

Swiss Biotech Report 2010

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Editorial

The Swiss biotech industry has handled the challenges of the global financial downturn remarkably well and remains dynamic, thanks to a traditionally high standard of living, a sustainable economy and an array of national initiatives supporting its high-tech industries. While the financial crisis has not left Switzerland untouched, Switzerland generally was not as hard hit as other highly industrialized countries.

The diverging nature of the biotechnology industry is characterised by a variety of stakeholders with a growing number of platforms to represent their interests. Switzerland's top innovative performance is partially attributable to the excellent collaboration of its highly reputable universities with industry, which ranges from enhancing the interface between industry and academia, promoting the transfer of knowledge and technology between universities and business, sharing findings from basic research projects, to the testing of new products in clinical trials. An example of such an initiative is SystemsX.ch, which aims to position Switzerland in the forefront of the ongoing paradigm shift represented by Systems Biology, by enabling member institutions to interact and cooperate through common technological platforms, through the funding of special research projects and sharing of the data collected.

Patents are also indicative of the well-being of an industry. The ongoing high level of patent activity in the Swiss biotech community and the high number of inventors with Swiss nationality reflect the excellent educational standards and international competitiveness of Swiss universities. Thus, the workforce in Switzerland tends to be well-educated and highly skilled, even when it comes to such specialized branches as biotechnology.

There has been positive news on the financing side, despite the global economic crisis. While financing did not become easier for the industry as a whole, especially for younger companies, there were some successful financing rounds for several more mature companies. Since Switzerland has attained critical mass in regard to its financial and life sciences industries, one can say that the situation here is currently more favourable than in most other European countries. Switzerland has successfully maintained its position as a major European biotech hub.

Further reasons why the sector did well can also be found with the various institutions featured in this report. They all work well together and comprise a solid value chain in the Life Sciences. Federal science programs, highly active academic institutions and rapidly-reacting industry associations guarantee further progress even in economically challenging times.



Innovation for the future

SystemsX.ch: The Swiss Initiative in Systems Biology



Daniel Vonder Mühl
Dr. sc. nat. ETH,
Managing Director,
SystemsX.ch: The Swiss Initiative
in Systems Biology

As a result of the Human Genome Project, Swiss universities and research institutions initiated inter-institutional cooperation to promote a systems approach in life science research. SystemsX.ch is supporting the paradigm shift from qualitative to quantitative and modelling approaches. This is a transition that affects many questions relevant to biological research. The Swiss government provided CHF 100 million for the four-year period 2008–2011. Legally speaking, SystemsX.ch is a simple society with 12 partners: ETH Zurich, EPF Lausanne, the Universities of Basel, Berne, Fribourg, Geneva, Lausanne, Neuchâtel and Zurich, the Friedrich Miescher Institute (FMI), the Paul Scherrer Institute (PSI) and the Swiss Institute of Bioinformatics (SIB).



Prof. Paul L. Herrling
Head Corporate Research,
Novartis International AG,
Vice-President of the ETH Board

Modern biology has reached a level of complexity that can no longer be overcome with conventional methods. In this regard, the best approach is quantitative systems biology. The multidisciplinary SystemsX.ch initiative involving several Swiss universities and industrial research institutes will help us to better understand the processes of life and disease. This type of basic research is essential for the pharmaceutical industry, enabling as it does new drugs to be developed that fight not only the symptoms of a disease but also its underlying cause.

SystemsX.ch enables member institutions to interact and cooperate by establishing common technological platforms, funding special research projects, and sharing the data collected. The initiative intends to position Switzerland among the world leaders in systems biology. Therefore, SystemsX.ch aims to:

- enhance, extend and implement a new form of interdisciplinary research culture by assembling complementary disciplines to stimulate mutual benefits;
- set up and develop the cutting-edge technology required for systems biology research;
- gather scientific competences on a national level to establish Switzerland at the forefront of systems biology research;
- establish collaborations with the private sector in various flexible forms of public-private partnership;
- foster the ongoing design, development and application of advanced technology and the training of scientists and engin-

– eers in the special skills required to understand biological systems.

The initiative relies on the creative talents of Switzerland's existing scientific and professional community. Their ability to initiate and nurture partnerships among the projects associated with SystemsX.ch and together with other international public and private institutions is essential for this change to be successful in society. SystemsX.ch supports this cultural change via several venues including :

- interdisciplinary projects at various levels involving several partner institutions: large integrated research, technology and development projects (RTD), interdisciplinary PhD projects (IPhD), and interdisciplinary pilot projects (IPP);
- new forms of public-private partnership following a sophisticated concept;
- setting up appropriate education measures (IPhDs, seminars, graduate courses, student retreats).

SystemsX.ch 2010

Two years after the first call for proposals, SystemsX.ch is supporting about 750 researchers from 250 research groups in 62 approved projects. Out of the 250 research group leaders, about 50% are biologists by training. The other 50% are comprised of chemists, physicists, engineers, computer scientists, medical scientists, mathematicians and even economists.

The flagship projects of SystemsX.ch are the 14 RTDs and the overarching IT support and implementation project SyBIT. Each of them brings together scientists from various disciplines and various institutions to apply the systems approach to a particular topic. Neurochoice, for instance, investigates decision-making processes back to various neuronal levels including molecules, cells, cellular networks and whole brain areas in humans. LipidX aims to answer several fundamental questions about lipids in living systems in order to begin building up a comprehensive understanding of these molecules as a whole. The goal of LiverX is to systematically collect and analyse quantitative and dynamic data sets of the important metabolic networks contributing to insulin resistance at the levels of single cells, organs and whole organisms. Together with clinical data from type 2 diabetes patients, this knowledge will be used to develop mathematical models of insulin resistance. The MetaNetX project aims at developing integrated computational methods and tools for the automated reconstruction of genome-scale metabolic networks, including the prediction of novel reactions and pathways and the leverage of this information for refined genome annotation.

Biognosys, a first spin-off from an RTD project (PhosphoNetX), has been launched already. The paradigm shift underway in proteomics opened up a great market potential for biomarkers. With the help of systems biology Biognosys aims to find diagnostic tools that could detect diseases or contamination in foodstuffs. A future vision of this company is to provide tools

enabling very early-stage cancer detection. This would increase chances of curing cancer compared to current treatments, which still rely on actual localisation of the tumour.

SystemsX.ch and private sector

SystemsX.ch is fostering collaborations with the private sector. Big industries with their own research facilities are invited to join RTD consortia to benefit from and contribute to the systems approach. For small and medium-sized enterprises (SME), SystemsX.ch organises SME-SystemsX.ch workshops together with the Swiss Biotech Association (SBA). Here ongoing activities are reported by academic and private representatives to initiate possible future collaborations.

Two particular project types conceived to promote such a collaboration are:

(1) Bridge to Industry Project (BIP) which provide funds for an academic and industrial partner to collaborate on a systems biology project. The aim of a BIP is to discover and develop mutually interesting technologies or research relevant to systems biology. BIP projects are limited in time to about one year. The academic research group is supported with a maximal amount of CHF 120,000. Successful BIP projects may lead to longer or more elaborate projects in future. Most importantly, the collaboration enables academia and industry to work together on a set of scientific questions or methods.

(2) Industrial Sabbaticals in Academia (ISA) provide a way for industry to get a first-hand look at systems biology activities at an academic SystemsX.ch research group. The scientist from industry formulates goals to be reached during the sabbatical. The aim of the ISA is to initiate a public-private partnership at the scientific level. The length of the sabbatical can be defined by the involved groups. Ideally an ISA should last about six months. It is important that the industrial scientists have enough time to see, understand, and get some hands-on experience with systems biology research. Hopefully this interaction will allow for these two partners to continue collaborating in future on other systems biology-relevant scientific questions and/or technologies. More details about these projects can be found on www.systemsx.ch



Photo: Stefanie Marie Couson/ETH Zurich

Future of SystemsX.ch

Implementation of a cultural change as substantial as this systems approach in life science takes time and persistence. In the first phase (2008–2011), the required transition in research approaches and systems level thinking have been initiated via the specific programmes mentioned above. This process has just started and is by no means complete.

The second phase of the initiative (2012–2016) is currently being prepared and the strategic plan was submitted to the federal authorities at the end of 2009. SystemsX.ch aims to consolidate first achievements and results while continuing to take the steps required for the sustained implementation of systems biology research capabilities in Switzerland.



Prof. Dr. Ralph Eichler
Chairman of the Board
of Directors SystemsX.ch,
President of ETH Zurich

The Scientific Advisory Board wrote in December 2009: "SystemsX.ch provides the potential to put Switzerland in the forefront of the new biology of the 21st century. It is as good as any international biology programme, and better than most."

Joining forces in research

Swiss research enjoys a first-class international reputation, thanks primarily to the young scientists who are supported by the Swiss National Science Foundation (SNSF) and pursue their research interests predominantly in individual projects. With a view to further strengthening Swiss research in strategically important areas, the SNSF currently maintains 19 National Centres of Competence in Research (NCCRs), just under one-third of which are devoted to topics related to biotechnology.

By guaranteeing top quality in Swiss research, the SNSF also plays an important role for the economy: in international competition, first-class research plus highly qualified and motivated young scientists are among the main locational advantages for innovative companies.

Strategically important topics

Although the majority of funding provided by the SNSF flows into individual projects submitted by researchers from a wide range of areas, for eight years now the SNSF has also been supporting long-term research projects relating to topics of strategic significance for the future of Swiss science, economy and society: the National Centres of Competence in Research. Here the SNSF sets research priorities in collaboration with universities and the federal institutes of technology and helps to improve the division of responsibilities between research institutions in Switzerland. It thereby establishes future-oriented research structures.

However, the aim of the SNSF is to use the NCCRs not only to facilitate globally renowned, first-class research, but also to promote knowledge and technology transfer in a targeted manner with partnerships between academic and non-academic areas. For this reason the SNSF supports fields of research with the

prospect of economic success or social innovation. Furthermore, the SNSF strives to ensure that the young researchers involved in the NCCRs receive, in addition to solid technical training, the opportunity to familiarise themselves with the research-related needs of companies, in the form of internships, for example.

From genes to robotic operating assistants

Of the currently active NCCRs, six are devoted to topics related to biotechnology:

- NCCR Molecular Oncology (**Onc**) researches the basic characteristics of cancer cells and explores possibilities for new cancer therapies.
- NCCR Frontiers in Genetics (**Gen**) investigates at four different levels the complex interaction of genes during organism development.
- NCCR Molecular Life Sciences (**MLS**) researches the spatial structure and function of biological macromolecules.
- NCCR Neural Plasticity and Repair (**Neuro**) brings together various specialist disciplines with a view to researching disorders and diseases of the central nervous system.
- NCCR Plant Survival in Natural and Agricultural Ecosystems (**Plant**) investigates how plants interact with insects, fungi and pathogens.
- NCCR Computer-Aided and Image-Guided Medical Interventions (**Co-Me**) researches and develops new tools for simplifying and improving patient treatment.

A further series of National Centres of Competence in Research has been prepared, and will be launched during the course of the year once the selection has been made.

Key figures (from launch in 2001 to the end of 2009)	Onc	Gen	MLS	Neuro	Plant	Co-Me	Total
SNSF Funding (in CHF mio)	35.0	34.5	28.4	32.8	27.0	33.0	190.7
Third-party funding (in CHF mio)	3.2	10.0	1.0	6.5	1.3	10.1	32.1
Cooperations with private companies	47	18	37	40	35	91	268
Patents/Licences	11	24	25	52	5	28	145
CTI projects¹	1	0	1	6	2	15	25
Start-up companies²	0	3	2	3	0	9	17

¹ Additional projects with further financing by the CTI aimed at practical, economic implementation of research results.

² Direct spin-offs from the NCCRs.

The Swiss National Science Foundation (SNSF) is the most important Swiss agency promoting scientific research. It supports, as mandated by the Swiss Federal Government, all basic research in all scientific disciplines, from philosophy and biology to the nanosciences and medicine. The focus of its activities is the scientific assessment of projects submitted by researchers. The best applicants are funded by the SNSF with an annual total amount equalling approximately CHF 600 million. The SNSF annually supports some 7,000 researchers, 5,500 or more of whom are aged 35 years or younger. The SNSF also works to ensure that scientific research in Switzerland has favourable conditions for developing internationally and encourages dialogue between scientists and representatives in society, politics and economy.

Various platforms for the life sciences industry



Domenico Alexakis
CEO/Director,
Swiss Biotech Association

The nature of biotechnology is manifold, with various stakeholders making up the increasing membership group. Therefore the Swiss Biotech Association (SBA) has introduced platforms with thematic focus. Below, you will find information on the various recent activities of the SBA.

Next Generation Antibodies Platform

Switzerland is one of the leading countries in antibody research and company development. Thanks to the support of many stakeholders, the association identified members and issues within the field of antibodies and launched the Antibody Platform Exchange Meetings back in 2006. The SMEs active in antibody research and production in Switzerland are invited to join in with the Antibody Platform. The goal of these events is the gathering of ideas and the identification of mutual interests and precompetitive issues that are of importance for the segment.

BioActors Platform

The key to remaining competitive is the management of the human and financial resources that allow a company to address the problem in a sensible and efficient time frame. In addition to this, life science companies have two important characteristics: (a) the highest innovation performers that are tremendously dependent on the quality of their human resources and (b) several structural redesign phases with a decisive impact on human and strategic resources.

Management excellence of strategic resources is vital for life science companies to increase their competitiveness on a global marketplace. The main goal of this platform is to help to improve the global competitiveness of the Swiss life sciences industry by improving the issue of finding the right person for the right job and simultaneously reducing the time and effort required for the job search and hiring processes.

Swiss Life Sciences Marketing Alliance (SLSMA) Platform

Switzerland has been participating in biotechnology conferences, always presenting high-quality Swiss products and services. Anchored by world-class research of home-based multinationals, the Swiss biotech industry is among the largest and most diversified in Europe. This position is reinforced by cutting-edge research carried out in a large and growing network of small and medium-sized biotech companies throughout the country. The research community in industry and academia is supported by a strong base of suppliers. These companies export worldwide and are involved in the innovative

development of equipment, consumables and platform technologies to cater for the biotech industry at large. The SWISS Pavilions are organised by Osec in close cooperation with Swiss Biotech, the Swiss Life Sciences Marketing Alliance. Other promotional issues are discussed in this platform consisting of the five life science clusters of Switzerland, the financial sector represented by the SIX Swiss Exchange and as a backbone of the platform, the two industry associations for medtech and biotech.

White Biotech Platform

Another platform programme of the national industry association is centred around industrial biotechnology (IB), an area that is significantly gaining ground in various fields. IB describes a wide variety of industrial products and services that use microorganisms and their respective enzymes for the manufacturing process. Policy makers are beginning to identify the potential of IB for a sustainable future and advocate the bio-based economy. This may be due to the wide regard of industrial biotechnology as one countermeasure to the negative effects of using fossil fuels, such as the greenhouse effect and atmospheric pollution. Switzerland could become a serious solution provider if academia and the industrial sector continue to join forces for further national programmes. The SBA supports this long-term goal in partnership with other industry associations and initiatives.

Regulatory Platform

In addition to the high costs and time requirement, there is a large number of critical points and pitfalls in the process of drug discovery and development. Today, apart from good research and sufficient financial means, knowledge of how to proceed with regulatory work is one of the key success factors in the industry. The Regulatory Platform organises seminars and provides information to drug discovery and development players. It works together with regulanet^{TR}, an international organisation with the goal of improving awareness and know-how in regulatory issues.

Swiss Biotech Association (SBA) was founded in March 1998. Today more than 200 companies represent this growing association. SBA is the industry association of small and medium-sized enterprises active in all areas of biotechnology but also a very good networking platform for the multinational companies active in the sector.

Company portrait

Telormedix

Given the ageing population, more people are now dying of cancer than of cardiovascular disease in developed countries. Medicine has, however, made considerable progress in the treatment of cancer, with new drugs for therapy or pain relief being discovered all the time. Two of the three drug candidates from Telormedix (TMX-101 and TMX-201) are intended for the treatment of bladder cancer, the fifth most prevalent type of the disease and, according to Telormedix, one of unmet medical need. TMX-101 is intended for localised treatment of superficial carcinomas, while TMX-201 has also been developed for use against skin cancer and as a vaccine adjuvant, in the hope of attracting the interest of vaccine manufacturers in the product's adjuvant properties.

Start-up Telormedix has various other drugs in the pipeline, including TMX-301, which is designed to treat autoimmune diseases, which are also becoming increasingly common. Of the three candidates, TMX-101 has made the greatest progress and is now set to enter into clinical phase I/II, which however means, however it still has a long way to go and it could be some years before it is ready for market.

Well connected

This small company, which is based in Bioggio in Ticino and employs a team of 10 employees, is already on the lookout for partners. The company was founded by Lorenzo Leoni, who was also the start up CEO, in October 2007 with technologies from University of California San Diego (UCSD), developed while he was a post doc there and seed money from Aravis Venture. Dennis Carson, a professor at UCSD, the renowned Swiss Nobel Prize laureate Rolf Zinkernagel, are also founders of Telormedix. Another member of the founding team is pharmacist Roberto Maj, the current Head of Drug Development at Telormedix. Carson and Zinkernagel form the original Scientific Advisory Board and offer the company probably the best scientific guidance in the area of Innate Immunity and cancer oncology. The mere presence of such prominent figures is, however, no guarantee for success. The main aim is now to advance TMX-101 into patients on the basis of the promising activity already shown in preclinical testing.

Zurich based Aravis Venture syndicated CHF 21 million in a Series A financing, shortly after the seed round. The syndicate was joined by Proquest Venture, a USD 400 million fund from San Diego, BSI of Lugano and Nextech of Zurich. The amount invested in the series A shall enable the company to finance the compounds to proof of concept in humans and advance the innate immunity platform.

The board of Directors is composed of the Venture capitalist Jean-Philippe Tripet of Aravis and Alain Schreiber of Proquest; the American oncologist Stuart Holden, and Davide Gai, CEO of Tecnopolo, the Swiss-Italian biotech and high-tech park in Lugano. Johanna Holldack replaced Lorenzo Leoni as managing Director in autumn 2009.

Small substances with a surprising effect

The small molecules interact with toll-like receptors, a group of proteins that can activate immune cells in the event of microbial infections. The molecule is intended to fight bladder cancer via the innate immune system, but the precise interplay between the TMX molecules and the specific TLR7 receptors remains to be explored. The preclinical data are however encouraging, and the company anticipates that TMX-101 therapy will have a shorter treatment protocol than other cancer therapies.

The paediatrician Johanna Holldack was appointed CEO of Telormedix last autumn. She studied in Göttingen, has worked at various German universities and Harvard Medical School and has held a wide range of leadership positions in pharmaceutical companies. She enjoys her new employer's close proximity to the Ticino lakes.

Dr. Johanna Holldack
Chief Executive Officer,
Telormedix SA



Economic and location promotion in Switzerland

As one of the most attractive business locations in the world, Switzerland, which offers numerous strategic advantages and is ranked number one in the Global Competitiveness Report 2009–2010, provides the best prerequisites for forward-looking research, production and service companies.

Economic and location promotion form an integral part of Switzerland's economic policy. Various measures implemented at the local, regional and national level support companies in their economic activities and help foreign companies extend their activities to Switzerland.

Switzerland. Trade & Investment Promotion

At the federal level, the Swiss State Secretariat for Economic Affairs (SECO) has mandated Osec with its programme Switzerland Trade & Investment Promotion since the beginning of 2008. Osec bears operational responsibility for location promotion, in addition to its export, import and investment promotion functions.

Within this programme, Osec organises and coordinates activities for promoting foreign investment in Switzerland. It opens the door to Switzerland and its authorities. In close collaboration with partners from different regions and cantons and from the private sector, the programme assists companies as they plan their operations:

- selection of ideal locations in Switzerland
- contact with regional and cantonal investment offices
- legal and administrative requirements
- collaboration with research centres and universities
- the Swiss tax system and incentives for investors
- partnering with Swiss firms in your area of business
- residence and work permits

More information is available at www.invest-in-switzerland.com

Switzerland Trade & Investment Promotion supports companies at all times during the fact-finding and investment project.

SWISS Pavilion

In addition to the general services offered, Osec is organising a SWISS Pavilion at three leading international trade fairs in 2010. The joint participations will be realised in cooperation with the Swiss Biotech Association, Swiss Biotech and the Swiss Business Hubs.

By participating in the SWISS Pavilion, Swiss companies profit from a turnkey stand solution, a prominent location, a high level of media and visitor attention, logistic and personnel support provided by Osec as well as from a strong presence under the Switzerland brand. The SWISS Pavilion unites Swiss know-how, Swiss quality and Swiss precision and offers the ideal platform to meet with Swiss exhibitors as well as with representatives of the association and of the various biotech clusters.

The following events usually feature a SWISS Pavilion:

- BioPharma Asia Convention
- BIO International Convention
- BioJapan
- BIOTECHNICA

More information is available at www.osec.ch/swisspavilion



Osec, the Export and Location Promotion Agency of Switzerland, informs potential investors about Switzerland as a business location. Together with cantonal specialists, investors are provided with first-class and comprehensive support for setting up their own operation in Switzerland in order to profit from this prime business location.

One goal – plenty of choices

The quality of life and the advantages of doing business in Switzerland are now almost as famous as our chocolate and watches. But whom do you talk to if you want some local information on a career or business move?

BioAlps

The BioAlps cluster in Western Switzerland is a major and vibrant centre for medical technology and biotechnology, providing a unique growth environment. The BioAlps region is rated the 3rd European centre for research into biotech and medtech research, just after Cambridge and Oxford in the UK.

BaselArea

The Basel region is home to Europe's largest (number of employees) and the world's most successful (hourly productivity) life sciences cluster. It is home to the headquarters of global companies and young, growing companies from modern biotechnology and pharmaceuticals to agribusiness and medical technology.

The Basel area provides fertile ground for companies, its economy having shown the fastest growth rate in Switzerland for over ten years.

Berne Capital Area

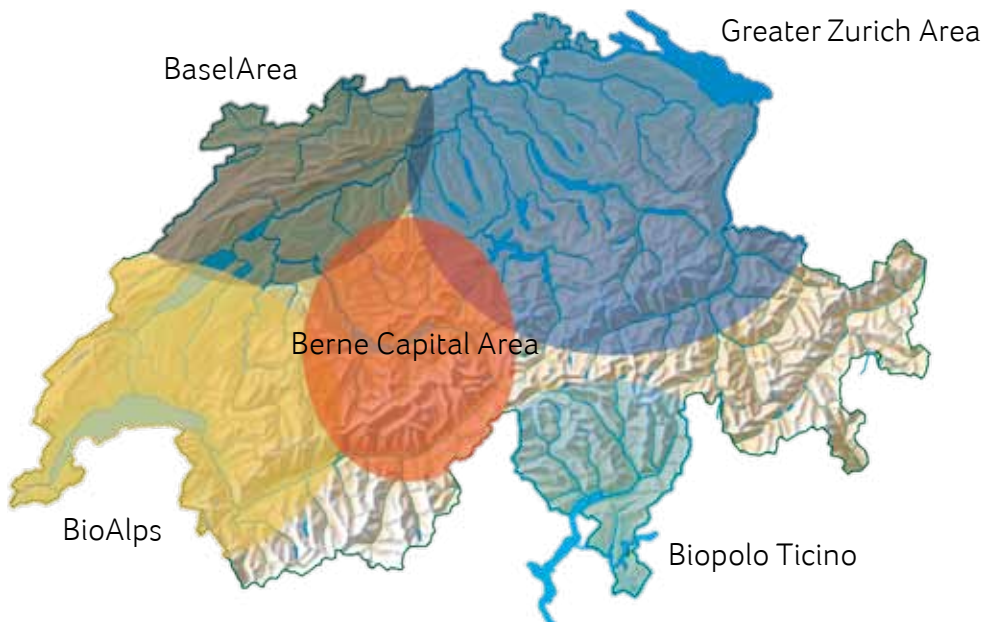
Berne Capital Area is the global centre of the precision industry, and an extremely valuable strength for the life science industry. This international reputation nurtures the clusters of both biotechnology and life sciences. Local industry and academia have been working together for years in public-private cluster initiatives that consistently provide momentum to the sector.

Biopolo Ticino

The vision of the Biopolo Ticino cluster is to act as a one-stop shop and as a portal for the life sciences to and from Southern Switzerland. The integrated life science cluster catalyses and sustains the integration process of the life sciences in Ticino, and promotes the results nationally and internationally.

Greater Zurich Area

The ever-increasing number of life science start-ups testifies to the high entrepreneurial spirit that characterises the Greater Zurich Area. Combined, dedicated support from a network of academic institutions and industry make Zurich highly attractive as a location for exceptional research and as a place with unmatched potential for business opportunities.



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www.baselarea.ch



www.wfb.ch



www.bioalps.org



www.biopolo.ch



www.greaterzuricharea.ch

Driving innovation through partnership with academia



Dr. Herbert Reutimann
Managing Director Unitectra AG,
swiTT President

The excellent collaboration of universities with industry is one of the important reasons for Switzerland's top performance in innovation. Such collaborations span a wide range from gaining new scientific knowledge in basic research projects all the way to the testing of novel products in clinical trials. Professional support by experienced technology transfer people and flexible and lean processes for collaborations and the commercialisation of research results are key success factors. The national association swiTT strives to further optimise the industry-academia interface.

Innovative pharmaceutical and biotech companies maintain a widespread network of collaborations with academia as a source of scientific knowledge, new product ideas or novel technology platforms. The trend for more outsourcing of R&D by large companies seen in the past decade resulted in a strong increase in the number of collaboration projects with academic research groups.

Swiss universities are attractive partners

Swiss research universities are traditionally attractive partners for industry. Top-notch academic researchers, their openness for industry collaborations and flexible and lean technology transfer processes are some of the key success factors. Inter-

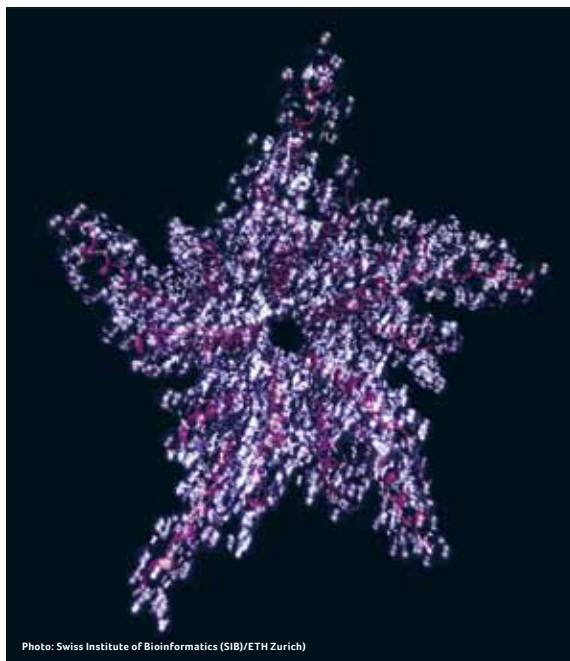


Photo: Swiss Institute of Bioinformatics (SIB)/ETH Zurich

national benchmark studies on innovation and economic competitiveness consistently place Switzerland in top ranks. For example The WEF Global Competitiveness Report 2009–2010 states as a main reason for Switzerland's top position: "Switzerland's scientific research institutions are among the world's best, and the strong collaboration between the academic and business sectors ensures that much of this research is translated into marketable products and processes, reinforced by strong intellectual property protection."

In the past few years major efforts were made to improve the performance of clinical research in Switzerland, a programme sponsored by the Swiss National Science Foundation. Specialised clinical trial units were established at all university hospitals and are now fully operational. These centres facilitate the planning and management of clinical trials either for joint trials with industry or own investigator-initiated trials by the clinicians.

Lean and proven processes for industry-academia collaborations

Industry collaborations are facilitated by technology transfer offices (TTO) with experienced personnel that support the academic researchers. The TTO are also in charge of commercialising research results through licensing to established companies or support for the creation of new spin-out companies. In contrast to other countries, a high percentage of people working in TTO at Swiss universities feature a background both in academia and industry and, thus, are familiar with the needs of both partners. This is instrumental in establishing flexible and lean processes which help to maintain transaction costs for industry-academia projects at a minimum.

A supporting role is played by swiTT, the Swiss Technology Transfer Association, which comprises professionals from academia and industry handling technology transfer issues. The association has an important role in the education, training and communication areas. In addition, it provides a number of services for its members, their institutions and for the public. One of them is swiTTlist a unique Web portal which comprises technologies which are available from Swiss universities for industry (www.swiTTlist.ch).

Cooperation between biotech or pharmaceutical companies with academia is a major driver of innovation in life sciences. Swiss universities are attractive partners for industry due to the top-class academic research performed and the professional management of technology transfer matters.

Spots on the industry



Year in review – Swiss Biotech

(selection of events in 2009)

Trigger	Company/Institution	Description
January 2009		
License agreement	Cytos	Pfizer takes the commercial licenses for specified vaccines based on Cytos' technology. Cytos obtains payments for the license and Pfizer acquires worldwide exclusive rights for the specified vaccines.
License agreement	Evolve	Evolve and Summit sign a worldwide licensing agreement in infectious diseases for imino sugar compound.
Product approval	Nitec Pharma	Nitec receives a EU recommendation for approval of Lodotra as a rheumatoid arthritis treatment.
Financing	Synosia	Synosia completes a CHF 32 million series B financing. Aravis Venture, Investor Growth Capital, Helvetia Fund as well as Versant Ventures, Abingworth, Novo A/S and 5 AM Ventures participated in the round.
Financing	CT Atlantic	CT Atlantic completes a series A financing round totalling CHF 10 million raised from QureInvest AG. The proceeds will be used to advance the research and technology programmes.
Manufacturing contract	Lonza	Lonza enters into a joint venture with Teva to develop, manufacture and market a portfolio of biosimilars. Lonza will manufacture the APIs whereas Teva will focus on the development and marketing of the biosimilars.
Financing and technology award	AC Immune	AC Immune receives CHF 40 million in round C financing. The investor group is not mentioned. HBM BioVentures may be a major investor.
Technology award	ESBATEch	ESBATEch receives the 2009 North American Frost & Sullivan Technology Innovation of the Year Award for its work in developing antibody fragment therapeutics.
Manufacturing contract	Bachem	Bionor Immuno and Bachem sign an agreement on supply of active ingredients and finished dosage forms for vaccine development projects.
Product approval	Actelion	Zavesca receives EU approval for the treatment of progressive neurological manifestations in adult patients and paediatric patients with Niemann-Pick type C disease.
February 2009		
License agreement	Debiopharm	Debiopharm and Pharmaleads sign a license agreement for PL37 as a treatment of chronic pain conditions. The compound could be used in the treatment of neuropathic pain.
Distribution agreement	The Genetics Company	The Genetics Company closes a distribution agreement with Stratech Scientific. Stratech Scientific will be in charge to distribute beta-Amyloid detection tools for neurodegenerative diseases in the UK and Ireland.
Study setback	Basilea	Basilea submits a request for arbitration in terms of the licensing agreement with J & J for Ceftobiprole. The delay in the approval of Ceftobiprole in the US and EU leads to losses in milestone and royalty payments for Basilea.
March 2009		
Financing	GlycoVaxyn	GlycoVaxyn raises CHF 25 million in financing. Lead investor is Edmond de Rothschild Investment Partners. Index Ventures and Sofinnova Partners also participated in the round.
License agreement	Synosia	Synosia enters into an agreement with Roche in order to develop a new antagonist for the treatment of cognitive disorders. Synosia receives the full development and commercialisation rights.
Financing	Kenta Biotech	Kenta Biotech raises CHF 12 million in a series B financing. The lead investors are Inagro Finanz (Peter Grogg) and Varuma (Ruedi Maag).
Collaboration	MD Biosciences	PharmaGap and MD Biosciences enter into a co-development collaboration for compounds in inflammatory and neurological applications. MD Biosciences has exclusive access to peptide compounds as inhibitors of protein kinase C theta.
Study setback	Cytos	Cytos suspends the preparations for a phase IIb study of the high blood pressure vaccine that failed to meet its target. The hypertension vaccine CYT006-AngQb did not significantly reduce blood pressure.

Financing	Redbiotec	The Swiss venture capital firm Redalpine grants an undisclosed amount to Redbiotec.
Manufacturing contract	Bachem	Bachem and Debiopharm sign a follow-up contract for supply of Triptorelin Pamoate. The product is applied for the treatment of advanced prostate cancer.
Product approval	Basilea	Toctino receives approval in major European markets. It is applied as a treatment option for adults with chronic hand eczema.
May 2009		
Financing	NovImmune	NovImmune completes CHF 62.5 million equity financing in order to reacquire product rights of its antibodies. The lead investor is BZ Bank. Further investors are Ingro Finanz, Picted Private Equity Investors and Varuma.
Financing	GenKyoTex	GenKyoTex raises CHF 2 million from the canton of Geneva to complete series A fund. This investment will allow to further achieve preclinical development of Nox4 inhibitors.
Manufacturing contract	Lonza	Morphotek and Lonza enter into a manufacturing services agreement. Lonza will support the development and manufacturing of antibodies.
Study setback	Santhera	The US phase III clinical trial which evaluates Catena (treatment of Friedreich's Ataxia) misses its primary end point. The company is willing to continue the study even though clinical approval might be postponed by one year.
Manufacturing contract	Lonza	Lonza secures a major manufacturing contract using its proprietary microreactor technology. The manufacture enables the company to scale-up clinical trials and large commercial quantities.
June 2009		
Manufacturing contract	Lonza	Elusys Therapeutics and Lonza enter into an agreement for the production of Anthim. Lonza will provide process development services and manufacturing capacity.
Financing	Lumavita	Lumavita receives a second round financing of CHF 6 million. The financing is granted by Endeavour Vision and HealthCap.
Collaboration	Covagen	Covagen and Roche enter a collaboration agreement. Covagen will use its protein engineering technology (Fynomers) binding to undisclosed Roche targets.
Study success	Pevion	Pevion Biotech and Bio Life Science announce positive phase I clinical trial results for their jointly developed virosome-based breast cancer vaccine. The trivalent vaccine was found to be safe, well tolerated and immunogenic in patients moderately over-expressing the HER-2/neu oncoprotein.
July 2009		
Product approval	Actelion	Tracleer receives EU approval for paediatric formulation. Tracleer is prescribed against pulmonary arterial hypertension (PAH).
Manufacturing contract	Lonza	Medarex and Lonza sign agreement for the supply of antibodies. Lonza acts as a collaboration partner to provide manufacturing services.
Manufacturing contract	Lonza	Lonza and LFB sign an agreement to manufacture a monoclonal antibody. Lonza will provide GMP manufacturing services.
Product approval	Debiopharm	Debiopharm obtains a Swiss marketing authorisation for Moapar prescribed for a reversible reduction of serum testosterone.
License agreement	Debiopharm	Debiopharm and MSM Protein Technologies sign an exclusive agreement for an antibody targeting a G protein-coupled receptor (GPCR). This protein should be developed into a new oncology therapeutic drug.
August 2009		
License agreement	Debiopharm	Curis enters into a worldwide license agreement with Debiopharm for Hsp90 technology. Debiopharm will assume all future development responsibility, Curis will receive an upfront license fee, additional near-term payments and additional contingent payments.
Product approval	Actelion	Ventavis receives US approval for increased strength formulation in PAH. The formulation is expected to reduce inhalation time.
Acquisition	Santhera	Santhera exercises its option to acquire Oy Juvantia Pharma Ltd of Turku, Finland. Santhera will issue previously reserved shares from its authorised capital to Juvantia investors.

License agreement	Santhera	Santhera and Biovail enter into a license agreement to develop and commercialise Fipamezole in North America. Biovail acquires the US and Canadian rights.
Stock exchange listing	mondoBIOTECH	1,248,671 registered shares with a nominal price of CHF 0.10 are placed on the market. The company is looking for non-financial investors.
Product approval	Lumavita	Lumavita receives marketing authorisation for Pentamycin in Switzerland. Pentamycin is used for the treatment of all types of infectious vaginitis.
September 2009		
Study success	Nitec Pharma	Nitec Pharma reports positive and highly significant phase III results from Capra-2 study of Lodotra in RA.
License agreement	Debiopharm	Ipsen and Debiopharm enter into a worldwide license agreement for the development and commercialisation of the CDC25 inhibitor, an anti-cancer agent.
Merger	Arpida and Evolva	Arpida and Evolva announce the merger of their two companies. The merged entity will operate as Evolva. Prior to the merger, Evolva raises equity financing in order to progress its clinical compounds.
Acquisition	Alcon and ESBATech	Alcon enters into a definitive agreement to acquire ESBATech. Alcon pays USD 150 million in cash plus contingent payments of up to USD 439 million based upon the achievement of future research and development milestones.
Study success	Kenta Biotech	Kenta Biotech presents positive phase IIa results of its lead drug candidate, panobacumab (KBPA101), showing it is safe and well tolerated in patients with hospital-acquired pneumonia caused by Pseudomonas aeruginosa.
Public financing	Swiss National Science Foundation and Biozentrum	A team of scientists from the Biozentrum is awarded a research grant by the Swiss National Science Foundation (SNSF). Over the next three years they will receive CHF 1.2 million.
Collaboration	mondoBIOTECH and Bachem	mondoBIOTECH and Bachem enter into a long-term cooperation whereby Bachem provides its experience in the manufacture of peptides and finished pharmaceutical products. Bachem will receive unlimited access to the development projects of mondoBIOTECH.
October 2009		
Financing	Covagen	Covagen completes a financing round from Novartis Venture Fund and MP Healthcare Venture Management. This financing allows the company to further develop its Fynomer technology platform for its lead drug candidate for the treatment of multiple inflammatory diseases.
Acquisition	Lonza	Lonza acquires cell-biology platform company Simbiosys Biowares. It strengthens Lonza's position in cell discovery.
Product approval	Basilea	Toctino is approved by Swissmedic. The drug has already been approved in major EU countries.
Study setback	Cytos	Cytos's anti-smoking vaccine missed its main target in a mid-stage study. This makes it highly unlikely the product will reach the market.
Award	NovImmune	NovImmune is the winner of the 2009 European Biotechnica Award. The company receives a cash prize, which is awarded each year by Deutsche Messe AG and its partners.
Study setback	Arpida	Arpida announces that EMEA has reached a negative conclusion regarding the market authorisation application for intravenous Iclaprim in complicated skin and soft tissue infections.
Financing	Evolva	Evolva announces a CHF 28 million B financing round. The financing is led by Aravis. New investors are Auriga Partners, Vinci Capital, Renaissance PME, Wellington Partners and BioMedInvest as well as an undisclosed private investor.
Award	AC Immune	Prof. Andrea Pfeifer – CEO of AC Immune – is awarded Swiss Life Sciences/High-Tech Entrepreneur of the Year 2009; recognition of personal qualities and successful development of thriving biopharmaceutical company.
License agreement	Octapharma	Octapharma and Fresenius Kabi enter into an license, development and supply agreement for a HESylated recombinant protein. Fresenius Kabi licenses its HESylation technology to Octapharma.

November 2009		
Award	Santhera	Santhera receives a CHF 1 million grant from Association Française contre les Myopathies for its omigapil programme in congenital muscular dystrophy.
Acquisition	Lonza	Lonza acquires Algonomics NV (Ghent, Belgium) in order to strengthen its protein design technology competency.
Manufacturing contract	Lonza	Lonza develops a manufacturing process for Arzerra™, a biopharmaceutical from GSK and Genmab. Lonza will supply drug substance.
Award	Lonza	Lonza receives the Frost & Sullivan Market Leadership Award for Global Transfection Leadership.
Financing	Xigen	Xigen has completed a series B financing round. It raised CHF 20 million from existing investor Tilacor Life Science.
Product approval	Basilea	Toctino also receives marketing authorisation in Canada.
Manufacturing contract	Lonza	Lonza enters into an agreement with Micromet for the process development and manufacture of Blinatumomab (MT103).
Divestment	Arpida and Acino	Arpida's shareholders approve the sell-off of the Iclaprim business to Acino. The transaction price amounts to CHF 2.1 million.
December 2009		
Financing	Covagen	Covagen completes a funding round with Ventech as financial partner. The new money should allow Covagen to accelerate its development.
Financing	AmVac	V+ GmbH & Co Fonds 2 KG acquires further shares in AmVac AG for CHF 3 million. V+ had invested CHF 1.5 million in AmVac since the first half of 2009 in order to expand the business.
Product approval	Basilea	Toctino is recommended for regulatory approval in 13 additional EU member countries as well as in Norway and Iceland.
Financing	Evolve	Evolve raises an additional CHF 16 million. Entrepreneurs Fund and six existing investors (Novartis Bioventures, Dansk Innovation, Auriga Partners, Wellington Partners, BioMedInvest and Vinci Capital) participate in the second part of the series B financing round.
Stock exchange listing	Evolve	Evolve Holding SA is listed on the SIX Swiss Exchange through a reverse takeover of Arpida.
Financing	Molecular Partners	Molecular Partners closes a series B round of CHF 46 million. Essex Woodlands Health Ventures, Index Ventures, Johnson & Johnson Development Corporation, BB Biotech Ventures and Endeavour participated.
Study setback	Addex	Addex stops developing ADX10059 after reporting liver problems in a clinical study against migraine.
Manufacturing contract	Lonza	Femta Pharmaceuticals and Lonza enter into a manufacturing services agreement to develop and manufacture FM101.
Study setback	Basilea	The FDA sent its complete response letter to development partner J&J indicating that it cannot approve the application for Ceftribiprole. Data have been found unreliable or unverifiable.
January 2010		
Collaboration agreement	Evolve	Evolve signs an agreement with Roche to create compounds in oncology and anti-infectives. Roche will pay Evolve an upfront technology access fee and ongoing research fees.

Disclaimer:

This information was put together based on publicly available information only. We therefore cannot exclude that an individual event is not reflected in the above-presented summary for 2009.

Company portrait

INFORS HT

Founded by Alexander Hawrylenko back in the sixties to commercialise innovative and patented benchtop shaking machines used in bioprocessing research and development laboratories, INFORS HT is encountering its fastest growth rate ever. "Despite the economic downturn, we are expanding and growing quickly. We have rented all the available properties in our immediate vicinity to keep up with demand," said Michael Hawrylenko, President of the Bottmingen (Basel) based company.

A lawyer and economist, Michael Hawrylenko joined his father in this family-run business in 2002. He attributes the upturn in revenues to the firm's growing reputation for high-quality, flexible equipment, close contact with customers, an enthusiastic management and a great team. He also points to tactical market development moves, such as the opening of sales subsidiaries in China, Benelux and Canada, in addition to its existing subsidiaries in Germany, UK and France.

It appears that the company's customers, university and industrial labs, have been less affected by the economic woes that are hitting other industries these days as a result of the financial crisis in the banking sector that began in 2008. Customers include companies like Novartis, Roche, Pfizer and Sanofi-Aventis, as well as academic institutions, such as the University of Basel, and food processing labs.

Just how fast this biotechnology lab equipment company's revenues are growing, Hawrylenko declines to say, citing the company's privately owned status, but he did confirm that annual turnover is greater than the figure indicated in a 2006 article that appeared in the Basler Zeitung, which estimated INFORS HTs revenue at that time to be about CHF 20 million when the company employed 110 people. Today, the company employs 150, and it can be assumed that turnover has grown apace with expansion in headcount and manufacturing plant.

So how does a medium-sized Swiss equipment manufacturer stay competitive in a global market? One way it survives and thrives is to keep a clear focus on its customer needs, according to Hawrylenko. "We've been expanding the product range over the years so that it now includes sophisticated bioreactors, as well as shakers and incubators in a range of sizes," he said, as an example of customer-driven product development.

The firm's market niche is mainly the R&D segment, but the size of the equipment is increasing. "We have started to manufacture production-sized systems, in addition to benchtop ranges," said Hawrylenko.

A line of accessories enables customer-specific design solutions. "While our products are standardised, we have the engineering know-how and capacity to customise when someone wants something special. We are known for this," commented Hawrylenko.

Future product innovation is fuelled not only by customer input, but also by development partnerships with companies like Hamilton, which has a Swiss presence in Bonaduz. Its new high-tech sensors are being incorporated in a bioreactor to boost

monitoring for better quality control and to cut down on labour costs.

Another partnership with University of Neuchâtel resulted in a spin-off company, called Madep SA, that offers bioremedial services for cleaning contaminated soil. The equipment has the potential to replace chemical and mechanical methods, with a biological approach which can preserve the soil for safe use in the future.

Innovative hardware is a core strength but lab equipment today has to be configurable, so software is important too. "We have a team of software engineers developing our own software used to control and monitor the INFORS HT bioreactor equipment," explains Hawrylenko. Interfaces enable the equipment to be linked together to share process information with other equipment used in the lab.

The Swiss company also keeps its eye on the competition. And there are several international competitors. According to Genetic Engineering and Biotechnology News in a feature article early last year, the major player in the market is Germany-based Sartorius AG. Eppendorf in Germany is also active with recent acquisition activity. "We know our competitors well," said Hawrylenko, confirming the consolidation trend with a comment about the disappearance of the names of some old, well-known companies.

Michael Hawrylenko
President,
INFORS HT



Patent statistics as indicators for the well-being of an industry



Heinz Müller
Prof. Dr. sc.nat.,
Patent Expert,
Swiss Federal Institute of
Intellectual Property in Berne

In Business Week's 10 January 2010 edition, mondoBIOTECH AG of Stans (canton Nidwalden) was named the world champion in pharmaceutical industry patent publications in 2009 when compared to the number of employees. mondoBIOTECH is a Swiss research company which focuses on discovering medicinal product candidates by exploring known peptides and other immuno-modulating substances regarding their use for treatment of rare and neglected diseases. Although the sheer number of patent applications does not reflect on a one-to-one basis the future success of the company or its inventiveness, the fact that mondoBIOTECH owned 306 patent families published in 2009 is impressive (cf. World Patent Index established by Thompson Reuters). According to the Thompson Reuters patent database, mondoBIOTECH owns in total 320 patent families, of which 306 were published in 2009. Even though such a small company might not keep up this incredible pace in patent filing in the next few years, this story indicates that Swiss biotech companies are among the most inventive and competitive in the world of biomedicines.

250 patent documents per million Swiss inhabitants

Another look at the World Patent Index database reveals that Switzerland as a whole is doing well patenting biotechnology inventions. Approximately 250 patent documents per million inhabitants were classified by the World Patent Index as being biotechnology patents from Switzerland in 2009. Compared to other countries, this is a very high rate: in 2009 approximate numbers per million inhabitants for other countries were 70 for the US, 65 for Japan, 45 for Germany and 40 for the UK. The same applies when analysing patent document owners' nationality (patent assignees' nationality) on these documents: in relation to its population, Switzerland again tops the other countries named in 2009 with approximately two- to threefold the number of biotech patents owned by individuals or companies based in Switzerland. This demonstrates that the Swiss biotech community is very active in patenting its inventions (see the figures for mondoBIOTECH AG above). Even if the above rates, which were extracted from the World Patent Index by using a simple search approach with the index word "biotechnology", do not reflect the true absolute number of biotech patents, these figures allow good estimations of the relative relationships between countries and a ranking of the relevant countries as to the specialised branch of biotechnology.

Furthermore, when analysing the nationality of the inventors revealed on all biotech patent documents published in 2009, e.g. on the same set of patent documents used above, at least twice as many Swiss nationals per million inhabitants are registered as inventors on these documents than any nationals of the other four countries considered. This appears to reflect the elevated proportion of individuals benefiting from a high degree of general education in Switzerland as well as the international competitiveness of Swiss universities. One of the most striking features of postsecondary education in Switzerland is the distinction between two highly specific professional tracks. The broader of these is the apprenticeship, known as the dual system. Students attend a vocational school for approximately two days a week, with the rest of the time spent in on-the-job training schemes. Almost 70% of Swiss 16-to-19-year-olds enrol in the dual system of school and apprenticeship. This track allows them to enrol in any university of applied sciences in Switzerland without restrictions. The other track is for those students planning to attend university and provides a general academic education in high schools or colleges. The number of pupils choosing this track has increased significantly in recent years. As a consequence, the workforce in Switzerland is in general well educated and highly skilled, even when it comes to such specialised branches as biotechnology.

Competitive Swiss universities

Using the above biotech patent documents data set again, it is possible to identify the active areas in this industry in Switzerland today. In particular, the addresses of the patent documents' owners (assignees' addresses) can be identified and statistically compared. For example, a Basel and Zurich city address for the biotech patents' owner is given with almost the same frequency in 2009. Geneva and Lausanne, with about a third, and Berne with about a sixth of the numbers of Zurich or Basel, are also among the top cities in this category. All these cities have long-established universities, universities of applied sciences and/or federal institutes of technology. The number of biotech patents issued from these institutions is, however, rather small when expressed as a percentage of all biotech patents applied for in Switzerland in 2009. Thus we can conclude that the majority of the patents originating from these cities are filed by companies or individuals. Taken together, patents from these five cities account for approximately 20% of all biotech patents filed in 2009. The level of patenting activity is therefore quite high outside these cities. Whether these activities are developed in suburban areas or away from the big cities cannot easily be gauged from these data. However, four of the big pharmaceutical companies, namely Roche, Novartis, Serono and Lonza, account for just about 30% of all biotech patents published in 2009. Most likely, the other patents can largely be allocated to SMEs based in the urban agglomerations of Swiss cities or elsewhere in the countryside.

Building strong companies



Dr. Martin A. Bopp
Head of Section Start-up
Promotion & Entrepreneurship,
Innovation Promotion Agency CTI

Innovation drives the economy. This is why the Innovation Promotion Agency CTI specifically backs the transfer of knowledge and technology between universities and business. As part of the Federal Office for Professional Education and Technology OPET, CTI supports application-oriented research and development. One of CTI's main missions is the promotion of start-ups, because many innovations are realised and put on the market by young entrepreneurs. Switzerland urgently needs men and women with exciting business ideas who are willing to take on the competition and persistently implement their visions in the market. CTI's start-up promotion offers them a wide range of training and coaching opportunities. These seminars are modular in structure and enable young entrepreneurs to selectively obtain the knowledge they need. The promotion of entrepreneurship specifically targets growth-oriented business projects with a technological focus. In the field of start-up promotion, CTI offers support in the following four areas:

CTI Entrepreneurship

With training and further education modules from venturelab for potential business founders.

CTI Start-up

With a coaching programme for business founders and young entrepreneurs.

CTI Project Support R&D

With a development programme for application-oriented research and development.

CTI Invest

With a platform for business financing through business angels as well as both national and international venture capital firms.

CTI Entrepreneurship is looking for

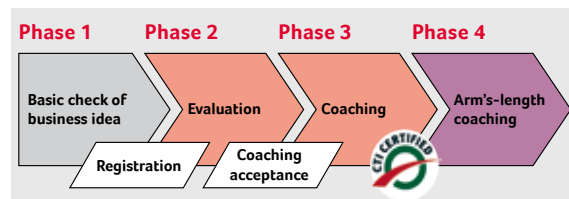
university graduates and professionals with exciting business ideas who are thinking about setting up a business. You are working or are in the process of completing a degree and are a specialist in your field, have a technology-oriented, innovative business idea and the courage it takes to set up your own company. In this case venturelab is the right place for you (www.venturelab.ch). This is because the coaching and training programme launched by CTI aims to raise awareness among university graduates of the subject of entrepreneurship, while specifically supporting them in planning and setting up a company of their own. venturelab offers a variety of coaching and training modules, allowing participants to jointly realise the vision of their own company step by step together with other prospective entrepreneurs. This includes one-day workshops (venture ideas), practically oriented crash courses (venture plan and venture training) and semester courses (venture challenge). And with venture leaders each year 20 young entrepre-

neurs have the chance to spend ten days at business training in the US. They will be given the opportunity to attend an entrepreneurship course at the renowned Babson College in Boston and meet inspiring entrepreneurs and start-up founders.

CTI Start-up is looking for

company founders and young entrepreneurs who have set their sights on sustainable growth with technology-oriented projects. You are on the verge of setting up your own company, or have already done so. Now the time has come to plan the right strategy that will enable you to conquer the market and convince customers, and above all financial backers, of your business project. In this case CTI Start-up is the right place for you. Here, you will receive individual professional training preparing you for the market. After completing the coaching, you can then apply for the CTI Start-up Label. It confirms that your company has the potential for sustainable growth. Coaching takes place in four phases:

Goal-oriented business coaching



I Basic check of business idea

First of all, the project team or young entrepreneur has to submit a business idea to CTI Start-up, which is then evaluated by experts.

II Professional evaluation

If a project is accepted for registration, it is allocated a coach. All CTI Start-up coaches are experts in their field and help company founders and young entrepreneurs to professionally prepare their business concept. Next, the experts carry out a detailed evaluation based on the following criteria: market, technology, feasibility, management team, patents.

III Professional coaching

If the evaluation is positive, the business strategy is then optimised together with the coach and a detailed business plan devised. Specialists can be consulted in order to clarify specific matters. This phase lasts between 6 and 24 months. At the end, project teams can apply for the CTI Start-up Label. This requires a presentation before an independent board of managers, entrepreneurs, finance and patent experts. They decide whether a company is awarded the CTI Start-up Label or not.

IV Arm's-length coaching

If necessary, CTI Start-up offers companies that have been awarded the Label additional support, to enable them to overcome other obstacles and help the start-ups to establish themselves successfully in the market.

Two examples

ESBATEch AG,
an Alcon Biomedical Research Unit GmbH
www.esbatech.com

CTI Label award: March 2000

14 September 2009 (press release) – ESBATEch AG has been acquired by Alcon, the world leader in ophthalmology, and is working to lay the foundation for Alcon to move into biotechnology. ESBATEch was founded in 1998 and, prior to the acquisition, focused on advancing therapeutic antibody fragments in ophthalmology but also other fields. All rights outside ophthalmology have been spun off to Delenex Therapeutics. ESBATEch will remain in Zurich-Schlieren to become Alcon's centre of excellence in the field of biologics. With the support of Alcon, ESBATEch has a unique opportunity to develop new antibody fragment-based medicines for ocular diseases. ESBATEch will be responsible for activities from discovery up to clinical proof-of-concept, while Alcon will lead further clinical development and apply its global marketing and sales expertise and network to bring new medicines onto the market. Both companies share the vision of developing new treatments to help patients see better.

Molecular Partners AG

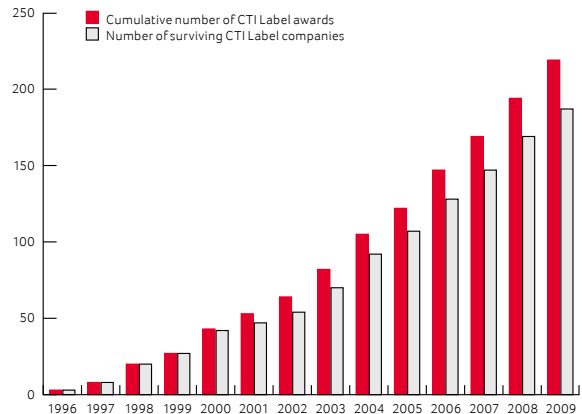
www.molecularpartners.com

CTI Label award: October 2007

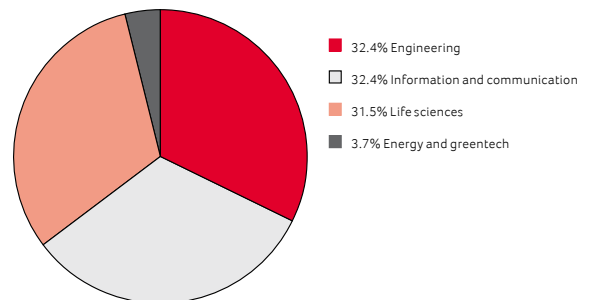
15 December 2009 (press release) – Molecular Partners AG, a pioneer in the development of DARPins as next generation protein therapeutics, announced the closing of its series B equity investment round securing CHF 46 million.

Molecular Partners was founded in 2004 and is a spin-off company of the University of Zurich. It focuses on the commercialisation of a novel class of biological drugs known as DARPins. The company is exploiting this novel class of protein therapeutics to create medicines for diseases with unmet medical need and to dramatically improve existing therapies. DARPins combine the high specificity, selectivity and safety of monoclonal antibodies with the many advantages of small molecules, including high stability and low-cost production. In 2005, the DRP technology was awarded the Swiss Technology Award 2005, the most prestigious technology award in Switzerland.

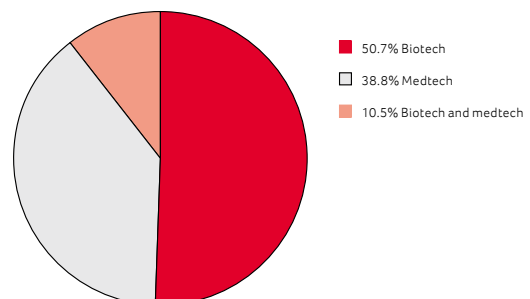
CTI Label awards and surviving companies



Partition of CTI Label awards by industry segment



Partition of CTI Label awards in life science



Company portrait

Debiopharm Group

Founded in 1979 by Rolland-Yves Mauvernay, a scientist and entrepreneur, Debiopharm Group™ (Debiopharm) is a privately owned biopharmaceutical group of companies. Its business model is unlike that of its peer biotech and pharmaceutical companies in the region. It does not do its own R&D, or drug discovery, rather it in-licenses promising biologics and small molecule drug candidates. It handles and finances the trial phases and development through to global registration. Sales and marketing are taken care of by out-licensing partnerships with larger global pharmaceutical companies. Its revenues come primarily from royalty payments.

It is a business model that this 300-employee-strong, family-run business has practised for some time and it can point to a track record of success, although it does so indirectly. As a privately owned company, Debiopharm does not disclose its revenue figures publicly, but what it does report is the performance in the market of five of its products: a colorectal cancer treatment with the brand names Eloxatin® and Elplat®, marketed by Sanofi-Aventis and Yakult respectively for the treatment of colorectal cancer; as well as three sustained-release formulations of Decapeptyl®/Trelstar®/Pamorelin® used in the treatment of hormone-dependent advanced prostate cancer that are marketed by Ipsen in the EU, Watson Pharmaceuticals in the US and Mepha in Switzerland; and Salvacyl®/Moapar® recently launched in the EU by Ipsen for the treatment of severe sexual deviations. These products together generated USD 2.6 billion in sales in 2008 for Debiopharm and its licensing partners.

Because Debiopharm takes on the financial risk once it licenses in the drug candidate, its selection and sourcing process is critical to its success. When it comes to stage selection, Debiopharm is quite open. A target can be preclinical to Phase III, as well as at the formulation stage, according to Maurice Wagner, Director of Corporate Affairs and Communications.

A typical partnership is exemplified in a recent deal it signed with Novartis to complete the development of a compound known as Debio 025, currently in Phase IIB, for treating patients with the hepatitis C virus.

Currently, Debiopharm is working on new formulations for Decapeptyl®, a treatment for hormone-dependent advanced prostate cancer. It is highlighted here as exemplifying how the Swiss company's innovation can make a positive change for patients and reduce health care costs by applying in-house formulation know-how and drug delivery technology. "The initial formulation was an immediate release formulation for daily injections. We developed a one-month sustained-release formulation, then a three-month formulation, enabling a quarterly visit to the doctor for an injection, and we are now releasing one that requires an injection just twice a year, after a successful registration process in several EU countries and the US so far," says Wagner.

Debiopharm recently entered into a co-development agreement with Pfizer concerning a molecule for the treatment of melanoma. It is unusual for the Lausanne-based company to

co-develop a new drug with a licensing partner, according to company spokesman Wagner, but it plays into its strengths, namely oncology drug know-how and Debiopharm's expertise in preclinical and clinical trials and drug delivery technologies.

New trends such as personalised medicine are also in evidence in this project. Using Pfizer's compound and a biomarker, the aim is to create a therapeutic package that enables doctors to determine if a patient's genetic make-up is the right kind to benefit from a treatment with the new drug.

Debiopharm may cast a wide net when it comes to stage of development of drug targets, covering the range of preclinical to formulation stages, but it is very selective when it comes to the potential efficacy of a candidate. "We have an exceptionally robust search and evaluation process. A compound must have superior potential compared to standard care," says Wagner, who goes on to remark that in a typical year the company looks at more than 1,000 targets, and selects just four or five for further development. The sources of its targets and therapeutic products emerge typically from biotechnology, pharmaceutical and academic organisations worldwide.

The challenges of a business model such as Debiopharm's are well documented, so to what does this three-decade-old company owe its success? "The business model is only as good as the people applying it," says Wagner.



biotechnet Switzerland – a partner of choice when innovation becomes a challenge



Prof. Daniel Gygax
President of biotechnet Switzerland,
Head of Bioanalytics at the University
of Applied Sciences of Northwestern
Switzerland

The Swiss biotech scene also felt a cold wind blowing with the slackening of the economy. Nevertheless, companies in this field – mainly small and medium enterprises – know that no market success is free and are striving to find new, innovative ideas with the help of the biotechnet Switzerland. A large number of promising projects, all involving cooperations between universities of applied sciences and industry, were launched in 2009, and biotechnet Switzerland has also been able to draw a positive initial balance of some existing projects.

Go-ahead for top-level research

A good example is the expression and purification of membrane proteins, especially ion channels, a collaboration between the biotechnet Switzerland, University of Zurich and F. Hoffmann-La Roche Ltd, Basel. In the focus of attention is the production of a human ether-a-go-go (hERG) potassium channel. The main concern is to identify or establish an efficient expression system in order to obtain recombinant protein in a quality and quantity which facilitate use for protein crystallisation but also for the investigation of protein/ligand interactions with biophysical methods.

Another project connects researchers of the University of Applied Sciences of Northwestern Switzerland (FHNW) with Biolytix AG Witterswil, which specialises in molecular and microbiological analysis. The scientists work on the recombinant expression of taq polymerase in yeast. Taq polymerase is a DNA polymerase of the bacterium *Thermus aquaticus* (Taq), which is so heat-resistant that it can survive in geysers.

The FHNW researchers have joined forces with their colleagues at the Zurich University of Applied Sciences (ZHAW) Wädenswil and BASF (formerly Ciba Inc.) to realise a biocatalytic process for the production of special monomers by transesterification. This biocatalytic process requires the production of the enzyme on a large scale. Consequently, an engineered protein displaying an optimised performance and synthetic promoters to optimally express the biocatalyst in *Pichia pastoris* are used. *Pichia pastoris* technology has been established within several international projects, and the universities of applied sciences within the biotechnet Switzerland are today among the world's leading specialists in this domain, offering this platform to Swiss SMEs and newcomers in biotechnology.

Science for human needs

In the spotlight of a ZHAW project is the expression and characterization of recombinant human collagen. The new procedure should facilitate the realisation of miniature sponges made of absorbable biomaterial used in dental medicine instead of tissue grafts.

The scientists at the ZHAW Wädenswil are involved in a pioneering achievement within a project supported by the innovation promotion agency CTI, the Swiss Biotech Association, the Swiss Industrial Biocatalysis Consortium and the DSMZ (German Collection of Microorganisms and Cell Cultures). In recent years, the handling of microorganisms and their metabolites has progressed. In future it will play a crucial role in many fields of science and research. The ZHAW team in Wädenswil collects bacteria and yeast strains from institutions all over Switzerland, characterises them and makes them available for academic research. This national "microorganism library" helps to preserve microorganism species and will strengthen the competitiveness and innovation ability of Switzerland on an international level.

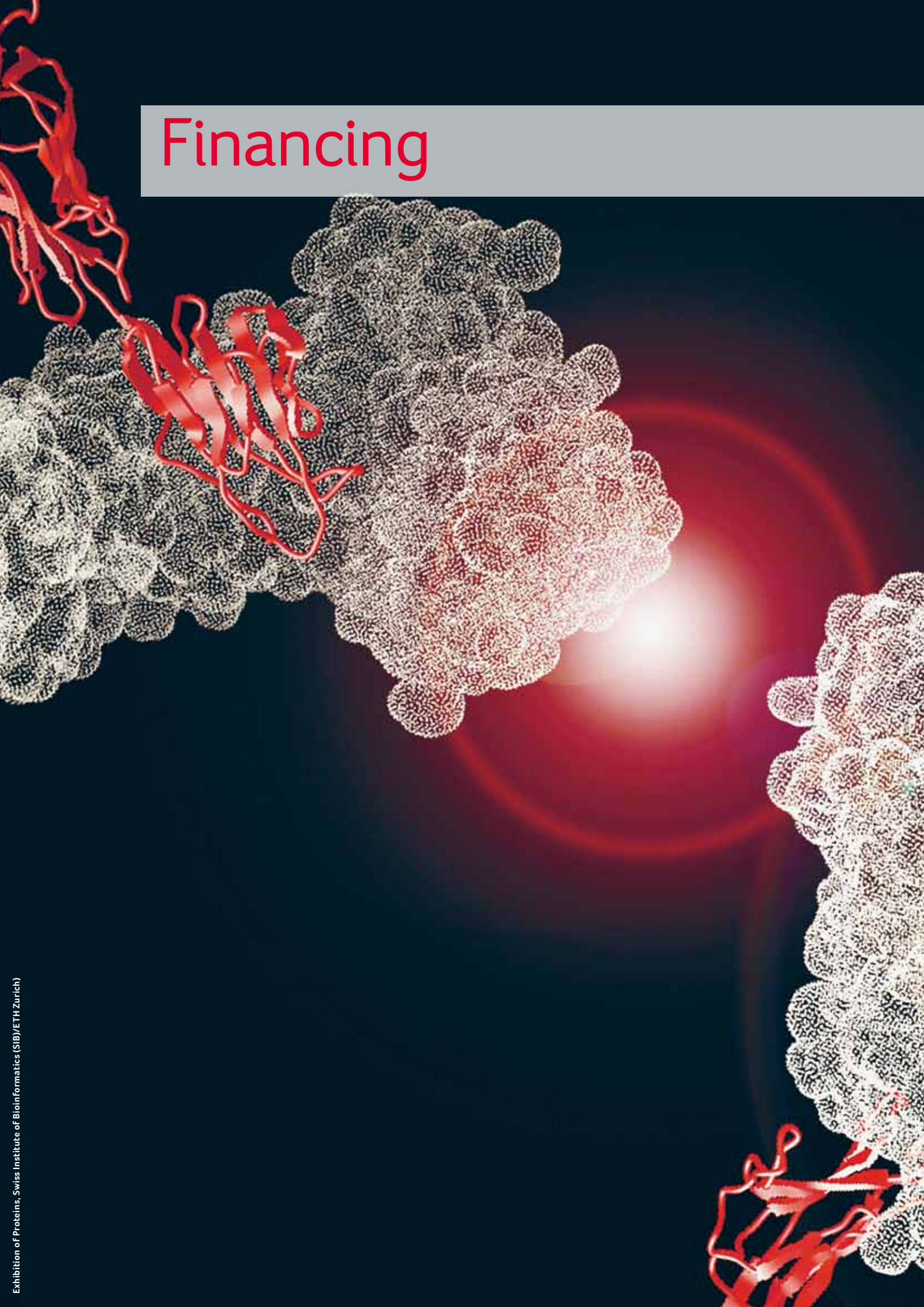
The biotechnet Switzerland also gave birth to a challenging CTI project aiming at achieving a platform for the development of an *in vitro* enzyme test. Together with the University Hospital Basel and BÜHLMANN Laboratories AG in Schönenbuch, manufacturer of diagnostic test kits for clinical routine and research applications, the FHNW specialists realised the necessary biological components. In autumn 2009 the company launched a new enzymatic test, which delivers within ten minutes from a urine or blood sample reliable results as to whether an individual has taken GHB (gamma-Hydroxybutyric acid). Up to now, this popular party drug could only be determined chromatographically with considerable personnel expenditure and not around the clock.

Do good research and talk about it

Besides the cooperation with the private sector, the biotechnet Switzerland has also been active in events aimed at promoting new technologies, supporting education and training and bringing together representatives from academia and industry. For instance, the biotechnet Switzerland was involved in the organisation of the "Days of Gene Research", arranging a day of "Open Laboratory Doors" at the University of Applied Sciences Western Switzerland (HES-SO) in the canton of Valais. On 29/30 June "BioTech 2009", a conference on the isolation, identification and preservation of microorganisms, was held at the ZHAW in Wädenswil. Basel was the location chosen for the 4th International Summer School on Advanced Biotechnology. The prestigious speakers from all over Europe attracted an interested audience from academia and the private sector. Finally, on 19 November, the traditional Olten Meeting offered selected lectures on the topic of how to orientate biotech research to more efficient diagnostic instruments and therapies to lead the fight against incurable diseases. The participants were able to take a look behind the scenes of current research in Swiss biotechnology.

The biotechnet Switzerland lives up to its name as a breeding ground for innovative ideas created by bringing together the know-how of scientists and their industrial partners.

Financing



Switzerland benefits from critical mass in the industry



Dr. Reinhard Ambros
Head Novartis Venture Funds,
Novartis International AG



Patrick Scherrer
Director Vinci Capital,
Vinci Capital



Dr. Rainer Strohmenger
General Partner,
Wellington Partners

Investor round table with Dr. Reinhard Ambros, Novartis Venture Funds; Patrick Scherrer, Vinci Capital Switzerland SA; Dr. Rainer Strohmenger, Wellington Partners.

What is the situation like at present for biotech firms seeking growth capital? And how does the situation in Switzerland compare with that in other countries?

Dr. Rainer Strohmenger: Though the situation has recently improved, biotech firms still have difficulties raising new equity, in particular private biotech companies. What we currently see in the market is an excess demand for capital. Since Switzerland has critical mass with respect to its financial, pharmaceutical and biotech industries, I would regard the situation as more favourable than in most other European countries. What we as investors very much appreciate about Switzerland's biotech clusters is the close collaboration between science, industry and investors, and the availability of good talent. In order to overcome this period of capital restriction, biotech firms should focus strictly on their key project(s), try to obtain financing from alternative sources and improve and extend investor relations.

Patrick Scherrer: Switzerland offers a very powerful environment for developing biotech and medtech companies, with good legal and financial infrastructures. Switzerland hosts world-class talent covering all the complex aspects inherent to the development of global products in the life science sector. Also, numerous start-ups have been created and launched by foreign entrepreneurs who have elected Switzerland as their home base for their new ventures: this is a very positive external recognition of our excellent environment. Start-ups should really pay attention to the endgame: how the world will look if their product is successful and plan backwards from there.

Dr. Reinhard Ambros: It remains difficult and only top biotech companies will be able to raise money; Switzerland has an

excellent talent pool, legal and financial structure for start-ups and will continue to be in a more privileged position to attract biotech companies and create a positive funding environment compared to other EU countries. For me, a strong capital-efficient development is key to success and part of such a plan are also non-dilutive funds.

VCs have increasingly taken on a bridge financing role of late. They are focusing more and more on financing individual active ingredients or projects and, in successful cases, seeking out a pharma firm as a partner to continue the project. The risk is thus shared. How do you view this trend?

Dr. Rainer Strohmenger: This trend makes a lot of sense. Late-stage clinical development requires competences most biotech companies do not yet have, and financial resources that usually exceed what a private biotech company is able to raise. Increasingly, big pharma companies regard the biotech industry as an important and valuable source for high-quality projects, not only to complement their internal pipeline, but also as a benchmark and even effective competition for their own R&D activities. I expect this trend to continue.

Patrick Scherrer: Risk mitigation has always been a key element of any product development project. Early partnering is certainly a way of achieving that objective, but it has to be done for the right reasons on both sides. Also, some therapeutic areas are out of reach for start-ups to be developed on a stand-alone basis due to the size of clinical validation trials required to obtain registration. A very positive aspect of developing a partnership with an established company is to be found in the overall quality, discipline, precision and long-term planning which are required on the start-up side to successfully conclude such a partnership.

Dr. Reinhard Ambros: The trend of project financing will continue as long as funds are restricted for Venture funding. We prefer to have a broader programme platform to mitigate risks, knowing, however, that there is always one key value driver which need to be guarded and supported specially. Early partnerships unless done in a very limited and fair way (such as the Novartis Option Fund concept) will take out value for investors.

What lessons have you learned from turmoil of the past few years?

Dr. Rainer Strohmenger: In the past few years we have focused on companies that are able to reach cash flow break even on their own. This strategy has been very successful for us and we will basically continue this way. However, we are also keeping our eyes open for attractive biotech companies with a convincing strategy of developing innovative products, because this is where the best opportunities are.

Patrick Scherrer: Companies really have to focus on unmet medical needs which they address in a capital-efficient manner. It is extremely difficult, in today's environment, to finance research platforms aspiring to discover a lead candidate sometime in the future, for example. Also, the complexity of the regulatory aspects of the business has increased continuously, and building a strong intellectual property position from the very beginning is essential.

Dr. Reinhard Ambros: Adopt an anti-cyclical approach to investment and have enough funds to cover downturns. We found 2008 and 2009 to be very good years for investments, with many more reasonable valuations than before. We hope to be able to have a good return from our strategy.

What is the outlook for IPOs in 2010? Is there increasing pressure on VC funds to achieve an exit for portfolio companies after two rather difficult years?

Dr. Rainer Strohmenger: I am optimistic that we will see biotech IPOs in 2010. From the lowest points in early 2009, many biotech stocks have now moved into a stable upward trend.

There might be some pressure on VC funds to score an exit, especially on those VC firms that have not been able to raise further funds or are approaching the end of their fund lives. However, exits can also be achieved by trade sales to secondary

players, many of whom have the strategy to buy a portfolio and to provide further financing to portfolio companies. For the portfolio companies this means that they might have access to additional financial resources.

Patrick Scherrer: We focus on developing sustainable companies. When a company reaches late development stages, it has to evaluate the prospect of entering the public market in order to continue developing its business. Being a VC in the life science sector requires a long-term view: we have not seen any increased pressure in the past few years to generate exits. We have always invested in companies with a business to develop and a given time horizon to reach value-creation milestones: if a company is on track, there is no reason to generate an earlier exit.

Dr. Reinhard Ambros: The outlook is bleak but not hopeless and is getting better by the month. I think we will see some IPOs by the second quarter this year but far below the long-term average. Key will be very strong clinical programmes and a clear regulatory path for approval. The exit pressure depends on the fund structure and stage, and people will continue to focus on funding exiting portfolio companies rather than making new investments. The M&A route will still be the main exit and large pharma is in need of good programmes, however, transactions will come with more conservative deal structures.

Swiss biotech companies attract significant international capital



Dr. Ulrich Geilinger
Member of the Executive
Committee of SECA,
Board Member of HBM Partners AG

Despite the disappointing performance of several public Swiss biotech stocks in 2009, Switzerland was able to maintain its position as a major biotech hub in Europe. Start-up activity and private financings of emerging biotechnology companies remained strong. And, as in previous years, Switzerland's biotech industry was able to attract significant capital from major international investors.

In addition, capital raising for domestic venture funds was strong with the closing of two follow-on funds (BB Biotech Ventures III and BioMedInvest II) and the establishment of Qurevest, a new venture fund targeting early-stage biotech companies. Last but not least, Merck Serono launched its corporate venture funds with a capital of EUR 40 million, following in the footsteps of Novartis and Roche.

As expected, trade sales activity picked up during 2009, with the sale of Esbatech to Alcon grabbing most headlines. Late in 2009, privately held Evolva went into a reverse merger transaction with listed Arpida raising more than CHF 40 million at the same time. Listed Cosmo offered to buy its Italian peer Bioxell, a transaction expected to close in early 2010.

As already mentioned, 2009 was not a very good year for investors in Swiss biotech stocks. There were no IPOs of biotechnology companies in Switzerland during 2009, and we do not expect a revival any time soon. In contrast to the public biotech sector, the private Swiss biotech industry had a strong year with over CHF 320 million (or over EUR 213 million) of capital raised by 20 companies.

This significant interest from international investors confirms the attractiveness of Switzerland as a location to start and grow medical and biotechnology businesses. In the biotech field, additional positive factors come into play such as the strong position of the pharma industry, world-class medical research and treatment quality and the large pool of talent.

Switzerland: an international marketplace for life sciences companies



Andrea Isler
Relationship Manager, Issuer Relations,
SIX Swiss Exchange AG

The Swiss biotech industry, which employs almost 20,000 people, is home to a total of 227 biotech companies and generated turnover of more than CHF 9.3 billion in 2009, is an innovative force in the Swiss economy. The strong concentration of the life science sector in Switzerland is no coincidence, but rather the result of long-standing and fruitful interaction between the tradition-rich Swiss pharmaceutical industry and the financial institutions based in the country. Thanks to this interaction, even complex biotech projects arouse the interest of a large number of expert investors.

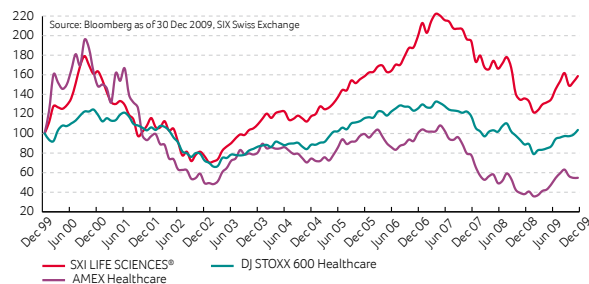
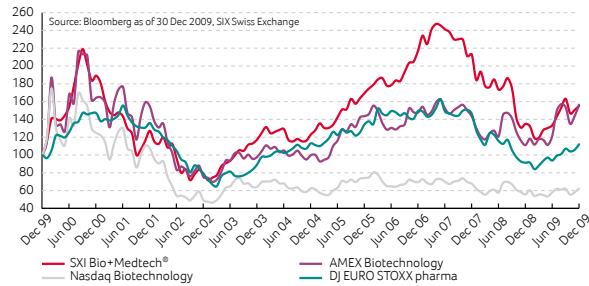
Broad buy side with extensive experience in valuing life sciences companies

The Swiss financial centre holds a strong appeal for Swiss and foreign life sciences companies and offers them fertile ground for growth and prosperity. Swiss banks are global market leaders, especially in the area of asset management. The total volume of all client deposits stands at roughly CHF 4,355 billion¹. Private as well as publicly traded companies benefit from this concentration of liquidity. Particularly when it comes to raising capital in the public markets, the investment banks and consortia represent strong financing and placing power. Thanks to the dominance and long tradition of the life sciences sector in Switzerland, the buy side for biotech stocks is broader than elsewhere in Europe. It encompasses family offices, institutional investors and a large number of specialised funds. Due to their background in, and focus on, life sciences, they have extensive experience in evaluating complex business models and the challenges associated with developing biopharmaceutical products.

Visibility enhanced by special life sciences indices

As a result of the strong focus of the financial centre on life sciences, Swiss sector indices – SXI LIFE SCIENCES®, SXI Bio+Medtech® – show an outstanding performance compared to foreign benchmarks. The two sector indices and benchmarks serve to increase the visibility of the sector in the financial market and have a positive effect on liquidity. The maximum weighting of an individual security is limited to 10%, which strengthens the focus on smaller and medium-sized enterprises.

Performance comparison of international life sciences indices (TR, CHF-adjusted)



SIX Swiss Exchange – focus on life sciences

Companies active in the globally oriented biotech sector aim to benefit from the unique focus on the life sciences sector in SIX Swiss Exchange. With about 40% of European life sciences market capitalisation, it has grown to become the most important marketplace in Europe. In addition, SIX Swiss Exchange was the only exchange in Europe to record cross-border IPOs by European biotech companies (BioXell, Newron Pharmaceuticals and Cosmo Pharmaceuticals) in a regulated market during the last IPO window (2004–2008).

In addition, listed companies benefit from excellent visibility among investors and the media, as well as broad coverage by analysts specialising in the sector. Investors are multilingual and multicultural; due to the fact that Switzerland is geographically easily accessible and investors are concentrated in a small number of locations, companies benefit from short communication paths when addressing their investors.

¹Source: Swiss National Bank, Monthly Statistical Bulletin, December 2009.

SIX Swiss Exchange is Switzerland's principal stock exchange. The Swiss financial centre's globally leading position in terms of cross-border private banking and the tremendous placing power the local banks have as well as the general location-specific attractiveness of Switzerland, lend SIX Swiss Exchange a gravitational pull both for domestic and foreign companies. SIX Swiss Exchange offers companies optimal conditions for obtaining capital. Thanks to Swiss legislation that provides for self-regulation, the exchange has the ability to ensure a high degree of investor protection while offering issuers an attractive regulatory environment.

Company portrait

GlycoVaxyn

The name GlycoVaxyn signifies that the start-up based in Schlieren near Zurich has its core competence in the development and manufacture of conjugated vaccines.

Glycoproteins, which strengthen the immune system, are manufactured in a simplified biological procedure that avoids many of the laborious stages of conventional methods. The company is well on its way to developing a broad portfolio of vaccines against common and severe bacterial diseases. The greatest progress made so far by the ETH spin-off has been in the battle against severe diarrhoeal diseases caused by the bacteria *Shigella dysenteriae* and hospital infections caused by the highly dangerous bacteria *Staphylococcus aureus*. In addition, GlycoVaxyn is researching the development of vaccines against the genus *Neisseria*, species of which cause meningitis and Type A streptococcus. Given that the potential of conventional antibiotics is quickly exhausted due to increasing resistance, GlycoVaxyn is operating in a market worth billions. The area of glycosylated vaccines alone is generating USD 4 billion in sales and enjoying growth just below double digits. The company's current team of around 40 members includes the founder Michael Wacker and, as can be expected, renowned scientists sit on the board. The company is managed by the former Axovan boss Philippe Dro, the Frenchman who took over the reigns in May 2008 and is known in the industry for his role in several strategic corporate transactions.

Young and already successful

Despite only having been created in 2004, GlycoVaxyn has already won the Swiss Life Science Prize and attracted a wide range of first-class investors such as Index Ventures and Sofinova, as well as Edmond de Rothschild Investment Partners in the last round of financing in 2009. The freshly invested CHF 25 million are intended to enable GlycoVaxyn to send a large selection of preclinical vaccine candidates for three-phase clinical trials. To date, a total of CHF 36.5 million in financing has been collected. Given that clinical trials have only just begun, the series B financing in early 2009 is unlikely to be the final round. GlycoVaxyn hopes that simplifying the production of immunogenic substances into a proprietary single-step procedure will also make drug production accessible to poor countries. Since 2006, the Schlieren-based company has been securing increasing patent protection for its procedure. The production of immunogenic glycoproteins based on the processes of genetic engineering in *E. coli* bacteria facilitates improved yield, purity and reproducibility. This could even enable existing vaccines to be improved further and made safer. The initial preclinical data are highly encouraging. The spread of the dreaded *Staphylococcus aureus* bacteria among mice, for example, can be reduced by 90% by means of passive immunisation (using CP5-EPA) and 99% with active immunisation. Due to the broad scope of the GlycoVaxyn method, the company is seeking potential cooperation with vaccine manufacturers.

GlycoVaxyn's own product pipeline is currently focussing on the areas of diarrhoea, hospital (nosocomial) infections and meningitis. There are over one million cases of bacterial meningitis throughout the world every year. Ten times greater is the number of patients who become infected in hospital, including by the bacterium *Pseudomonas aeruginosa* that thrives in the vase water of cut flowers. GlycoVaxyn aims to prevent these serious intestinal infections. Furthermore, GlycoVaxyn investigates the potential application of its innovative technology to non vaccine area (therapeutic).

Dr. Philippe Dro
Chief Executive Officer,
GlycoVaxyn AG



Company portrait

Lumavita

Lumavita AG, a Basel-based biopharmaceutical company that targets the gynecological prescription market for anti-infectives and anti-viral products that was founded in 2008. Backed by European venture capitalists and employing just six full-time employees, Lumavita has the hallmarks of what it takes to make a successful “virtual” biotech company, according to CEO Nicholas Benedict, specifically executives with strong personal networks and exceptional project management skills. “The team has a drug development and commercialisation background with Big Pharma and biotechnology industry backgrounds,” says Benedict.

It also has two novel high-potential drug candidates in its current product pipeline. The closest to market launch is pentamycin, known commercially as FemiFect. It is already approved in Switzerland. It will be sold into the prescription market, one that has a peak value worldwide of an estimated USD 350 to 400 million annually, according to Benedict.

With its external service providers, Lumavita improved the manufacturing process of an earlier approved version, and is currently in the final stages of a Phase II clinical trial as part of the registration programme for North America and the EU.

The end product is an intravaginal tablet for the treatment of not one but three of the most common causes of vaginal infections. “Often the diagnostics for vaginitis are inadequate. What is more, almost half the time women are suffering from two kinds of infections. So there is a real need for a broad spectrum treatment,” says Nicholas Benedict, CEO Lumavita.

Furthermore, what makes the pentamycin product stand out from other prescription treatments is its apparent lack of side effects. “There appears to be little risk that the natural flora of a woman’s body is disturbed by the drug,” explains Benedict.

There has not been a lot of innovation in this area of prescription medicine for women’s health, according to one of Lumavita’s investors, and the competitive environment is not overpopulated. Results of the current clinical trial are expected by the end of the second quarter 2010, with plans to launch sales in Switzerland before the end of the year.

The second drug that Lumavita is working on is at an earlier stage, but with a much larger revenue potential. LMV-601 is a potential treatment of infections caused by human papilloma virus and herpes simplex virus. Originally discovered at the German Cancer Research Center in Heidelberg, LMV-601 was acquired, as was pentamycin, from Shogoo Pharmaceuticals, a now-defunct Japanese start-up specialty drug developer.

The market for such an anti-viral drug is significant, according to Benedict, even with the advent of HPV vaccines. “Estimates vary, but it could take up to 50 years for the vaccine to have a real impact on the occurrence of HPV. In the meantime, there is a large unmet need for an effective treatment,” says Benedict.

The challenge for an organisation of the size of Lumavita is to manage the portfolio while building partnerships with vendors and service providers, according to Benedict. “We have the right product portfolio for our size,” he says. The real challenge

is the management of external partner relationships. “It is difficult for a smaller company to get the attention of the key vendor and service providers. And this is where our people, their skills, experience, and their networks give us a real advantage,” explains Benedict, whose relevant professional experience includes responsibility for Basilea Pharmaceutica’s commercial strategy and commercial operations worldwide. There he led three product launches.

Before that he held positions at Novartis as Chief Operating Officer of Novartis UK, as well as heading up a global business franchise unit that included Novartis’ women’s health products. The early part of his career was spent at F. Hoffmann-La Roche. The head of project management is Manfred Schulz who has over 16 years of pharmaceutical R&D experience, including leading projects at Novartis in Basel, Switzerland and New Jersey, USA. At Novartis he led drug development project teams from early to late stage, as well as taking care of drug approvals in the US and the EU.

Nicholas Benedict
Chief Executive Officer,
Lumavita AG



Swiss Biotech in review



Jürg Zürcher
Partner,
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2009 was a wave bath of mixed feelings for the Swiss biotechnology industry. The dark shadows of the global financial downturn also had an impact on some of the most recent developments in Switzerland. However, overall there was also a lot of good news to be noted.

Revenues

The industry achieved sales of more than CHF 9.3 billion and continued to expand to hire new employees.

Based on the latest product approvals the base of revenue-generating companies has increased compared with prior years.

Financing

Financing did not become easier for the industry as a whole, especially for the younger companies. Nevertheless, some of the more mature companies were able to attract new investors in execution successful B and C series of financing. The total amount of new capital raised by the Swiss biotechs was CHF 370 million, a remarkable increase by 62%, compared with 2008. The largest financing round was executed by NovImmune, with more than CHF 60 million raised, followed by Evolva, Molecular Partners and AC Immune, all raising between CHF 40 and 50 million.

Another positive signal on the financing horizon was the fact that BioMedInvest II was closed as a new fund with over CHF 100 million of new capital available in addition, Index Ventures in Geneva announced a new fund (Index Ventures V), equipped with more than EUR 350 million, which is dedicated to the early-stage funding. As both funds are known as early-stage investors, this financing gap (also known as the death valley) might get smaller in the near future.

Public markets/products/ clinical development

Besides this positive development on the financing segment, SIX Swiss Exchange also registered two new participants in the life sciences sector. mondoBIOTECH announced in late August (on a short-term notice) the listing of its shares whereas Evolva announced in early September its intention for a listing via a

reverse merger with Arpida. The announcement reflected one of the potential strategic options for the future of Arpida after the negative decision by the US Food and Drug Administration (FDA) in late 2008 (followed by a similar one by the European Medicines Agency [EMA] in early October 2009) to not approve Iclaprim. This decision by the regulatory bodies was one among a few others, in which Swiss biotech companies had to accept setbacks in their clinical development stages with either receiving negative feedback from the approval bodies or even not meeting the expected end points in the phase II respectively III trials. Examples to be mentioned are Addex, Basilea, Cytos and Santhera. However, some Swiss companies were able to announce positive information during FY 2009. Nitec Pharma got its product Lodotra approved for Europe and reported a successful phase III trial for Capra-2 in the US. Basilea reported marketing authorisation for several European countries for Tactino. Pevion and Kenta Biotech, both located near Berne, reported positive phase I respectively II trials for their lead compounds and Actelion was able to receive approval for Zavesca in a new medical indication.

Deals

Furthermore, positive news respectively acknowledgments for the successful development of Swiss biotech companies were seen in the area of collaborations. Santhera announced an out-licensing deal with the Canadian biotech company Biovail, after acquiring the Finnish company Juvantia, which led to double-digit upfront payments. Nitec announced a distribution agreement with Mundipharma for Europe (except Austria and Germany which is done by Merck KGaA) and Evolva was able to announce a collaboration with Roche shortly after its SIX Swiss Exchange listing.

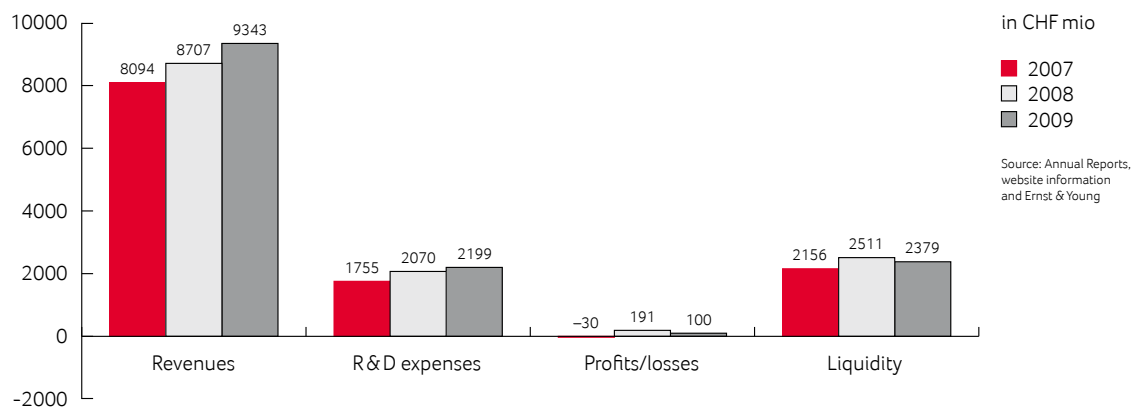
ESBATEch was acquired from the ophthalmologic giant Alcon. This deal has a total potential of approximately CHF 600 million whereof CHF 150 million upfront payments were received by the VCs which were supporting ESBATEch in its development for more than ten years. Alcon itself got a final takeover offer from Novartis in early 2010 which would lead to one of the largest takeovers in the pharma field.

Academia

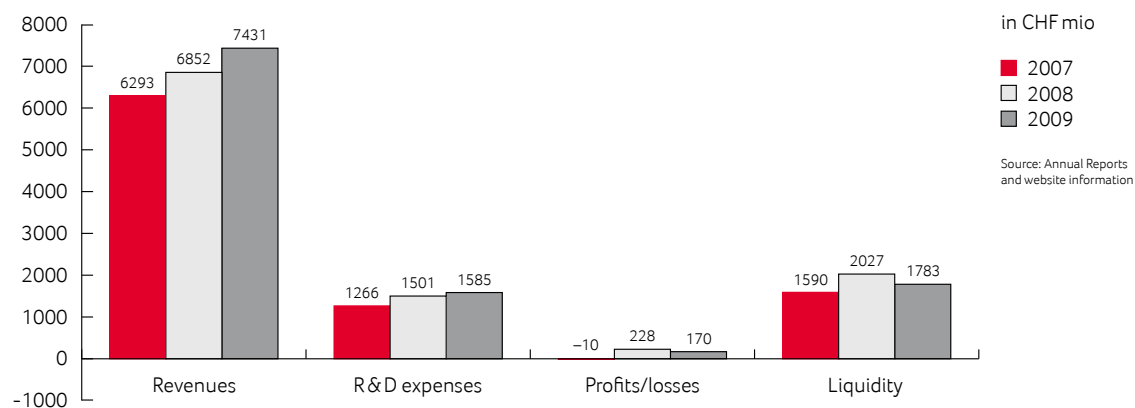
Academia contributed its part of the development of the industry with having SystemsX.ch and its related programmes up and running at full speed. Furthermore, new infrastructure investments were made in Switzerland. An example is the newly opened life sciences park in Basel where an incubator has been installed in collaboration with the University of Basel.

Facts & figures

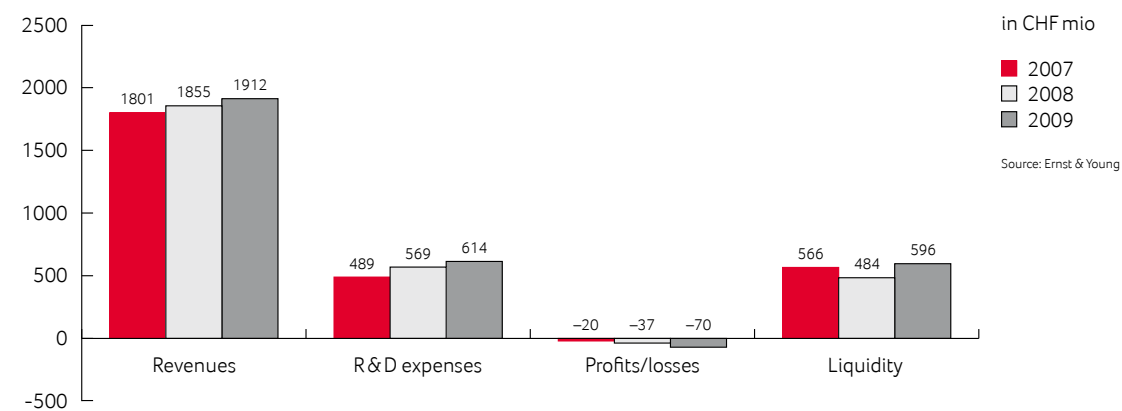
Total Swiss biotech companies



Public Swiss biotech companies



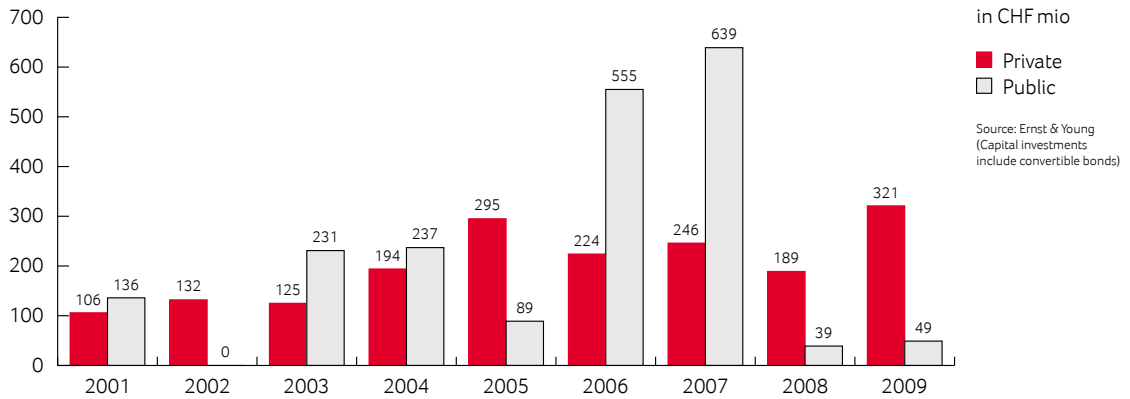
Private Swiss biotech companies



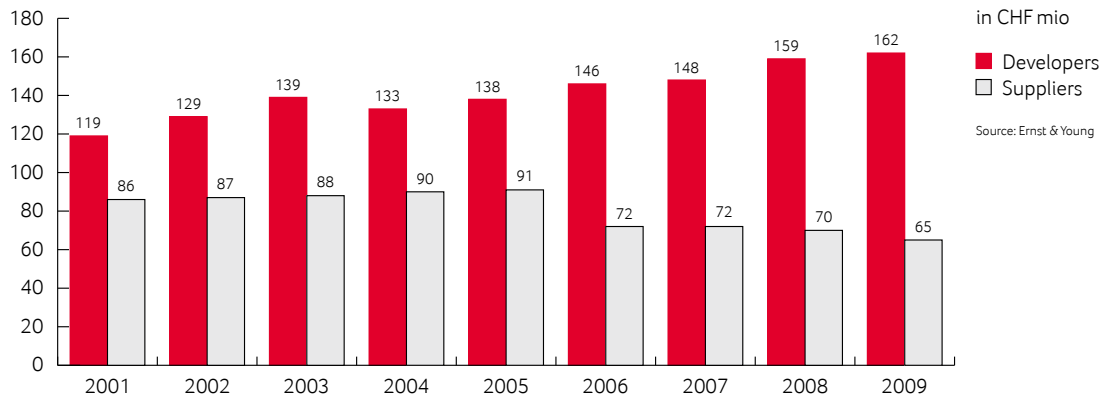
Notes

- The 2009 data in this table are based on the information available in early March 2010, when this report was compiled. At this time some of the companies had not yet disclosed the final financial figures for 2009. Therefore, some figures were carefully extrapolated on the basis of newest interim data publicly available (e.g. Q3 2009).
- Financial figures of Lonza's business sectors "Bioscience" and "Biopharmaceuticals" are included for all years presented based on actual figures publicly available or careful estimates. Lonza's Bioscience and Biopharmaceuticals business sectors are presented due to

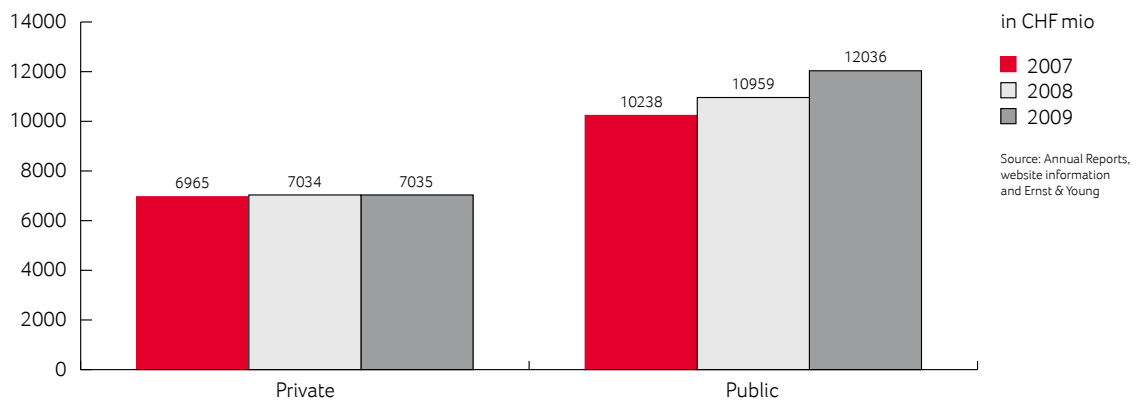
Capital investment in Swiss biotech companies



Number of biotech companies in Switzerland



Number of employees



Lonza's transformation into a life science company and its inclusion into the ICB Biotech Sector and the SXI LIFE SCIENCE® and SXI Bio+Medtech® indices at the SIX Swiss Exchange.

- Merck Serono's operations (a division of Merck Germany) which are operationally headquartered in Switzerland remain in the data analysis with regard to revenues, R&D expenses and employees.
- As some private companies do not disclose financial figures, the figures represent Ernst & Young's best estimate.
- All figures are headquarter-counted.



Impressum

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