the World's most prominent Biotech regions, a joint plan was put forward in 2003 by academia, industry and the public sector in Uppsala. During the first three years the Uppsala BIO initiative has been moulded to meet the challenges outlined in this plan including dealing with an excess of small and often under-financed companies, securing long term availability of a skilled work force, securing a pipeline of innovations and developing the city as an international meeting place.

Since the long term goal of Uppsala BIO is economic growth, industry was given a strong role in the steering group to exploit commercialization experience and maintain a focus on market needs. Uppsala BIO is a relatively small initiative. The greatest effects were deemed to be achieved in the interface industry – academy, which was where we focused our resources. Uppsala BIO's operational strategy is to initiate activities, monitor and support, and to act only where no other natural player exists. The most significant results are judged as being realizable within the borderland between academia and industry where few other organizations operate. In spite of the tax authorities decision no to allow Uppsala BIO to deduct VAT, Uppsala BIO has already made significant impact. An appeal has been lodged.

Uppsala BIO-X was started in order to strengthen cooperation between academia and industry and to more efficiently commercialize research results. This program supports unique, cross-disciplinary research with the goal of creating new commercial opportunities. Uppsala BIO-X currently supports three projects originating from academic research and involving a large number of researchers from the Mälardal area. Uppsala BIO-X not only provides finances but, more importantly, an industrial mind-set for these "early" projects. Uppsala BIO-X scientific advisory board, with international competence from both industry and academia, continually scrutinizes and guides the projects. Already after three years new constellations of scientist from different departments have formed. The industrial mindset has influenced these new groups and so far one new company has started.

The fragmented picture that many have had of Uppsala's innovation support system has gradually changed. By channelling most of Uppsala BIO's support for innovations through Uppsala Innovation Centre, UIC, and their incubator program, UIC has become a clear asset for innovators and one of the country's leading incubators for the Life Sciences. At the close of 2005, 44 companies had benefited from the program. Of these, 50% originated from universities and 60% are Life Science-related. Public investments in the program have been returned by a factor 5 through taxes, VAT and social fees.

The role of the universities as providers of an appropriately trained work force is important for growth of the companies in the region. Collaboration between education and industry also has a positive effect on the motivation of students and their understanding of the work place and makes courses more attractive. Uppsala BIO has therefore focused on activities which bring educators, students and industry closer together, for example Career Days. After a good deal of branch restructuring, the challenges facing leaders in both industry and academia have increased. Uppsala BIO's coaching for project leaders addresses precisely this issue.

Increasing awareness of the importance of the Life Science sector to Uppsala and the Mälardal area is an important strategic issue. Uppsala BIO has, together with partners in the rest of the Mälardal area, worked to position the sector internationally and locally. Visibility has increased through our web, news letters, press activities and events. Uppsala BIO is today perceived as a clear actor for the life sciences in the region.

During the entire reported period, Uppsala BIO's collaboration with the Centre for Research on Innovations and Industrial Dynamics, CIND, has resulted in a documentation of the process. CIND has also contributed, for example with their questionnaires from 2004 and 2006, to providing a foundation for strategic decisions. Their ability to interact with the project leadership has functioned as a form of coaching. In addition, a close contact has been built up with the leading biotech regions in Europe via

the Council for European Biotech Regions, CEBR, and this provides another important source of learning experiences as well as a natural springboard into Europe.

Uppsala BIO is well on the track to achieve the long term goals. Employment in life science is increasing and the sector's visibility has increased. Uppsala BIO-X has directly influenced the way of working in the academic research groups involved as well the relations between academy and industry. Centring the innovation support on UIC has been a successful way for helping innovations to access the market.

Sammanfattning

Med visionen att bli erkänd som en av världens främsta bioteknikregioner utformades 2003 en handlingsplan för Uppsalas biotekniksektor gemensamt av akademin, industrin och offentlig sektor i Uppsala län. Under de första tre åren har initiativet Uppsala BIO formerats för att möta handlingsplanens utmaningar: De många företagen var små och ofta underfinansierade, den långsiktiga tillgången på kompetens kändes osäker, flödet av idéer för innovationer behövde säkras och staden utvecklas till en internationell samlingspunkt.

Det långsiktiga målet är ekonomisk tillväxt, varför industrin gavs en stark roll i den styrgrupp som bildades. Uppsala BIO är ett förhållandevis litet initiativ. Genom att fokusera på gränslandet akademi – industri sågs de viktigaste förändringarna kunna åstadkommas. Uppsala BIO skall initiera, övervaka och endast agera där ingen annan naturlig utförare finns. Trots skatteverkets beslut att inte tillåta avdrag av moms i verksamheten, vilket överklagats, har Uppsala BIO åstadkommit stor skillnad.

För att stärka samverkan och effektivisera kommersialiseringen av forskningsresultat startades Uppsala BIO-X. Här stöds särklassig korsfunktionell forskning med målet att skapa nya kommersiella möjligheter. Uppsala BIO-X har idag tre projekt utgående från akademisk forskning som involverar ett stort antal forskare från Mälardalen. Uppsala BIO-X är inte bara en finansiär. Dess viktigaste funktion är att introducera ett industriellt tänkande i de tidiga projekten. Uppsala BIO-Xs vetenskapliga råd, med internationell kompetens från industri och akademi, granskar och styr kontinuerligt projekten. Redan efter tre år har nya grupper med forskare från många olika institutioner bildats, det nya arbetssättet har genomsyrat dem och hittills har ett nytt bolag också uppstått.

Den splittrade bild som många hade av Uppsalas innovationsstöd har successivt förändrats. Genom att styra en stor del av Uppsala BIOs insats för innovationer via Uppsala Innovation Centre (UIC), har inkubatorprogrammet i UIC blivit en tydlig tillgång för innovatörer och en av landets ledande inkubatorer för life science projekt. Vid slutet av 2005 hade totalt 44 företag deltagit i olika UIC-program. Av dessa hänförs 50 % från universiteten. Totalt är cirka 60 % av projekten/företagen life science relaterade. De offentliga medel som investerats har återbetalats i form av skatter och avgifter från företagen med en faktor 5.

Universitetens roll som leverantör av kompetens är viktig för företagens möjlighet att växa i regionen. Nära samverkan har också positiv inverkan på studenternas motivering och förståelse för arbetslivet och gör kurserna mer attraktiva. Uppsala BIO har därför fokuserat på aktiviteter som ökar förståelsen mellan utbildare, studenter och arbetsgivare. Karriärdagarna är ett sådant exempel. Efter branschens omstruktureringar har kraven på projektledare i gränslandet akademi och industri ökat. Programmet för projektledarcoachning adresserar just denna fråga.

Att skapa medvetenhet om life science sektorns betydelse för Uppsala och för Mälardalen är en viktig strategisk fråga. Uppsala BIO har, tillsammans med samarbetspartners i övriga Mälardalen, arbetat med att profilera sektorn mot omvärlden och mot hemmaplan. Genom hemsidor, nyhetsbrev, pressbearbetning och events har synligheten ökat, både nationellt och internationellt. Idag uppfattas Uppsala BIO som en stark aktör för life science i regionen.

Under hela perioden har Uppsala BIO samarbete med följeforskarna vid Centre for Research on Innovations and Industrial Dynamics, CIND, bidragit till att processen dokumenterats. CIND har också bidragit med att ta fram underlag, t ex enkäterna från 2004 och 2006, för strategiska beslut. Deras förmåga att interagera med projektledningen har fungerat som en bra form coachning. Till yttermera visso är de nära kontakterna med ledande bioteknikregioner i Europa via EU-projektet Council for European Biotech Regions, CEBR, en viktig källa lärande och en naturlig språngbräda till Europa.

Uppsala BIO är på god väg att nå de långsiktiga målen. Sysselsättningen ökar och Uppsalas life science syns tydligare ute i världen. Uppsala BIO-X påverkar konkret arbetssätt inom den akademiska forskningen och relationerna mellan forskning och industri. Det samlade innovationsstödet inom UIC har varit lyckosamt för att tillgängliggöra innovationer.

Introduction

The life science sector in Sweden has undergone important restructuring during the last ten years. These changes have, of course, not passed unnoticed in Uppsala. The dramatic increase in new companies and investments during the years 1998 to 2001 was followed by drastic downsizing as well as a number of mergers, acquisitions and even bankruptcies. Today, we see growth recovering, though at perhaps a healthier pace than the former peak.

About every tenth job in Uppsala is directly involved in life science. Add to this the specialised services and suppliers, and the dependence of this region on life science becomes obvious.

The region's long history of strength in biochemistry and protein chemistry is clearly evident in today's industrial make-up. Tools for biotechnology and life science research are the hallmark of Uppsala. Over the years, the application of this knowledge into predicting medical disorders has developed well and become a strong subsection on its own. Equally, Uppsala University's Faculty of Pharmacy and the long presence of a global pharma company, Pharmacia, have led to a strong position in drug development, especially drug delivery. Pharmacia, however, is no longer present. Instead, a broad flora of individual companies has established itself in Uppsala. Some were formerly part of Pharmacia, e.g. AMO's production of Healon. Some are spin-offs from the Pharmacia environment, while others are based on discoveries made at the universities in Uppsala and other regions.

Uppsala's life science sector has emerged fairly well from these turbulent years. In fact, employment in private industry increased by as much as 13% between 2001 and 2004. The Uppsala BIO initiative became operative in January 2004, so we cannot take credit for this development. The sector had, however, received clearly expressed support from Uppsala's leadership before the launch of Uppsala BIO. We can only guess the extent to which this support helped the sector to develop positively. Nevertheless, bringing the different parties together around one common action plan and the decision to delegate the operative responsibility to a new group with its own budget – Uppsala BIO – is undoubtedly a plus-factor.

Uppsala BIO is still a very young initiative. A report to VISANU (the National Program for the Development of Innovation Systems and Clusters in Sweden) analyses and compares several initiatives in the larger Mälaren region. According to this analysis, the relatively young Uppsala BIO is regarded as a mature initiative.[1] Uppsala BIO has entered its operative stage rather quickly.[2] The VINNVÄXT program played an important role here, together with the support that the leading regional actors had expressed some years before the launch of Uppsala BIO's action plan, as this support focused the players in Uppsala on the need to act together towards a common goal.

Thus, our hope that being part of the VINNVÄXT program would speed up life science development, as stated in the first strategy and action plan from 2003[3], has been fulfilled.

Of course, the challenges we saw in 2002 and 2003 are still present. But the Uppsala BIO process has taught us some ways to deal with them, and to gradually develop them into strengths.
The main challenges identified in the strategy of 2003 were:

- **The large number of small and under-financed biotech companies** – how could we help them grow and make them stay?
- **Secure a steady, long-term flow of people with competencies in science and in management skills**
- **The risk of a drought of ideas for new products and new companies if academic research and industry did not grow a closer working relationship**

---

[1] *Hallencreutz, Lundequist, Stockholm BioRegion – Erfarenheter och lärdomar av att stärka och utveckla bioteknik-/läkemedelssektorn genom ett klusterinitiativ I en storstadsregion, CIND Research Paper 2006:1*
[2] *Hallencreutz and Lundequist define five stages: Prospecting, Investigation, Start up, Operative and Maturation.*
[3] *Strategi och handlingsprogram för utveckling av innovationssystemet för bioteknik i Uppsalaregionen, adopted by STUNS in January 2003*

- **A physical infrastructure that more resembled a small university town than a growing, international science city**

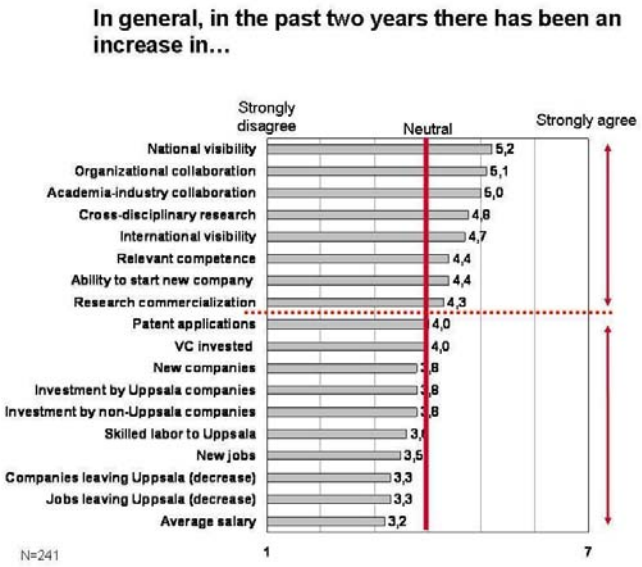
The action plan designed to meet these challenges and support long-term growth focused on the academic/industry interface. The four main action areas, all described later in this report in terms of goals, strategy, action and results, are:

- Uppsala BIO-X: Market-need orientated research
- Innovation support mainly via our incubator program Uppsala Innovation Centre
- Skills and training
- Communications

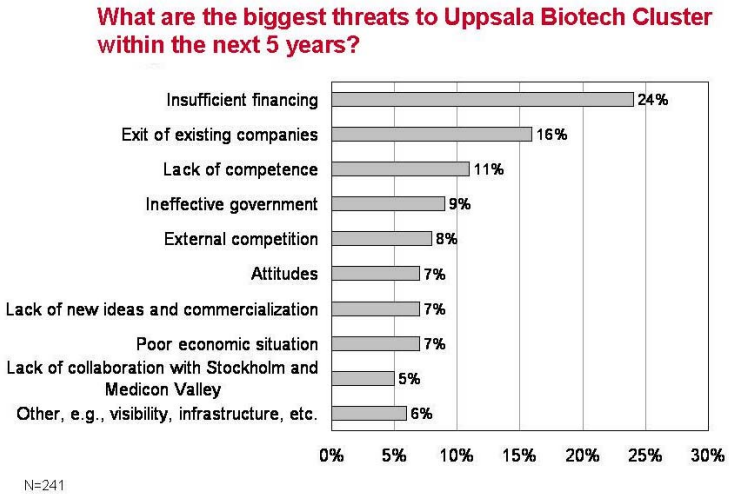
In March 2006, the interactive research team linked to Uppsala BIO launched a survey among parties interested in the process. Its aim was to follow up the respondents' view of Uppsala's life science sector's competitiveness relative to other regions', and to measure the degree of satisfaction with Uppsala BIO's work so far. According to the respondents, Uppsala/Stockholm together is one of Europe's most competitive life science environments, surpassed only by Cambridge, UK. This statement is not based on facts and analyses, but rather reflects viewpoints expressed in the survey. Nevertheless, it demonstrates that the respondents rate the environment in which they work quite highly.

It was also clear from the answers collected that the respondents still consider, two years after the first survey, that they have a clear view of Uppsala BIO's vision and mission, and that they still have high expectations of what the process may achieve.

When asked about what Uppsala BIO had actually delivered, the respondents did not yet see any effects on job numbers, new companies, new investments, etc. However, they did observe an increase in collaboration, in the commercialisation of research, and in visibility. The table shows that Uppsala BIO has largely delivered according to its project plan from 2003, but that the effects on employment and other economic variables are either still to come or not yet perceived.



In the same survey, we also asked the respondents to point out the biggest threat to Uppsala's life science over the next five years. The answer was almost unanimous: lack of early financing for projects leaving research or in new research-oriented companies. This, of course, is an issue we have to address in our next action plan. Add to that the growing number of employees working in foreign-owned companies. The opportunities for investments and development are great, but they always exist in competition with other locations globally. Our overall challenge – to prepare the region to be truly competitive in life science activities, and to make this known to the world at large – remains the same.



Uppsala BIO – Vision, strategy and organisation

> ***"Uppsala – Stockholm shall within five years time be recognized as one of the leading biotech regions in the world with a growing competitive industry, with world class research and education and a climate where industry, academy and people thrive. Within this region, Uppsala's emphasis is on methods, models and tools for biotech research."***

The vision, as stated in the original action plan from 2003

Uppsala BIO is an initiative with high ambitions but limited resources. This requires a focused strategy and the ability to stick to it.

A bottom-up approach, i.e. building upon needs and ideas expressed by our regional partners, and especially those directly involved in research and industry, has guided the development of both overall strategy and concrete actions.

Strategic features

The actions should target the interface academia/industry. Rather than having a large number of small initiatives, we prefer to initiate a limited number of activities that are given sufficient resources to have a chance of succeeding. A few but successful actions also have a greater possibility of attracting additional financing and support from other sources.

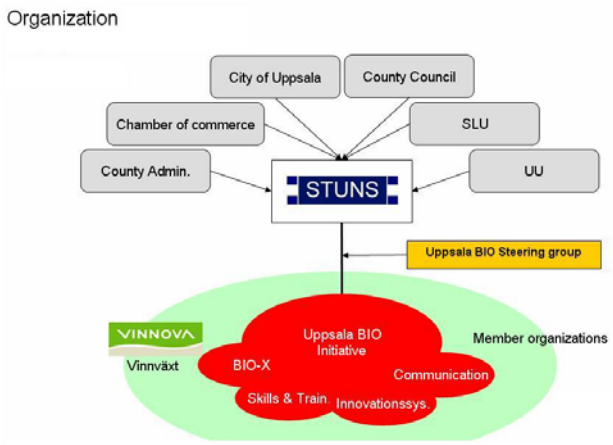
A growth initiative must allow for individual interests and benefits. As economic growth is generated by company activities, the management of the initiative should have a strong company representation.

Uppsala BIO intends to induce a long-term change in behaviour. Thus, it is important that Uppsala BIO finds permanent actors willing and competent to carry out as much of the activities as possible. Uppsala BIO initiates, but is not the sole actor.

Finally, it is important to keep the long-term perspective allowed for in Vinnova's VinnVäxt-program.

Organisation

Uppsala BIO was the first initiative to deliver a regional strategic plan involving so many different actors. It is clear that an endeavour of this nature requires a structure that both involves a diverse group of organisations and at the same time has the ability to take decisions. If this structure is dominated by the Uppsala BIO management, the sponsor organisations will soon lose interest. Similarly, thrust will be lost if individual member interests dominate conflicts and internal power struggles. We have thus allowed for some trial and error during the starting-up phase.



Current organization of the Uppsala BIO initiative

The current organisation has evolved over time, and allows for rather quick decisions while still respecting the need for trust among the various sponsor organisations. We currently have a strong and clear ownership: the STUNS foundation and its founding members. The STUNS' board endorses the long-term strategic goals and visions. Uppsala BIO's role is to carry out and realize these visions with the help of a steering group that drafts the decisions to be formally endorsed by STUNS. Day-to-day management is run by Uppsala BIO personnel with regular steering group meeting checkpoints. This organisation has successfully engaged industry

(which dominates the steering group and holds the chair post) as well as the academic and public sectors. An interesting aspect of this way of working is that people from different levels within the same organisations are represented in the initiative. This has provided us with interesting insights into how well the various companies and organisations communicate within their own structures.

The research program Uppsala BIO-X is run (as described in the Uppsala BIO-X chapter) within this same structure, *i.e.* the steering group recommends decisions to be finally taken by STUNS. A scientific advisory board (SAB) is also engaged in dedicated project-reviewing meetings to provide input on issues such as scientific excellence and market potential.

To complement the information flow from Uppsala BIO into the large academic organisations, the two universities have created coordination groups to function as interfaces with the Uppsala BIO initiative. This has not only helped the initiative operate, but also increased the awareness of internal communication at the universities. Finally, we publish an internal (for STUNS and steering group members only) monthly letter edited by the process leader, together with a public monthly newsletter. Securing information on the Uppsala BIO proceedings is highly prioritised.

Approximately once a year, Uppsala BIO gathers representatives from all sponsoring organisations to review results and discuss matters for the future.

For the ongoing work with Uppsala BIO, we (*i.e.* STUNS, Uppsala BIO and the steering group) all feel that the current set-up is working well and that it provides flexibility and a clear decision making structure, while still allowing for input from sponsors.

In order to deliver, the vision of the strategic plan work was broken down into four major areas of activities, Uppsala BIO-X (needs motivated research), Innovation support, Skills and training, and Communications. These areas naturally mix and support each other; especially communications is part of all areas but also has its own discreet activities. The responsibilities of these areas are currently divided among the management team such that Jonas Åström is the overall Uppsala BIO process leader and also the Uppsala BIO-X manager. Rhiannon Sanders is the main responsible person for Innovation support and Skills and training. Madeleine Neil is responsible for communications and public relations. Having stated this, it is obviously so that day to day operation is shared among the management team. Furthermore activities are regularly coordinated with STUNS at the weekly Uppsala BIO management meeting. In the following sections the four areas will be described in terms of strategic considerations, activities, and goals. Some initial results achieved from the work within them will also be described.

Member organisations Uppsala BIO

Apart from Vinnova, Uppsala BIO has today the following member organisations or partners:

- Uppsala University
- Swedish University of Agricultural Sciences
- City of Uppsala
- Region of Uppsala
- County of Uppsala
- Innovationsbron
- Uppsala University Holding AB
- Forskarpatent AB
- SLU Holding AB
- Connect Uppsala
- Chamber of Commerce
- Almi Uppsala
- GE Healthcare
- Phadia (Pharmacia Diagnostics)
- Q-Med
- Biotage
- Biacore
- Svanova
- SICS
- Åmic
- Doxa
- Olink
- Orexo
- Resistentia

Equality perspectives in the Uppsala BIO initiative

Equality between sexes implies giving each individual the possibility to develop and grow from his or her own and unique possibilities – to participate, to contribute and to be rewarded. As the overall

target of Uppsala BIO is economic growth in our region generated by research and entrepreneurship within biotech and life sciences, such a perspective is absolutely relevant to an initiative like ours.

In the first action plan from 2003, we established that the distribution between sexes at bachelor and master degree levels is equal. Further on and further up the hierarchies, we see a male dominance. However, there is no absolute dominance. We have companies and research institutes where men occupy the leading positions, but we have examples of the contrary as well. Uppsala BIO has not tried to explain the reasons behind prevailing inequalities. Most probably tradition and systemic factors play an important role. It is beyond the reach of the Uppsala BIO initiative to change the systemic level. However, we can make sure that our own actions visualise instances where competent men or women are underrepresented, and that we ourselves try to look beyond common borders, and identify, utilise and reward competent men *and* women. On a general scale, therefore, Uppsala BIO does not try to attack inequalities on a systemic scale, but rather on an individual level.

We want to profile what we see as good examples and success stories as a way to encourage those individuals who want to excel. There are both men and women who have paved the way and succeeded. Some of them feature in our series 'Biotech Personalities', presented in print and on the web. So far, two men and two men have been portrayed in this series. Likewise, it has been important to be able to present an interesting mix of speakers at BIO-Pubs, at our Career Days and at other public events.

Other good examples are the people selected for our steering group; today six men and two women, as well as the Scientific Advisory Board for Uppsala BIO-X, with four men and one woman. It is important that these groups are formed by persons who are willing and able to contribute to the development of the Uppsala BIO initiative, and who represent and have a status in organisations that can deliver. The current male majority reflects today's situation, but as noted, it is not an absolute male dominance. On the other hand, process management consists of two women and one man. When proposing new members to the steering group or the Scientific Advisory Board, it is important to ask if we have missed potential candidates, male or female, simply because we did not look outside our usual circle.

If we can contribute to an environment where each individual, regardless of sex, age, religion, etc. feels that they can grow and contribute, the benefits will reach us all. To a large extent, this reflects the very same values we try to communicate about Uppsala's biotech community, where ideas, people and companies are encouraged to grow and to flourish.

Overall results

The life science sector's growth and development is of great importance to the Mälaren region. Only two industries, life science and IT, in this region have shown a positive development of both the number of full-time employees (FTE) and of average salary levels.

The life science sector in Uppsala continued to grow substantially between 2001 and 2004, the last year for which we have complete statistical data. The data shown below have been compiled and analysed by CIND, the Centre for Research on Innovation and Industrial Dynamics.

Life Science industry in Uppsala	**Year 2004**
Number of companies	150
Number of FTE in companies	4 000
Number of FTE in National Agencies	1 100
Number of FTE in biotech research and education at universities *(estimates from 2001)*	2 400
Sales in MSEK	10 000

Percentage change 2001 - 2004	
Number of FTE in companies	+ 13 %
Sales	+ 4.5 %
Value added	+ 11 %
Value added in Swedish industry, all sectors	+ 2 %

Cluster's competitiveness

The 2006 survey conducted by CIND assembled respondents' views on the competitiveness of Uppsala's biotech cluster as well as on the Uppsala BIO initiative[4]. When ranking biotech clusters in the world, the respondents estimated Stockholm/Uppsala as being among the world's leading, sharing fifth position with Medicon Valley (Öresund region). The four top-ranked regions were Boston/Cambridge, USA; Cambridge, UK; San Francisco/Palo Alto, USA and San Diego, USA. There is a tendency for the political world to overestimate the importance of our own region, while the business world is less convinced. But the difference is not enormous, and has actually diminished somewhat since the first survey in 2004. This ranking is made by persons close to our region, and it should thus not serve as an indicator showing a global view of the clusters' relative positions.

Respondents were also asked to estimate how well our cluster performs in terms of the competitiveness factors of Prof. Michael Porter's diamond model. According to the answers, the cluster's weaknesses are to be found in the poor availability of capital, low local rivalry and ineffective government policies. Its strengths are the local supply of skills, the presence of sub-suppliers and a high level of innovation, especially in diagnostics and discovery methods and tools. The region, and notably Uppsala, is also considered to have a tightly-knit innovation system with a high degree of openness.

The Uppsala BIO initiative

In general, the respondents to the 2006 survey are both aware of and understand the vision of Uppsala BIO. They also express quite high expectations for what the Uppsala BIO process shall achieve in terms of improved competitiveness. Given the rather limited resources available, dealing properly with these expectations is definitely a challenge for the process management.

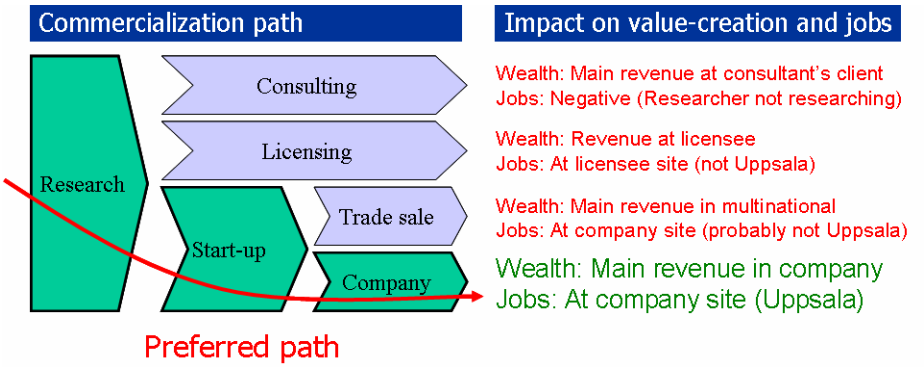
Respondents were, however, positive to the achievements made so far. An absolute majority consider Uppsala BIO as a good or very good use of resources. They also say that Uppsala BIO has so far made an impact on the areas that are the primary objectives of the initiative.

The following chapters will present in more detail how Uppsala BIO's four action areas have progressed during the first 3 years regarding activities and results.

[4] See appendix 5

Market-orientated research – Uppsala BIO-X

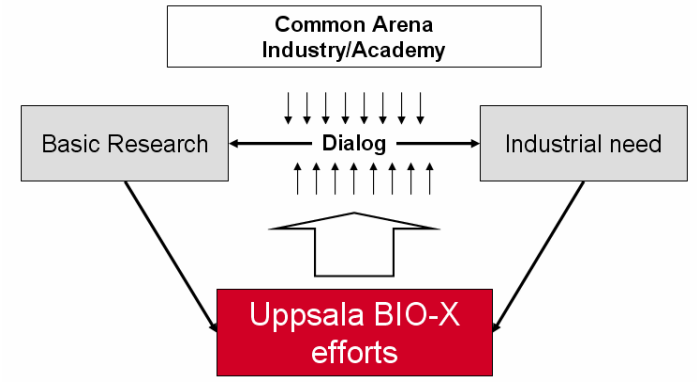
Historically, transferring academic research results into business opportunities in Uppsala has to a large extent taken place via collaboration between researchers and a major company (e.g. Pharmacia). Today, this 'early-phase incubation step' is gone and no similar dominating relationship exists locally. The Uppsala BIO-X initiative was started as an effort to fill this gap, i.e. to support the transfer of early research, to shorten the time from invention to business opportunity, and to strengthen the interaction between academic and industrial research groups. Uppsala BIO-X's goal is thus to create a platform for cooperation between academic and industrial research groups at the operative level. This platform is in turn built on creating an understanding for market and product development needs, and on creating an interest from industry for the potential of local academic research.



Alternative pathways for successfully commercialising research results.

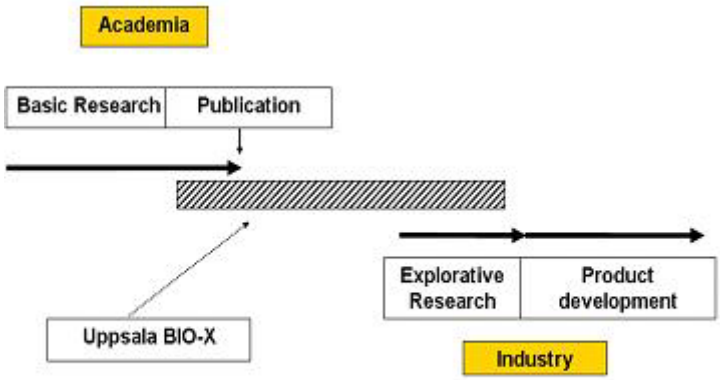
A key aspect of this objective is to create conditions for increased interaction between academia and industry, with the vision of an, in the future, independent research centre – a functioning forum for both groups. The overriding goal for Uppsala BIO-X is described graphically in the figure above – a model of the different ways to achieve commercialisation, including the path we want to see for the initial Uppsala BIO-X efforts.

From interviews with researchers who have commercialized their own ideas or even started their own business initiatives, it is evident that it is the interface and repetitive contacts with industry people in an *informal* setting that triggers the collaboration or business initiative. It is therefore clear that Uppsala BIO-X should stimulate such meetings and bring together industrialists and academics in groups focused on specific research projects or challenges. This is illustrated by the figure below.



General strategic considerations

In the early phases of translational research (turning an invention into a business opportunity), there is a gap in the availability of resources. This gap arises because few clear stakeholders/risk-takers can be identified at this stage. The usual end-point for grant providers is publication, which is generally too early to provide enough proof-of-principle to attract industry to take up an idea (see figure below).



The resource gap that Uppsala BIO-X aims to fill

Uppsala BIO-X thus aims to create meeting places and other hands-on activities around active research projects. The Uppsala initiative can be said to differ from the original Stanford BIO-X program in several ways. We try to gather different research groups around the actual projects and the interest in them, rather than merely physically bringing together different academic fields. Furthermore, our goal is to create business opportunities and regional growth, not just pure academic excellence. However, we do maintain the cross-functional aspect and, of course, the demand on scientific excellence.

To steer the Uppsala BIO-X initiative, to select and govern projects, we recruited a Scientific Advisory Board (SAB). The SAB is a mixture of top-class scientists and industry R&D managers (five core members and three affiliated members, the latter also part of the Uppsala BIO steering group). The SAB reviews projects that are up and running every six months or as needed. Furthermore, it provides input for the Uppsala BIO-X strategy and reports its opinions to the Uppsala BIO steering group.

Members of the SAB are contracted for one to two years at a time, so that as projects change character over time, the competence of the SAB can be tailored to match. The sponsored efforts are no longer than 24 months in duration. Our idea is to maintain both consistency and flexibility in the system. Rather than spreading resources over many projects, our strategy has been to make substantial contributions to few select projects.

In the first round of project sponsoring, we chose to support local academic research initiatives based on cutting-edge science within several branches of life science and medical research. The goal of these projects is to start-up new company initiatives or generate new research-based opportunities, either within the project itself or in cooperation with local industry. We now make it possible for these groups to carry out explorative research primarily focused on commercialisation rather than publication. They thus receive funding for this task, help in the form of advice from our scientific advisory board (SAB), and active support from the Uppsala BIO steering group and UIC, etc.

Current Uppsala BIO-X projects

The goal for the first wave of projects has been that each group shall develop its research ideas, primarily in the form of prototype/product development, but also with regard to business plans. At their conclusion, these projects should ideally lead to new business activities based on the original research, either in cooperation with industry or via a sales agreement.

The first project was started in June 2004: 'High throughput analyses of microbial communities' and was run under the direction of Ass. Prof. Mats Nilsson, Institute for Genetics and Pathology, Uppsala University, with the assistance of Prof. Ulf Landegren of the same institute and Prof. Janet Jansson, Institute for Microbiology, SLU, *et al* (see appendix Participating actors). The project was a large cross-functional technology platform development effort. After revision by the SAB and Uppsala BIO-X management, the project was found not to be as focused and application-guided as at first expected. The original project was thus terminated and divided into two discrete projects.

MICPROF, run by Prof. Janet Jansson et al, is currently looking into commercialization opportunities for profiling microbial communities in clinical applications. The group has access to a large number of samples via collaboration with several hospitals in the Mälardalen area. At the moment, this project is investigating the possibility of feeding the development of new technologies for rapid microbial profiling by a revenue stream from a service business in the same field.

For the second project, Ass Prof. Mats Nilsson *et al*. were urged by the SAB and Uppsala BIO steering group to further refine the nucleic acid and protein analysis technologies that they presented in the original project. This has now taken the form of a project named **CAMDIA**. Here, the Uppsala University group has teamed up with the Swedish HPR (Human Proteome Resource) initiative under Prof. Matthias Uhlén and the Uppsala University Hospital colon rectal cancer clinic (Prof. Bengt Glimelius) to further develop their proprietary technology (proximity ligation assay) for detecting early circulating markers of colon rectal cancer. The results from this research already have a commercial partner in the local start-up company Olink AB.

During the autumn of 2004, we sought, selected and started-up yet another Uppsala BIO-X project, 'Lab-on-a-Chip Point-of-Care' (**Loc&Poc**), under the direction of Prof. Lars Baltzer, Dept. Organic Chemistry, *et al* (see appendix Participating actors).. This project aims to create a proof-of-principle prototype for a new point-of-care chip platform. It unites the organic chemistry, clinical chemistry, surface chemistry skills of Uppsala University with the micro-fabrication technologies of the Ångström facility. The group is now in its second year of development and a first prototype of the chip and its detection system will be demonstrated in September. The application chosen for the prototype is CRP, a circulating early marker for inflammation, which has recently drawn new attention to itself for its ability to predict outcome and recovery time after heart attacks and during surgical procedures.

Some results

To date, Uppsala BIO-X engages about 20 senior researchers from the Swedish University of Agricultural Sciences in Uppsala, Uppsala University, Uppsala University Hospital, and several other universities and technical institutes in the Uppsala/Stockholm region (see Appendix Participating actors*).* Practical work with commercialising the basic research has also involved graduate students and post-docs at the various departments. Furthermore, it is of great value to regional development to have a common reviewing board with industrial and academic representation meeting at regular intervals to discuss concrete research issues as well as translational research strategies in Uppsala (five half-day SAB meetings with project reviews and presentations during 2004 to Q2 2006).

During the first three years, some 40 project suggestions from industry and academia (and combinations thereof) have been reviewed. Those that do not receive active support by Uppsala BIO-X nevertheless receive advice and guidance to find other sources of financing. At least one company (Olink AB) has been created with the help of Uppsala BIO-X and is currently in its growth and expansion phase.

Scientifically, all groups publish their own basic research. This, however, is not the primary goal for Uppsala BIO-X.

The MICPROF project has translated basic research into the possibility of profiling the microbial communities of human, food or veterinarian samples. This is currently leading to better understanding of the dynamics between health and gut flora. CAMDIA explores new uses for the proximity ligation

assay, a technology that has the potential to become a powerful tool for directed proteomic investigations as well as clinical diagnostics applications. Both projects have clear links into the clinical setting and thus address relevant issues.

In Loc&Poc, the integrated chip/chemistry system functions as a 'shop window' for individual technologies such as the high-performance, high-pressure native nano-flow actuator pumps and the luminescence reporter system. The new set of C-reactive protein binders developed permits a move away from antibodies, which both lowers costs and increases the reproducibility of the system. Unwanted surface binding has been addressed by the application of 'pluronics' (Prof. Caldwell), something that has implications for all protein-handling chip technologies. The active participation of the clinical chemistry department at the University Hospital is also important in Loc&Poc. Currently, this project is looking for industrial partners to boost the development of the chip and the chemistries involved.

Besides the direct effect that Uppsala BIO-X have had in terms of forming new research constellations creating possibilities to investigate commercialization potential of basic and applied research results, it has started several other processes in the region. Uppsala BIO-X has activated a discussion within Uppsala's biotechnology community regarding the potential for commercialization and which is the best route to the market for early ideas. We have organized both a scientific advisory board where international and local experts meet and discuss the projects and their potential, these discussions are then transferred to the Uppsala BIO steering group (where the decisions regarding run/stop etc are taken) thus also involving the public sector. This generates a more widespread common view of the needs that translative projects have. Uppsala BIO-X can be regarded as a "Venture Philanthropist" not primarily concerned with direct capital return to our investors, (which almost all other VC actors are, *eg* Innoventus or even business angels). This makes Uppsala BIO-X a forum where hands on projects engage partners the triple helix in discussions on the best way forward in individual project, within the innovation system, and from a regional perspective.

Stimulating cross-disciplinary research

In order to create and stimulate cross functional discussions and meetings, a prerequisite for steady flow of new exciting ideas, an annual event called BIO-Ångström was started. The event is a one-day meeting to get researchers (only academics during the first 2005 meeting, but from 2006 also industry scientists) with different areas of expertise to meet and discuss their various issues and thoughts about what is needed to solve the future major biological issues (e.g. systems biology, brain disorders, regenerative medicine, infectious diseases, etc.). For the 2006 meeting, we also plan to get Uppsala's industry to share some of its visions on future application demands in its respective fields, and on the implications this may have for future R&D. During the 2005 meeting, about 130 scientists met to discuss these types of issues and several new research connections were made.

Future Uppsala BIO-X efforts

To engage not only academia, we have during the spring of 2006 initiated a series of dialog meetings with the heads of research and business development in Uppsala's major biotech tools companies. Our goal has been to identify common needs-motivated projects that the Uppsala biotech industry feels would help it secure growth. Furthermore, this is also a way to increase communication between the different companies, and get industry more involved in Uppsala BIO-X.

A complication that soon becomes evident in all initiatives of this kind, i.e. common development projects, is ownership and the model for sharing the business opportunity. We have so far chosen to leave out these issues from the general discussion until a more concrete situation arises.

These first meetings showed that there exists a clear interest to generate development projects (identify needs, get end-user input, find relevant and validated samples, and maybe test early iterations) closer to the clinical setting. The ultimate goal would be to set up a long-term research centre in close proximity to the Uppsala University Hospital and involving the two universities. Typical subjects could be cancer research or research into neurodegenerative conditions, for example. In an effort to further investigate these possibilities, Uppsala BIO-X will propose that a dedicated resource

works half-time (or similar) for a couple of months during 2007 to look closely into the possibilities of mapping ‘stakeholders, payers and players’. In this context, it is evident that the regional health administration must be part of the effort and, to that end, meetings will be held with Uppsala County Council during the autumn.

The mode of operation of Uppsala BIO-X is constantly under revision. This ensures that Uppsala BIO-X does not become an ‘institution’ but stays an active forum and venue for world-class functional research. In the coming three years, we plan a more directed effort to engage the University Hospital and local industry even more strongly, and to connect academic research tightly to them.

Skills and Training

Training skilled people for the biotech industry is a long-term strategic issue. We find challenges at all levels of the chain of education – from attracting young people to science, to offering attractive further-education programs, and to empowering entrepreneurship and leadership. Since provision of an appropriately-trained and skilled workforce is such an important factor for the growth of today's life science industry, as well as for the companies of the future, skills and training has been given a special focus within Uppsala BIO.

The life science sector in the Uppsala region needs individuals with a deep factual understanding of the life sciences, as well as good leaders in all aspects of business and research, plus entrepreneurs who will break new ground and push ahead future development.

Within the Skills and Training project, we have therefore identified a number of priorities. These include:

- improving recruitment from schools to universities
- tailoring the content of university courses to the needs of the employment market
- supporting innovators, entrepreneurs and industry in developing next generation's managers (within entrepreneurship and project leadership, for example).
- supporting job-seekers with inspiration and information

The initial challenge in 2003 was seeing exactly how to achieve this. Several specific efforts were launched and tested, and many contacts were sought with individuals responsible for relevant education programs at Uppsala's two universities; Uppsala University and the Swedish University of Agricultural Sciences (SLU). A number of organisations existing at the onset of the project became natural collaborators for many of our planned activities. Certain of these relationships have continued with growing success, and many new ones have been established.

Recruitment from schools to universities

For example, improving recruitment from schools to universities was almost exclusively dealt with through Uppsala University's already existing MOR-unit (Unit for Marketing, Collaboration and Recruiting), a group with a program in place for both short-term and long-term improvement of recruiting students to the natural sciences. A formal collaboration agreement listing specific activities was written to cover 2003 and 2004. In addition, Uppsala BIO has ongoing collaboration with the National Resource Centre for Biology and Biotechnology, also based at Uppsala University. Once a year, this centre organizes a week of activities to educate natural science teachers about recent research and developments in biotechnology. Uppsala BIO has supported this activity and provided sponsorship funding.

Tailoring university courses to the needs of the employment market

There is a significant need for more and better contacts between schools, universities and industry. In many instances, we see a very real will to work through direct collaboration. However, the individuals and organisations concerned lack a viable contact network, as well as an understanding of how the academic or industrial worlds work.

We believe that one of the simplest and most powerful means of reaching our goals is simply to facilitate appropriate contacts. For example, other regions have learnt that a close and open contact between industry and university courses increases the attractiveness of these courses to the best of the new students. Teachers may need support for building new course structures and content with a greater industrial significance.

Strategic Education Issues

One activity in our original plan was named the Strategic Education Council (Strategiskt Utbildningsråd). This was intended to develop a dialogue across faculty and institute borders, to build

contacts between educators and employers, to predict future educational needs, and to initiate education programs wherever these did not already exist.

One immediate result of our initial contacts and discussions to construct this council was the realization that the university system is complex, and that authority and mandate are spread thinly over a large organisation. At the same time, many faculties and individuals already work actively towards these goals and therefore often only need better contacts with industry to realize them. Uppsala BIO offered practical help in this process and have thereby developed many valuable contacts. We have also maintained contacts with several of the heads of Human Resources at biotech companies in Uppsala, and have used these contacts as a route in to other functions at the companies.

In other instances, Uppsala BIO has been more directly involved in larger programs. For example, the Biology Education Centre (Institutionen för Biologisk Grundutbildning) has established contacts with the great majority of biotech companies in the region for the purpose of better placing students for course-related project work. It now has its own contact network in Uppsala.

During the latter half of 2005 and the spring of 2006, Uppsala BIO has had a seat on the Uppsala University council responsible for the course content within the natural sciences – a 'programråd'. The goal of this participation is to represent Uppsala region's biotech companies and influence the course content to better reflect the competence needs of the industry. Several individuals from biotech companies in Uppsala sit on various councils for the natural sciences, and it is clear from discussions with some of them that a good deal still needs to be done. Creating a structure and system for these council meetings that genuinely gives industry a voice in structuring the courses is one clear priority.

Next generation's managers

Many of the regional Life Science companies have, for example, expressed a need for experienced project leaders, and for training that is tailored towards leading the research-intensive projects typical for the industry. Academia also faces many specific leadership challenges, not least regarding the larger, multi-centre collaborative projects that are becoming increasingly common. Leadership qualities are thus in high demand but there are few courses tailored specifically to this specific need within project leadership.

Coaching and leadership training for project leaders

Leadership is thus a special focus of the unique project leader training program that we started in 2005. A questionnaire completed by participants at the end of each course has shown that it is extremely well accepted and appreciated. To date, 18 individuals have participated in this training and we are currently recruiting participants for the third course in September 2006. After the first course which Uppsala BIO financed in full, the participants have paid a fee that covers our costs for the course.

Our aim is not only to provide a unique education that is currently lacking for project leaders in the sector, but also to bring together project leaders from academia and industry so that they might better understand each other's organisations and cultures. In the long term, we hope that this will contribute in a concrete way to improving the prerequisites for successful collaborative projects between local companies and researchers. Each course we run expands the network of trained project leaders in Uppsala.

Training for entrepreneurs

Uppsala BIO has its overall primary focus at the boundary between universities and industry. It is at this interface that we can play a special role in supporting and stimulating budding entrepreneurs to develop the kinds of skills needed to found, initiate and sustain the companies of the future. Information and training is needed at all levels, from a general understanding of the principles of commercialization to the ability to start one's own company.

Thanks to our agreement with Uppsala Innovation Centre (UIC, see later), we have been able to establish a training program for budding entrepreneurs. This program also provides training for individuals from other Uppsala BIO activities.

Supporting job-seekers with inspiration and information

Career Days

Uppsala BIO Career Days is also a unique activity. It is a two-day workshop that we have now held on two occasions and which promises to be a successful recurring annual event. Over several years, unemployment in Uppsala among persons with a higher education in the life sciences has reached significant levels. We do not want to lose this valuable labour force to other regions or other countries.

The primary driver for this event was thus the acute need for information (on the types of jobs available in industry) and inspiration for academics currently out of work. This need has not changed since the first event on 16-17 March 2005, and we have now run the Career Days for a second time in March 2006.

The main theme for both Career Days has been to present career choices with the emphasis on the less obvious, or on areas of which academics are not particularly aware. A recurring theme is the concept that a carreer in life science may involve moving from large companies to start-ups, from research to marketing and sales, into journalism or patenting, or from a specialist position to starting their own company. On both occasions, the second day has been dedicated to offering free career advice. This initiative has been enormously appreciated and the audience has numbered approximately 200 on both occasions.

We also aim to provide as much input as possible from local companies, and encourage them to talk about how a company functions and the type of work culture that exists. This is to an alarming extent unknown to students leaving university and looking for a career in industry. These students also lack a network of contacts among local companies. In the latter sense, the Uppsala BIO Career Days support our efforts to remove barriers between universities and industry, and between education programs and employment. This event is run in collaboration with the Swedish Association of Scientists (Naturvetareförbundet), one of the major trade unions for the biotech sector. This valuable collaboration will continue, and we are discussing ways to develop it further.

The job market and VinnVinn

The situation in the job market in the biotech sector has clearly been strained over the last few years, not least for those who have newly graduated. But what are the facts? Is the situation the same for graduates from different courses and with different levels of qualification? Suggestions have been put forward for a program (Post-Ing) to help science graduates (civilingenjörer) get a foot in the door of industry. But are they truly the most needy group?

We needed a clearer picture of the actual situation and therefore gave CIND (Centre for Research on Innovation and Industrial Dynamics at Uppsala University's Department of Economic Geography and Stockholm School of Economics) the task of putting together statistics within the mandate of their interactive research on Uppsala BIO. This study was completed in the autumn of 2005 and it is clear that the situation varies significantly between different groups of graduates with the 'green' biologists having the worst situation. The group we originally considered for the Post-Ing program had been rather successful in finding work. Nevertheless, there remains a serious challenge in finding work for academics from Uppsala's two universities. During the autumn of 2005, Uppsala BIO therefore became actively involved in a program initiated by Vinnova that addresses out-of-work academics. This program has already been implemented with success in Gothenburg (2003-2004) and Skåne (2004 onwards).

VINNVINN is an initiative that focuses on regional employment of individuals with higher education and specialist skills, either out of work or newly graduated. It is built on collaboration and mobilising the efforts of local organisations including County Labour Boards (Länsarbetsnämnden), TRR

Trygghetsrådet (an agency that helps redundant employees in affiliated companies find new careers), Regional Development Councils, industrial organisations, key companies, universities and colleges, and similar organisations within a region, and on using existing resources more efficiently. The project carries out matchmaking activities between companies and appropriately-qualified job-seekers and also seeks out potential entrepreneurs to man projects from industry or small start-up companies. Financial support is available to companies for trial employment periods, and they are encouraged to continue the engagement via full-time employment.

In Uppsala, we intend to start a VINNVINN process during 2006. We have established a steering group, manned with representatives from industry (with Uppsala BIO representing local Life Science companies), the County Labour Board, Uppsala University, the Swedish University of Agricultural Sciences. The steering group will establish two programs, one for IT and one for biotech, targeting employment at established companies as well as start-up companies or projects ripe for commercialisation. Activities started during the spring of 2006 and we are currently awaiting funding that will allow us to expand these activities and initiate the biotech sector program.

Other methods - workshops etc.

An effective way to build on and improve contact networks in Uppsala, and which we will continue to exploit, is to organize one-day workshops on critical topics. In this way, we can raise broader issues for a wide audience, initiate discussions and continue contacts that would otherwise have been unlikely to occur. The first workshop Uppsala BIO organized on the 2nd June 2004 was a collaboration with Bioteknik Forum entitled: “How do we solve future needs for competence within the Biotech sector?” Participants came from schools, universities and the government’s Department of Education.

Innovation support

Regional growth is based on developing existing companies, establishing new companies, and attracting companies from other areas. In the life science sector, establishing new companies is based on innovations, and these often require major investments of capital and time before they take root. Without a constant flow of new initiatives and a general atmosphere of renewal, this fast-moving sector, which is highly dependent on cutting-edge technology, will quickly stagnate. We thus need to dedicate professional resources to creating the most effective support and selection procedures for biotech start-up companies. Furthermore, these resources need to be focused on and tailored to the special needs of this sector.

One of the longer-term goals with which Uppsala BIO has worked is to coordinate as many as possible of the innovation support organisations in Uppsala. There are many such organisations in Uppsala and the system in general has been perceived as difficult to penetrate. One move that has made a significant contribution to achieving this goal was to co-localize most of the organisations dealing with the high-tech sectors in the same premises at Uppsala Science Park from the end of March 2004.

In keeping with Uppsala BIO's general strategy of meeting its goals by as far as possible building on partnerships with existing organisations, we identified Uppsala Innovation Centre (UIC) at the beginning of 2004 as an ideal partner for providing support for start-up companies in the biotech sector. At this time, UIC went through a reorganisation and restart, creating a new structure with new owners. This collaboration of Uppsala BIO with UIC has no doubt contributed to the success of both the co-localization and reorganisation. Since 2004, we have seen a very tangible increase in the efficiency of the system and the potential for collaboration around specific issues. Gradually roles and responsibilities become clearer, not only to the partners but also, and more importantly, to the users.

Through its ongoing collaboration and agreement with UIC, Uppsala BIO has been able to focus on defining the needs of innovators and entrepreneurs in the biotech sector, while UIC has been responsible for finding the best organisations and solutions for satisfying these needs. The written agreement between UIC and Uppsala BIO, which has been renewed for 2006, specifies a number of deliverables for the Life Sciences, such as the number of places in training programs, support from business coaches, places in the incubator program and support for developing patenting strategies. The process of formulating the agreement between UIC and Uppsala BIO has had the added effect of highlighting questions and issues around areas of responsibility within Uppsala's innovation support system. Reaching a formal agreement is of course an important goal in itself, but the discussions en route to the agreement, which involved most of the UIC owners and their partners and collaborators, have arguably been of greater consequence.

Latterly, we have begun to integrate Uppsala BIO-X projects and researchers with the program of innovation support. For example, these researchers have had access to advice on patent strategy from Forskarpatent (a firm offering patent guidance for scientists), as well as prioritized access to Business Start.

About Uppsala Innovation Centre, UIC

See www.uic.se.

UIC's owners are Almi, SLU Holding, STUNS, Uppsala University Holding Company (Uppsala universitets Utveckling AB), and Innovationsbron Uppsala (an organisation that contributes to the commercialization of research-based and knowledge-intense business ideas).

UIC offers entrepreneurs access to training programs for developing their own skills, their companies and their business ideas. It supplies hands-on management, advice on financing, and access to networks of commercial and technical expertise.

UIC supports businesses based on ideas from Uppsala's two universities, but also ideas originating in industry and the public sector. About 50% of the approved applications come from academic scientists. Over 60% of these ideas and companies belong to the life sciences sector. UIC offers three programs that deal successively with the progression from idea to financed company.

Business Start

The first program, called Business Start, is for entrepreneurs who have not yet started the commercialization process. The only requirement for participation is an idea that could potentially be developed into a company, and the will to invest a sufficient amount of time to develop it. The program consists of seven workshops where experienced professionals and experts give general information on subjects such as the business development process, financing, patents, project management and business law. Participants are also given the opportunity to create professional presentations of their business concepts and have these evaluated by a panel of experts.

Business Lab

The Business Lab program offers more in-depth knowledge on business development, customers, marketing and financing for those who have progressed further towards realizing their business idea, and who have a business plan. UIC requires that the business plan indicates potential for increasing the number of employees significantly in the future, and that the first financing, e.g. from Uppsala University Holding or SLU Holding, is in place. Developing a good business plan is the focus here, and each company gets individual feed-back plus some business coaching.

Business Accelerator

For the third program, the Business Accelerator, not only must the company have the potential to develop into a growth company, it must also be able to succeed in an international market. Financing for at least six months must also be in place. Processing applications takes 6-12 weeks and in most cases is a very valuable process in itself. If successful, each company gets its own dedicated business coach.

UIC is currently one of twelve business incubators that form the National Incubator Program (NIP, formerly Vinnova's Vinnkubatorprogrammet) of Innovationsbron. One distinct feature of UIC is the system it uses for accessing the knowledge of experienced business coaches. UIC has a network of about 40 business coaches and each company in the Business Accelerator incubator program has its own coach. This coach is a senior figure with good general knowledge and experience of commercialization processes, but also with specialized knowledge of a field relevant to the company. UIC charges the incubator company consultancy fees for business coaches on a 2-3 year credit, which are paid back only if the company develops successfully. UIC has rarely had to directly recruit a business coach – a testimony to the interest in the concept among established business people. The business coach concept pioneered by UIC has proved very successful and is now being adopted by other Swedish incubators.

Another important feature of UIC is that it does not take ownership of any part of the company in return for its services. This allows it to remain independent and objective in judging the merits of business plans.

UIC also uses some 25 specialists as consultants in areas like prototyping, clinical studies and analyses, and has a number of partners, including accountants, banks, lawyers, real estate companies, and operators in the local innovation system. They contribute their knowledge at seminars and individual counselling. They can also contribute to the financing of companies

UIC has now established itself with a clear roll in the innovation support system in Uppsala. This has required and will continue to require much work to maintain good relationships with the important actors in this system.



Uppsala Innovation Centre (UIC) at Uppsala Science Park. In the same building are STUNS, Uppsala BIO, the Centre for Entrepreneurship and Company Development (CEF), the holding companies of both Uppsala University and SLU, Connect Uppsal, Forskarpatent, plus a number of start-up companies and consultants.

Some results from 2005-2006

The main deliverables and results according to the agreement between UIC and Uppsala BIO for 2005 were:

Deliverable	**Results achieved**
50% of the companies in the Business Accelerator, at least 7 companies, should be Life Science companies.	Over 50%, 16 companies total in all programs
Potentially commercialisable ideas from Uppsala BIO-X have access to a Business coach (or equivalent) for evaluation of the idea.	Achieved
At least 2 UIC Business Lab programs should be carried out during 2005 with places for at least 7 Life Science companies. A report summarizing an evaluation of each program should be sent to Uppsala BIO.	2 programs completed, a third started during 2005. Total of 12 companies participated, 8 Life Science
An educational program, Business Start, will be developed and executed during 2005 with at least 20 participants. The program should be accessible to members of the Uppsala BIO-X projects.	First program run during autumn with 15 participants. Second program during spring 2006 with 13 participants. One Uppsala BIO-X member registered in second program.
Ideas och projects (in Business Lab and Business Accelerator) shall be given IP-strategic advice as needed and Uppsala BIO-X projects will have access to a maximum of 40 hours patent strategy advice per project per year to be administered through UIC.	Fulfilled. Uppsala BIO-X project “Lab-on-a-Chip” in particular has exploited its quota of patent strategy advice.

Written and verbal assessments of the UIC Business Start program gave very positive feedback from participants and lecturers alike, and the program was repeated in the spring of 2006 with a full-house of participants. Rhiannon Sanders, Uppsala BIO, plays an active part in the planning and execution of the Business Start program and its success has ensured a third program, planned to start in September 2006.

UIC Business Lab has undergone significant improvements. Individual coaching, albeit on a small scale, was provided in addition to the formal program. UIC Business Lab has also been extended to include a 'Due Diligence period' for companies who apply to the Business Accelerator. Together with Innovationsbron Uppsala, UIC is now developing a common method for this Due Diligence.

Work with companies in the UIC Business Accelerator (step 3 at UIC) yielded good results in terms of financing, customer relationship development and expansion possibilities for a number of the companies. During 2005, over 50% of the UIC Business Accelerator companies have come from the Life Science sector. Among these is Olink AB, the first company to come directly from the Uppsala BIO-X program.

Incubator companies have attracted attention in business competitions such as VINNOVA's VINN NU, where one winner was Biovica, a young life science company in Uppsala, and two of the other winners were UIC companies, though in other sectors. In the Venture Cup Business Plan competition, the second prize went to UIC company Xi-bao Research.

Together with scouting organisations, UIC has established clear collaborations, regulated by agreements, regarding the delivery of new commercial ideas into UIC and their development. Agreements currently exist with Innovationsbron Uppsala AB, SLU Holding/Omvärld, and Connect. Regular meetings occur with Uppsala University Holding Company AB , Almi, Connect, and Aktietorg Uppland (a holding company that promotes regional share emissions for local companies). For example, Uppsala BIO funds have partly financed a collaboration agreement between UIC and Connect under which Connect Uppsala will identify 8-10 projects per year that fulfil the criteria for the UIC Business Lab and 2-3 projects per year for the Business Accelerator. This agreement has a term of three years. The requirements for 2005 were filled satisfactorily.

UIC has now reached a collaboration agreement with the holding company and incubator of the Karolinska Institute, KIAB.

The total financing of UIC during 2005 was 8.1 million SEK, 5 million of which was public funds. 15% of UIC financing during 2005 and 2006 has been provided by Uppsala BIO, which makes Uppsala BIO its largest contributor regionally.

According to the latest report, UIC had achieved the following quantitative goals:

Input

Indicator	**Explanation**	
Number of ideas assessed	How many ideas the incubator has assessed for at least 1 hour in a personal meeting (not by phone) during 2005.	220
Source of innovation	* University/College * Industry (spin-off) * Entrepreneur * Public sector * Industrial research institute * Others	80 % 4 % 15 % 1 % 0 % 0 %

Selection

Indicator	**Explanation**	
Number of ideas selected	The number of ideas the incubator adopted during 2005	44
Projects accepted	How many projects: - Were companies when accepted? - Have become companies? - Remain as projects? - Have been discontinued?	 20 4 20 4
Origin of ideas – selection	What percent of ideas came from * University/College * Industry (spin-off) * Entrepreneur * Public sector * Industrial research institute * Other	 50 % 18 % 25 % 7 % 0 % 0 %

Results

Indicator	Explanation	At end 2004	At end 2005	Life Science at end 2005	First half year 2006 (where results are available)
Number of incubator companies	How many companies are currently in, or have passed through, the incubator since its start. Bankrupt companies are subtracted.	42	33 during 2005. Total since start: 48	16	33 (15, 45 %, Life Science. 5 newly started)
Number employed in incubator companies	How many employees in companies currently in or having passed through the incubator since its start. Figures for bankrupt companies are subtracted.	56.5	40 during 2005 (25 newly employed during 2005). Total since start 87	17	26 newly employed
Turnover in incubator companies	What was the total turnover in companies currently in or having passed through the incubator since its start?	36257 k SEK	57800 k SEK	17054 k SEK	
Financial results in incubator companies	What is the cumulative financial result for companies currently in or having passed through the incubator since its start?	-13435 k SEK	-11000 k SEK		
Attracted public money	How much public capital has been invested in the incubator companies?	6021 k SEK	4800 k SEK	1926 k SEK	1000 k SEK
Attracted national and regional risk investment	How much national and regional risk capital has been invested in the incubator companies during the year?	2202 k SEK	25500 k SEK	2587 k SEK	10500 k SEK
Accumulated tax income	How much direct tax (tax on profits, social security payments, employees tax and VAT) was generated by incubator companies during the year?	9422 k SEK	25400 k SEK	6674 k SEK	
Public Return-On-Investment (ROI)	Accumulated tax income generated during the year divided by invested public financing of the incubator. Gives the direct profit for the state on investments made.	4.2	5.1		

Communication and visibility

The goals of the communication plan adopted in 2003 were defined as:

- Attract new investments to Uppsala in terms of capital and competence.
  - New actors may bring new business and new employment, but may also increase competition between established players.
- Support the growth of companies already established in Uppsala
  - Can we support the building of trust between actors by supporting and enlarging networks?
  - How can growing companies profit from the positioning of Uppsala's life science sector?
  - Can we raise awareness of Uppsala's competence in life science in boardrooms and headquarters outside Uppsala?
- Secure long-term support for the life science sector in Uppsala and for Uppsala BIO's action plan.

Strategic considerations

The original communication plan was drawn up when few Uppsala BIO activities had started. The focus of the plan was therefore on attracting new investments. We decided to concentrate messages around persons, companies and events that could serve as examples of Uppsala's strengths. In cooperation with a group of representatives from companies, academia and the public sector, we defined these strengths as:

- A solid track-record of research leading to unique and profitable products
- A tight, well-functioning network of competitive and complementary skills – short lead-times from idea to market!
- Room for entrepreneurs!

In 2006, Uppsala BIO has further developed this picture of strengths in life science. Highly successful research groups and life science companies have been identified in an attempt to highlight one or more winning sub-sectors within life science – sectors where the region has a competitive edge within both research and industry, and where we can see an ongoing development. *Late-stage drug development*, including regulatory steps, and methods for *predicting medical disorders* are two such growing sectors where Uppsala may contribute substantially in the future.

Over the years, discussions of whether we should brand Uppsala or Stockholm *and* Uppsala as one region have continued on many levels. Uppsala BIO has a mandate to brand and market Uppsala as a beneficial location for life science investments. Undoubtedly, the close vicinity of competencies, companies and capital in Stockholm, as well as the fact that Uppsala and Stockholm is one labour market, is an advantage for the whole region. When communicating Uppsala, we therefore choose to include relevant actors from Stockholm and other parts of the region. However, the Stockholm/Uppsala region still lacks a common market and communications plan for the life science sector. In spring 2006, Uppsala initiated discussions with the Stockholm Business Alliance, Biotechvalley.nu (Strängnäs) and Stockholm Bioregion on this issue.

Close collaboration with the universities' information departments is vital to secure a common message and to be able to share resources. For example, Uppsala University's press seminars on life science influence how the national media view this sector. Another example is the development of research databases on the web.



Suppliers *Coordination* *"Sales department"*

In a similar way, coordination with inward investment organisations, primarily Invest in Uppsala, must be handled in an appropriate manner. We must agree on the image we give of Uppsala. That image must be both interesting and solid. Invest in Uppsala should work as the region's 'sales department', and thus also feed back comments and demands from markets outside the region.
Uppsala BIO's role is to co-ordinate and packet relevant information about Uppsala's life science industry proactively or in response to external inquiries.

Target groups for attracting investments were selected in co-operation with Invest in Uppsala. These groups are investors and researchers in Europe, the US and South East Asia. Relations with China have grown quickly, mainly with the Zhejiang province and the city of Nanjing.

In this strategy, we chose to make as much use as possible of 'ambassadors', *i.e.* representatives from companies and research groups, for communicating our strengths. Their credibility when describing the region and environment to which they belong is generally high.

A number of new investments have or will expand the biotech industry in the region. None of these are so-called green-field investments. The majority are acquisitions of companies already established in Uppsala, or investments to scale up their activities. The latest example is GE Healthcare's bid for Biacore AB in June 2006. So far, these acquisitions have led to few examples of downsizing, rather the opposite. Nevertheless, the challenge is to maintain a positive relationship with company boards located far away from our region. As green-field investments are quite rare, encouraging companies to stay and grow is at least as important as attracting new players.

Whether or not a company chooses to grow in our region depends on a number of diverse issues: available land, housing, communications and the quality of schools, for example. A mutual understanding of these needs and of decision-making processes will have a positive impact on the development potential of the sector and the region. In May 2006, Uppsala BIO therefore initiated meetings between the industry and the City Council where industry leaders and politicians are able to exchange information in an informal way. The first meeting was appreciated by all involved. We will therefore continue to meet twice a year in future.

Media relations are another important tool for broadcasting the image of Uppsala's life science locally, nationally and internationally. Continuity is the key to building successful media relations. To support our process, we have therefore signed a co-operation agreement with a media agency also involved with Invest in Sweden. By working with a media agency, we benefit from both a push effect – proactive contacts following our own news releases – and a pull effect – a network of journalists constantly looking for information and news. All news releases and newsletters are also fed into the Invest in Sweden Agency and their network. Locally, the regional newspaper Upsala Nya Tidning has a dominant role and good relations with its editors must be nurtured. Also relevant to local communication, is the regional radio station (Radio Uppland).

History has given Uppsala a network of highly talented people. For the future, it is important to maintain and enlarge these networks, i.e. inviting new players from Uppsala and outside to participate

actively. BIO-Pubs, seminars and the use of the internet as the sector's information hub are some of the tools we employ to support and grow our networking.

In 2001, in a survey ordered by the City of Uppsala, citizens in Uppsala and in Stockholm we asked to name topics with which they associated Uppsala. 30% of business leaders in Stockholm answered "Uppsala is biotechnology". In Uppsala, the respondents talked about the Cathedral and the University. Only 4% mentioned biotechnology. If so few inhabitants associate the city with an industry that directly employs 10% of its workforce, politicians may have a problem to actively support both the sector's growth in general, and particularly the Uppsala BIO initiative. Long-term support for the sector and for Uppsala BIO thus requires more information on what biotechnology and life science is about, on what researchers and companies actually do, and on how they influence the economy and the welfare of the region.

Activities carried out

The most important and recurring communication activities carried out to communicate the strengths of our biotech region and to spread information on Uppsala BIO's goals and activities are listed below. The majority are coordinated by Uppsala BIO.

- Website uppsalabio.com. The information hub for the sector in the region.
- English brochure on Uppsala's life science sector featuring many success stories.
- Biotech Personalities. Portraits of people active in research and commercial life viewed from several angles.
- PowerPoint presentations on the region, also available on the web
- Participation in trade fairs such as BIO in the US and Biotech Forum in Scandinavia.
- Media relations and press kits in cooperation with Cloudberry Communications.
- Newsletters, one in English covering events in Uppsala's life science sector, one in Swedish, reporting on proceedings in the Uppsala BIO process
- Press seminars organized by Uppsala University on life science topics.
- Media training arranged by Uppsala University, primarily for researchers in the Uppsala BIO-X program.
- Database of life science companies in Uppsala available on the web. A Scandinavian Life Science Database in co-operation with other regions in Scandinavia.
- BIO-pub events (4 per year) each with around 100 to 125 participants, plus seminars to encourage networking.
- Meetings set up between the City Council and industry leaders.
- Science and Magic (*Vetenskap & Magi*). Bringing life science companies and research to the general public on the streets of Uppsala.

Comments on activities and results

The website has about 1,500 individual visits every week. Here the readers find information not only on events arranged by Uppsala BIO, but also on others of interest to the sector. The web is also used for posting news releases from companies and universities. Highlighting successes in newsletters, and profiling leaders as biotech personalities profiles the region as such, while also supporting the companies and research groups efforts to position themselves. The PowerPoint presentation of Uppsala's life science appears to be useful in this respect, and is downloaded between 30 and 60 times per week.

The English newsletter reaches approximately 1,200 readers, with a reader frequency of 50 %. 35 % of the recipients are based outside Sweden. The Newsletter on proceedings in the Uppsala BIO process is in Swedish only. It targets mainly persons in the Uppsala/Stockholm region, and to some extent in other regions as well. The May 2006 edition reached some 900 persons, with approximately the same reader frequency as the English version.

In cooperation with Invest in Uppsala and Stockholm Business Alliance (SBA), Uppsala BIO has exhibited at Biotech Forum in Scandinavia and twice at the BIO trade fair in the US. To date, the outcome of this participation can be seen in the number of so-called leads. Approximately 50 contacts

have been made require follow-up. According to our own evaluation, however, the results of these quite costly efforts are limited. In 2006, Uppsala BIO chose to withdraw from active trade fair participation.

Several media groups from abroad have visited Uppsala BIO during these first three years. As the survey in March 2006 indicates, Uppsala's visibility has definitely increased. Its respondents mainly appreciated that visibility has increased on the national level. In reality, it is probably the international visibility that has increased most, although this fact is certainly less visible(!) from the Uppsala horizon.

Instead of trying to give a complete list of press cuttings we have selected some highlights:

- Genome Web, 2004-06-22, Swedish BIO-X funds Single Molecule DNA Analysis Systems Development.
- Euro Biotech News, No. 1-2, 2005, Uppsala BIO Funds Microchip.
- 26 different articles on the Uppsala BIO-X Loc & Poc project, February to June 2005.
- Naturvetaren, 10/2005, De starka bioteknikregionerna i Sverige, (Illustrated with interviews with Uppsala BIO).
- Drug Discovery Today, Vol. 11, no. 3/4, 2006, Uppsala: Turning knowledge into profits.
- Four articles on Uppsala's life science in Nikkan Kogyo and one in Nikkan Biotech in April and May 2006 following a visit to Uppsala in March.

In co-operation with Connect Uppsala, we have arranged four to five BIO-Pub (Partnership University Business) events every year. BIO-Pubs are popular arenas for networking. In general, we have 100 to 125 participants per event. In addition to the BIO-Pub events, we have arranged several 'stand-alone' seminars with external partners. One example is the '*Future Trends in Biotechnology*' seminar held with Sweden BIO in conjunction with their 2005 Annual Meeting. This event gathered together over 200 participants from the whole of Sweden, as well as a number of foreign visitors. We consider it vital that our networking activities attract more than just the citizens of our hometown!

We have twice staged 'Vetenskap & Magi' and both have been fantastic successes. Many companies and research departments cannot receive visitors for reasons of security. Open days usually attract those already familiar with science. But we wanted to explain life science to everybody!



We thus took Uppsala's life science to the streets of Uppsala. On a busy Saturday in November 2004, the two universities, eight companies, one high school and the local newspaper met the local population. Visitors and exhibitors were equally enthusiastic. In 2005, we had fifteen exhibitors, now also including two local-based national agencies (the Medical Products Agency and the National Veterinary Agency).

Vetenskap & Magi receives wide local media coverage. In 2005, a group of national politicians from the parliament visited the event to get a better understanding of the sector in general and of its significance to Uppsala in particular. Planning for Vetenskap & Magi 2006 has just started.



General and transverse comments on the Uppsala BIO process

The mere fact of having a process like Uppsala BIO's going on in the region – a process that many different actors care for and feel responsible for – creates effects that are difficult to directly relate to the four areas of action. We call these 'transverse effects', and have tried to capture some of them in this chapter.

Regional leadership

The building of a formal organisation around the issues of creating sustainable long-term growth brings together leading people from different layers of the triple helix. The interesting effect in a forum with an external sponsor (Vinnova's Vinnväxt program), is that it forces the delegates to look beyond their own interests and more towards the common good.

Furthermore, decisions taken within the Uppsala BIO steering group and the STUNS board are very hard to ignore at a later date. Thus, both the focus and commitment at Uppsala BIO meetings increase. Moreover, the meetings *per se* become a regular forum were a lot of small bilateral issues between the members are dealt with in intermissions and at side meetings.

Contacts generated from the new partners

The mode of action of Uppsala BIO, positioned at the interface between academia, industry and the public sector, will by its nature create new opportunities. In all our efforts, this goal is not only the direct benefit but also intended to give secondary effects, *e.g.* enhance networking, generate new contacts, promote regional strengths, etc. An interesting example of this was an activity to identify a number of real-life work cases for the Stockholm School of Economics' Executive MBA-Live program. This program gathers some 30 people with substantial industrial experience from around the world and trains them formally in business management. Uppsala BIO thus made an offer to Uppsala's life science companies to supply cases of interest; four companies did. Furthermore, Uppsala BIO-X took the opportunity to have one MBA group working with our own research efforts. The four participating companies not only got a challenging problem reviewed by these competent 'students', but also established new contacts with the other companies in the meetings and seminars that were held during the course. Here, non-sensitive parts of the cases were presented for the group, market experiences shared, old investigations dusted off, etc. The value of this exercise for fellow Uppsala companies surprised all those participating. Hopefully, this event will be revisited the next time MBA-Live focuses on the life sciences.

Increased co-operation between life science companies in Uppsala

The benefits from working with hands-on projects have not been limited to just academia. During the spring of 2006, Uppsala BIO-X has also worked with identifying new cross-functional platform projects. To this end, a series of meetings was arranged with four of the major biotechnology supply companies in Uppsala (GE Healthcare, Phadia, Biacore, Biotage). At these meetings, representatives for R&D or external contact organisations have met and discussed areas of common interest and of how research projects in these areas could be structured and run. Interfaces with academia and interaction with the centre of excellence programs have also been discussed. The direct aim from Uppsala BIO-X's perspective has been to identify a platform project around clinical diagnostics, thus finding a connection to our Uppsala BIO-X projects, all of which have a clinical diagnostics angle. Furthermore, we wanted to find a common ground for joint long-term strategic efforts between industry and the universities. Besides gathering useful information for our primary goals, we have created a structured and recurring meeting forum where industry sits down and discusses R&D-related issues such as funding, resource needs, competence development and future prospects. That this has been of great value, at least to value is clear. All persons involved are avid attendees and active contributors. These meetings will continue with an expanded focus that will create industry groups for medical devices and drug delivery, as well as biotech tools.

A node for Uppsala's life science sector

Uppsala BIO has become an entry-point and node for visitors, investors, etc., seeking contacts with life science in the Uppsala region. Our idea is not to be the sole point of entry, but to be a clear and focused partner in guiding questions to the right receiver. It is not only industry that needs this type information collaboration. In an effort to highlight Uppsala's strengths, we have initiated collaboration with the information departments of the two universities. The effort to position Uppsala's life science involves people from companies, the universities, and the public sector. This work has led to a clearer picture of what Uppsala's life science has to offer and what our areas of expertise are. Uppsala BIO brings this work to the broader regional level (Strängnäs - Stockholm - Uppsala) in order to be able to better support our profile internationally.

Co-operation on the national level

On the national level, Vinnova's program Vinnväxt has created an interesting forum for high-tech industry, and innovation initiatives in their Vinnväxt ERFA meetings that take place twice a year. Here, the eight current programs meet and exchange experiences. New contacts of a more direct nature are also formed. For example, Uppsala BIO now has not only regular contact with Göteborg BIO but also with the IT and robotics areas. This opens up possibilities for new future collaborative projects spanning these different fields.

Additionally, Uppsala BIO works together with the biotech industry lobbying organisation Sweden BIO to promote awareness of what life science has to offer, and what its needs are in order to secure growth for and investment from industry. In this relation, Uppsala BIO also becomes a conduit for ideas from companies in the region that otherwise had not been able to make their voice heard (e.g. start-ups and small companies). Similarly, Uppsala BIO becomes a tool for getting regional ideas and strengths to penetrate work efforts like the suggested European Innovative Medicine Initiative (IMI) and other parts of the EU R&D framework program. Here we can introduce the region's suggestions and also create new contact points at the national level.

European/International role and co-operation

If we learn from other regional growth initiatives in VINNOVA's realm, we must also learn and communicate with other biotech initiatives globally. Uppsala BIO has created entry-points to several other life science and high-tech communities both national and international. Within Europe, Uppsala BIO is part of (founding steering committee member) CEBR, the Council of European Biotech Regions, which was initiated in 2004 and for which the first full meeting for members was held in June 2006. More than 100 individuals attended, representing over 40 European Biotech regions. The Uppsala BIO-X model was presented in an oral session on early finance and incubation, which led to several new contacts with other regions and new input on how innovation support can be set up. Ideas that were raised for common concrete actions on early financing, incubation or training have great potential to make a difference for life science in Uppsala and in Sweden. Here the Uppsala region, through Uppsala BIO and the CEBR network, has a major opportunity to find new contacts for investing, competence, partners and markets.

Regions/organisations currently represented in the CEBR Steering Group are:

- Uppsala BIO — Sweden
- ERBI, Cambridge — Cambridge
- Oxford Bioscience network — Oxford
- BioM AG — Munich
- BioTOP — Berlin
- Technologiepark — Heidelberg
- FlandersBIO — Zweijnaarde
- Barcelona Science Park — Barcelona
- Biovalley — Basel
- Tallinn Technopol — Tallinn
- Genopôle — Lyon
- Genopôle — Paris

Interactive research

When launched in 2003, the Uppsala BIO initiative was something new in Uppsala – a new experience. Vinnova's recommendation to prepare for and include a team of interactive researchers into the program was therefore well received.

The issues we initially believed most relevant to follow up were:

- Is the Uppsala BIO process efficient and effective regarding issues like delegation of responsibilities to and from Uppsala BIO, organisation, decision-making, cooperation, etc.?
- How does Uppsala BIO perform relative to its planned deliverables?
- How does the process effect the local environment and the life science sector?

Uppsala BIO management was also very clear from the start that they wanted a team of interactive researchers that actively commented on the process and 'disturbed' the management with their observations. Interactive research would be valuable when preparing and presenting research reports, but the management also needed faster feedback.

The interactive research team

The Centre for Research on Innovation and Industrial Dynamics (CIND, www.cind.uu.se) was founded by researchers from Uppsala University's Department of Economic Geography and the Stockholm School of Economics at approximately the same time as Uppsala BIO.

CIND's focus on innovation processes *and* innovation polices went hand-in-hand with Uppsala BIO's need to have an external partner who could critically follow the process and both advise on process management and comment on a policy level to VINNOVA. It was also in CIND's interest to be able to closely follow a process aimed at strengthening a well-defined sector in a region. An agreement between CIND and Uppsala BIO covering goals, methods, ownership of results and how these results should be reported was concluded in early 2004.

CIND's activities for the Uppsala BIO process project include the following:

- Regular surveys to follow the development of the sector as well as the performance of Uppsala BIO.
- Develop indicators that reflect the process.
- Act as partner and coach to the process management and steering groups.
- Supply process management with necessary background data on the sector for relevant decision-making

The research team performed its task mainly by:

- Interviews (live and via internet)
- Desk-research
- Active, in-place observation
- Quantitative analyses from available databases.

Some results

The surveys

CIND started out with by surveying people with a close relation to Uppsala's life science sector. The focus of the survey was two-fold. Firstly, how did the respondent judge the competitiveness of the sector (expressed as ''is Uppsala's life science a competitive cluster according to Michael Porter's cluster theory'')? Secondly, we wanted to know if the respondents were aware of Uppsala BIO and, if so, what they expected of the process.

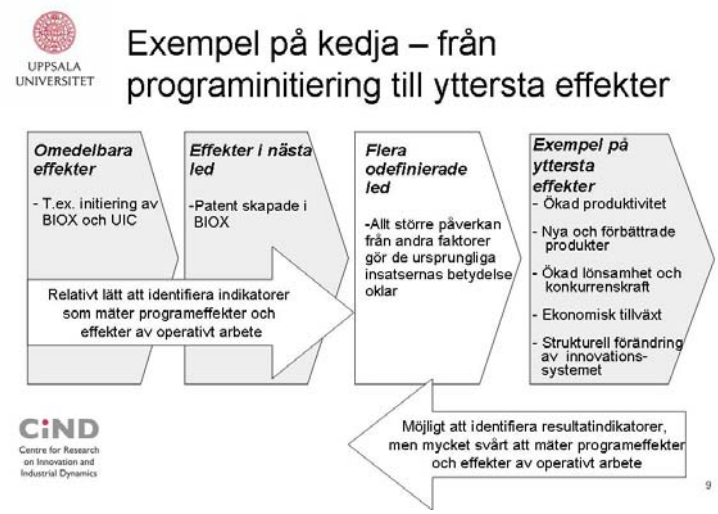
According to Porter's model, the survey indicated that Uppsala's biotech cluster "seems to fulfil the model's conditions for a high level of worldwide cluster competitiveness only to a poor to medium degree."[5] Local demand, rivalry between companies, and the quality of suppliers were in general deemed to be low. Yet it continues… "On the other hand, a number of factors more often cited in theories of innovation systems showed a strong biotech innovation system, e.g. high levels of labour mobility, of interaction on organisational and personal levels, and of cross-disciplinary research. Equally one could trace a moderate degree of openness between individuals."

The respondents turned out to have very high expectations on this new process called Uppsala BIO, and they also seemed to have a good understanding of the vision and the goal of the process. They hoped that the new effort would improve the cluster's competitiveness. The most important activity, according to respondents, was to expand the cluster organically by supporting spin-offs from research and companies, and by attracting new actors to the region. In its first report, CIND recommended focusing both on the interface between academia and industry, and on the 'tools' field of the biotechnology sector.

In March 2006, CIND launched a survey to follow up that from 2004. In general, this latest survey concludes that Uppsala BIO delivers according to plan, and that the respondents still have a clear view of what Uppsala BIO wants to achieve. But they also have high expectations of what the process can deliver. A report of the survey results will be published as a CIND research paper in 2006. However, its main conclusions have already been presented to Uppsala BIO's management, the steering group and also to the board of STUNS.

Indicators

Choosing the right indicators for follow-up is primarily a strategic issue. CIND is an important discussion partner for Uppsala BIO's management group regarding indicator selection. During the spring of 2005, CIND participated in a locally-arranged seminar on how we measure contributions and initiatives made within innovation systems. The figure below, taken from CIND's presentation (in Swedish) at this exercise, well illustrates the difficulties in choosing indicators.



We have initiated a more in-depth discussion with CIND concerning which indicators we should select for following up the Uppsala BIO process, and which we should choose for monitoring the development of Uppsala's life science sector. We also hope to be able to engage the Dahmén institute in this question as a great deal of wisdom can certainly be gleaned from and given to other similar processes in the world at large. The overview of the labour market for biotechnology students made during spring 2005 and the proposal from MBA students at the Stockholm School of Economics on how to measure and account for the financing of biotechnology research belong to this latter category. We also regularly follow data on employment, number of companies and their sales.

[5] "Investigating the Uppsala Biotech Cluster – Baseline results from the 2004 Uppsala Biotech Cluster Survey", CIND Research paper 2004:1.

Partner and coach to the Uppsala BIO process

The first report from CIND on Uppsala BIO's performance, based on the 2004 survey, was presented in February 2005[6]. This report concentrated on the organisation of the process. The first year of Uppsala BIO's life had been rather turbulent with several changes of process manager. The general view, however, was that the process proceeded very much according to plan. CIND also raised several interesting issues and recommendations. Some have been dealt with, others await further action.

⇒ Is it possible to benchmark the process internationally, especially Uppsala BIO-X? Today, Uppsala BIO is part of the Council of European Biotech Regions. One aim of this is to be able to identify opportunities for benchmarking and best practice.

⇒ Is there a risk that networks in Uppsala become too inwardly looking, thus closing out innovative ideas and people from outside?

⇒ Are the internal channels of information sufficiently structured, and is the meeting culture created a result of non-functioning information channels?

Steering group meetings originally tended to be long discussions on more or less the same issues. Decisions taken were brought up for discussion again. To some extent, the report said, this could be explained by lack of internal information. Newsletters on the process and monthly letters from the management to the steering group are now in place since early 2005. There has also been some rotation in the steering group.

CIND usually participates as an observing partner in all meetings with the steering group, and in a large number of the management group's meetings. From observations made on such occasions, CIND provides the management team with useful reflections as to how different parties interpret a proposal or an issue in the action plan. CIND's observations on how the discussions have developed over the years have been of great help to Uppsala BIO in understanding the changes in mind-set that have actually occurred among the parties involved. These changes are incremental and therefore difficult to observe for someone deeply involved in the process.

Over the years, the CIND research team has become more and more involved in the Uppsala BIO process, and has also become the 'disturbing coach' that the management team hoped for. Being familiar with the process' goals and activities, but remaining the outside observer, the research team is able to catch and analyse courses of events that the management team would lose sight of.

Quantitative analyses

During 2006, CIND has provided Uppsala BIO's management with statistics on how Uppsala's life science sector has performed in terms of sales, value added and employment. The figures cover the period 2001 to 2004 and accounts are given earlier in this report. Figures for 2005 will be available shortly. CIND plays a key role not only in providing data, but more importantly in supplying expert analysis.

Uppsala BIO has also used CIND's experience to provide benchmarking on incubators, especially on how new ideas for incubation are recruited, and on the organisation of innovation system initiatives:

- Akademisk scouting i Uppsala – En jämförelse av fyra regionala innovationssystem. CIND PM, 040627.
- Arbetsorganisation och resursanvändning i regionala klusterinitiativ – Med exempel från Biotechvalley.nu, Gränsland, IDEA Plant och Robotdalen. CIND PM, 041012.

Learning from interactive research – some reflections from the interactive research team in the context of Uppsala BIO and CIND

CIND has been appointed as interactive researchers since the Uppsala BIO project began. It is a relationship that has developed over time (i.e. tasks, questions at issue, deliverables, etc.). The

[6] "Att sjösätta ett regionalt klusterinitiativ – Erfarenheter och lärdomar av Uppsala BIO – en Vinnväxtsatsning", CIND Research Paper 2005:1

question at issue in this section is “What can be learnt from an interactive research project. Which kind of factors etc., must be in place if a project like this (i.e. a regional innovation system initiative appointing an interactive researcher) is to be successful”. According to our experience, it is important:

- That both parties be flexible (i.e. dare try different methods and approaches as well as make errors).
- That both parties understand their ‘logic’ of production, mind-set and different agendas.
- That the interactive research function works in teams with different types of competencies, since the initiatives needed differ over time.
- That the researchers understand the initiatives’ crucial problems and needs.
- That the researchers give feedback continuously (i.e. not present a report every third year).
- That the initiative itself can act as demanding customer.

It is also important to note that well designed (and functioning) interactive research generates many positive results for the researcher, the two most obvious being a) better access to empirical data for papers, and b) the potential to create a more ‘embedded’ relation to the object of study. The latter means better access to networks, information and a kind of ‘trust’ that facilitates the process of creating newer and more exiting research projects.

Finally, we should note that another major positive effect for the initiatives is the fact that appointing competent interactive researchers, i.e. researchers who understand many of the above-mentioned aspects, means that the initiative gains access to onlookers who are external, yet still have a very good ‘inside’ feel of how it is developing.