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The Swiss Federal Institute of Technology Zurich, ETH, opened the Zurich Center for Imaging Science and Technology (CIMST) in 2006. This Swiss Biotech report has been enriched with some of the incredible images created there (see pages 5, 23 and 25). The ETH Zurich initiative in the realm of scientific imaging comes as no surprise – 2 ETH Nobel Laureates Richard Ernst und Kurt Wüthrich contributed much to the development of magnetoresonance-imaging technology. Applications range from non-invasive imaging used in biomedicine to visualisation of molecules at the nanolevel. The CIMST will host an "Interdisciplinary summer school on biomedical imaging" in September 2008. See www.cimst.ethz.ch

Executive Summary

The Swiss Alps are a wonderful metaphor for the Swiss biotech industry. A wide choice of different peaks invite climbers to embark on an onerous, yet fascinating adventure. The route to the top is open to only the best. And those talents who reach the upper regions recognise that they are among peers. Near the summit, you have to share your experience, trust is essential and helping one another is the only safe option.

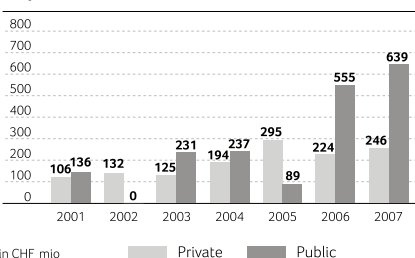
Prof Peter Meier-Abt of the University of Basel emphasises how short the distances in Switzerland are, including those between the universities and private industry. However, his concern is growing that private industry is recruiting university talents so rapidly that basic research capacity may be endangered (page 6). The Swiss National Foundation is committed to ensuring the flow of new research talent. So each year it supports more than 7,000 young researchers (page 12).

Domenico Alexakis, Executive Director of the Swiss Biotech Association, emphasises the openness and transparency that can be experienced in the sector in Switzerland (page 10). This readiness to share knowledge has an impact on an important rating: the IMD worldwide report has declared Switzerland the best nation for basic research and knowledge transfer between industry and academia. This accent is set by Dr Herbert Reutimann of swiTT, the national association that strives to further optimise the interface between industry and academia (page 13). Dr Ralf Lindner from the German Fraunhofer ISI explains how Switzerland is characterised by four geographical clusters that are linked by a high density of formal and informal networks (page 16).

For all the qualities of the Swiss networks, biotech is an international business and necessitates international connections. The Innovation Promotion Agency CTI, led by Prof Dr Oreste Ghisalba, creates international networks for and with Swiss biotech players from the business and academic communities (page 20). In a country like Switzerland, where so many summits can be climbed, it is vital that pioneers can stake their due claims to success. The Swiss Federal Institute of Intellectual Property is a valued partner of the biotech industry (page 22). After all, without the right equipment, there is no setting out from base camp. The tools required for the trek to the top carry sometimes hefty price tags.

Private and Public Swiss Biotech Companies

Capital Investments



in CHF mio

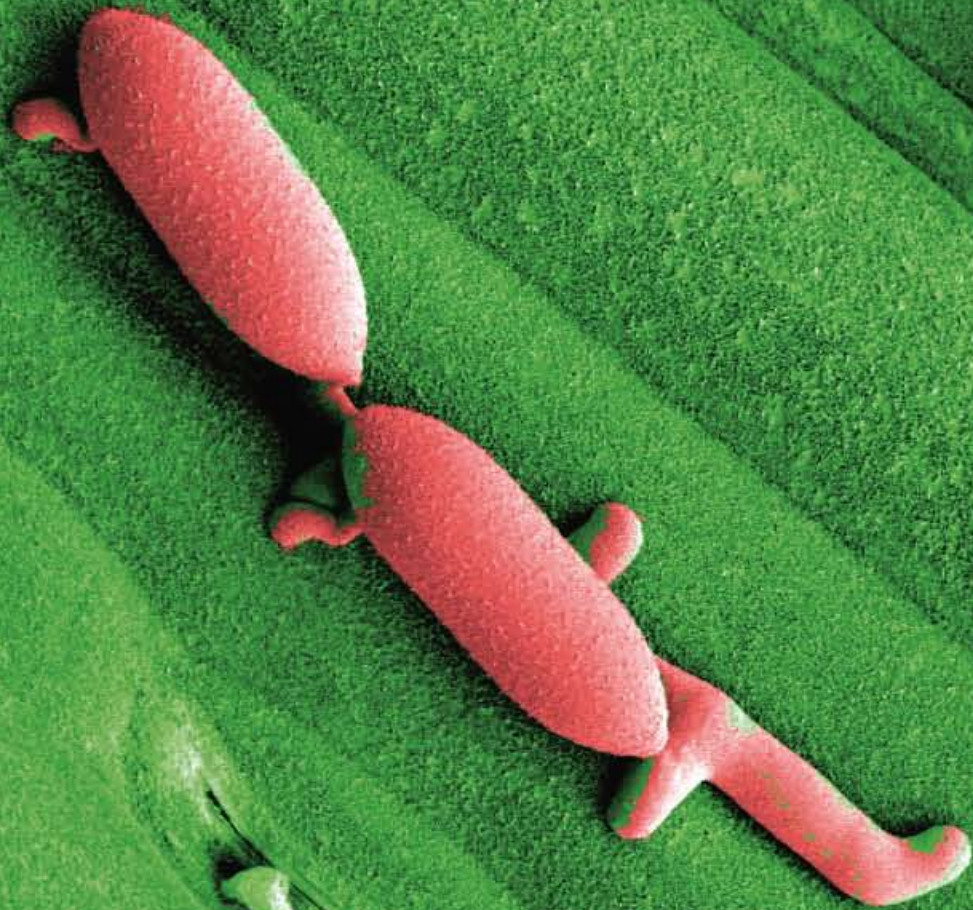
Private Public

Sources: Ernst & Young (capital investments include convertible bonds)

It is never easy to raise funding for challenging endeavours. But the long-standing interaction between the life sciences and the financial industries have created an atmosphere in which private and public investors are very open to funding of biotech companies. Every year since 2004, the Swiss stock exchange SWX accounted for the largest IPOs in Europe in terms of money raised on the day of the IPO. Dr Yvonne Gunsch-Wegmann of SWX rightly points out that foreign companies considering an IPO on SWX should be aware that a link to Switzerland can be helpful in trying to gain visibility and investors' trust (page 26). Jean-Philippe Tripet of Aravis Venture Associates emphasises the high level of mutual trust: "Everybody knows each other, it's no different to Silicon Valley in that respect" (page 29).

In 2007, the biotech industry in Switzerland noted another record year with regard to total revenue, R&D and new capital raised. Jürg Zürcher of Ernst & Young dares the question of whether 2007 is in fact the year before the great breakthrough (page 31). Either way, Switzerland's life sciences, academia and the financial sectors welcome new talents and innovators on the way to the top. For there is still space at the summit.

A Vantage Position in the War for Talent



Passionate About the Needs of Our Future-Talent Pool



“It is bad for a society when its brightest minds have to choose between a lower-paid position doing research or a better-paid job managing. Because if the trend continues who will be left to make the discoveries.”

Prof Peter Meier-Abt is clearly passionate about new talent promotion, one of his key responsibilities as Vice-Rector of the University of Basel. Since his arrival from Zurich three years ago, he has been engaged in the development of a focus strategy that he hopes will strengthen Basel and make the country as a whole more competitive. “I think we need to talk in terms of the University of Switzerland,” he says boldly and explains the need for increased cooperation between the various national institutions and clusters. Practicing what he preaches, Prof Peter Meier-Abt has been a member of various medical expert committees at a local, national, and international level. Having served on the Research Committee for Biology and Medicine of the Swiss National Science Foundation for eleven years, ending up as President, he understands the importance of policy. On the other hand his experience reorganising clinical research as Director of the Centre for Clinical Research at the University of Zurich from 2001 to 2005 means he is well versed in the challenges of managing change in complex academic institutions.

“In Switzerland, it is important to involve all the stakeholders,” says Meier-Abt. With the referendum system, people expect to have a voice on important issues. While slowing reforms this prevents expensive mistakes. But does it stifle innovation? History will be our judge. In the meantime, we have a question about the innovation gap in big pharma. “Are the more innovative scientists attracted to biotech because teams are smaller and less bureaucratic?” Possibly, but Meier-Abt believes the innovation gap could be a signal of a deeper malaise in Western society. Science is struggling to compete as an attractive career choice for young graduates.

By asking him about his personal motivation in developing new talent, the interview shifts up a gear as the Professor brightens. “There is nothing more important! At my age, one can still publish the odd paper but developing the young minds has to be the priority.” He goes on to explain that the most intelligent students are often neglected, either because they can work things out on their own or because their originality itself is a challenge. “But they are our hope, so we have to catch up with some foreign universities in terms of the intensity of supervision.”

Biotech is a strategic focus for Basel. I suppose he wants more computing power. “Number crunching is only part of the equation. The genome data gives the trees. Of course we need to see the forest, but more importantly, we need people who can spot the flowers and pick the berries.” In the perfect knowledge economy, the brightest stars will be groomed to do pure research. The next tier scientists develop the applications. And then you have those who get an MBA and work out how to turn those ideas into money. The problem is that if everyone starts managing and selling, who will do the research that is the basis of the whole value chain. “My fear is that if we wait until we feel the pain, we’ll be too late with the intervention,” explains the former clinical pharmacologist. In Switzerland, politicians are basically aware of the problem and they listen when academics propose solutions. Obviously it takes investment. Earnings in pure research need to rise but Meier-Abt sees other areas where improvements are equally important. Esteem is vital. Scientists need to feel that society values their work. We have to encourage excitement. In Basel we’ve started running regular public science meetings. The general public can get enthusiastic about science if we talk in terms they can understand. That contributes to a positive research environment.

The environment is very important for students. All the Swiss university cities are world-class locations when you assess the sports, recreation and cultural opportunities. Swiss distances are, globally-speaking, tiny so any differences between the rest and recreational options are rather negligible. Basel has Fasnacht – confetti littered the pavement as we arrived. But Zurich has Sechseläuten and Bern has the Mattenquartier or the Gurten Open-Air Rock Festival. Geneva, Lausanne and Lugano are equally blessed with opportunities; like the rest of Switzerland they have easy access to stunning alpine or water sports environments. Talking of the environment: students are generally greener thinkers. They certainly appreciate the excellent public transport the country offers. But the opportunities are not limited by the Swiss borders. Rome, Paris, Berlin and London are easily reached for a weekend break.

With all these environmental assets, is Swiss academia guaranteed a flow of foreign scientific talent? Prof Meier-Abt is quick to qualify, “It all starts with a good research programme. This generates the curriculum. And that is ultimately what pulls in the new talent.” The links between industry and academia are intense in Basel, but they are generally informal. Students spend time in industrial labs and industry collaborators teach at the university. But these arrangements are unofficial and usually depend on individuals. Work is going into structuring these collaborations but it gets rather complex when you try to formalise them. The same could be said of Swiss relationships with the EU. How he feels about Switzerland not being a member. “Swiss researchers have access to all major European research programmes and young investigator awards. In general, EU research is well developed in Switzerland. Where it gets more difficult is when it comes to funding of new infrastructural facilities. But the potential is still enormous,” he says tirelessly.

The Master and PhD programmes reveal the particular emphasis of each university. Basel has pure research strengths in chemistry, physics, molecular/integrative biology and biomedicine. On this basis four interdisciplinary areas of special significance for life sciences have been defined. They are nanoscience, systems biology, pharma science and molecular foundations of mental health and human development (e.g. neurosciences). Most important is the concept of translation research, where basic natural sciences meet clinical research to develop new diagnostic methods and therapies for important diseases in the future. Beyond interdisciplinary studies, Meier-Abt is also a firm believer in the importance of student diversity and interaction between the science and arts students. That may not be immediately obvious, but prior to molecular biology, who would have foreseen the implications of the biologists rubbing shoulders with the mathematicians?

For further information please visit
www.swissuniversity.ch

A Prime Business Location for Life Sciences Companies

Osec. With 148 biotech companies and 72 biotech suppliers, Switzerland boasts the world's highest per capita biotech density. In 2007, the Swiss biotech industry generated a turnover of more than CHF 7 billion and had a workforce of over 14,000. Located in the heart of Europe, the Swiss biotech industry is in close proximity to important biotech areas in neighbouring Germany, France and Italy and is therefore a perfect gateway to the EU markets that include well over 450 million consumers.

Why Is Switzerland the Best Location for Your Biotech Business?

The Human Capital Advantage. Access to a vibrant, skilled labour force is among the most important factors when relocating or starting a business. Switzerland has long been a magnet for highly skilled, quality-conscious, multilingual workers. Numerous recent international studies found that Switzerland offers:

- The most rewarding work environment in Europe (geva Institut 2007)
- The most motivated workers in Europe (IMD 2005)
- The most competitive economy in Europe, second worldwide to the US (World Economic Forum 2007)
- The highest overall quality of living in the world, with 3 of the top 10 cities (Mercer 2007)

These accolades also translate into serious advantages for business:

- Higher satisfaction with employers and work-life balance results in a lower worker absence rate than in other European countries.
- The Swiss have a strong work ethic working almost one hour more per week than the EU average.
- Plentiful skilled labour: Most citizens of the EU can work freely in Switzerland, and companies like Google, IBM, eBay, Medtronic and Philipp Morris International R&D have opened R&D centres because of the international pool of skilled labour.
- A consistent, healthy work environment combined with one of the lowest crime rates, world-class health and educational systems, and great leisure options makes Switzerland an attractive place to set up business.

The innovation-friendly Swiss environment attracts high-quality academics and professionals from the US and other countries. The generous research support and superb infrastructure include:

- Unrestricted academic venture capital, provided by major universities and private sector partners, allowing researchers enormous leeway in deciding which projects to pursue.

- Collaboration and knowledge exchange among institutes, universities and private companies, promoting commercialisation. In fact, 14% of all European biotech products in the pipeline come from Switzerland, where more than 70% of all scientific contributions originate in academia.
- Skilled workers at all levels in the lab and the office thanks to the apprenticeship system, the universities and well-established chemical and pharmaceutical industries.

An Attractive Fiscal System

Switzerland offers very favourable tax environment. The maximum corporate tax rate in 2007 was 21%, one of the lowest in Europe. The administrative and regulatory framework encourages new business with low payroll taxes, short product registration cycles, strong IP protection and easy access to markets.

A Leading Financial Centre

The Swiss Stock Exchange (SWX) is Europe's leading stock exchange for the life sciences industry. Sector-specific indices SXI LIFE SCIENCES® and SXI Bio+Medtech® have continuously outperformed US and European benchmarks. Over 40 venture capital firms and private equity funds, and numerous science parks and incubators support new ideas.

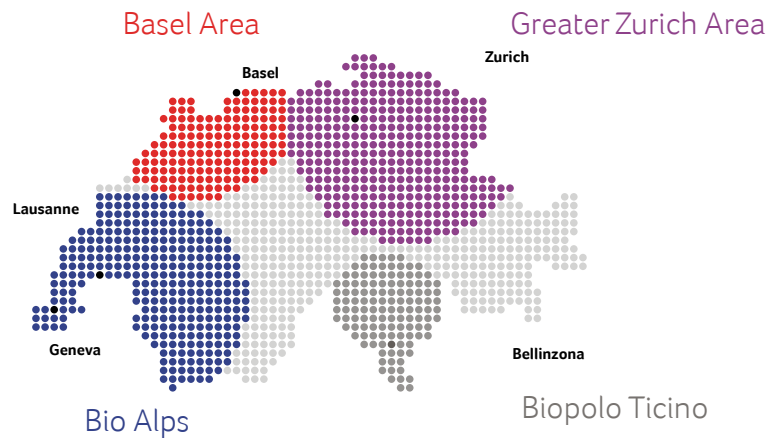
Osec

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.



For further information please visit
www.osec.ch

One Goal – Plenty of Choices



**SWISS
BIOTECH**[™]

Founding members
of the alliance:



BaselArea⁺



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

Bio Alps serves Western Switzerland – one of the major European centres for biotech research. It is home to more than 200 bio- and medical technology companies, over 500 research laboratories, more than 10 universities, university hospitals and universities of applied sciences. Research parks and technology transfer institutions support rapid development of the life sciences industry.

Biopolo Ticino promotes life sciences in Ticino, the Italian-speaking sunny south of Switzerland. Aiming to create a fully integrated life sciences cluster, Biopolo Ticino seeks to align, network and integrate the life sciences value chain in the area and to attract foreign biotech companies and investors to the region.

BaselArea welcomes you to the Basel area, one of the world's most dynamic economies and home to a successful life sciences cluster. Here you'll find biotech and nanotechnology, medical equipment and pharmaceuticals, agribusiness and specialty chemicals. Besides the headquarters of global companies such as Novartis, Roche, Syngenta and Lonza, there are young and growing companies such as Actelion, Basilea Pharmaceuticals and Speedel. With the fastest growth rate in Switzerland, the Basel area provides fertile ground for new and established companies.

Greater Zurich Area is a leading European centre of medical innovation. Its life sciences cluster comprises more than 400 biotech and medical companies, universities, technical colleges and technology transfer institutions. The region features numerous research and business parks and several incubators – all facilitating the prosperous development of biotechnology companies.

National information about the Swiss biotech industry is also available from the Swiss Biotech Association, www.swissbiotech.org, and the Swiss Stock Exchange, www.swx.com.

For further information please visit

www.bioalps.org

www.biopolo.ch

www.baselarea.ch

www.zurichmednet.ch

www.swx.com

www.swissbiotech.org

Open Knowledge – a Strategic Success Factor for the Life Sciences Industry

Swiss Biotech Association (SBA). We all know people who play their cards very close to their chest. Ask them how they are doing the answer is always “Fine”, how’s business it is always “Excellent”. Forward-thinking companies have realised that sharing problems and solutions is a much better strategy. Thus the Swiss biotech community benefits from a level of openness and transparency that is uncommon in more established sectors.

At every stage of the value chain, jobs in biotech are knowledge-intensive and highly specialised. Because innovation speed is so intimately linked with human capital, the SBA was a key partner in the creation of the European Job Portal, www.eurobiojobs.org, which in turn gave rise to the BIO-ACTORS project.

Many biotech players are emerging young companies. As spin-offs from research organisations they share a common set of challenges: they have to manage the transformation process of innovative ideas and intellectual properties into commercial products and services.

Whatever the business development stage the questions are generic. In other words everyone is basically facing similar challenges and asking questions like: what competence or job profile is needed for our next transition step or how can we access practical knowledge in these support processes? How can we learn from more advanced players? Perhaps a new product or network organisation needs to be set up, a specifically qualified scientist or business developer needs to be hired or a new job description needs to be defined around a novel product or process.

These types of challenges have high strategic relevance for corporate development and the mobility of employees. Improving the resource development system would positively impact the European business innovation system in the field of life sciences and contribute to the creation of values and jobs from research results.

Recognising the importance of a joint response to these challenges, the BIO-ACTORS project has arisen with the support of some of the leading European biotechnology industry associations and the Swiss competence network Biotechnet.

The overall intent of the BIO-ACTORS project is to help life sciences companies develop and provide them with the necessary support to efficiently and sustainably manage their corporate transformation process.

The Swiss Biotech Association is a national association with 170 member organisations representing biotechnology companies, academic institutions, regional biotechnology centres and related organisations throughout Switzerland. Founded 10 years ago, the SBA vision is to identify, communicate and utilize the advantages of modern biotechnology for economic gains and the benefit of society.



Domenico Alexakis
Executive Director
Swiss Biotech Association



For further information please visit
www.swissbiotech.org

The Relational Advantage

Kenta Biotech is developing fully human monoclonal antibodies against life-threatening hospital infections, using their proprietary MabIgX platform. They have a promising lead-product candidate in clinical development and several product candidates in preclinical development.

“You need special clothing and various other protective measures to enter the labs,” explained the receptionist during the company tour. In this business that’s routine, but the infections Kenta Biotech is targeting are especially deadly: highly resistant to antibiotics, they kill up to 50% of victims despite hospital intensive care. However, we are here on a brighter note, to chat to one of the few female CEOs in Swiss Biotech about the HR challenge for small start-ups. Violetta Georgescu is a pharma professional with over 20 years experience and a welcoming smile. What she tells us, is clear evidence that people skills can be a critical asset – even when you’re creating the life-saving drugs of the future in sterile laboratories.

It all started in 2005 when Berna Biotech decided to spin out their monoclonal activities and appointed Georgescu to build the firm. I asked her if it would have been easier to get investors in the US. “Maybe, but investors here can also recognise a good opportunity,” she replies. Evidently: for Kenta found private investors who put in CHF 15 million. Deciding to rent labs and offices at Berna Biotech operations were up and running in no time. Many of the additional employees required were hired through the founder’s networks. “There is definitely a war for talent,” she says and explains that the big focus of research into monoclonals in the past was mostly in the US. Obviously a small start-up can never compete with big pharma on fringe benefits and salaries but Kenta has its own unique strategy. Kenta is using people skills to add value for the company and employees. This starts during the interview process. Looking at both professional qualifications and soft skills they take candidates through a multiple selection process that involves all the people the candidate will be working with. “If anyone has reservations, then we continue the search,” she explains. In other words, at Kenta, human chemistry is as important as scientific qualifications. The result is a close-knit motivated team of 16 with almost no employee fluctuation. “People in a start-up feel the pressure more than in a bigger company and in R&D work, discouragement is inevitable. We can’t avoid that, but a strong team rebounds much better,” she says.

Kenta’s management is also convinced that the company performance is very much a product of the individual performance and motivation of each employee that needs to be sustained beyond recruitment. So the company’s annual milestones are broken into individual goals for

each employee. So everyone knows their precise roles and responsibilities. Kenta has also established a feedback culture of honest praise or constructive criticism. Regular progress meetings ensure that all know whether the company is on track.

How important is the Bernese location to your company and candidates? “From the applications we receive, we know that people really want to move to Switzerland, even from relatively attractive places like Munich or San Diego in the US. Work permits are absolutely no problem and cultural integration is not hard, even though the international community in Bern is not as big as Basel or Zurich.”



From left: Christophe Hammer, Regulatory Affairs; Verena Gafner, Clinical Development; Holger Koch, Research Scientist; Wolfgang Schuette, Chief Medical Officer; Bea Fluri, Assistant; Violetta Georgescu, CEO; Michael Rudolf, Chief Scientific Officer; Stefanie Fas, Research Scientist; Hedvika Lazar, Clinical Development; Markus Haake, Head Preclinical Research; Aniko Fels, Assistant; Sandra Jampen, Technician; Markus Tarkóy, Head Process Development; Marianne Wyss, Technician; Lea Schott, Technician. Not on the photograph: Laurence Blazianu, Head of Business Development.

For further information please visit
www.kentabiotech.com

The SNSF Supports the Best Young Researchers

Swiss National Science Foundation (SNSF). Each year, the SNSF supports thousands of talented young researchers at Swiss universities. Thanks largely to this support, Swiss research is now among the best in the world. At some point, however, the majority of research scientists leave academia and take their expertise to private companies. In order to maintain Switzerland's top economic and scientific ranking, the SNSF plans to increase its commitment to talented young scientists over the next four years.

The majority of the CHF 500 million that the SNSF grants annually, goes to supporting young talent. Because one cannot underestimate the importance of the painstaking work done by young scientists in university laboratories. Driven by their curiosity and creativity, the young generation of scientists contribute to the excellent reputation of Swiss research. In life sciences, physics and chemistry, Switzerland occupies a top rank behind the USA. That is part of the reason why Switzerland is such a popular education and research location among foreign young scientists – evident in their rising numbers at all levels. Research teams with a mix of nationalities are not only an excellent creativity booster, they are also an ideal preparation for a later job in industry.

As a research and development location, Switzerland faces tough competition to attract the best young talents. The main competition comes from other parts of Europe, North America and increasingly Asia. Therefore, the SNSF's promotional role is vital not only for academic research; the overall competitiveness of the Swiss economy is at stake. In this context, while it is essential to stay up to date and contribute to advances in cutting-edge research, trends and methods, "soft factors" such as networkings, etc. are also important considerations (cf. statements below).

In order to strengthen Switzerland's top position in research and technology, the SNSF is going to increase its support for young scientists over the next four years. Plans include a general increase in the salaries of doctoral students, and a human resources development tool called "Ambizione". This instrument is designed to fill the gap between postdoctorate and assistant professor positions, by allowing young scientists to lead a small research team on their own. The SNSF has two hopes for this new tool; firstly, it should serve as an incentive for those researchers with the most initiative to return to Switzerland after foreign studies. Secondly, it offers the best foreign postdocs an opportunity to continue their career in Switzerland.

This latter aim of giving foreign students a good reason to remain in Switzerland could prove particularly rewarding for the country. Because it is not enough to attract a young researcher for long enough to do a

postdoc here. Switzerland needs to offer them a personal perspective that will make them want to stay and continue to invest their intellectual capital in our national R&D community.

"The support of the SNSF was, for me, a doorway to a broad network of scientific contacts (...) that are still useful in my current job in research and development."

U. Grauschopf, Hoffmann-La Roche, Basel

"(...) the events regularly organised by NCCR Structural Biology ... and the opportunity to present results ... lead to great and fruitful exchanges and collaboration."

N. Eifler, Novartis Pharma AG, Basel

"The SNSF has been a precious enabler in the exploration of innovative ideas. (...) It helped me develop problem-solving skills and a knowledge of the pharma and biotech industry that were crucial to my becoming a consultant in the life sciences sector."

E. Aloy, Deloitte Consulting GmbH, Zurich

Portrait of the Swiss National Science Foundation

The Swiss National Science Foundation (SNSF) is Switzerland's foremost institution for the promotion of scientific research. It funds more than 7,000 researchers every year, at least 5,500 of whom are 35 years old or younger. With its federal mandate, the SNSF promotes basic research in all scientific disciplines, from philosophy to biology, medicine to nanoscience. It also invests in application-oriented science in different fields.

The main task of the SNSF is to evaluate the quality of research proposals submitted by scientists. The SNSF funds the best of these with a total of CHF 500 million annually.

Committed to young scientific talents, the SNSF primarily supports basic research in the form of individual projects. Additionally, it conducts research programmes such as the National Centres of Competence in Research (NCCR) that improve research structures and strengthen Switzerland's position in strategically important fields. The National Research Programmes analyse and help find solutions to current problems in society. The SNSF also works to ensure that scientific research in Switzerland is in the best possible position to develop internationally. It also encourages the dialogue among the economy, politics and society.



Dr Urs Christ
Head of National Centres
of Competence in Research
Swiss National Science Foundation



For further information please visit
www.snf.ch

Driving Innovation Through Collaboration with Swiss Academia

swiTT. Swiss research universities are attractive partners for the biotech industry. Top-notch academic researchers and flexible and lean processes for collaboration and technology transfer are key ingredients. The most recent IMD worldwide report on the competitiveness of countries ranks Switzerland 1st both in basic research and in knowledge transfer between industry and academia. The national association swiTT strives to further optimise the interface between industry and academia.

Research collaborations with academia are crucial for most biotech companies. The number of joint projects between Swiss universities and industry has been steadily growing. In some places it has nearly doubled since 2004. At universities with a medical school and an associated university hospital, the life sciences sector accounts for up to 75% of all collaborative projects.

If handled properly, industry-academia collaborations represent win-win opportunities. Industry gets access to top-notch researchers and well-educated young talents, as well as the broad network and knowledge of academic research. Academia profits from industrial know-how, relevant research topics and additional research funding. Established processes on setting up collaborative research projects are in place at most universities and researchers are supported by experienced personnel at their local technology transfer offices.

In order to minimise transaction costs for joint projects administrative and contractual burdens need to be watched and optimised where possible. A good example is the negotiation of standardised clinical research agreements with numerous companies at the university hospitals in Bern and Zurich, which was handled by their technology transfer unit Unitectra. The use of these templates drastically reduces the time to execution of the agreements and saves on resources on both sides. swiTT, the Swiss Association of Technology Transfer Professionals, strives to foster and facilitate industry-academia collaborations and technology transfer through its members. In future, industry needs will be embraced even more strongly in particular in the areas of education and training and in the elaboration of best practice processes. Several joint training events with the Swiss Biotech Association in 2007 were well received. swiTT will continue to develop its collaboration with industry. This will allow to further strengthen the ties between industry and academia.

Biotech companies are frequent licensees for academic inventions. About two thirds of academic licenses go to small- and medium-sized enterprises which either commercialise the technology on their own or sublicense it to large pharmaceutical companies after development has reached an advanced stage. To facilitate the screening of licensable academic technology opportunities for companies swiTT runs "swiTTlist", a unique web portal which comprises technologies from most Swiss universities. Cooperation between biotech companies and academia is a major driver of innovation. Swiss universities are attractive partners for industry due to the top-class academic research performed and the professional management of technology transfer matters. Through its activities swiTT contributes to maintain the excellent position of Switzerland in industry-academia collaborations.



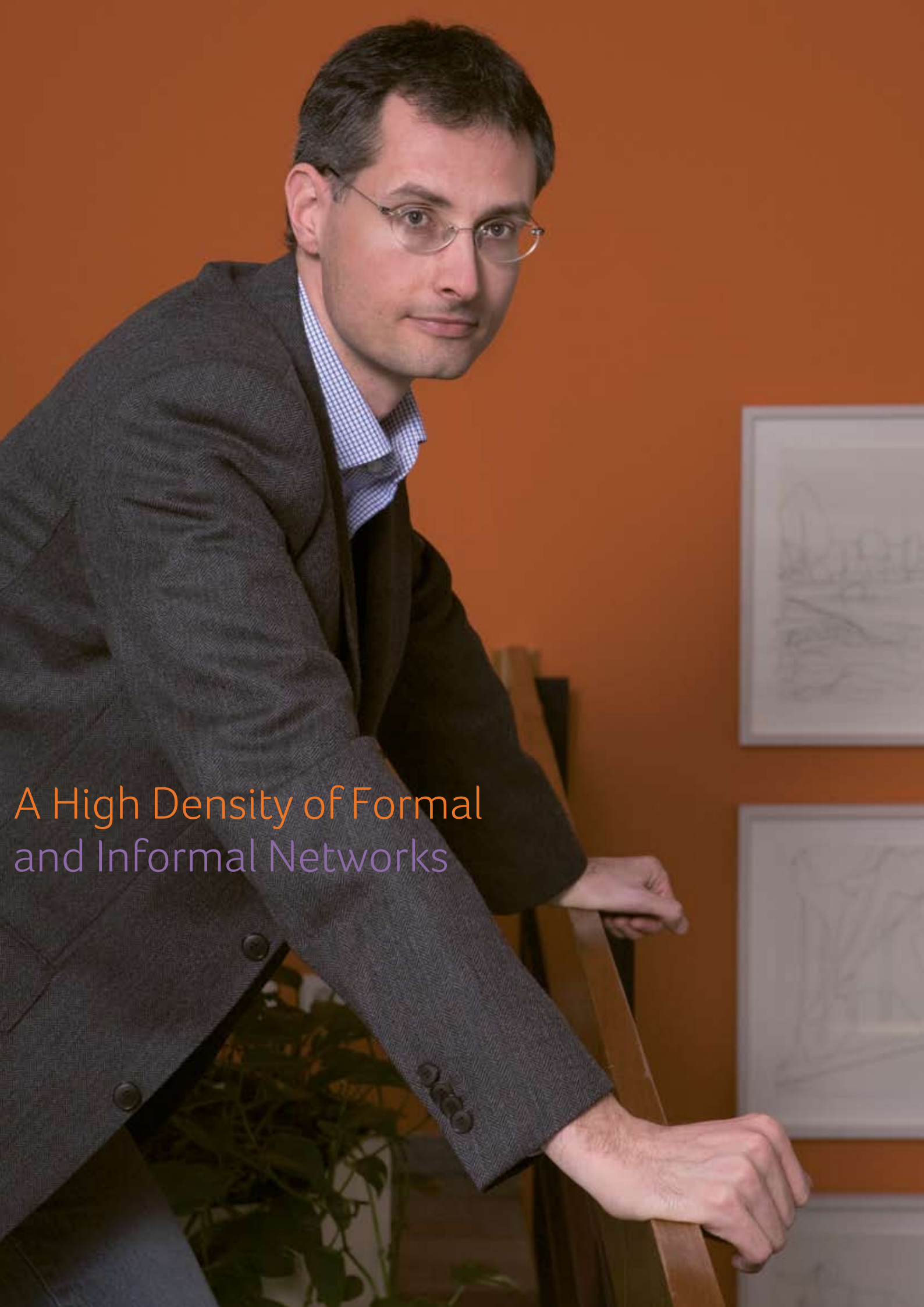
Dr Herbert Reutimann
Managing Director Unitectra AG
President swiTT



For further information please visit
www.switt.ch
www.uniectra.ch

Cluster and Network Benefits





A High Density of Formal
and Informal Networks

Fraunhofer ISI. In March 2007, the Fraunhofer Institute for Systems and Innovation Research (Fraunhofer ISI, Karlsruhe), TNO (Delft) and SPRU (Brighton) published the BioPolis report. Commissioned by the European Union, it was a scientific study that compares biotech-related policies in 32 countries during the period 2002 to 2005. The conclusions of the National Report on Switzerland paint a favourable picture for Swiss biotech. Focused government investment in biotech basic research during the nineties that after 2000 shifted towards promoting valorisation has been fruitful. Thanks to these policies, coupled with historical traditions, geographic advantages and other factors, Switzerland now has a very high density of biotech companies and a large pool of individuals with significant biotech experience. The good news is that these individuals, be they research scientists, experienced technicians or start-up advisors, are concentrated into 4 geographical clusters and linked by a high density of formal and informal networks.

Because biotech is about complex cutting-edge innovation speedy access to tacit knowledge is vital. Tacit knowledge is know-how that cannot be easily captured and distributed. Location really matters when you need tacit knowledge because it is unearthed and transferred only when you work together on a problem. In Switzerland, no one is ever that far away and the clustering of the biotech industry shortens distances even further.

Relative to the 31 other countries studied, the qualitative impression was that Swiss institutions from the national funding bodies to the regional cluster initiatives were remarkably dynamic and engaged. The country also has a real advantage due to the presence of several powerful pharma multinationals. Small Swiss biotech start-ups might have a greater chance of licensing successful discoveries than say their Austrian counterparts because of the opportunity to network with major players. Excellence in research needs to be paired with experience in regulatory and marketing aspects. The topography of the industry encourages the exchange of tacit knowledge and the formal networks foster the informal contacts that make a lively, positive environment for biotech ideas and investments.

Let's look in more detail at some of the facts we discovered.

Traditionally, Switzerland's gross expenditure on research and development (GERD) as a percentage of GDP is comparatively high with an investment of 2.9% of its GDP in R&D in 2004. This puts it in the premier league alongside countries like Sweden and Japan. Switzerland is also in the privileged position compared to other European countries of having a private sector that strongly contributes to R&D spending. In 2004, 70% of total GERD was from industry. Meanwhile, Switzerland's federal organisation splits the responsibilities for education, science, research and innovation between different ministries and departments, and the two levels of government. With a consensus-based approach and the involvement of so many actors, decision-making procedures create a high density of formal and informal contacts with surprisingly little overlap or organisational friction. Stakeholders are thus better informed about ongoing initiatives. Of course, given the complexity of these coordination activities, decision-making processes tend to be time consuming.

Life sciences and biotechnology in Switzerland are well established both as a research field and a flourishing industry. The bulk of scientific research is performed at the universities and the two federal institutes of technology (ETH). A small number of publicly funded non-university institutes, such as the renowned Friedrich-Miescher Institute contributes to the scientific knowledge base. But the research conducted by industry is a very important pillar of the Swiss biotech science.

More than 80% of the Swiss biotechnology R&D activities are performed in one of the country's three main biotechnology/life sciences clusters. These tightly knit regional networks around the cities of Basel, Zurich and Lake Geneva bring together actors from different sectors of the regional innovation systems.

The thematic strengths of the Swiss biotech scene are mainly in medical biotechnology, particularly biopharmaceuticals, genomics and proteomics. The areas with the strongest growth rates (measured by publications) between 1994/1996 and 2002/2004 were industrial and food, followed by plant and environmental biotechnology, all of which started with very low publication levels.

The density of biotechnology companies relative to population size is one of the highest in the world. The geographic proximity to the important biotechnology markets of the neighbouring countries and the presence of leading multinational corporations in the chemical-pharmaceutical industry such as Lonza, Novartis, Roche and Syngenta seem to be beneficial factors.

With regard to public promotion, biotechnology enjoyed intensified support through the Swiss Priority Programme Biotech in the 1990s. The programme successfully contributed to the establishment of biotechnology R&D in Switzerland. The scientific field is still granted a priority position by the federal government, but due to maturity and the high degree of institutionalisation, special funding for basic research does not seem as expedient anymore. Instead, funding is increasingly channelled through bottom-up schemes such as the National Research Programmes (NFP) and the newly created instruments of the National Centres of Competence in Research (NCCR). Four NCCRs focusing on biotechnology, which were executed between 2002 and 2005, supported biotechnology with EUR 43 million public funds. More biotechnology-specific promotion activities were initiated on the valorisation side of the innovation process. In 2003, the Innovation Promotion Agency (CTI) introduced its programme CTI Biotech, which aims to encourage technology transfer and the creation of new companies. Between 2003 and 2005, the programme funded biotechnology-related projects with a total sum of more than EUR 13 million. Apart from these programmes exclusively targeting biotechnology, generic policy instruments such as bottom-up response mode schemes are still of great importance as a source of funding.

During the last few years the once sharp separation between the Swiss Federal Science Foundation, as the chief promotion agency for basic scientific research, and the CTI has been gradually supplanted by a more integrated approach. Increasingly, these two institutions are jointly designing and developing funding instruments as an attempt to respond to the necessities of complex innovation processes.

Dr Ralf Lindner, Fraunhofer ISI

Based on BioPolis – Inventory and analysis of national public policies that stimulate research in biotechnology, its exploitation and commercialisation by industry in Europe in the period 2002–2005.

For further information please visit
ec.europa.eu/research/biosociety/library/brochures_reports-bioplis_en.htm

Innovation Gap in Big Pharma

The biotech industry was mainly created by dynamic entrepreneurs or academic ideas spun into small companies. Is the innovation gap in big pharma a sign of a lack of entrepreneurial spirit?

Elmar Schnee: The perceived higher rate of innovation success for small companies may be biased by the fact that many start-ups disappear before they gain significant visibility. Moreover, the goals pursued by start-ups have a tendency to be more short-term and may not consider all aspects of the full drug development cycle.

Rolland-Yves Mauvernay: When I founded the Debiopharm Group, I didn't want to do drug discovery or sales and marketing, my primary focus was, and still is, drug development. We have resisted the temptation to create a sales force so we can invest all our resources, creativity and energy into the development of innovative drugs. In big pharma, multi-layered decision-making processes, strategic turnarounds, lack of self-questioning or financial pressure, can sometimes stifle or delay innovation. For many entrepreneurs, innovation is an extraordinary human venture that requires faith and courage, determination and perseverance.

Elmar Schnee: There may be a detrimental effect on innovation above a certain size, with too rigid structures and numerous procedures. However, innovation in large pharmaceutical companies should not be underestimated. Although the context is different than that of small start-ups, in this very fast moving industry, an entrepreneurial spirit also drives the actions of senior management as well as the research staff in large companies.

Some pharmaceutical companies are trying to reorganise their R&D departments using the model of the biotech industry. Is this going to work given the large corporate structure?

Rolland-Yves Mauvernay: A company is characterised not only by the products or services it provides, but also by its frame of mind. The establishment of therapeutic or business units and the creation of dedicated and empowered project teams have brought changes to the R&D organisation of large pharma, for the better, it seems.

Elmar Schnee: Yes, I consider it certainly one of the ways to be explored. Bear in mind though, a small biotech is often focused on one or two products while larger companies may have 20–30 programmes to manage in parallel, which unavoidably affects structures and the way that priorities and resources are managed. At Merck Serono we have recently implemented a new proof-of-concept (POC) structure to ensure a better bridge between R&D activities. Splitting R&D departments by therapeutic areas, for instance, or creating integrated units in a campus fashion can favour the dynamics of innovation. Smaller units foster personal contacts and collaborations. Being able to follow the progress of projects from inception until advanced stages also gives the different actors a strong sense of ownership and is highly motivational.

Rolland-Yves Mauvernay: At Debiopharm Group, which is considered a medium-size biopharmaceutical company, we are fully project oriented. Greater facility and rapidity of know-how acquisition and sharing plus profound understanding of the complexity of new product development have added efficiency to mere good science.

Elmar Schnee: It remains true that the industry has limited hindsight to judge the effects of these reorganisations. But I believe they are promising and some companies such as Wyeth and GSK claim increased efficacy with their new R&D structure. With the restructuring of our own Clinical Development department, we certainly aim at being faster and more efficient.



Elmar Schnee
President of Merck Serono
Member of the Executive Board
of Merck KGaA

www.merckserono.net

How far can new management methods and techniques go to making drug development and marketability more efficient?

Rolland-Yves Mauvernay: Drug development is a very risky, expensive, long and heavily regulated business! Leveraging portfolio and cash effects is important. Implementing lean development plans, knowing when to stop projects that are not yielding the expected results is essential. Perhaps you have to seek new formulations or indications to salvage them. Finally having sufficient cash to maintain several projects at once to dilute the attrition effect must be sought at all times.

Elmar Schnee: One has to acknowledge the fact that today's drug development is not as inefficient as claimed. The industry has faced a tremendous increase of regulatory requirements in the past 15 years. For example, the numbers of patients needed for the clinical trials is up several fold, and the costs of development of a drug have more than doubled. So a fair comparison with the success rates of the 80s or the 90s requires that we take such complexity into account. We monitor our performance through a Balanced Score Card, a methodology that balances quality and quantity, as well as short-term and long-term objectives. Another efficiency factor is our portfolio evaluation approach that enables us to balance risks and opportunities.

Rolland-Yves Mauvernay: One opportunity to save costs is the externalisation of certain activities, namely manufacturing, in growing markets such as China and India. Personalised medicine may also be a way to address development more efficiently.

Elmar Schnee: Yes I agree, pharmacogenomic approaches are a next step in the tailoring of treatments to the patient and could have a positive impact on the marketability of a drug. Also, we now have an increasing number of biomarkers as well as pharmacopredictive models available.

The pressure to gain access to novel science and technology is forcing pharmaceutical companies to search outside their own labs. Will collaborations be a successful strategy to close the innovation gap?

Rolland-Yves Mauvernay: Alliances have always constituted a strong axis in small and medium biotech industry development and were only a secondary way to secure innovation in large pharma. Now, large pharmas are starting to do what small biotechs have been doing all along: teaming up with universities or doing mergers between technology and target biotech companies with the hope of making a successful product. Acquisition of biotech by pharma for a new technology or to build a portfolio is now most common.

Elmar Schnee: Collaborations are a must, as no company can claim to cover the whole spectrum of the potential for innovation in life sciences. We aim at having 30% of our discovery research budget dedicated to external collaborations. Close contacts and exchanges with innovation pockets such as universities, incubators and start-ups are very important for cross-fertilisation of ideas. While we can share our expertise in the drug development process we also learn from approaches taken by the small-scale biotechs.

Rolland-Yves Mauvernay: The Debiopharm Group has always and still relies on alliances both to renew its project pipeline with innovative compounds and to commercialise the products that it has developed. When we lack extensive expertise we establish alliances to add value to our products.



Dr Rolland-Yves Mauvernay
President and Founder
Debiopharm Group
www.debiopharm.com

Building a Bridge Between the Lab and the Market

The Innovation Promotion Agency CTI. CTI is the Swiss Confederation's innovation promotion agency. Activities include funding of market-oriented R&D projects, coaching and promotion of start-ups, R&D and KTT consortia, and the dedicated strategic support for the biotech sector. These activities have been described in detail in earlier editions of the Swiss Biotech Report. This article will take a closer look at the activities of CTI on the international level.

Swiss Biotechnology Goes International

In the global innovation race the future prosperity of a business location is intimately linked with its ability to innovate today. CTI's international engagement aims to extend the reach of Swiss biotech companies and networks and leverage the potential of global R&D to boost growth. To this end CTI:

- helps SME's access market-oriented R&D programmes.
- promotes R&D cooperation between Swiss SMEs or research institutions and overseas partners.
- collaborates with Switzerland's science councillors and Swissnex (formerly called "Swiss Houses" in Shanghai, Singapore, Boston, and San Francisco).

The goal of CTI's global engagement is to create international networks for and with Swiss biotech players from the business and academic communities. This is important because the Swiss biotech scene needs to sustain opportunities on the international stage, open up new markets and encourage joint ventures and R&D partnerships with the objective of value creation in Switzerland.

Besides the US and the EU, Asian regions including Japan, China, Korea, Singapore, and India are key markets for Swiss biotech products and services but also for new joint ventures and R&D partnerships.

International Programmes

Switzerland is now chairing the global Intelligent Manufacturing Systems collaboration scheme (IMS). IMS addresses problems of sustainability, emerging technologies and global education in manufacturing. Bringing together global enterprises with niche SMEs and top research institutes, IMS projects have generated several international standards. Current members are the EU, the US, Japan, Korea, and Switzerland.

So far, IMS has had a low profile in biotech and pharma, but CTI believes in the potential for Swiss biotech enterprises to take a lead in a global biotech manufacturing project under the IMS umbrella.

EUREKA is a rather well-known collaboration mechanism, bringing together 37 countries in Europe, including, for example, the Russian Federation, the Ukraine, Turkey, and Israel. Biotech and related fields have long been part of the EUREKA project portfolio. The collaboration between EUREKA and the EU commission is increasingly important and resulted in the creation of the EUROSTARS programme. Once this programme is approved and implemented, it will be an interesting option for research-intensive high-tech SMEs in Europe. Switzerland intends to participate in this programme, pending government approval.

Dedicated Bilateral Activities

Several projects are running under a bilateral scheme with China, and the first biotech project is expected in 2008 (with Hong Kong). Further projects from this sector are encouraged; the inclusion of other countries is possible. The funding mechanism is based on the CTI scheme, however, some projects have been funded through the EU framework programme.

A group of Swiss Biotech stakeholders coordinated by CTI Biotech/CTI International, the SBA and the Swiss Embassy in Tokyo is actively promoting the cooperation with Japanese Bioregions. These activities are also supported by the Japanese External Trade Organisation JET-RO and the Japanese Bioindustry Association JBA. They include both the annual participa-

tion at BioJapan with an impressive Swiss Pavilion and specific joint events and partnering meetings with selected Japanese Bioclusters, alternately in Japan and Switzerland. So far promising relations were established with Bioclusters in Kobe (Biotech and Medtech) and Toyama (Pharma including Kampo medicals, Pharmatech, Biotech). As a result, a number of company-to-company cooperations and the establishment of subsidiaries in the respective countries have been triggered and supported. Bilateral R&D projects with CTI funding scheme are a future option.

CTI, the Innovation Promotion Agency: Bringing “Science to Market”

CTI promotes market-oriented R&D collaborations between business and academia funding 1,000 research salaries per year. CTI Start-up supports the launch of high-potential companies with international prospects. By building a bridge between the lab and the market, CTI furthers the innovation process that drives the economy. CTI’s funding for 2008–2011 is CHF 532 million. Businesses benefit doubly from this mission: both from project results and from the supply of qualified, market-oriented R&D professionals.



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs FDEA
Federal Office for Professional Education and Technology OPET
Innovation Promotion Agency CTI



Prof. Dr. Oreste Ghisalba
Head of CTI Biotech
Innovation Promotion Agency

For further information please visit

www.kti-cti.ch

www.ktistartup.ch

www.venturelab.ch

International programmes

www.bbt.admin.ch/kti/dienstleistungen/index.html?lang=en

www.ims.org

www.eureka.be

www.eurostars.eu

Counting on a Reliable Patent System

Swiss Federal Institute of Intellectual Property. The Swiss Federal Institute of Intellectual Property is the national centre responsible for all matters concerning patents, trademarks, design, and copyright. This includes the administration of industrial property rights, drafting legislation in the field of intellectual property, acting as a consultant to the Federal Council and other federal administrators, and representing Switzerland internationally.

The debate on the role of patents is an old one. At the end of the nineteenth century, several of the countries in Europe had their own patent law and in Germany laws even varied regionally. Legislation differed in the nature of patentable matters or in the extent of protection. Whereas, in France patents protected chemical compounds, British patents included compounds and their production procedures. In Switzerland, inventions required a tangible model to qualify for patent protection, meaning that chemical compounds were excluded. Temptation of misuse of the system could be anticipated. The heterogeneous patent legislation certainly led to many disputes between competitors within and across the borders. The first initiative to harmonise national patent law was signed in 1883 in Paris. The next big step had to wait until 1963 with the agreement of Strasbourg, which defined conditions of patentability such as industrial applicability, novelty, and inventive step. Switzerland ratified this agreement in 1978 and introduced protection for any type of chemical compounds in compliance with the European Patent Convention of 1973. This finally gave pharmaceuticals patentable status.

What patent application procedures are concerned, the Patent Cooperation Treaty is providing since 1970 a centralised application procedure for national applications to the member states worldwide. As harmonisation of substantive and procedural patent law continues, patenting in multiple countries is becoming a more predictable endeavour. But global patenting is still a highly complex and specialised activity requiring lots of country-specific knowledge and experience.

Researchers and developers have become accustomed to working within the framework of patent legislation. In fact, they rely on the patent system. The biotech industry fought vigorously for its interests during the second part of the reform of the Swiss Patent Law. At stake was the patentability of biotechnological innovation. The crucial question revolved around the extent of patent protection that should be given to nucleic acid sequences. Some demanded comprehensive protection of nucleic acid sequences as original organic compounds. Others argued that the patent should be restricted to the initial industrial application of a given sequence. Finally, some argued against all patents on nucleic acids claiming that it would be unethical to allow a company to patent life's building blocks.



Dr Verena Bichsel
Patent Expert
Swiss Federal Institute
of Intellectual Property

The Federal Council ended up proposing product protection for nucleic acid sequences under the provision that a specific and credible function is disclosed (Swiss Patent Law article 1b and 49). This prohibits competitors from producing and marketing a given compound for any use, not just for the application that was first protected. The scope of the protection is limited to the gene or gene sequence relevant for the function (Swiss Patent Law article 8c). In addition, in order to qualify as patentable matter, nucleic acid sequences have to be distinct from any natural genomic sequence (Swiss Patent Law article 1b) that can for instance apply to cDNAs or to any type of synthesised primers. This new legislation is expected to come into force on 1st July, 2008, and applies to both Swiss national patents and European patents that are set enforced in Switzerland. These amendments represent a step towards clarified and reliable patent legislation in Switzerland and harmonisation with the directives of the European Union.

Swiss Patent Law Amendments Regarding Biotechnological Inventions

Art. 1b

¹ A naturally occurring sequence or partial sequence of a gene is not patentable as such.

² Sequences that are derived from a naturally occurring sequence or partial sequence of a gene, may however be patented as an invention, if they are produced by a technical process, their function is specifically indicated, and the further requirements of Article 1 are fulfilled; Article 2 is reserved.

Art. 8c

The protection conferred by a right to a nucleotide sequence that is derived from a naturally occurring sequence or partial sequence of a gene is limited to the sequence segments that perform the function specifically described in the patent.

Art. 49

² The patent application must contain:

b. a description of the invention and for a claim in respect of a sequence derived from a genetic sequence or partial sequence, a specific description of the function it performs.



Eidgenössisches Institut für Geistiges Eigentum
Institut Fédéral de la Propriété Intellectuelle
Istituto Federale della Proprietà Intellettuale
Swiss Federal Institute of Intellectual Property

For further information please visit
www.ige.ch



Friends in High Places or Expert Support for Tricky Problems

Photo: F. Pfeiffer and C. Davis, Zurich Center for Imaging Science and Technology (CIMST)

Biotechnet. For enterprises with limited personnel and financial resources, the rapid pace of technological change is a particular challenge. That's why the Swiss Universities of Applied Sciences created biotechnet – a national network that provides connections, support and access to resources for smaller players in the Swiss biotech scene.

Assembling specialists in bioanalytics, biomolecules' production and tissue engineering, Biotechnet helps companies by reinforcing their R&D teams with top biotech experts – it offers support for state-of-the-art bioprocesses and product development, and gives access to sophisticated infrastructure and laboratory equipment. Technology is developed with industrial partners and customised to individual requirements as required. Biotechnet also has good connections to the Swiss Innovation Promotion Agency CTI. This can be a great help in obtaining subsidies for promising R&D activities.



Prof. Daniel Gyax
President of Biotechnet Switzerland
Head of Bioanalytics at the University
of Applied Sciences of Northwestern
Switzerland

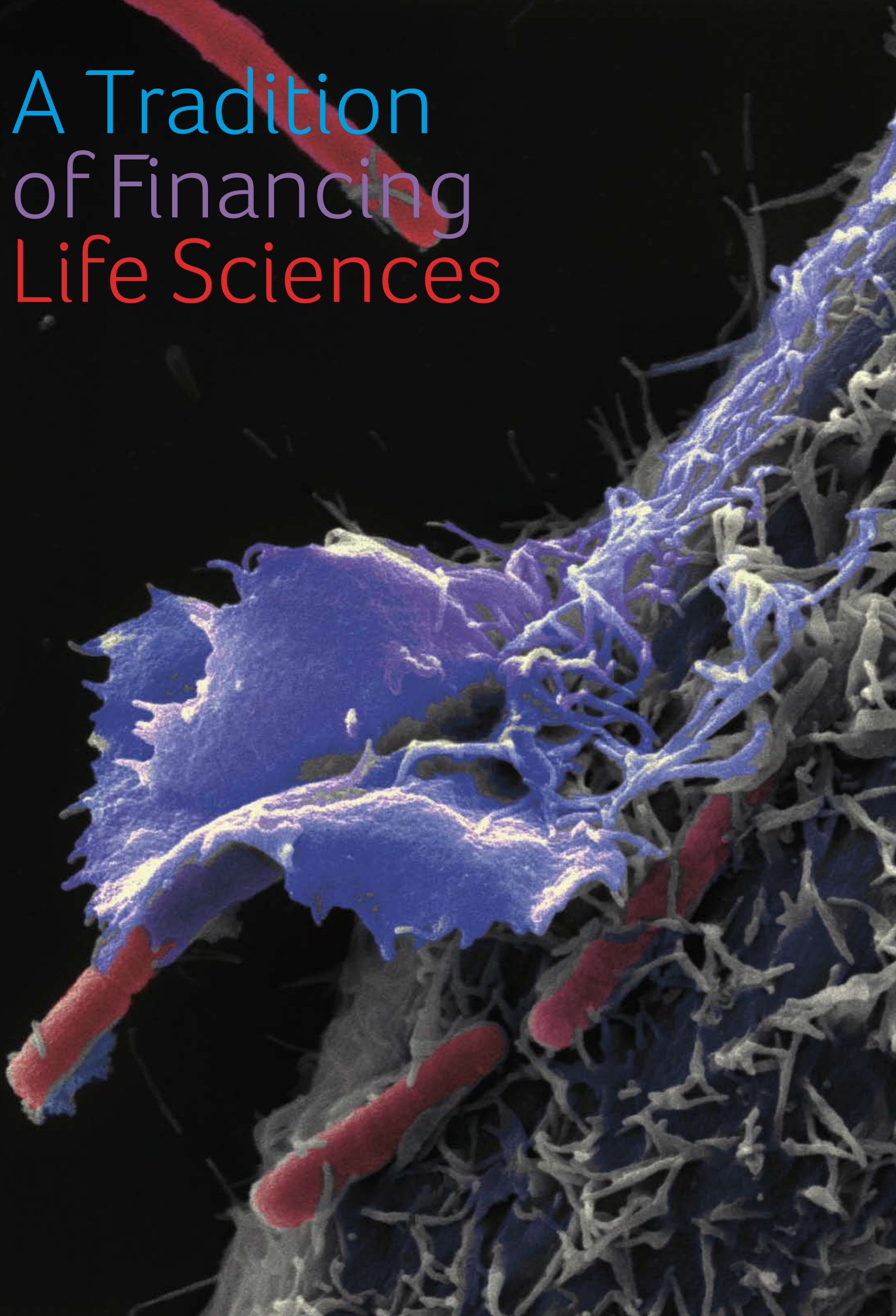
One CTI project is a novel online ATP measurement device based on luciferin-luciferase bioluminescent assays, attracted a lot of attention at BIOTECHNICA 2007. The speed of realisation by the Zurich University of Applied Sciences Winterthur (ZHAW) and the installation at Novartis Pharma has set a new benchmark. This breakthrough makes it possible to monitor and respond to the metabolic state of cells during the whole cell culture process.

The CTI also supported a cooperation between the "Hochschule für Life Sciences" of the University of Applied Sciences Northwestern Switzerland (FHNW) and BÜHLMANN Laboratories AG. Together, they developed a platform for easy and rapid quantitative determination of biomarkers for diagnosis and prognosis in the fields of ageing and wellness research, toxicology and cardiovascular and other risks. For two specific applications the industrial partner was able to apply for a patent in autumn 2007. Since its creation in 1998, the Swiss biotechnet specialists have managed R&D projects worth CHF 25 million.

biotechnet
switzerland

For further information please visit
www.biotechnet.ch

A Tradition of Financing Life Sciences



Switzerland: a Positive Environment for Specialised Life Sciences Investors

SWX Swiss Exchange. The practice of raising large amounts of money in Switzerland shows that Swiss and foreign companies appreciate the outstanding market environment in Switzerland and at SWX. The many successful IPOs at the SWX Swiss Exchange, combined with the long-standing interaction between the life sciences and financial industries, have created an atmosphere in which private and public investors are very open to the funding of such companies. Stable demand and a vibrant market in life sciences stocks have evolved as a result, and companies can usually expect to receive a fair price for their shares.

The backbone of this remarkable development is Switzerland's long tradition of financing life sciences stocks and the existing expertise in valuing life sciences stocks. The Swiss financial marketplace offers companies 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 EUR 3,130 billion, of which more than two thirds are invested in shares and equity funds.

A Biotope for Life Sciences Companies

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, which are mainly centred in Zurich, represent enormous financing and placing power.

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, and life sciences companies were able to raise more money in Switzerland than elsewhere. The high concentration of biotech and medtech companies in Switzerland (highest per capita concentration worldwide) is supported by a long-standing pharmaceuticals industry in which the financial industry has been involved from the beginning and therefore has built up broad specific sector know-how.

Great Confidence in Life Sciences

The strong focus on the life sciences sector is also reflected at SWX. Since 2004, SWX has every year accounted for the largest IPOs in terms of money raised on the day of the IPO in Europe. Addex Pharmaceuticals continued this practice in 2007. Around one third of the total market capitalisation at SWX (approx. EUR 225 billion) is attributable to this field, making it the largest peer group of its kind in Europe. The extension to life sciences came naturally and created an outstanding market environment where life sciences companies in search of funding can count on the support of a wide base of experienced investors.

Thanks to the dominance of the life sciences sector in Switzerland, investors in the Swiss market are experienced and well funded. Due to their background in and focus on life sciences, they have wide experience in evaluating complex business models and the challenges associated with developing biopharmaceutical products. Therefore, they are more eager to invest in such companies and have created a comparatively stable yet vibrant market environment and growing demand for life sciences stocks, facilitating IPOs on SWX even when the new-issue market slowed in other European countries.

Cross-Border Listings Are Gaining Ground

Due to the manageable size of the Swiss market, every IPO at the SWX Swiss Exchange gains outstanding visibility among investors, analysts and the media. Analyst coverage in Switzerland is very broad given by about 70 brokers and banks. Furthermore, analysts covering life sciences in Switzerland are highly specialised and usually have scientific background. Not surprisingly, the Swiss financial centre and SWX hold great appeal for foreign companies. Recently, three European biotech companies – BioXell, Newron Pharmaceuticals and Cosmo Pharmaceuticals – went public on SWX by means of cross-border listings. The three companies raised a total of more than EUR 140 million.

Switzerland: a Highly Attractive Location

Swiss biotech funds (EUR 2.82 billion) dominate the European market: 10 out of the top 25 European biotech funds are located in Switzerland. Furthermore, investors in the Swiss market are multilingual and multicultural; due to the fact that Switzerland is easily accessible and investors are concentrated in a small number of locations, companies benefit from short communications paths when addressing their investors.

Foreign companies considering an IPO on SWX should be aware that a link to Switzerland can be helpful in trying to gain visibility and investors' trust. Such a link could be established by means of Swiss partners, investors, members of management, operations or a Swiss heritage (e.g. a spin-off from a Swiss company). Other possibilities are a pre-existing market share or a key client in Switzerland. Several companies have moved their headquarters to Switzerland and become Swiss companies prior to their IPO's.



Dr med. Yvonne Gunsch-Wegmann, MBA
Vice-President
SWX Swiss Exchange AG

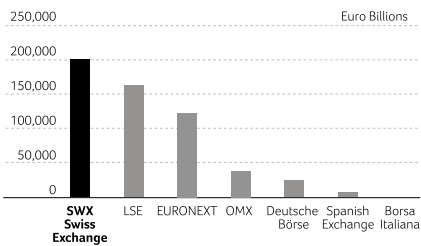


For further information please visit
www.swx.com

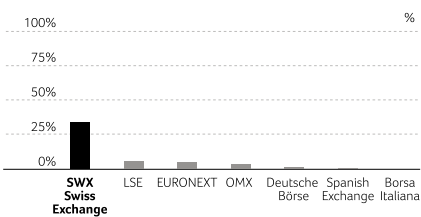
Focus: SWX and the Swiss Financial Centre

SWX is the Leading Health Care Stock Exchange in Europe

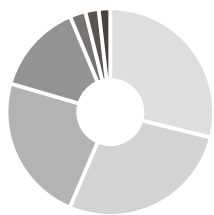
Market capitalisation of health care companies:
Approximation based on DJ STOXX TMI Companies applying ICB classification



Share of health care versus total market capitalisation



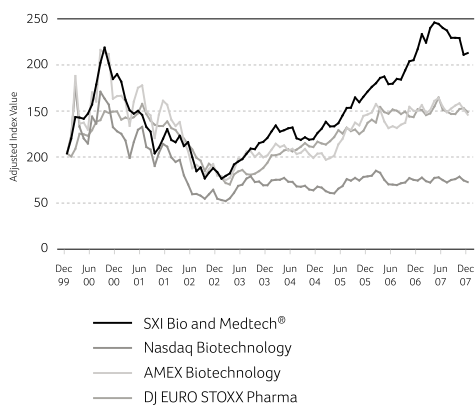
SWX Industry Breakdown as of December 2007



Health Care	27.6%
Financials	26.8%
Consumer Goods	23.1%
Industrial	14.1%
Basic Materials	4.5%
Other	2.4%
Technology	1.2%

Figures based on SPI® companies. Source: SWX Swiss Exchange

Performance of SXI Bio and Medtech®



Performance comparison of International biotech indices (TR, CHF adjusted)
Chart based on monthly figures

SWX Swiss Exchange: an international, transparent and efficient market. The SWX Swiss Exchange, with its internationally oriented market, attracts many foreign companies – 25% of the listed companies are foreign (40% foreign companies in the life sciences field). Unlike in other countries, the concrete administration of securities trading is largely entrusted to SWX inasmuch as the Swiss legislature delegates to the Exchange broad regulatory competences. This provides special opportunities for SWX to set the course it deems most appropriate, as well as to weigh the interests of the various market participants.

A Self-Regulatory Framework

While SWX is legally obligated to align its rules and regulations with international standards, there remains considerable leeway for SWX in specific matters. Thanks to this flexibility, it has the capacity to temper the current tendency towards overregulation, e.g. some parts of the Sarbanes-Oxley Act and the Financials Services Action Plan.

Today, SWX offers a regulatory environment that is in close touch with the market and takes into account the needs of both international investors and issuers. For instance, Swiss GAAP FER, US GAAP, IFRS and other internationally recognised accounting standards are still accepted at SWX and companies only have to report on a semi-annual basis. Furthermore, as a self-regulated exchange with the authority to handle the entire listing process on its own, SWX offers a very straightforward listing procedure. Once a listing application is submitted, the decision of the Admission Board can be expected within just four weeks.

Financial Centre Switzerland: an Overview

- International investor base and leading position in cross-border private banking:
 - Worldwide market share of cross-border private banking: 32%¹
 - Assets in deposits in Switzerland: EUR 3,130 billion²
 - Proportion owned by foreign clients/institutional investors: 59%² / 59.3%²
 - Proportion invested in stocks and funds: 75%²
- One of Europe's leading centres for equity-investing institutions
- ~70 banks and brokers providing analyst coverage for life sciences stocks listed on SWX

SWX: an Overview

- Continental Europe's largest and most international marketplace in terms of market capitalisation and origin of listed life sciences companies
- Around one third of the total market capitalisation on SWX, or approximately EUR 225 billion, is attributable to companies active in this sector
- Multilingual and multicultural Swiss investors with a strong focus on life sciences
 - 4 out of the top 10 biotech funds, and 10 out of the top 25 biotech funds in Europe, investing in listed companies, are located in Switzerland
- Close attention paid to IPOs (and beyond) – high placing power
- A small number of yearly IPOs, special sector indices (SXI®) and an above-average number of analysts covering the market ensure high visibility
- Market-oriented listing regime
- Acceptance of IFRS, US GAAP and other internationally recognised accounting standards
- Short communication paths – high concentration of investors in a small number of locations

¹ Source: Boston Consulting Group 2004

² Source: SNB, Monthly Stat. Bulletin, Dec. 07

For further information please visit
www.swx.com

Private Biotech Financing Remains Strong

SECA. During 2007, SWX-listed biotech companies could not repeat their excellent recent performance: On average, Swiss biotech stocks declined by 15% during 2007, after +34% in 2006. Despite weak stock market performance, Switzerland held its position as a premier biotech location and continued to attract an overproportional amount of capital for private biotech companies. With a less receptive IPO market, more corporate deals including M&A and trade sales are expected during 2008.

While nobody expected a repetition of 2006's excellent rises, the overall performance of Swiss biotech stocks was clearly disappointing. Worst hit with declines in stock prices were the younger and smaller capitalised biotech companies such as Arpida, Cytos, Bioxell or the newly listed Addex. The two larger capitalised stocks, Actelion (-2.9%) and Basilea (+3.5%), held up better.

IPO activity during 2007 was also weak: Only Addex and Italy-based Cosmo managed to get a new Swiss Exchange listing. The generally disappointing performance of recently listed biotechs has halted investors' appetite for new issues. This means that, at least for a while, the "IPO window" will be closed except for most mature companies or companies with products on the market.

The good news for 2007 is that Switzerland remained one of Europe's "hot spots" for private financings: 10 companies raised more than CHF 10 million during the year. This number was substantially higher than in 2006 and also compares very favourably with larger countries such as Germany, France or the UK.

Country Comparison	No. of private biotech + pharma financing in 2007 CHF > 10 million
Switzerland	10
Germany	7
France	8
United Kingdom	4

The largest deal during the year was the financing of Pharma Swiss, a company with substantial pharma presence in Eastern Europe. Other larger, more typical venture rounds to mention were the financing of PregLem (drug development women's health), Pevion Biotech (vaccines), Nitec Pharma (anti-inflammatory diseases) and Molecular Partners (development of antibody-like proteins). Foreign venture groups invested substantially into some of the larger deals demonstrating the attractiveness of Swiss Biotech to the investment community. Sofinnova Partners (PregLem, GlycoVaxyn), NGN Capital (Nitec Pharma) and

Advent Ventures (4-Antibody) were some of the major foreign investors. Also Swiss investment houses participated actively during 2007 such as BB Biotech, BZ Bank, Biomedinvest, Global Life Sciences, Index Ventures, HBM BioVentures and the Novartis Venture Fund.

Overall, Switzerland remains one of the best places in Europe to start and finance new biotech or speciality pharma companies. European and US venture capitalist have recognised that and are becoming more active in our country.

The general outlook for 2008 is uncertain and biotech companies might have less financing options. Entrepreneurs and investors should therefore stick to the quality over quantity rule (in terms of numbers of companies founded or financed). Excellence and critical mass from product pipeline to management expertise, clinical development know-how and the investor base will become even more important.

Profile Swiss Private Equity & Corporate Finance Association (SECA)

The Swiss Private Equity & Corporate Finance Association (SECA) is the representative body for Switzerland's private equity, venture capital and corporate finance industries. SECA has the objective to promote private equity and corporate finance activities in Switzerland.

Members of the SECA include equity investment companies, banks, corporate finance advisors, auditing companies, management consultants, lawyers and private investors.

SECA's activities include:

- Seminars and events including the annual Swiss Private Equity & Corporate Finance Congress
- SECA weekly media survey and monthly newsletter
- Working groups (e.g. collaboration with business angels)
- Networking with other associations and lobbying



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

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Aravis Venture Associates (www.aravis.ch)
[NovImmune SA](#), [Evolva](#), [TeLoRmedix](#)
Atlas Venture (www.atlasventure.com)
[Nitec Pharma](#)
Banca Svizzera Italiana (www.bsibank.com)
[TeLoRmedix](#)
Banque Pasche (Swissfirst Asset Management) (www.cmcic-banquepasche.com)
[Apex Pharma](#)
BB Biotech Ventures (www.bbbiotechventures.com)
[Pevion Biotech](#), [Molecular Partners AG](#), [Apex Pharma](#)
BCV Initiative Capital (www.bcv.ch)
[Addex Pharmaceuticals SA](#)
Bio One Capital (www.bio1capital.com)
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BioMedinvestor AG (www.biomedinvest.ch)
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[Vivendy Therapeutics](#), [Santhera Pharmaceuticals Holding AG](#)
BVgroup Private Equity (www.bvgroup.ch)
[Covaly Biosciences AG](#)
BZ Bank (www.bzbank.ch)
[NovImmune SA](#)
Clarus Ventures (www.clarusventures.com)
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[Polyphor AG](#)
Endeavour Vision SA (www.endeavourvision.com)
[Molecular Partners AG](#)
Fongit Seed Invest (www.fongit.ch)
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Genevest (www.genevest.ch)
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Global Life Science Ventures (www.glsv-vc.com)
[Nitec Pharma](#)
Grazia Equity GmbH (www.grazia-equity.de)
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HBM BioVentures AG (www.hbmpartners.com)
[ESBATech AG](#), [PharmaSwiss](#)
Index Ventures Management SA (www.indexventures.com)
[GlycoVaxyn AG](#), [Molecular Partners AG](#),
[Addex Pharmaceuticals SA](#)
Initiative Capital (www.defigestion.ch)
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Novartis Venture Fund (www.venturefund.novartis.com)
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(in red: investments in Switzerland)
(continued)

Investor Round Table with Nicholas Draeger, Adamant Biomedical Investments AG, Patrick Treuer, Equity Capital Markets, Credit Suisse, and Jean-Philippe Tripet, Aravis Venture Associates

How would you describe the specific dynamism of the Swiss market?

Nick Draeger: Many other countries admire and even envy the well-connected investor community and health care industry. This excellent connectivity is one of the keys to long-term success.

Jean-Philippe Tripet: I agree. In the last 10 years Switzerland has built an incredible platform in particular in biotech and medtech. Health care companies can find the infrastructure, human resources and capital needed at all stages. Everybody knows each other it's no different to Silicon Valley in that respect.

Patrick Treuer: This facilitates the access to resources and a healthy information flow within the industry, which is critical for growth.

Traditionally, a lot of innovative potential starves in the "valley of death" because VC companies prefer to wait until a biotech start-up is closer to the clinical test phase. What is happening on the early investment front? Any hope there?

Nick Draeger: Obviously, Switzerland's biotech industry has been largely based on companies such as Actelion, which was built around a partially developed product, Tracleer, where a substantial amount of the development work on the product had already been done in Roche. To some extent, it is the same story for Basilea. Serendipitously, this helped to create a very solid, profitable base on which to build the younger, more high-risk companies.

Jean-Philippe Tripet: I view this development rather as part of a cycle of maturation. There are currently too many companies with later-stage products seeking funds. This means their prices are very attractive and consequently financing for start-ups and early-stages is harder to find.

Patrick Treuer: All else equal, advanced companies which have entered the clinic with one or more compounds are certainly more attractive to VC firms. Still we believe there is a functioning market for VC investments in preclinical-stage companies provided their science and technology is differentiated, has significant commercial potential and is covered by strong intellectual property.

Jean-Philippe Tripet: Biotech is hugely capital intensive and attrition rates are very high. The extreme competition for management and capital implies that many early-stage firms will die in the "valley of death".

Nick Draeger: This does not mean that early-stage funding does not exist in Switzerland. For example, BioValley Basel assists young companies in accessing early-stage funding and there are several business angels clubs, such as the BioValley Business Angels Club, that are very interested in supporting early-stage companies. Therefore, substantial early-stage funding does exist for good investment opportunities. The scrutiny of the projects will be intense but those companies that are investment grade will successfully raise funding.

Patrick Treuer: This is evidenced by several "blockbuster" financings of preclinical/discovery-stage companies in European biotech in recent years.

Entrepreneurs are often the first to spot innovation potential. What role does the intensive communication among stakeholders in the Swiss biotech scene play in evaluating innovation?

Nick Draeger: Switzerland can only compete successfully with countries such as the US, China and India if the biotech companies continue to innovate. However, innovation does

(concluded)

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Schroder Ventures Life Sciences Advisers (www.svlisa.com)
ESBATech AG
Signet Healthcare Partners
(www.signethealthcarepartners.com)
Alpex Pharma
Sofinnova Partners (www.sofinnova.fr)
PregLem SA, GlycoVaxyn AG, Addex Pharmaceuticals SA
TVM Capital (www.tvm-capital.com)
Biovertis AG, Addex Pharmaceuticals SA,
Vivendy Therapeutics
Venture Associates AG (www.aravis.ch)
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(in red: investments in Switzerland)
(completeness of this list is not guaranteed)

not necessarily mean new drug mechanisms of action. Delivery mechanisms or new uses of drugs based on a superior understanding of the underlying science can also be highly innovative.

Patrick Treuer: The various forums for management teams of young biotech companies here in Switzerland allow for a healthy and early-stage contact with “stakeholders” such as institutional investors. This helps them to focus on the issues of profitability and market potential.

Nick Draeger: The close links between the stakeholders are helpful in guiding innovation into areas of real unmet medical need as opposed to hype. The intense competition and scrutiny of the industry in Switzerland is healthy for its long-term success.

Biotech is a fast moving industry, which requires a supportive regulatory context, especially with regard to financing. Recently some Swiss laws were adapted to improve this area. How do we compare now with other countries?

Nick Draeger: The rise of venture funding has possibly been slower than in other parts of the world. Maybe because Switzerland does not want to follow the route of some countries where sources of funding were too loosely controlled. This ultimately led to a boom and bust situation with the result that investors lost interest in young health care companies.

Jean-Philippe Tripet: The recent revision of the company act goes into a more flexible, less capital intensive company creation phase. What seem to take significantly more time are agreements on taxation of venture funds and is probably the main reason for the slow take-off.

Patrick Treuer: We believe Switzerland offers an attractive regulatory framework for biotech companies and investments, which is reflected by the increasing number of non-Swiss companies, which are currently contemplating relocating to Switzerland.

Jean-Philippe Tripet: For venture capital, the new federal act on collective investment schemes opened the use of limited partnership structures to venture capital with a mandatory submission to the Swiss Banking Commission. This is a very positive development, but because few fund sponsors have made the decision to go onshore we are still waiting for the tremendous echo.

Big pharma is increasingly in acquisition mode. How do you value the potential of trade sale compared to IPO as an exit strategy?

Patrick Treuer: The chosen exit strategy will ultimately depend on prevailing market conditions in order to maximise shareholder value.

Nick Draeger: Absolutely! The IPO route should never be considered as the only route to creating success in the biotech industry. The best discoveries are, more often than not, made in small, dynamic, creative teams. But it is vital that management teams recognise their limitations. The aim of the industry is to discover, develop and bring to market innovative therapies. If this is achieved by innovation in a small company and development and marketing in a larger enterprise, then the trade-sale route to an exit should be considered as a very viable alternative to the IPO.

Jean-Philippe Tripet: This is a cyclical pattern. In general, when markets are high we tend to see less M&A and more IPO. On the other end, with pharma pipelines drying up we clearly see a trend to purchase earlier and earlier products and technologies with high potential. In particular companies and products in cardiovascular, oncology, immunology, vaccines, antibody products and technologies are currently busy areas for business developers.

Patrick Treuer: It is true that major pharmaceuticals companies are increasingly looking at the biotech sector to shore up their product pipelines. On the other hand, a number of biotech companies have been founded in the past by acquiring product portfolios from their former parent companies (spin-offs). These companies want to stay independent and will continue to favour access to the capital market as primary funding and exit strategy.



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Adamant Biomedical Investments AG



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Equity Capital Markets
Credit Suisse



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Aravis Venture Associates

2007 – the Year Before the Great Breakthrough?

Ernst & Young. The year 2007 was all about impressive advances in research and development for Swiss biotech. However, it was not only a period of great science, but also a formidable year for financing.

Impressive R&D Results

Basilea Pharmaceuticals, Santhera Pharmaceuticals and Arpida all reported positive results with their lead products that are in phase III and were also able to lodge applications for market approval with the EMEA and the FDA. Experts say these three companies stand good chances of launching their first commercial products in 2008. Speedel is a business step ahead. With FDA approval received in March 2007 and a licence agreement with Novartis, the hypertension drug Tekturna is now on the market and generating regular royalties. Speedel in-licensed the product from Novartis and took it successfully through phase I and II before Novartis exercised a call-back option in 2002.

But the R&D successes were fortunately not limited to listed companies. Some private firms like Mondobiotech and PregLem presented some impressive research results. And Nitec Pharmaceuticals can almost count on the market approval for 2008 of its key product Lodotra.

Actelion continues to be a fascinating story: besides having Tracleer as lead product with massive potential, the company has an attractive pipeline with several promising products in phase III. The ten-year anniversary for the Swiss biotech front runner was sweetened with a record turnover of more than CHF 1.3 billion.

International awards are further indications of the excellent R&D performances of some local companies. In 2007, Speedel (Novartis) won the Wall Street Journal's "Gold Award for Technology and Innovation" for their high blood pressure treatments and the World Economic Forum nominated Mondobiotech and Anecova in a list of 39 technology pioneers for 2008.

Fund-Raising Efforts Break All Records

New investors pumped more than CHF 885 million into biotechnology, exceeding the previous record of CHF 780 million from 2006.

Private Swiss Biotech firms raised approximately CHF 246 million, the second best result after 2005. The Swiss-Romande PregLem, raised eye-brows and capital to the tune of CHF 68 million in two funding rounds. Pevion Biotech and Nitec raised over CHF 30 million each.

The secondary financing rounds of some of the listed Swiss biotech companies were also unprecedented. Basilea alone floated shares worth CHF 324 million, Arpida raised almost CHF 52 million with new shares. Cytos and Speedel issued convertible bonds to raise CHF 70 million and CHF 55.5 million respectively.

Quiet on the M&A Front but Plenty of Licence Activity

While there were a number of exciting M&A deals in 2006, except for a few stakes changing hands, the report period was quiet in this respect – assuming Galenica's acquisition of the Canadian Aspreva doesn't really count as biotech deal. Nonetheless, Swiss companies are hearing increasing rumours of acquisitions since AstraZeneca bought MedImmune for the price of USD 15.6 billion in April 2007 and Biogen Idec put a "for sale" sign in the window. Having fairly full pipelines and somewhat low stock values, some Swiss biotech companies might well be targets for Big Pharma takeovers in 2008: especially when some of the large pharma companies are plagued by expiring patents and rather hollow R&D pipelines.

A clear and positive sign of the prosperity of the Swiss biotech industry is the whole list of attractive licence and partnership deals that were successfully signed in 2007. For example Cytos signed a licence deal with Novartis to develop a vaccination against nicotine addiction for which Cytos will receive an upfront payment of CHF 35 million and potential royalties of up to CHF 600 million. Neurimmune signed a deal with Biogen Idec worth up to USD 380 million and Santhera expanded its cooperation with Takeda. Most recently, in early January 2008, Addex announced a very lucrative increase in its cooperation with Merck & Co.

Brief Portrait of Ernst & Young

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Facts & Figures

Ernst & Young. Switzerland saw new records set in 2007 with regard to total revenue, R&D and new capital raised. These are only some of the highlights in another strong year for Swiss biotechnology.

Switzerland is home to 220¹ biotech companies, of which 148 are biotech developers and 72 are biotech suppliers. In 2007, the steady flow of new biotech company founding continued.

In the same period some companies were acquired, moved out of Switzerland or discontinued their business operations. The most prominent change in this respect was the acquisition of Serono by Merck KGaA in early January 2007. Because Merck decided to concentrate all its biotechnology activities in Switzerland, some of the Merck Serono data has still been included in the statistics presented in this report. In these cases, the related figures are separately remarked. (See table to the right; public companies only.)

The article on page 31 explains that 2007 was a great year with regard to financing. However, looking at financing over a longer period, one sees an increase of 14% (compared with 2006), which is significantly higher than the increases over the previous years.

This is further significant evidence of the strength of the Swiss biotechnology sector. The various investments clearly reflect the strong belief of the capital investors in the biotech companies and their employees. It is also remarkable that relatively small young companies, which only have some preclinical products so far, achieved some of the larger financing rounds. This is a clear sign of the regained trust in the biotech sector.

In Switzerland in 2007, there were 8 public companies compared to 9 the previous year. Isotis relocated to the United States and Serono was acquired by Merck, so they had to be eliminated from the count. On the other hand, in May 2007, Addex Pharmaceuticals completed its IPO on the SWX, raising CHF 137 million. These companies increased their total number of employees by approximately 10% in order to continue their growth and R&D activities. The mid-sized biotech companies noted a similar development whereas some of the young (mainly start-up) companies hired an even higher number of employees in order to establish themselves as full-fledged companies. Here there was a doubling (or even more) of headcounts within one year.

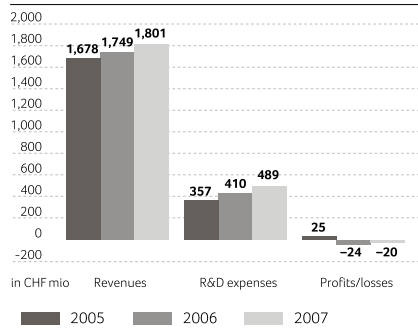
The business focus for the Swiss biotechnology industry remains the same; mainly the area of red biotech. The global “hype” around biofuels didn’t jump over to Switzerland due to the limited availability of farmland. However, there are a handful of companies actively pursuing the potential of plants in order to find new solutions for medication, nutrition as well as environmental issues.

¹ ELISCOs (Entrepreneurial Life Sciences Companies). These are companies that use modern biological techniques to develop products or services to serve the needs of human health care or animal health, agricultural productivity, food processing, renewable resources or environmental affairs. Not included in these figures are pharmaceutical or agribusiness companies with secondary activities in biotech (e.g. Novartis, Roche, Syngenta), Swiss subsidiaries of foreign biotech companies and biotech consulting companies.

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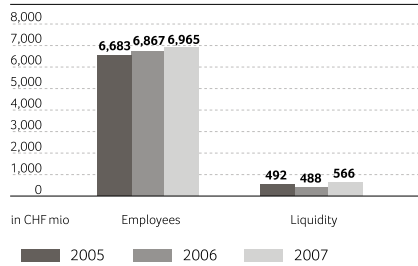
Private Swiss Biotech Companies

Revenues, R&D Expenses, Profit/Losses



Sources: Ernst & Young

Number of Employees, Liquidity

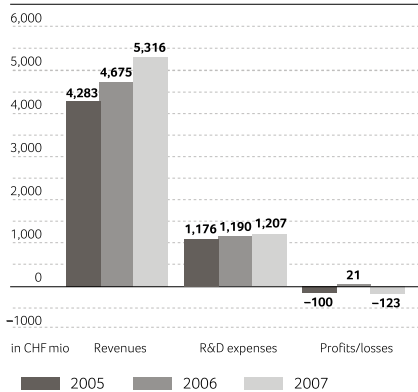


Sources: Ernst & Young

Please note:
 - All figures are headquarter counted
 - As some private companies do not disclose financial figures, the above figures represent Ernst & Young's best estimate

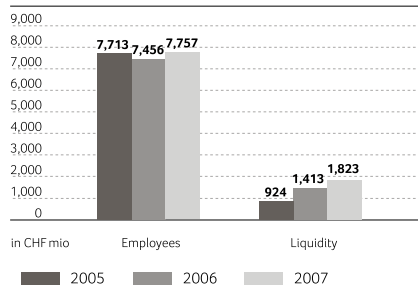
Public Swiss Biotech Companies

Revenues, R&D Expenses, Profit/Losses



Sources: Annual Reports and website information

Number of Employees, Liquidity

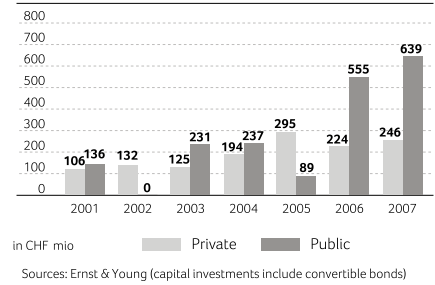


Sources: Annual Reports and website information

Please note:
 - All figures are headquarter counted
 - The 2007 data in this table are based on the information available in early March 2008, when this report was compiled. At this time some of the companies had not yet disclosed the final financial figures for 2007. Therefore, some figures were carefully extrapolated on the basis of newest interim data publicly available (e.g. Q3 2007)
 - Revenues, R&D expenses and employees include Serono figures/estimates. Other 2007 data exclude Serono figures (as no reliable figures are available)

Private and Public Swiss Biotech Companies

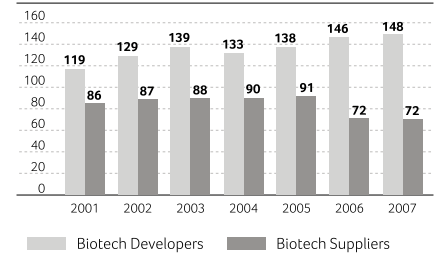
Capital Investments



in CHF mio

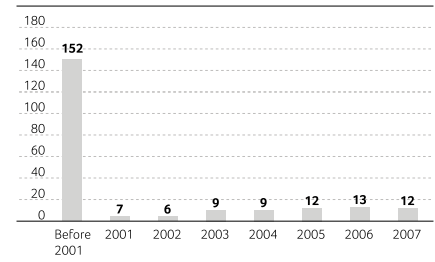
Sources: Ernst & Young (capital investments include convertible bonds)

Number of Biotech Companies in Switzerland



Sources: Ernst & Young


Year of Foundation of the 220 Swiss Biotech Companies



Sources: Ernst & Young

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