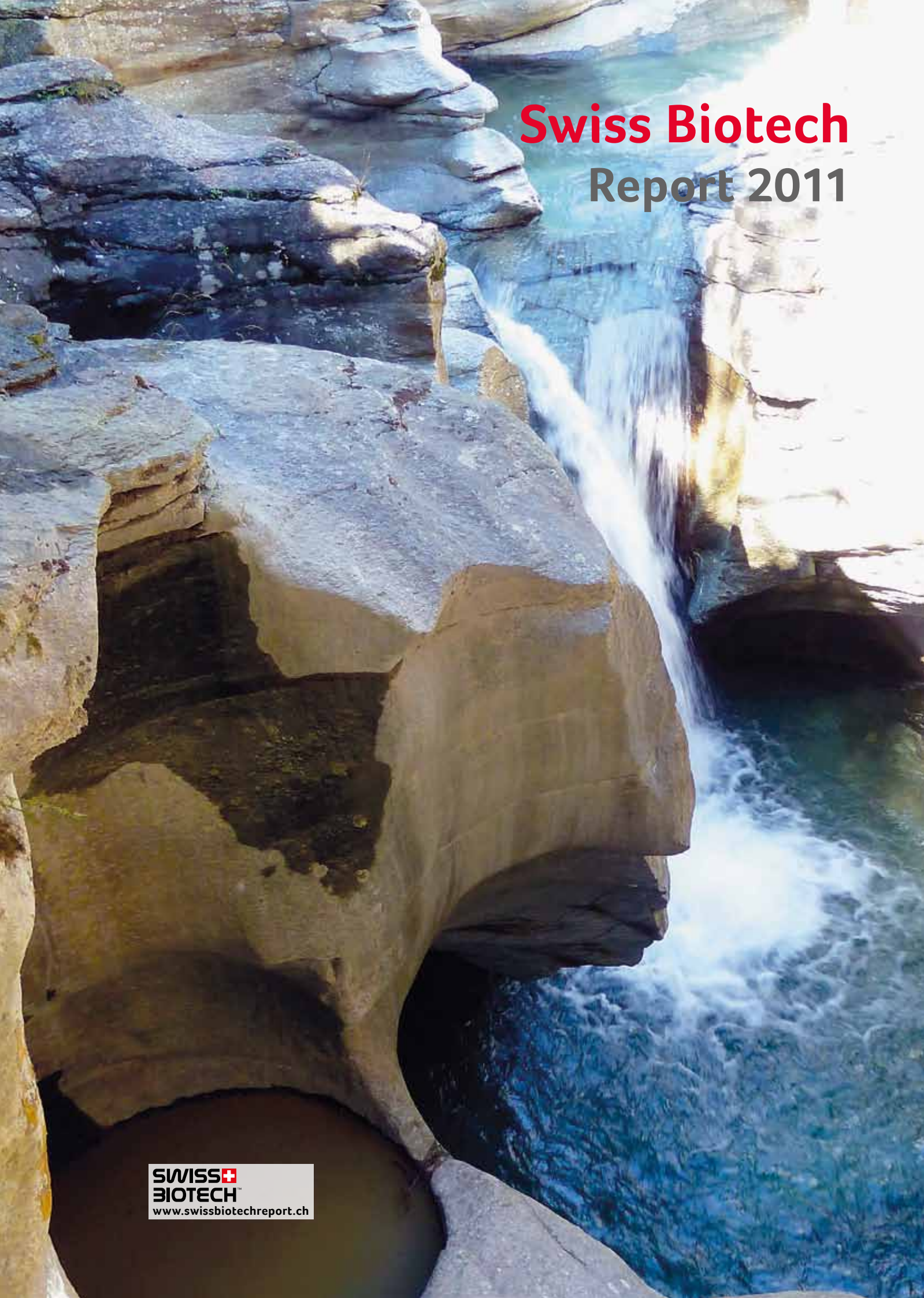

Swiss Biotech
Report 2011

SWISS BIOTECH
www.swissbiotechreport.ch

Picture courtesy of Urs Spörri® – photographed in 2010.

The picture shows part of a group of deep potholes called moulins in Cavaglia, Grison (altitude 1,703 metres or 5,587 feet). Derived from the French word for mill, a moulin or glacial mill is a narrow tubular chute, hole or crevasse through which water enters a glacier from the surface. They are typically found on a flat area of a glacier in regions of transverse crevasses. Up to 10 metres wide, moulins can be hundreds of metres deep and extend all the way to the bottom of crevasses (about 10–40 m), where englaciated streams flow. They are the most common cause for the formation of glacier caves.
[http://en.wikipedia.org/wiki/Moulin_%28geology%29]

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Editorial

Biotechnology can be expected to continue to play a central role in Switzerland's sustainable development in future and to make a vital contribution across a wide range of areas – economic growth, environmental protection, the commercialisation of new technologies as well as public health. We predict a continuing boost to innovation in this industry. The critical management of relationships will be strengthened and the work of academia, enabling organisations and competitive clusters further enhanced, resulting in an even sounder future for the sector.

The Swiss biotech industry has achieved a much higher profile in recent years based on its record of success. Unlike many other industries Swiss biotech stood up remarkably well during the economic crisis, and in fact achieved significant growth. The total turnover of the industry in 2010 was CHF 9.2 billion, while the workforce in Swiss biotech remained at approximately 19'000 employees.

This edition of the *Swiss Biotech Report* explores the reasons behind the sector's impressive track record, in particular highlighting intensive ongoing research as the basis for successful innovation. The authors have compiled a benchmark of the industry over a period of ten years and provided a multidimensional analysis of its development. It reveals the ways in which innovation has advanced and how the Swiss Confederation has supported it through its programmes, providing clear "takeaways" on how financial and industrial markets have used the steady influx of ideas and capital to achieve economic growth.

The steering committee
Domenico Alexakis
Oreste Ghisalba
Heinz Müller
Antje Runschke
Andrea von Bartenwerffer
Jürg Zürcher

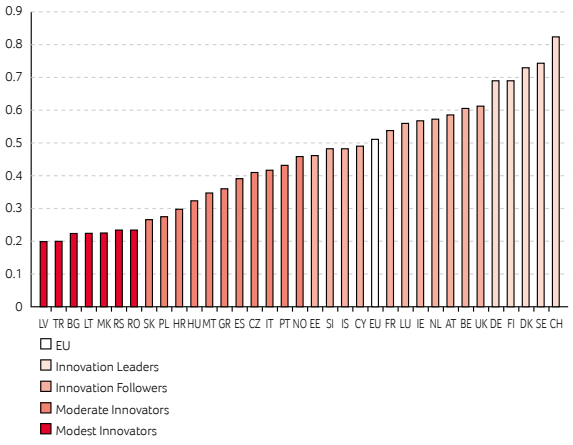
Sustainable decade

Is Swiss biotech sustainable?

The biotech sector plays a key role in Switzerland's economy, acting as a driver in national growth and innovation. The country's biotech companies – start-ups and mature companies alike – continue to benefit from close links to academia at home as well as abroad and attract highly qualified employees. One of the few sectors that continued to grow during the economic crisis, the Swiss biotech industry has shown itself to be vigorously robust. Twenty years after SPP BioTech was launched and more than twelve years since the Swiss Biotech Association was established, examination of the sector emphasises its underlying sustainability.

Switzerland is the most innovative nation in Europe. According to the Innovation Union Scoreboard survey published in early 2011 the country's annual innovative growth rate is 4%, ranking first in front of other innovative countries such as the UK, Denmark, Germany, Finland and Sweden. Indeed the high number of patents granted puts Switzerland well to the front of the other nations. Promoting and fostering science and technology has a long tradition in Switzerland. Bringing biotech and life sciences products to the market has been and remains a focus of government and parliament for many years. The result is a Swiss biotech sector that now is a self-sustaining and growing industry.

Figure 1: European countries innovation performance



Source: European Commission (2011), "Innovation Union Scoreboard 2010: The Innovation Union's performance scoreboard for Research and Innovation", PRO INNO Europe Paper No. 18.

Note: Average performance is measured using a composite indicator building on data for 24 indicators going from a lowest possible performance of 0 to a maximum possible performance of 1. Average performance in 2010 reflects performance in 2008/2009 due to a lag in data availability.

It's been almost twenty years since the Swiss Priority Programme (SPP) BioTech was launched in the early 1990s. The programme was conducted under the auspices of the Swiss National Science Foundation (SNSF). It's aim was to give biotech a head start, by promoting technology transfer from universities to start-ups and spin-offs. Biotechnology was a hot topic in those days. Partners and representatives of venture capital firms attended scientific conferences to find out about new and promising biomedical developments. University administrators were convinced their scientists held the key to new products that would help the money roll in. Politicians identified biotechnology as vital to national development. As a result programmes to foster the new field were launched in a number of countries. Compared to its neighbours Switzerland may have lagged, but nonetheless it started the SPP BioTech, that ran from 1992 to 2001, helping in the process to make the sector a pillar of Switzerland's high-tech economy.

In biotech we trust

Biotechnology is considered to be one of the key technologies to help meet tomorrow's challenges. Other areas previously attracting attention and substantial amounts of funding from public and private sources include electronics and new materials. Since then, however, enthusiasm for them has waned somewhat whereas biotechnology and the life sciences in general remain very alive. The implications for society and environment remain as much a topic of public debate as ten or twenty years ago.

What has changed tremendously since is the economic importance of biotechnology. The industry was only in its infancy when SPP BioTech was launched. In the meantime a large number of companies have been established, academic centres have successfully installed technology transfer offices to exploit the potential of their academic output, many university and company spin-offs have been founded, and products based on knowledge and technology from the life sciences have become an accepted part of our lives.

A new but mature industry

The global biotech industry is now an established fact of life. It contributes to the wealth of nations, gives employment to hundreds of thousand and generates significant returns for private equity firms and venture capitalists worldwide. There are hundreds of peer-reviewed journals, innumerable conferences, and giant industry fairs throughout the world – all signs of an arrived but still growing field. In total internationally, the biotech industry now generates a turnover of over USD 80 billion.

Today, almost ten years after SPP BioTech ended in 2001, is a good moment to look back and assess just how profitable and sustainable Switzerland's biotech industry really is. For, if this country wants to point to a sound economic record in the field of biotechnology, start-ups must be shown to have transformed themselves into profitable enterprises capable of surviving in the long run under their own steam without repeated injections of investment. To answer this question, therefore, the fortunes of the companies founded during the existence of SPP BioTech offer the best evidence. Their "death rate" gives a

far more accurate estimate than any balance sheet. At the same time a health-check of Switzerland's biotech ventures also sheds light on the impact of the SPP BioTech programme, which was seen as the initial key to the sector's development.

SPP BioTech was catalyst for growth

SPP BioTech ran through three consecutive phases from 1992 to 2001, investing overall more than CHF 156 million (64% government funding, 20% from academia and 16% from industry). Initially it concentrated on research topics that were already being pursued in Switzerland where the country's scientists were in a position to deliver world-class results. Support was given in form of project funding, technology transfer assistance and consulting and coaching. The programme involved an international group of top biotech experts and benefited from professional programme direction. Projects were chosen for funding on the basis of their ability to contribute to Switzerland's standing in biotechnology.

SPP BioTech was ambitious and had several objectives. One was to establish new fields of biotechnological research of particular interest to Switzerland. Others were to support the exchange of young academics and technology transfers between universities and industry. To achieve this, SPP BioTech established three institutions, two of which were Biotectra (at that time entirely dedicated to biotechnology) – still operating very successfully as Unitectra – for technology transfer and BATS – which continues to exist today as the Centre for Biosafety and Sustainability – to foster research into biosafety and sustainability. Only one of its institutions, BICS, the SPP's office for information and communication, ceased to operate when the programme ended.

In the period up to 2000 more than 100 companies took part in SPP BioTech. They became R & D partners for researchers, took out licences and benefited from knowledge transfer. Interestingly, the vast majority were Swiss SMEs (73). Also represented were companies from abroad (23) as well as nine large international enterprises with activities in Switzerland. Several companies were involved in more than one SPP project or module. This huge success is an indicator of the economic potential of academic research.

During the first phase from 1992 to 1995 the programme got under way, the foundation was laid and the infrastructure put in place. The overriding focus at that point was on application-oriented or targeted research and on the development of research networks and modules. Close collaboration between academia and the industry was encouraged. This phase saw the first evidence of transfer of products, methods and services. In the second phase, from 1996 to 1999, the emphasis on application-oriented research continued but the programme was enlarged and university contacts with industry were further strengthened. Most of the start-ups were founded in this phase. During the final phase from 2000 to 2001, the programme of research continued, but the emphasis shifted to valorisation of the achieved results and getting start-ups off the ground. All projects supported in this exit phase involved a transfer partner such as a state agency or an SME providing a financial contribution.

Of the companies that received some kind of support by SPP BioTech a large number are still operating today (see Table 1). Some companies failed to develop ideas into products, but a considerable proportion proved a major financial success for their investors, when they went public or were sold to big pharma. The "failure rate" is within the international range. Disappointments are common in an industry that works with biological systems.

Turning ideas into products

One of the single most impressive contributions of SPP BioTech has undoubtedly been to technology transfer in Switzerland. Technology transfer aims to make discoveries of university researchers available to industry which, based on the research results can develop new products and services for the benefit of society and economy. In the 1990s, when it was still in its infancy in Switzerland, successful examples were rare. Today, an effective system for technology transfer has become one of the country's most important competitive advantages – as the WEF's 2009/2010 Global Competitiveness Report shows.

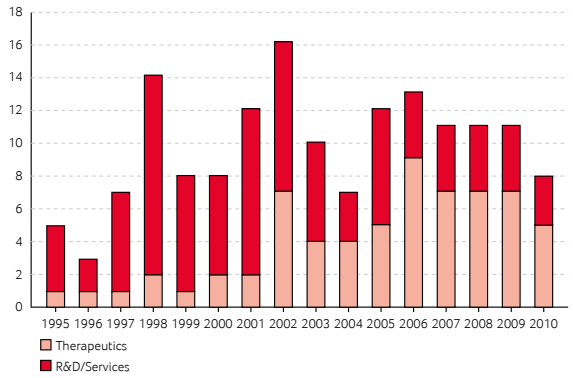
From the outset the leading technology transfer centres felt the need for a shared platform to exchange knowledge and expertise. Many stakeholders believed that valuable ideas and technologies were failing to be put into practice because university researchers didn't know either how to market ideas or in some cases didn't even consider it. Experience from the US indicated that special institutions devoted entirely to technology transfer were a valuable tool to facilitate the transition of projects from academia to industry for economic exploitation. The establishment of well functioning technology transfer offices was fostered by swiTT (Swiss Technology Transfer Association), the association of the technology transfer professionals founded in 2003.

Support was essential

The SPP BioTech impact can also be seen by the fact that Unitectra which was established by SPP BioTech in 1996 now acts

as the joint technology transfer organization for the Universities of Basel, Bern and Zurich. Since its foundation Unitectra has assisted in the creation of more than 100 spin-off companies. Similar to technology transfer offices at other universities it also supports researchers in their collaborations with industry and in commercializing their research results. The stakeholders, however, were quick to realise that efforts by universities and research institutes were not enough. It became clear that an active voice was needed to speak on behalf of the biotech industry still in its infancy. In 1998 the VSBU (Vereinigung Schweizer Biotech Unternehmen) was formed in order to take over a leading role during the discussions in the campaign for the national vote on the future of gene-technology in the late 1990s. The association helped win this crucial vote which highlighted the support of the Swiss people for high-tech industry.

Figure 2: Biotech start-ups created in Switzerland



Source: Global Biotechgate Database (www.biotechgate.com) by Venture Valuation and research done by Ernst & Young

Re-formed as the Swiss Biotech Association in 2003, the organisation became over time the driving force in the sector. Complementing existing industry associations such as Interpharma, ViPS (Vereinigung Pharmafirmen in der Schweiz) and SGCI Chemie Pharma Schweiz (the Swiss Society of Chemical and Pharmaceutical Industries), it works closely with key authorities and institutions. The SBA focuses strongly on its members' business development and aims to position Switzerland as a leading country in biotechnology internationally. Though limited in infrastructure and financial resources, the association collaborates with national life sciences clusters and international stakeholders to raise the profile of the sector.

The spirit of SPP Biotech lives on strongly in swiTT and SBA. Unitectra, for example, only dealt with 247 cases in 2000. In ten years that figure has increased to over 1,100 a year. swiTT's record shows that by 2009 technology transfer has not only become more extensive but much more sophisticated in approach. Two decades ago many academics were sceptical about getting into bed with industry. They felt that working with business partners might compromise academic freedom and standards and hamper further progress in the science. Happily, this attitude is rarely seen today, and scientists are now generally very eager to find partners that will help them to bring their ideas to the market. The established rules and processes by universities and facilitated by swiTT have provided a framework for successful collaboration whereby both universities and companies can profit.

But what is perhaps most astonishing is the fact that most of the spin-offs and start-ups are still operating today. The legacy of the SPP Biotech programme has been to bring about a shift in attitude that will provide a solid foundation for generations of idea generators and innovators to come.

Successful and still independent

One of SPP BioTech's start-ups that attracted a great deal of public attention was **Prionics**, founded in 1997. Mad cow disease was seen as a major health treat in the last decade of the millennium, and to diagnose the disease the company developed a ground-breaking BSE test. In 2000 this spin-off from Zurich University had 23 employees working in the company's research and development facilities. Today the workforce is almost six times larger, with 115 people working for the company in five different countries. Ten years ago Prionics produced only one diagnostic kit used in veterinary medicine. Today its product range includes 250 different diagnostic solutions that can identify more than 50 different animal diseases. Prionics has also developed DNA test kits for forensic investigation and animal disease identification. And the company has successfully moved into larger markets. While it was only serving the BSE test market ten years ago, today it is active in the global market of diagnostics for use in veterinary medicine and animal disease identification. The company has grown from a small enterprise that only carried out in-house R & D, relying on third parties for production and distribution, into one that directly controls much of its value chain. Today, its production and distribution is mostly centralised, using subsidiaries as well as third parties. Prionics is not only a spin-off itself but one that in turn has successfully helped spinning off other companies such as Neurotune und Malcisbo. It undoubtedly represents a most innovative and sustainable enterprise.

A highly successful venture is **ExcellGene**, a company founded 2001 as a spin-off of EPFL and employing a workforce of 23 today with headquarters in Monthey (VS). The company develops cost-effective solutions for cell culture that are marketed by partners globally. It managed to generate enough revenues to cover the costs for growth running up to CHF 5 million during the past ten years. CTI supports the collaboration with EPF in Lausanne and other R & D partners. Other companies, like Zurich-based **Cytos Biotechnology**, have also increased their workforce and product range considerably over the past ten years.

These outstanding companies have helped their industry associations keep abreast of change. Their precise formulation of needs in various fields has led to a number of initiatives such as the "Therapeutic Biologics Platform" within the SBA. These members at the heart of the association have also helped shape other strategic decisions on the future of industrial biotechnology (variously categorised today as "White Biotech" or "Cleantech by Biotech"). The SBA has initiated many similar platforms where the members can network, exchange know-how, learn from each other and initiate projects.

In 1997 the Swiss Innovation Promotion Agency CTI started to develop its own dedicated strategy to support the biotech industry. During the last phase of SPP BioTech a significant number of successful SPP BioTech projects got additional follow-up support from CTI for their valorization and company set-up. CTI actively supported the foundation of VSBU (now SBA) in 1998. Since 2003, CTI has its own Science and Technology Funding Area "Life Sciences" comprising the two strategic support initi-

atives CTI Biotech and CTI Medtech. The development of biotechnology in Switzerland gets additional boosts via the CTI-supported R&D Consortia "Biotechnet Switzerland" (and to a lower extent also "Swiss Food Research") and through the CTI-KTT (Knowledge and TechnologyTransfer) programme and the CTI Start-up/Entrepreneurship initiatives. Switzerland is predominantly made up with SME's (small and medium-sized companies), and many of these companies are highly receptive to innovation. It is vital for Switzerland's whole economy to achieve sustainability in this sector, not only because these companies are key partners with academic institutions but also because they serve as crucial conduits to big, blue chip pharmaceutical companies.

Table 1: Companies supported by SPP BioTech and their fate (selection).

	Operating	Inactive
Argonaut Technologies		•
BATS	•	
BICS		•
Biolytix	•	
Biospectra	•	
Cistronics Cell Technology	•	
Cytion	•[1]	
Cytos Biotechnology	•	
Diagnoswiss	•	
ESBATech	•[2]	
ExcellGene	•	
Ecostrat	•	
Glycart Biotechnology	•[3]	
Gnothis		•
Institute for Biopharmaceutical Research	•	
Lunamed	•	
Madep	•	
Metabolic Concepts	•	
Oncoscore		•
Pharma Design		•
PolyTag		•
Prionics	•	
Sciartec	•	
Selexis	•	
Tenaxis		•
The Genetics Company		•
Unitectra	•	
Zeptosens	•[4]	

1 bought by Molecular Devices
2 bought by Alcon, now Novartis
3 bought by Roche
4 bought by Bayer

Bought up by big pharma

Not all of the new companies managed to remain independent. Others always wanted to be acquired by larger companies in a later phase of their existence. A number of spin-offs and start-ups funded and supported by SPP BioTech proved so successful that they were finally bought by big pharmaceutical companies.

The Swiss universities, as well as Swiss Federal Institute of Technology (ETH) in Zurich and EPF in Lausanne, continue to provide a steady flow of ideas and methods for established pharmaceutical as well as new companies, capitalising on Swiss universities' strong position in the life sciences. **Glycart Biotechnology**, founded in September 2000 as a spin-off company from ETH, was bought five years later by Roche and merged into the company's pharma division. Roche paid CHF 235 million for the Glycart shares in order to gain access to the company's state-of-the-art GlycoMAb-Technology, in support of its drive to put together an antibody portfolio in the battle against cancer. As well as receiving help from SPP BioTech, Glycart was backed by a number of venture firms, like Novartis Venture Fund, GLSV, Gilde, DVC, ABN AMRO Capital, Quester and BioMed Invest. Today, Roche Glycart AG – still operating from its premises at Schlieren – carries out the whole range of product development, from early stage concepts to validation in comparative studies. The compounds studied and developed offer a powerful reflection of Roche's fundamental commitment to improving cancer treament.

ESBATech, founded in 1998 and currently employing a work force of fifty, is a University Zurich spin-off that was acquired by big pharma. It was first bought by the American eye-care company Alcon for almost USD 590 million. Alcon paid USD 150 million in cash and is obliged to pay a further 439 million, provided ESBATech meets certain specified R&D targets. Alcon was taken over by Novartis in 2010. Technologies not related to eye-care stayed in the hands of former ESBATech shareholders and have since been mergeded into the newly founded Delenex Therapeutics.

Similarly, **Zeptosens**, a Novartis spin-off that had also received support by SPP BioTech, has been bought by Bayer Technology Services (BTS), a subsidiary of Bayer. Employing a workforce of twenty, Zeptosens' core business consists of the development, production and distribution of a biochip system vital in diagnostics. Unfortunately operations in Switzerland will be dislocated to Germany in 2011.

In conclusion

For over a decade Switzerland's biotech sector has proven both to be robust in moments of crisis and sustainable over the long haul. And the good work begun by SPP BioTech (funded by SNSF) goes on. CTI development instruments such as CTI Projects, CTI Start-up, CTI Invest and the CTI Consortia together with stakeholders all along the value chain, continue to promote and foster biotech ventures. More than 250 companies are now active players in Switzerland's biotechnology platform. Ten years after SPP BioTech closed its doors, its beneficial influence can still be felt in Switzerland's aspiring biotech industry. The money was well spent.

Oliver Klaffke, Klaffke & Dietschi's
Oreste Ghisalba, Commission for Technology and Innovation (CTI)
Domenico Alexakis, Swiss Biotech Assocation (SBA)

An innovative decade in Swiss biotech: evidence of patent statistics

Renée Stadler,
Patent Expert,
Swiss Federal Institute
of Intellectual Property

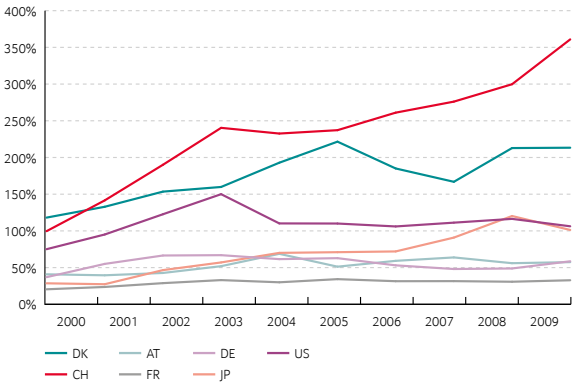
Switzerland is among the leading countries in science, technology and innovation, but overall – R & D and innovation activities have tended to stagnate. However this is certainly not true for the biotechnology sector (see OECD Territorial Reviews: Switzerland 2011), which is showing impressive figures for patent turnout per capita and patent applications growth.

The rate of innovation in biotechnology depends on the availability of a highly skilled and well-educated workforce. Switzerland's well-established, publicly-funded education system, combined with the strength of its universities, technical institutes and universities of applied sciences have all contributed to the country's excellent reputation in this field. The quality of the education system is shown by the fact that Switzerland has one of the world's highest number of scientific publications as well as citation rates per capita (Thomson-Reuters, 2009). The quality and rate of innovation in Switzerland can best be demonstrated by analysing the patent protection of inventions. In biotechnology, the rate of innovation benefits from the procurement of patent protection, which has been available for more than twenty years. Since innovation costs are particularly high in biotechnology projects, effective protection of innovations substantially increases the return of investment. Intellectual property rights, therefore, play a pivotal role in driving innovation: as the basic legal means for commercial exploitation of inventions they help secure competitive advantages and – thereby promote a healthy industry.

High rate of biotechnology patents in Switzerland

A statistical break-down of biotechnology patent documents from 2000 to 2009 reveals impressive performance. In fact, the per capita number of biotech patent documents more than tripled in Switzerland over the past ten years (Fig. 1). This contrasts with the situation in the United States, Japan, Germany, and France and in countries of similar size to Switzerland such as Denmark and Austria, where this number did not quite double during the same period. Although the average number of patent documents submitted per year by applicants from Switzerland was only 5 to 6 % of the number from the United States, on a per capita basis Switzerland has twice as many patents. Similarly, while in absolute terms the number of patent documents submitted by applicants from Switzerland was much smaller than in Japan and Germany, the country's per capita ratios were two and three times higher, respectively. In comparison with France, Switzerland produced almost the same patent documents turnout, but its per capita patent ratio is seven times larger. Compared to countries of similar development and size, such as Denmark and Austria, Switzerland performs very well again, with at least twice the number of biotech patent documents lodged over the same period. All this indicates that the success of the Swiss biotech industry is here to stay.

Figure 1: Biotechnology patents per capita

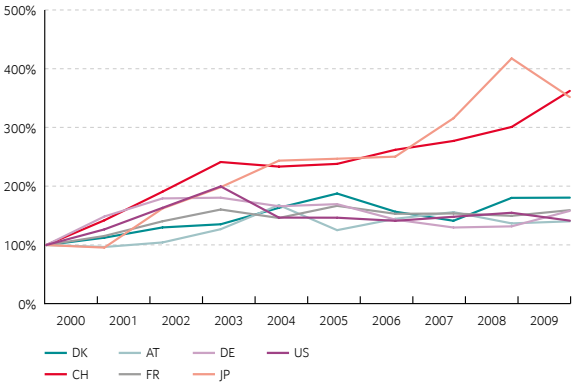


Note: Patent documents per year (the number of patent documents from Switzerland in the year 2000 was set to 100%).

Signs of an accelerating sector

Patents are good index of product innovation. Analysis of patent application growth rates points to market trends and future company performance. Switzerland saw its numbers of published biotechnology patents more than tripling from 2000 through 2009, topping the United States, Germany, France, Denmark and Austria with a smaller than two-fold increase. Only Japan shows a sharper growth rate in patent numbers, which quadrupled from 2000 through 2008. This indicates that the highly productive Swiss biotechnology sector is still gaining speed and lays ground for more years of steady growth (Fig. 2).

Figure 2: Growth of biotechnology patents per capita



Note: Patents documents per year (the number of patent documents in the year 2000 was set to 100% for each country).

Red, green and white biotechnology

Analysing biotechnology sector patents worldwide with a view to identifying documents from red, green and white domains shows that distribution between the three types does not seem to have changed considerably since the year 2000. Roughly equal growth seems to have occurred in all three domains. However, in Switzerland red biotechnology patents appear to have grown much more rapidly than their white and green counterparts. As of 2005, the rate of these documents published per year almost doubled while green biotechnology grew by about 50 % and growth in white biotechnology patent documents remained flat.

How competitive are Swiss biotech inventions?

Patent mapping in areas such as biotechnology can help highlight the competitiveness of countries or companies. Patent landscape maps group patents relating to the same technological areas into clusters. Clusters containing a large number of patents are represented as peaks and areas with few closely related patents as flat islands or ocean. Analysis of Swiss biotech patents compared to Germany for the years 2000 through 2009 reveals that biotech patenting in Switzerland (shown as white dots on map) largely overlaps with the same areas in Germany, i.e. covers most of the mountain areas. This indicates that, far from being a niche activity, Swiss biotech spans a wide range of profitable mainstream technology areas.

Figure 3: Patent mapping of biotech inventions in Switzerland and Germany

Note: The map shows technologies in the biotech field. Patent documents were selected when they addressed biotechnology issues and were filed by German or Swiss applicants since 2000. The advanced abstracts and titles of the inventions were processed through data and text mining in order to determine prevalent technologies. Technological aspects addressed by a comparably large number of documents are visualised by mountains on the landscape, such as the whitish region in the lower central part of the map ("Vaccine – Antigene – Immune"), concerning vaccines and immune response. Documents from Swiss applicants are highlighted (white dots). The X and Y axes have a mathematical but not necessarily physical meaning while the colour-coded Z coordinates reflect the density of patent documents at a given position. The distances between patent documents correspond to their technological similarity.

Swiss TPH: providing quality in research and services for decades

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and Infection Biology Department
Swiss Tropical and Public Health Institute

Prof. Dr. Reto Brun,
Deputy Head of the Medical Parasitology
and Infection Biology Department
Swiss Tropical and Public Health Institute

Since its foundation in 1943 the Swiss Tropical Institute (STI) has been known both in Switzerland and worldwide for the quality of its teaching, research and services, and its commitment to work for better health nationally and internationally. Since June 2009 the Institute for Social and Preventive Medicine, with more than 50 collaborators, has been integrated into the former STI. Under the new name of Swiss TPH, some 600 men and women from more than 40 nations collaborate in Basel and more than 20 countries around the globe with the shared vision of understanding diseases and their spread, launching appropriate health interventions, strengthening health systems, and helping to alleviate poverty.

Of the five departments of Swiss TPH – Epidemiology and Public Health (EPH), Medical Parasitology and Infection Biology (MPI), Swiss Centre for International Health (SCIH), Medicines Research (MedRes) and Medical Services and Diagnostic (MEDDIA) – two – EPH and MPI – primarily focus on research, teaching and training. Building on a strong foundation of interdisciplinary research in infection biology, MPI develops innovative concepts, methods and products, such as drugs, vaccines and diagnostics. The department is also involved in the validation and clinical testing of new tools, and supports other Swiss TPH departments in the application and strengthening of health systems. MPI's research is focused on host-pathogen interactions and determinants of infection and morbidity at the molecular, cellular, clinical and population levels. This multidisciplinary research process is based on close interactions within Swiss TPH and on national and international collaborative networks. With an emphasis on neglected tropical diseases and the diseases of poverty, exploring the basics of host-pathogen interactions has been a key research area of the Institute since its foundation. In our research particular attention is given to malaria, trypanosomiasis, leishmaniasis, tuberculosis, Buruli ulcer, and helminthiases.

The Parasite Chemotherapy Unit started some fifteen years ago, establishing a Screening Centre for parasitic protozoa in collaboration with the TDR Programme of WHO. Today in vitro assays are available for *Plasmodium falciparum, Trypanosoma brucei, T. cruzi* and *Leishmania donovani* as well as the corresponding mouse models. Two in vitro platforms are available: a medium throughput screen (MTS) and a serial dilution assay with IC_{50} determination. The MTS can handle thousands of molecules if provided in an appropriate format. The Unit collaborates with Product Development Partnerships such as the Medicines for Malaria Venture (MMV, malaria), the Drugs for Neglected Diseases initiative (DNDi, trypanosomatid diseases), the Consortium for Parasitic Drug Development (CPDD, trypanosomatid diseases) and a Consortium under the leadership of the Novartis Institute for Tropical Diseases (malaria). Collaboration with pharma/biotech includes Actelion, MerckSerono, Pfizer, BASF, GSK, Scynexis and others. Many collaborations with academic partners in Europe, USA and African countries exist, covering synthetic compounds as well as natural products. Our strategy is not only to identify new chemical entities but also exploit existing anti-infectives and drugs already registered which can be used for other indications.

Screening for helminth diseases was added a few years ago. The primary focus is on parasitic worm infections (nematodes and trematodes). The Helminth Drug Development Unit conducts research projects in drug discovery, preclinical research (pharmacokinetic studies) and drug development (proof-of-concept studies). The Unit has a wide collaborative network of academic partners ranging from medicinal chemists to pharmacologists. In collaboration with partners several clinical trials were conducted, and drugs registered for other indications (e.g. malaria) were tested for their anti-helminthic properties.

In vaccine research we are developing and evaluating new technologies for the design of candidate vaccines and the analysis of the genetic and antigenic diversity of pathogens. To understand the diversity of human responses to vaccine candidates we combine modern immunological methods with high throughput technology platforms. Our preclinical and clinical studies in the past ten years in collaboration with Prof. J. Robinson (University of Zurich) and Pevion Biotech Ltd. have shown that Immunostimulating Reconstituted Influenza Virosomes (IRIVs) represent a highly suitable antigen delivery system for synthetic peptide antigens. IRIVs are non-replicating virus-like particles, lacking the genetic material of the native virus. They are prepared by detergent removal from a mixture of natural and synthetic phospholipids and H1N1 influenza virus derived hemagglutinin and neuraminidase glycoproteins. A phase I clinical trial has demonstrated safety and parasite cross-reactive immunogenicity of two prototype IRIV-based malaria vaccine components. In a phase IIa trial the two combined IRIV-formulated peptides showed evidence of vaccine-induced blood-stage efficacy for the first time in a sporozoite challenge study. Recently a phase Ib trial at the Bagamoyo Research and Training Centre in Bagamoyo, Tanzania, confirmed the safety and tolerability of the vaccine formulation as well as its immunogenicity in both, healthy semi-immune adults and children. Optimisation and preclinical profiling of additional peptidomimetics have been finalised and these are now available for clinical testing.

biotechnet Switzerland – towards a smarter, sustainable world

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

In spite of the global economic crisis the Swiss biotech scene is holding up well, as the number of patent applications confirms. With excellent research institutions and a close network with industrial partners the sector is growing strong dynamically and has become a major player on the international stage. Future trends, rooted in high-level research, include on the one hand, synthetic biology, on the other, the promising domain of regenerative medicine, which aims to restore dysfunctional cells, tissues and organs. The goal of Swiss biotech is to be at the heart of core industrial sectors (e.g. pharmaceutical, chemical, IT, textile, food/feed, agriculture) in their drive to create a smarter and more sustainable world.

Continuously building skills and knowledge

biotechnet Switzerland can look back on ten years of cooperation with the private sector. In this period the turnover of relevant R & D projects has reached over CHF 40 million. Most of the projects focused on the continuous improvement of processes of the biotech value chain and many resulted in new products. This certainly is a proof that the achievements of biotechnet are becoming widely recognised.

biotechnet Switzerland has also been active in events aimed at promoting new technologies, supporting education and training and bringing together representatives from academia and industry. biotechnet Switzerland is living up to its name as a breeding ground for innovative ideas bringing together the know-how of scientists and their industrial partners.

The year in review

As part of its efforts to contribute to continuing education, biotechnet Switzerland supported a Symposium on Biocatalysis, organized by PD Linda Thöny-Meyer, a member of our board, in St. Gallen on January 28, involving speakers from all over Europe. The aim was to provide a platform for scientific knowledge transfer and the exchange of ideas between interested parties from industry, academia and research centres working in this cutting edge research field.

From August 31 to September 3, the 5th International Summer School on Advanced Biotechnology took place in Santa Margherita di Belice, organized by the BIRS (Master degree in Biotechnology for Industry and Scientific Research) of the University of Palermo in conjunction with biotechnet Switzerland.

The SATW Transferkolleg 2010 "Synthetic Biotechnology", held in Basel on November 18 and 19, organized by the Swiss Academy of Engineering Sciences (SATW) and biotechnet Switzerland was particularly successful. Synthetic biotechnology aims to make the engineering of new functions fast, cost-effective, scalable, predictable and safe. The innovative content of the submitted biotechnet projects 2010 was very high with SATW approving 16 out of 34 proposals. The academic partner of each funded project received a subsidy of CHF 16,000.

The annual Olten Meeting acts as an important forum for Swiss biotech, providing the opportunity for a broad overview and exchange of experience between academia and private industry. The meeting on November 24 was held under the banner "Biotech in Medicine".

Single use technology – Switzerland takes the lead

On June 7–8, scientists Regine and Dieter Eibl organized an International Conference on Single-use Technology at the Zurich University of Applied Sciences (ZHAW) in Wädenswil. Both have a broad experience in this domain as they were among the first researchers to experiment with the cultivation of cells in "plastic bags". Co-organizer was the German DECHEMA who collaborates with biotechnet Switzerland to promote the application of single-use technology in German-speaking countries.

Active networking – the driving force of Swiss biotech

On the initiative of the Swiss Biotech Association and with the support of biotechnet Switzerland, CHIMIA, the International Journal for Chemistry, focused its November issue on Swiss biotech, providing a state-of-the-art update on opportunities in the field of industrial biotechnology. The articles, written by Swiss specialists in the domain, highlight the importance of shifting industrial chemical synthesis towards processes that combine the best of chemistry and biotechnology in order to contribute towards a more sustainable environment.

Over the years, the Institute for Chemistry and Biological Chemistry (ICBC) in Wädenswil has become the mecca for the development of physiologically relevant in-vitro models for active agent testing, combining existing know-how and technologies with intimate knowledge of users' requirements. This in turn convinced the GEBERT RÜF STIFTUNG to award ZHAW Wädenswil start-up financing to build up – with the help of biotechnet Switzerland – a "Tissues for the Active Agents Development" competence centre under the aegis of Dr Ursula Graf, Professor for Biology and Head of Cell Cultivation Technology and Tissue Engineering at ZHAW.

Steady economic output

Year in review – Swiss biotech (selection of events in 2010)

Trigger	Company/Institution	Description
January 2010		
Collaboration Agreement	Evolva/Roche	Evolva signed an agreement with Roche to create compounds in oncology and anti-infectives. Roche will pay Evolva an up-front technology access fee and ongoing research fees.
Collaboration Agreement	Debiopharm	Debiopharm and Pfizer entered into a co-development agreement for a Phase 3 trial of CP675,206, a human antibody for the treatment of melanoma (skin cancer).
Financing	Covagen	Covagen announced the closing of a financing round with its existing shareholder Ventech and Edmond de Rothschild Investment Partners (EdRIP).
Collaboration Agreement	AC Immune	AC Immune in-licensed an AMPAkine memory enhancer (ACI-518) from the State University of Moscow. This small molecule activates global memory function.
Collaboration Agreement	Kenta Biotech	Kenta Biotech entered into an agreement with Rentschler Biotechnologie. The companies will develop a human monoclonal antibody against MRSA.
Product Approval	Octapharma	Octapharma received FDA orphan drug approval for Wilate. Wilate is used in the treatment of spontaneous or trauma-induced bleeding episodes.
Positive Observation	Mondobiotech	Mondobiotech discovered a promising product candidate for patients affected by drug-resistant tuberculosis.
February 2010		
Positive Observation	Synosia Therapeutics	Synosia announced positive data from a Phase IIa clinical study of an receptor antagonist (SYN115) in Parkinson's disease.
Acquisition	Prionics	Prionics acquired the tuberculin business segment of Lelystad Biologicals B.V. No deal price was published.
Collaboration Agreement	Debiopharm/Novartis	Novartis gained exclusive rights to develop and market Debio 025 (alisporivir). Debio 025 is an antiviral agent for the treatment of hepatitis C.
Collaboration Agreement	Lonza	Lonza and Ehrfeld Mikrotechnik BTS will cooperate on micro-reactor-technology. Ehrfeld Mikrotechnik BTS (EMB) is a Bayer Technology Services company.
Study Setback	Basilea Pharmaceutica	The European Committee for Medicinal Products for Human Use issued a negative opinion on Ceftobiprole. Ceftobiprole was co-developed with J&J for the treatment of complex skin and soft tissue infections.
Product Approval	Novartis	Novartis received FDA approval for Menveo. The vaccine helps prevent invasive meningococcal disease.
Study Launch	GlycoVaxyn	GlycoVaxyn started a Phase I clinical study with the vaccine candidate GVXN SD133 against Shigella dysenteriae (intestinal infections).
License Agreement	Basilea Pharmaceutica	Basilea entered a licensing deal with Japan's Astellas Pharma for the anti-fungal drug Isavuconazole. The drug is used for the treatment of invasive fungal infections.
Positive Observation	Polyphor	Polyphor discovered a new class of antibiotics. These antibiotics are effective against drug-resistant Gram-negative bacteria.
March 2010		
Study Setback	Actelion	Tracleer/Bosentan did not meet the primary endpoint in idiopathic pulmonary fibrosis. Actelion will stop the development of the drug in this indication.
Collaboration Agreement	Actelion	Nippon Shinyaku entered into a collaboration with Actelion for the treatment of pulmonary arterial hypertension (PAH). The two partners will jointly initiate clinical trials on macitentan (a dual endothelin-receptor antagonist) in Japan
Distribution Agreement	Lonza	Axiogenesis entered into a worldwide exclusive distribution agreement with Lonza. The agreement includes Axiogenesis's product and service portfolio (embryonic stem cell-derived cardiomyocytes).
Development Agreement	Lonza	Lonza signed an agreement with Odyssey Thera, Inc. to obtain the protein-fragment complementation assay technology for drug discovery researchers. Odyssey Thera has granted an option to certain exclusive global technology licences.
Positive Study Result	Kuros	Kuros informed that the Phase IIb clinical trial for KUR-111 was positive. KUR-111 treats patients with tibial plateau fractures that require fixation and grafting.

Collaboration Agreement	4-Antibody	4-Antibody entered into long-term collaboration with Boehringer Ingelheim to discover and to develop human therapeutic antibodies. 4-Antibody provides Hu-PAC and Retrocyte Display technologies.
Study Launch	Pevion Biotech	Pevion launched Phase I clinical trials of PEV7, a vaccine against recurrent vulvovaginal candidiasis. PEV7 aims to provide relief for an estimated 3-6 % of women worldwide.
Restructuring Measures	Lonza	Lonza announced cost-cutting measures in Visp and Basel. Fixed costs are to be reduced by around CHF 40 million over the next 18 months.
Marketing Agreement	Actelion	Actelion and Invida Group extended their contract through 2015 to continue commercialization of Tracleer in markets throughout Asia. The contract now covers Thailand, Malaysia, Philippines, Vietnam, and Hong Kong.
April 2010		
Merger	Nitec Pharma/Horizon Therapeutics	Horizon Therapeutics and Nitec Pharma merged their activities. The companies will operate under the name of Horizon Pharma.
Financing	Biocartis	Biocartis raised EUR 30 million from its current shareholders as well as from Debiopharm and Johnson & Johnson Development Corporation (JJDC).
Product Setback	Basilea Pharmaceutica	Basilea reported that Janssen-Ortho Inc. decided to discontinue sale of Ceftobiprole in Canada.
Collaboration Agreement	Polyphor	Axxam will collaborate with Polyphor on ion channel-based research. They will use their drug discovery and screening platforms to identify drug candidates for pain, inflammation and metabolic disorders.
Award	Neurimmune Therapeutics	Neurimmune received the 2010 ZKB TECHNOPARK pioneer award, given for technological innovations which are about to be launched on the market.
Positive Study Result	Kenta Biotech	Kenta declared that results from a trial of panobacumab (KBPA101) showed 100% survival in patients with hospital-acquired pneumonia.
Positive Study Result	Pevion Biotech	Pevion completed the preclinical safety and efficacy studies of its RSV vaccine candidate PEV4. The vaccine candidate is a subunit vaccine candidate against respiratory syncytial virus (RSV).
Marketing Agreement	Actelion	Actelion appointed Accredo Health Group to serve as the sole pharmacy provider of Epoprostenol for injection in the US. The improved formulation is used for the treatment of pulmonary hypertension.
Study Launch	Molecular Partners	Molecular Partners AG enrolled patients in two separate Phase I trials in wet age-related macular degeneration and diabetic macular edema. The trials are investigating the safety of MP0112.
May 2010		
Product Approval	Basilea Pharmaceutica	Toctino received marketing authorization in Italy.
Financing	GlycoVaxyn	GlycoVaxyn and a Harvard University affiliated hospital received a USD 3.4 million NIH grant for Staphylococcus aureus vaccine development. S. aureus is a major cause of hospital-based infections.
Divestment	Cytos Biotechnology	Cytos sold its monoclonal antibodies platform technology to Intercell for EUR 15 million. The technology is based on monoclonal antibodies from human B-cells.
Collaboration Agreement	Polyphor/Novartis	Polyphor entered into a drug discovery collaboration with Novartis. Polyphor will use its PEM (Protein Epitope Mimetics) drug discovery technology to identify novel PEM drug candidates.
Acquisition	Lonza	Lonza acquired MODA Technology Partners, a software company that provides paperless quality control solutions. The acquisition will strengthen the Rapid Testing Solutions platform of Lonza's Bioscience division.
Study Setback	Santhera Pharmaceuticals	Santhera failed to meet the primary endpoint in the MICONOS Phase III study evaluating Catena/Sovrima for the treatment of Friedreich's Ataxia.
June 2010		
Manufacturing Contract	Bachem	Bachem will manufacture the active ingredients and supply the finished dosage forms of immunotherapeutic HPV-SLP products to ISA Pharmaceuticals. Bachem will be the partner for the Phase III program.
Collaboration Agreement	GeneData	Genedata has been selected to participate in an ERA-Net-funded applied pathogenomics project. Project owners will use systems biology to identify the role of small non-coding RNA in infectious diseases.
Collaboration Agreement	Lonza	Lonza entered into worldwide, exclusive licensing and supply agreement with California Stem Cell Inc. The collaboration involves pluripotent stem cell products.
Manufacturing Contract	Lonza	Cellectis and Lonza entered into an agreement for the development and commercialization of a bioengineered cell line. Cellectis bioresearch will use its meganucleases to deactivate the glutamine synthetase (GS) in CHOK1SV.

Study Launch	Telormedix	Telormedix announced the start of a Phase I/II clinical study of TMX-101 for the treatment of non-muscle invasive bladder cancer (NMIBC). TMX-101 is an immunotherapeutic compound.
Study Completion	Addex Pharmaceuticals	Addex presented encouraging data from preclinical studies with ADX48621. The compound completed three Phase I clinical trials.
Distribution Agreement	Basilea Pharmaceutica	Basilea entered into an exclusive distribution agreement with Almirall for Toctino. Toctino is used as an oral treatment for adults with chronic hand eczema.
Divestment	Bachem	Bachem sold its stake in Polyphor AG to Ingro Finanz AG. The involved parties have agreed not to disclose the purchase price of the transaction.
Study Setback	Basilea Pharmaceutica	Basilea reported that the request for re-examination for Ceftobiprole received a negative opinion from the European Committee for Medicinal Products for Human Use (see February 2010).
Positive Study Result	Santhera Pharmaceuticals	Santhera announced that the RHODOS study demonstrated positive results. Catena improved vision in patients with Leber's Hereditary Optic Neuropathy (LHON).
Stock Exchange Listing	Oxygen Biotherapeutics	Within the framework of a secondary listing, shares of Oxygen Biotherapeutics traded for the first time on June 29 on SIX Swiss Exchange. Shares are quoted under the same ticker symbol as they do on NASDAQ.
July 2010		
Financing	Evolva	Evolva received further funding from Ventureast and APIDC. The two venture capital firms provided CHF 3.5 million.
Manufacturing Contract	Lonza	Human Genome Sciences and Lonza announced an agreement for the supply of BENLYSTA as a potential new treatment for systemic lupus erythematosus (SLE).
Acquisition	Actelion	Actelion and Trophos entered into an acquisition agreement. Actelion obtained an exclusive option for EUR 10 million to acquire Trophos SA.
Financial Restructuring	Lumavita	The Swiss Commercial Register announced that Lumavita noticed a negative equity status. In order to balance the situation, the company primarily reduced its capital and then issued new shares.
License Agreement	NovImmune	NovImmune entered into an exclusive licensing agreement with Genentech for an anti-IL-17 antibody.
Development Agreement	Lonza	Lonza and BioWa signed a research and development contract with Daiichi Sankyo. Daiichi Sankyo will use the Potelligent Technology CHOK1SV cell line to develop and produce recombinant antibodies.
Capital Increase	Mondobiotech	Mondobiotech announced a share capital increase. Existing shareholders will obtain the rights offering whereas the remaining shares will be placed privately. The company's share capital will be increased out of the authorized share capital.
August 2010		
Product Approval	Octapharma	Octapharma received confirmation of orphan drug exclusivity approval from the FDA for Wilate. Wilate is used as a the replacement therapy developed for von Willebrand Disease (VWD).
Positive Study Result	SeneXta Therapeutics	SeneXta announced the successful completion of a confirmatory Phase I study. Healthy aged volunteers were treated with the oral acetylcholinesterase (AChE) inhibitor SNX-001.
Collaboration Agreement	Telormedix	Telormedix announced a collaboration with the Swiss Tropical and Public Health Institute. The study considers the adjuvant, TMX-201, in connection with immunization for Malaria and Buruli Ulcer.
Collaboration Agreement	Lonza	Lonza entered into a collaboration agreement with Roslin Cells for the development of customized cell culture media and processes for the production of pluripotent stem cells (PSCs). This agreement will advance cell therapy applications.
Manufacturing Contract	Octapharma	BAC BV entered into a license agreement with Octapharma (G-CSF Custom Ligand for Commercial Scale Manufacture).
Study Completion	Addex Pharmaceuticals	Addex completed the Phase I studies to commence Phase II testing of ADX71149 (schizophrenia and anxiety).
Product Approval	Actelion	Actelion announced that the FDA approved the brand name VELETRI for the epoprostenol injection therapy. The injection treats moderate to severe pulmonary arterial hypertension (PAH).
Distribution Agreement	Actelion/Basilea Pharmaceutica	Basilea entered into an exclusive distribution agreement with Actelion for the marketing of Toctino in Canada. Actelion will purchase Toctino from Basilea and bear all costs related to selling the product in Canada.
Positive Study Result	Octapharma	Octapharma announced that the clinical development for Uniplas has been successfully completed. The product has been filed for registration in Europe and will be submitted later in the USA.

Acquisition	Lonza	Lonza entered the viral based-manufacturing market with the purchase of Vivante GMP Solutions, Inc. The acquisition will broaden Lonza's biologics capability in the vaccine and gene therapy markets.
September 2010		
Award	Molecular Partners	Molecular Partners was named as Technology Pioneer 2011 by the World Economic Forum.
Development Agreement	Selexis	Selexis and BIOCRATES entered into a co-development agreement (mammalian cell cultures development for the pharmaceutical industry).
Positive Results	Anergis	Anergis SA announced new results with its 5- injection/2-month immunotherapy with AllerT.
Positive Observation	Addex Pharmaceuticals	Addex observed efficacy in a model of Alzheimer's disease. The molecule inhibits a receptor subtype via negative allosteric modulation (NAM) in order to treat cognitive symptoms of Alzheimer's disease.
License Agreement	Santhera Pharmaceuticals	Santhera and Ipsen entered into a license agreement for the development and commercialization of fipamezole. The license covers the territories outside of North America and Japan.
Financing	Lumavita	Lumavita closed a Series B financing round of CHF 11 million from its current investors (Atlas Venture, BB Biotech Ventures, BioMedInvest AG, Endeavour Vision SA and HealthCap).
Investment Fund Closing	Nextech Invest	Nextech Invest held a EUR 26 million first close on its fund "Nextech III Oncology". The fund's target is to invest globally in companies developing cancer products and to divest the investments within three years.
Award	Addex Pharmaceuticals	Addex was awarded a USD 900,000 grant from the Michael J. Fox Foundation. The award will help to fund a Phase II study of ADX48621 for the treatment of Parkinson's disease levodopa-induced dyskinesia (PD-LID).
Financing	Pevion Biotech	Pevion Biotech secured CHF 10 million in a venture financing round. The financing will be provided by its existing investors, BZ Bank, BB Biotech Ventures and Core Capital Partners.
Manufacturing Contract	Lonza	Lonza and GlaxoSmithKline entered into a manufacturing agreement. Lonza will support GSK's biopharmaceutical pipeline by supplying manufacturing capacity for five early stage monoclonal antibodies.
Product Setback	Basilea Pharmaceutica	Basilea Pharmaceutica announced that Janssen-Cilag AG will stop the selling Ceftobiprole in Switzerland following unfavorable marketing authorization assessments in the US and the EU.
Development Agreement	Atheris/Bachem	Bachem and Atheris will collaborate on Melusine venom peptide libraries for lead discovery. The agreement will include services to assist with the identification of the active ingredients and to synthesize individual compounds.
Study Launch	Debiopharm	Debiopharm and Aurigene announced the development candidate Debio 0617. The compound is a novel inhibitor of an undisclosed oncology pathway.
Product Approval	Mondobiotech	The FDA has granted Mondobiotech Orphan Drug Designation for the treatment of Chronic Beryllium Disease to Mondobiotech. The product candidate is the human peptide DasKloster0210.
Positive Study Result	LASCCO	LASCCO and the Lausanne Sepsis Network presented encouraging results from a study on pancreatic stone protein (PSP). The data showed that PSP is an accurate biological tool to stratify patients with serious infection.
Financing	Addex Pharmaceuticals	Addex raised CHF 6 million through the issuance of new shares as well as CHF 14 million through the issuance of a zero coupon six-month mandatory convertible notes to Biotechnology Value Fund.
Product Setback	Actelion	Actelion received a subpoena from the US Attorney's Office for the Northern District of California. The authority requested documents relating to marketing and sales practices of Tracleer in the US.
Product Submission	EffRx Pharmaceuticals	EffRx and Nycomed announced European filing for EX101 (effervescent alendronate for the treatment of osteoporosis).
Award	Genkyotex	Genkyotex received the Life Sciences Prize 2010, awarded by the Swiss Biotech Association and BioValley. The company demonstrated a strong focus and expertise on enzymes.
License Agreement	Selexis	Selexis signed a commercial license agreement with Merrimack Pharmaceuticals. Merrimack will obtain the rights to use a cell line for the cGMP production of an undisclosed antibody.
Product Setback	Actelion	Actelion reported that clazosentan failed a late-stage trial. Clazosentan had demonstrated a non-significant relative risk reduction of 17 % in patients who had suffered a hemorrhage.

Marketing Agreement	Lonza	Scarab Genomics and Lonza entered into a marketing and sales agreement for the Clean Genome technology. Lonza will give its customers full access to the platform for protein and plasmid DNA production.
Research Collaboration	ESBATech (Alcon/Novartis)	GENOVAC entered into a research collaboration with ESBATech. GENOVAC will apply its genetic immunisation technology to generate antibodies against molecular targets.
Positive Study Result	Synosia Therapeutics	Synosia announced the clinical study results for SYN-118. The compound provides benefits to Parkinson's patients. SYN-118 might become an add-on therapy.
October 2010		
Product Setback	Actelion	The FDA reported that Actelion didn't follow proper procedures in determining wether deaths in connection with Tracleer should be reported. The FDA issued a warning to Actelion.
Acquisition	PregLem	Gedeon Richter acquired PregLem for an initial cash consideration of CHF 150 million and further milestone payments of up to CHF 295 million.
Positive Study Result	GlycoVaxyn	GlycoVaxyn announced the completion of the Phase I study of its Shigella dysenteriae bioconjugate vaccine.
Financing	ImVisioN Therapeutics	ImVisioN Therapeutics announced it is planning to raise CHF 8 to 10 million before the end of 2010.
Financing	Synosia Therapeutics	Synosia Therapeutics raised USD 30 million in a Series C financing round. The round was led by new investor UCB which invested USD 20 million. The remaining funds came from existing investors.
Collaboration Agreement	Synosia Therapeutics	Synosia granted UCB exclusive worldwide rights to SYN-115 and SYN-118. UCB will take on late-stage development and commercialisation following completion of Phase II studies.
License Agreement	Santhera Pharmaceuticals	Santhera entered an exclusive license agreement with BioLineRx. BioLineRx acquired all rights to develop and commercialize MC-4R, a melanocortin-4 receptor.
Share Repurchase Program	Actelion	Actelion authorized the repurchase of up to CHF 800 million of the company's common stock over the next three years.
Development Agreement	Cytos Biotechnology	Cytos will support the U.S. National Institutes of Health (NIH) in the preclinical development of a malaria vaccine. The partner will be the National Institute of Allergy and Infectious Diseases (NIAID).
Positive Study Result	Neurotune	Neurotune announced positive results from its Phase IIa study of dimiracetam (NT-11624). The compound is applied for the treatment of neuropathic pain in HIV patients.
Development Completion	Santhera Pharmaceuticals	Santhera regained the US and Canadian rights for Fipamezole from Biovail (Valeant) as of January 2011. Santhera will take on the Phase III development for the North American markets.
Research Collaboration	Evolva	Evolva signed a research agreement with Abunda Nutrition. Evolva's technology platform will be applied to create new production methods.
Collaboration Agreement	Lonza	BD Diagnostics and Lonza entered into an exclusive licensing and collaboration agreement. Lonza can commercialize BD's microCompass molecular assays.
Study Launch	Octapharma	Octapharma started treatments with the first recombinant Factor VIII derived from a human cell line (Human-cl rhFVIII). The study will investigate treatments for patients with severe hemophilia A.
November 2010		
Milestone Payment	Basilea Pharmaceutica	Basilea received a milestone payment of EUR 5.5 million under its distribution agreement for Toctino with Almirall. The payment relates to Italy.
Acquisition	Ares Life Sciences	Ares Life Sciences acquired a 46.03% stake in Stallergenes S.A. representing an investment of EUR 800 million.
Collaboration Agreement	Biocartis	bioMérieux and Biocartis signed a strategic partnership in molecular diagnostics. The companies will cooperate in the development of assays as well as in the distribution of an integrated molecular platform.
Positive Study Result	Pevion Biotech	Pevion Biotech announced positive results from a Phase I study of PEV7 (first vaccine against recurrent vulvovaginal candidiasis). PEV7 has proven safe and well tolerable.
Development Agreement	Selexis	Selexis announced a strategic agreement with Zyngenia. Selexis will support Zyngenia to generate production cell lines for the Zybody therapeutic programs.
Financing	Delenex Therapeutics	Delenex Therapeutics raised CHF 13.5 million in a Series A financing round. SV Life Sciences, HBM BioCapital, HBM BioVentures, BioMedInvest and VI Partners participated in the funding.

Cooperation Agreement	Lonza	Lonza and Dalton Pharma Services entered into a co-operation agreement. The companies serve customers requesting early phase chemistry and kg-lab manufacturing services for small molecules.
Inauguration	Debiopharm	Debiopharm inaugurated the "Debiopharm Laboratory" at the University of Applied Sciences (HES-SO) Western Switzerland in the canton of Wallis.
Collaboration Agreement	Lonza	Lonza and California Peptide Research entered into a strategic collaboration for peptide manufacturing and development services.
Positive Study Result	Auris Medical	Auris Medical completed the first cohort of Phase IIb study with AM-111. AM-111 will be applied for the treatment of acute sensorineural hearing loss (ASNHL).
Positive Study Result	Auris Medical	Auris Medical received approval for its IND application with the FDA to start a clinical trial with AM-101 in the USA. AM-101 is a receptor antagonist for the treatment of inner ear tinnitus.
Arbitral Judgment	Basilea Pharmaceutica	The tribunal at the Netherlands Arbitration Institute found Johnson & Johnson in breach of the license agreement with Basilea. Basilea was awarded USD 130 million as compensation related to ceftobiprole.
December 2010		
Positive Study Result	Synosia Therapeutics	Synosia reported positive data using perfusion MRI in patients with Parkinson's disease. SYN-115 inhibits the indirect pathway that is over-activated in Parkinson's patients.
Financing	Covagen	Covagen announced the closing of a Series A financing round in which CHF 6.3 million was raised. The round was led by new investor Seroba Kernel Life Sciences based in Dublin, Ireland.
Patent Protection	Santhera Pharmaceuticals	The European Patent Office granted patent protection to Santhera for the use of omigapil until 2016. Omigapil is applied for the treatment of Congenital Muscular Dystrophy.
License Agreement	Serodus	Serodus entered into a license agreement with Roche for a selective serotonin-4 (5-HT4) antagonist for the potential treatment of heart failure.
Award	Addex Pharmaceuticals	Addex was named the EuropaBio's most innovative SME. The contest attracted applications by 32 companies from 12 countries.
Building Inauguration	Actelion	Actelion opened its new business center. The five-floor steel building offers space for 350 employees from central business functions.
Financing	Evolva	Evolva's shareholders will partially extend the lock-up on their current holdings until 1 September 2011. This will be done through a staggered release and a coordinated sale of shares.
Award	Neurotune	Neurotune won the third place in the 2010 Eurecan European Venture Contest (EEVC) finals. The finalists were selected out of 987 applications from 24 countries.
Collaboration Agreement	Cytos Biotechnology	Cytos and Singapore's Agency for Science, Technology and Research announced the extension of their existing collaboration. Cytos will develop a virus-like particle based influenza vaccine.
License Agreement	Lonza	Lonza and Stason Pharmaceuticals signed a license agreement. Stason received a non-exclusive license to use Lonza's glutamine synthetase Gene Expression System.
Study Launch	Evolva	Evolva initiated a multiple ascending dose Phase I clinical study with an extended release oral formulation of EV-077. EV-077 is being developed for renal and cardiovascular indications.
Financing	NovImmune	NovImmune obtained a series B financing of CHF 20 million led by BZ Bank. The financing round allows NovImmune to generate proof-of-concept data for two compounds.
Financing	Newron	Newron raised CHF 3.5 million through a private placement with Great Point Partners. The proceeds will be used to further capitalise the company and fund its pipeline development and clinical trials.
Acquisition	Panima Pharmaceuticals	Biogen acquired Panima Pharmaceuticals AG, a former subsidiary of Neurimmune. The deal includes the world-wide rights to three pre-clinical immunotherapy programmes focused on antibodies.

Disclaimer:
This information was compiled on the basis of publicly available information only. We therefore cannot guaranee that all events are included in the above summary for 2010.

Switzerland: the ideal biotech and life sciences business location

For the second year running Switzerland came top in the World Economic Forum's Global Competitiveness Report 2010-2011, reflecting its advantages for forward-looking research, production and service companies.

Switzerland is a leader in education and is one of the world's most active countries in research. Service quality is high and intellectual property is protected by a network of international contracts. Switzerland is therefore a valuable breeding ground for creativity and innovation. In the 2010 Innovation Union Scoreboard – a comparative analysis of innovation performance among the countries of the European Union – Switzerland ranked first, confirming its position as European's leading champion of innovation.

Table 1: Total per capita expenditure on research and development in USD (2008)

		2008
1	**Switzerland**	**1,967**
2	Sweden	1,942
3	Luxembourg	1,927
4	Finland	1,774
5	Denmark	1,692
10	US	1,308
11	Japan*	1,180
12	Singapore	1,041
13	Germany*	1,024
14	France	928
15	Belgium	908
16	Ireland	860
18	UK	813
19	Netherlands*	812
22	Italy	458
27	Hong Kong SAR	226
29	Russia	122
31	Brazil	94
35	People's Republic of China	50
48	India*	8

Source: 2010 IMD World Competitiveness Yearbook
*Data from 2007

Swiss universities and institutes of technology conduct research at the highest level, working closely with the international research community. The country's scientific research institutions rank amongst the world's best. It is home to various science and business clusters, as for instance the biotech cluster: Indeed, the density of biotech companies in Switzerland is unparalleled world-wide. Its companies in this field range from large multinational corporations such as Merck Serono, Novartis and Roche to innovative start-ups.

Switzerland. Trade & Investment Promotion.

In order to further strengthen the business location Switzerland, location promotion is done in close cooperation with the business community and the cantons. Switzerland fosters optimal conditions for a strong economic environment. For example, foreign trade promotion organisation Osec coordinates together with the cantons activities on behalf of the government to drive overseas investment and supports companies under the programme "Switzerland. Trade & Investment Promotion.", which opens the door to Switzerland and its authorities. In close collaboration with partners from different regions and cantons and from the private sector, the programme assists companies as they plan their operations in Switzerland.

Early on the Swiss biotech sector received a lot of support from Osec. Over the past decade Osec has built up a solid industry representation abroad in order to raise the profile of the sector world-wide. As well as key events that take place regularly, such as the "**SWISS** Pavilion" at BIO in the USA, BioJapan and BIOTECHNICA in Hannover, Germany, participation in smaller industry events through the co-operation with the Swiss Biotech Association have been extended over the years. Currently, a series of partnering and financing events, especially designed for the stakeholder audience of biotech, are part of the offer.

By participating in the "**SWISS** Pavilion" or smaller events, Swiss companies benefit from turnkey stand solutions, prominent locations, high levels of media and visitor's attention, logistical and strong support from Osec. The "**SWISS** Pavilion" unites Swiss know-how, Swiss quality and Swiss precision. It offers the ideal platform for visitors and media to meet with members of Swiss research institutes and companies as well as with representatives of the Swiss Biotech Association and of various biotech clusters.

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

OSEC – The Competence Centre for Swiss Foreign Trade Promotion
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Financing

Venture capital investments in life sciences

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The availability of venture capital is crucial for the life sciences sector. Fortunately, the industry has become the key destination for start-up firm investment in Switzerland. Most external financing is cyclical but this sector not only attracts most funds in the early stage but the largest average amounts of investment overall.

In the past decade life sciences have emerged as the most important destination for early-stage investments in Switzerland. Since 1999 over CHF 3.1 billion of venture capital have reportedly been invested in the areas of life sciences (of which 85% or CHF 2.6 billion for biotechnology alone, i.e. without medtech). This amount by far exceeds the combined early-stage investments in other innovative sectors such as ICT, energy and environment, chemicals and materials, and others during this period.

However, little has so far been known about the features of this impressive development at an overall level. Although widely acknowledged, the importance and range of investment in life sciences enterprises were virtually impossible to assess quantitatively until recently. Information about venture capital investments in Switzerland was not only scarce generally but also aggregate data on the industrial and regional distribution of such capital flows in Switzerland, let alone detailed patterns of external financing for the life sciences, were inexistent.

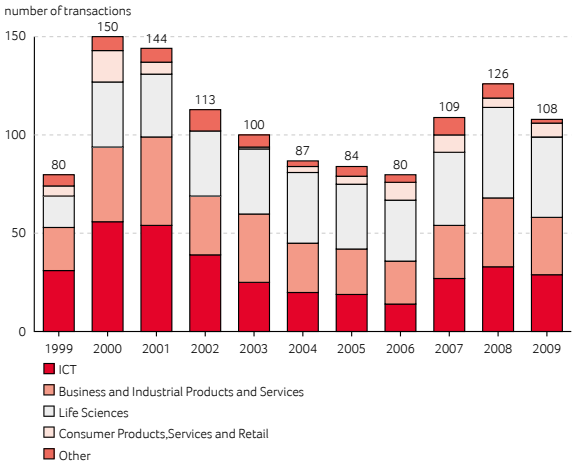
The Swiss Venture Capital Database at the University of Basel

The Swiss Venture Capital Database at the University of Basel aims to fill this gap. As of January 2011, the database covered 1,012 startup firms in innovative sectors and 1,277 venture financing transactions from 1999 until 2010. Based on this data set, it is now possible to analyze both early-stage financing in general and capital flows in life sciences in particular. In our analysis for the life sciences sector in Switzerland, five findings deserve to be highlighted.

Life sciences are the dominant start-up industry

In the past decade this sector has emerged as the dominant investment field among innovative start-up firms both in numbers of transactions and in total amounts of investment. After the dot-com bubble burst in 2001 life sciences raced ahead of all other sectors in terms of venture capital investment. Its share has risen from about 20% to over 70% since 2004. Even in such a well developed entrepreneurial ecosystem as Switzerland's life sciences have become the most important destination for venture capital.

Figure 1: Venture capital transactions in Switzerland



Note: Number of early and later stage capital transactions per year and sector

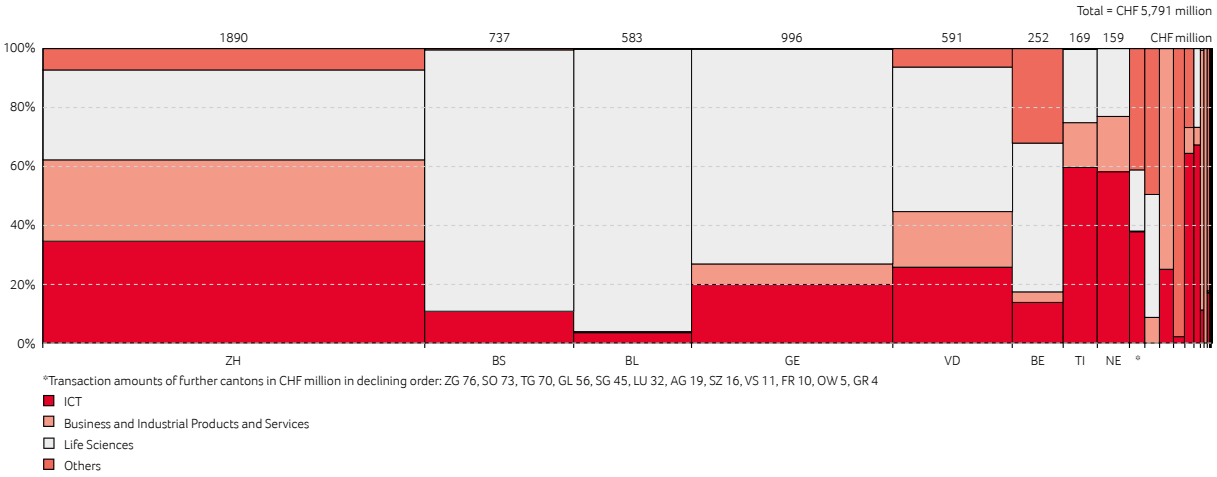
Cyclicality of external funds

Nevertheless, venture capital flows are highly sensitive to the economic cycle. As the period between 1999 and 2001 showed, although ICT was hit hardest, start-up firms in all industries were negatively affected by market decline. In general, declines affected both the amounts and the types of investment. In a downturn not only does the overall volume of invested venture capital fall, but it shifts from high risk early-stage investments to lower risk later-stage investments. In the most recent crisis, for example, it was notable that early-stage investment broke down, resulting in extremely limited first round investment and illiquidity risks among start-up firms. Furthermore, cyclicality impacts on the demand as well as the supply side, as business development behaves cyclically overall.

Largest investments are in life sciences

Biotechnology accounts for the highest proportion of R&D expenditure in the industries in our sample by far. Moreover, due to their business model, life sciences transactions also involve the largest amounts per single investment. In general, the distribution of investments across all industries is highly skewed. 27% of all transactions are under CHF 200,000 while more than

Figure 2: Transaction landscape 1999–2009 per sector and canton



half of investments involve less than CHF 1.5 million. However, the largest transactions mostly take place in life sciences. After all, 9 % of the transactions in our sample top the amount of CHF 25 million per single transaction. As a result, the average transaction value in the life sciences is by far the largest (CHF 6.4 million). A key factor behind this is that R & D expenses in biotechnology are sizable. This underlines just how important venture capital is to life sciences, as the R & D expenses of their venture-backed companies are much higher than in the rest of the sample. Other significant features of life sciences investment include greater involvement of international investors and of industrial business partners and corporate venture capitalists.

Clustering

In terms of firm behaviour the landscape of investment activity among all start-ups shows that firms tend to gather around knowledge clusters and economic centres such as Zurich, Basel, and Geneva/Lausanne, benefiting from strong universities, innovative entrepreneurs, more high net worth individuals and a balanced economic structure. These centres provide young firms with knowledge, networking opportunities, financial and entrepreneurial expertise and a broad customer base. This clustering behaviour can also be observed in the life sciences. At the same time, the distribution of start-up firms shows some specific regional biases. Zurich, for instance, historically has had, and still has, a relatively stronger focus on ICT, business and industrial products and services, whereas in Basel life sciences enterprises dominate among the start-up firms in the region.

Life sciences make the highest employment contribution

In the first years of their existence life sciences firms make the highest employment contribution. Within six years of starting up, firms in life sciences employ about 50 % more FTE staff on average than other industry. This reflects the level of their R & D activity and their growth expectations. And these expectations are not incorrect: firm growth is also highly concentrated in this sector.

In conclusion

The Swiss Venture Capital Database at University of Basel shows the success stories in the Swiss biotech sector. It is a powerful tool to scan the universe of start-up companies with respect to capital flow, success factors, and employment effects. The database reveals that life sciences have evolved as the most important sector among start-ups in Switzerland. They lead the field with respect to the number and the total amount of financial transactions. Although investments, especially in the early phase, are highly cyclical, life sciences show the highest average and absolute investment amounts. This is due especially to the costs of R & D. Furthermore, start-ups in life sciences tend to cluster around knowledge and business centres and display the highest employment contribution in the first years of business life. Finally, we also find that venture capital is highly important for this industry. For future economic growth in Switzerland venture capital and life sciences are vital.

SIX Swiss Exchange: a 10-year retrospective on a strong hub for life sciences

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Among European countries Switzerland has positioned itself especially well as the home-base for life sciences companies by offering an advantageous business environment during the last ten years. The strong concentration of biotech companies in Switzerland (the highest per capita concentration in the world) is no coincidence: it stems from long-standing and fruitful interaction between well-established Swiss pharma, biotech and medtech industries and the country's financial institutions.

The Swiss financial sector is of crucial national importance. It accounts for 12% of the GDP, 12% to 15% of tax receipts and 6% of the workforce – making it one of the nation's most important economic sectors. The sector manages around 5% of global wealth, of which 67% are invested in equities and funds. This makes Switzerland as a financial centre extremely attractive for both domestic and foreign companies seeking capital, because it is of a manageable size, closely networked and internationally oriented. Furthermore, banks based in Switzerland have outstanding placing and investment power.

A biotope for national and international life sciences companies

Currently, around one third of the total market capitalization at SIX Swiss Exchange is attributable to the life sciences field, making it the largest peer group of its kind in Europe. Its strong focus on life sciences is not a new phenomenon and has developed strongly over the past ten years. During this period 99 companies in total went public on SIX Swiss Exchange. With 20 companies stemming from the life sciences sector, this field counts for roughly 20% of all IPOs (primary listings), of which about 70% were biotech companies (see table 1).

Table 1: Biotech listings on SIX Swiss Exchange – 2000–2010

Listing Date	Issuer
29.06.2010	Oxygen Biotherapeutics Inc *(secondary listing)*
14.12.2009	Evolva Holding SA
26.08.2009	mondoBIOTECH holding Ltd.
22.05.2007	Addex Pharmaceuticals Ltd
12.03.2007	Cosmo Pharmaceuticals S.p.A.
12.12.2006	Newron Pharmaceuticals S.p.A.
03.11.2006	Santhera Pharmaceuticals Holding AG
22.06.2006	BioXell S.p.A.
08.09.2005	Speedel Holding Ltd.
04.05.2005	Arpida Ltd.
25.03.2004	Basilea Pharmaceutica AG
29.10.2002	Cytos Biotechnology AG
26.06.2001	Berna Biotech AG
23.06.2000	Modex Therapeutics Ltd
06.04.2000	Actelion Ltd.

Source: SIX Swiss Exchange

Compared to other sectors and other regulated European markets, SIX Swiss Exchange offers many advantages for biotech companies. In 2004, when capital market volatilities started to decrease again, Switzerland was one of the first European regulated markets to open up for biotech IPOs. Basilea was one of the first biotech IPOs in Europe and was the largest biotech IPO that year in terms of money raised on the day of the IPO, raising more than CHF 200 million in growth capital (see table 2).

In addition, the following transactions profited from this "window opener" and were able to raise large amounts of money by listing in Switzerland. More precisely, starting 2004 until 2007, SIX Swiss Exchange had accounted each year for the largest European biotech IPO on a regulated market in terms of money raised on the day of the IPO (see table 3).

Furthermore, SIX Swiss Exchange was the only exchange in Europe to record cross-border IPOs by European biotech companies (BioXell, Newron Pharmaceuticals and Cosmo Pharmaceuticals) in a regulated market during the IPO window 2004–2008. This heavy concentration in Switzerland and on SIX Swiss Exchange is no coincidence but the result of many years of fruitful interaction between traditional Swiss industries – pharmaceutical, biotech and medical technology – and the country's active financial institutions. This is why investors who are active in Switzerland are among the most knowledgeable in the sector. In addition, every IPO at SIX Swiss Exchange gains outstanding visibility among investors, analysts and the media. Not surprisingly, the Swiss financial centre and SIX Swiss Exchange hold great appeal for domestic and foreign companies.

Answers to a growing industry

SIX Swiss Exchange responded to the strong focus on life sciences in launching a new SXI® index family in 2004. The idea was to highlight industries that are of particular significance to the overall Swiss economy – in this case the life sciences sector. The two sector indices – SXI LIFE SCIENCES® and SXI Bio+Medtech® give the industry even greater visibility in the financial market and have a positive impact on liquidity. The maximum weighting of any given stock is limited to 10%, which gives greater prominence to small- and medium-sized companies. The SXI LIFE SCIENCES® index covers companies in the fields of pharmaceuticals, biotechnology and medical technology, while its subindex – the SXI Bio+Medtech® – is focused on biotech and medtech companies.

Table 2: European biotech IPOs in 2004 on regulated markets

Listing Date	Stock Exchange	Issuer	Issue Price in CHF	Transaction Size in MCHF	Market Cap in MCHF*
July 2004	Deutsche Börse	Epigenomics AG	13.7	63.3	218.9
March 2004	SIX Swiss Exchange	Basilea Pharmaceutica Ltd.	98.0	205.8	834.0
March 2004	London Stock Exchange	Ark Therapeutics	3.07	129.1	299.8

Source: SIX Swiss Exchange, website of other stock exchanges

*on the day of the IPO

Table 3: Largest European biotech IPOs on a regulated market in terms of money raised on the day of the IPO

Listing Date	Issuer	Issue Price in CHF	Transaction Size in MCHF	Market Cap in MCHF*
22.05.2007	Addex Pharmaceuticals Ltd	73.0	136.9	398.6
12.12.2006	Newron Pharmaceuticals S.p.A.	55.0	118.1	309.0
04.05.2005	Arpida Ltd.	18.0	97.2	217.7
25.03.2004	Basilea Pharmaceutica Ltd.	98.0	205.8	834.0

Source: SIX Swiss Exchange

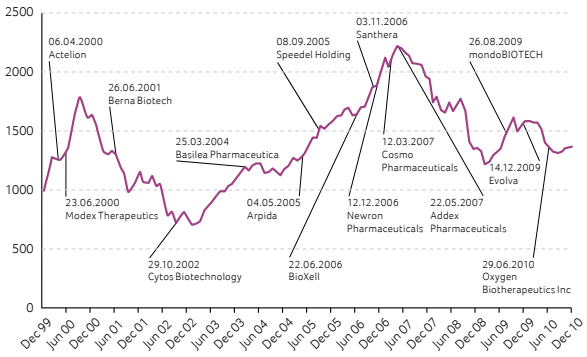
*on the day of the IPO

Both indices are open to Swiss and foreign companies alike, and since their initial calculation in December 1999 the two have also turned in strong performances on an international comparison (Fig. 1 & 2).

Despite the two dips during the past ten years that influenced the performance of the SXI LIFE SCIENCES® index and had an adverse effect on the financing capability of the Swiss biotech industry, biotech companies have been able to raise CHF 1,058 million through IPOs on SIX Swiss Exchange.

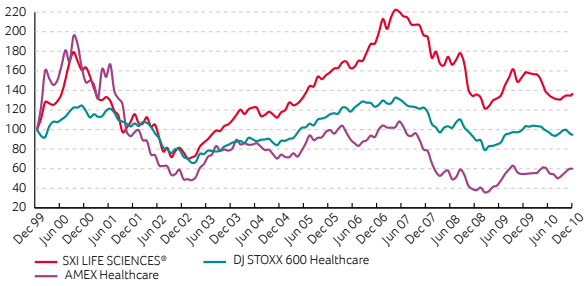
The sector will remain crucial to the Swiss economy and to investors active in Switzerland. The traditionally large number of experienced investors will remain able to evaluate such companies and above all be willing to secure funding for quality companies. When a sustainable improvement in overall market sentiment returns, the practice of raising large amounts of money will continue because of Switzerland's long tradition in financing life sciences stocks and the existing expertise in valuing these.

Figure 1: Biotech listings along the SXI Life Sciences® index



Source: Bloomberg, Jan-2011, SIX Swiss Exchange

Figure 2: Performance comparison of international life sciences indices*



*TR, CHF adjusted, chart on a monthly basis

Source: Bloomberg, Jan-2011, SIX Swiss Exchange

An eventful year: the Swiss biotech performance in 2010

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Audit Services,
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Despite its many ups and downs 2010 largely maintained the momentum of previous years.

All in all a good revenue record

The industry achieved total revenues of more than CHF 9.2 billion compared to CHF 9.3 billion in 2009. This result must be considered as very good, especially taking into account the significant foreign exchange impact caused by the weakening US dollar and the euro. Without that, the unfavourable FX impact the industry's revenue would actually have increased by approximately 11 %

Financing – a tough year but some bright spots

Financing continued to be tough in 2010. Overall, the Swiss biotechnology industry was only able to raise CHF 255 million of new money – a clear setback compared with 2009. However, this decrease needs to be seen in the context of the extensive financing that took place in the previous year. In part the harsh financing environment can also be explained by the somewhat delayed impact of the global financial crisis on Switzerland and the limited exit opportunities via trade sales or IPOs. Investors' sensitivity to risk did not greatly improve in 2010, and the investment profile shifted to more mature, respectively later stage development companies.

Nevertheless some Swiss biotechnology companies were able to obtain fresh funding through their existing collaborations with alliance partners. Biocartis (EUR 30 million), Okairos (EUR 16 million) and again NovImmune (CHF 20 million) were able to acquire larger amounts of fresh money. Despite the tough financing environment, Nextech Venture from Zurich was able to raise EUR 26 million for its new oncology fund.

Market and product innovation progress

The only biotechnology-related activity on SIX Swiss Exchange in 2010 was the secondary listing of Oxygen Biotherapeutics towards the end of June. Otherwise activity was flat. However, with an ongoing stream of filings in 2010 in the US, expectations are strong of another biotech IPO on SIX Swiss Exchange. The public companies Actelion, Basilea and Santhera reported negative third quarter results reflecting negative judgments by the regulatory authority. However, in the case of Basilea an arbitration court decided in favor of the Swiss company and awarded compensation of USD 130 million from its contract partner J & J.

In 2010 there was a string of positive product-related news. Companies like Auris Medical, GlycoVaxyn, Kenta Biotech, Lascco, Neurotune, Polyphor and Senexta were able to report positive data regarding developments. This confirms prior years' pattern of continuing strong efforts in R & D during the crisis rather than cost cuts or postponements.

Higher complexity and flexibility in deals

Reflecting a continuing desire to strengthen their portfolios, many pharma companies turned their gaze on the Swiss biotechnology community. A large number of Swiss companies were able to announce completion of strategic alliances or similar partnership collaborations in 2010 – the agreements between 4-Antibody AG and Boehringer Ingelheim, Basilea and Astellas, and Polyphor and Novartis, to name but a few. While these collaborations demonstrate the high quality of the Swiss biotechnology industry deal structures became more complex reflecting the increased expectations of risk sharing. However, just how quickly such collaborations can unravel was made clear in the case of Santhera. The company had just unveiled a new license agreement with Ipsen in late August when a few weeks later it had to announce the termination of a license agreement with Biovail following a portfolio review in the wake of its merger with Valeant.

M & A activities had a considerable impact on the Swiss biotechnology sector in 2010. During the first quarter Nitec Pharma AG and Horizon Therapeutics Inc. announced their intention to merge as Horizon Pharma Inc and the goal of listing its shares on NASDAQ. This transaction, executed on 1 April 2010, was another example of deals offering a structured exit to investors. To the surprise of most of the Swiss biotech community, the potential IPO candidate PregLem from Geneva, was acquired by the Hungarian specialist pharma group Richter for a price of almost half a billion Swiss Francs in early October. Meanwhile, the option purchase agreement with Actelion and Trophos represented a step acquisition approach in which Actelion has the right to acquire the French company until a certain deadline.

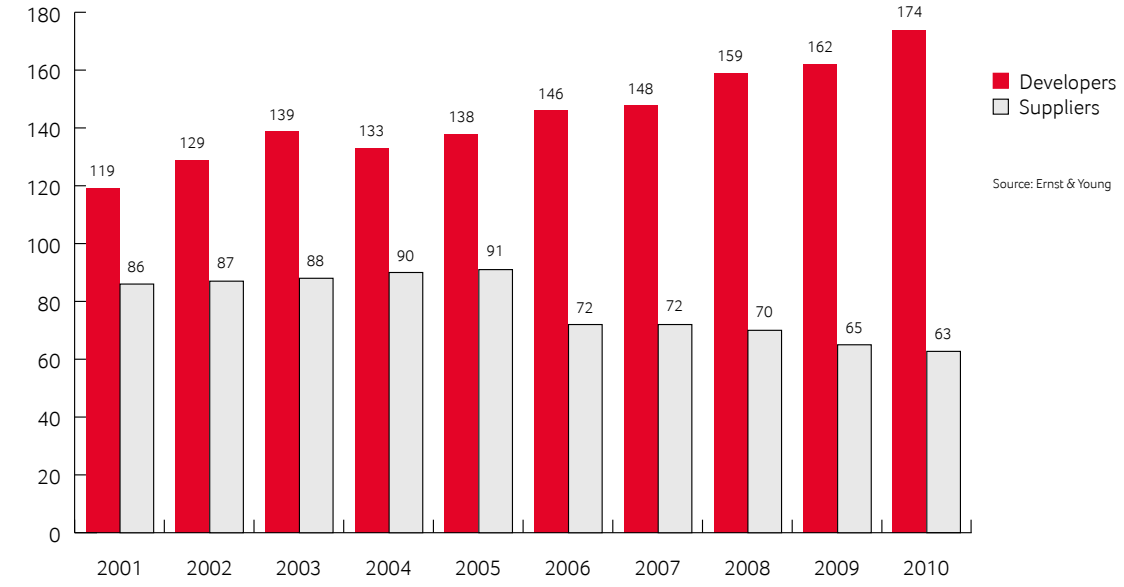
Last but not least – in a deal potentially worth more than USD 400 million – Biogen Idec acquired Panima Pharmaceuticals just before Christmas. This newly founded company, a subsidiary of Neurimmune AG, was used as the shell to bring together three preclinical antibody programmes from the existing collaboration between Biogen and Neurimmune.

An international magnet

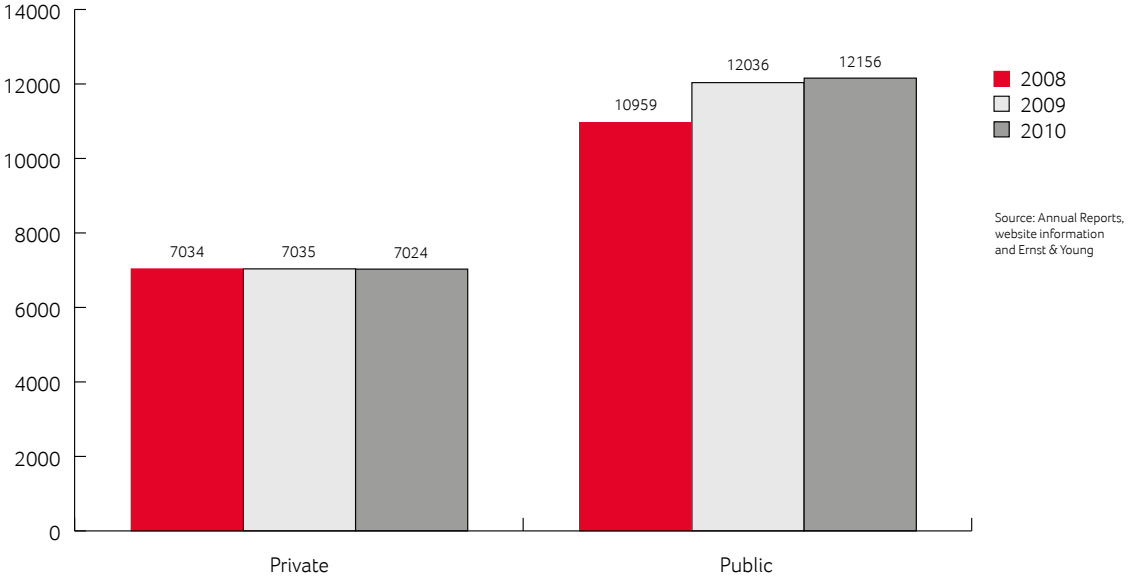
In the second half of 2010 the US company EffRx Pharmaceuticals relocated from Florida to Lausanne and InterMune Inc., California, opened a subsidiary in Switzerland to coordinate its European activities. Coming hard on the heels of the opening of this subsidiary was the decision of EMEA to approve its leading compound.

Facts & figures

Number of biotech companies in Switzerland



Number of employees

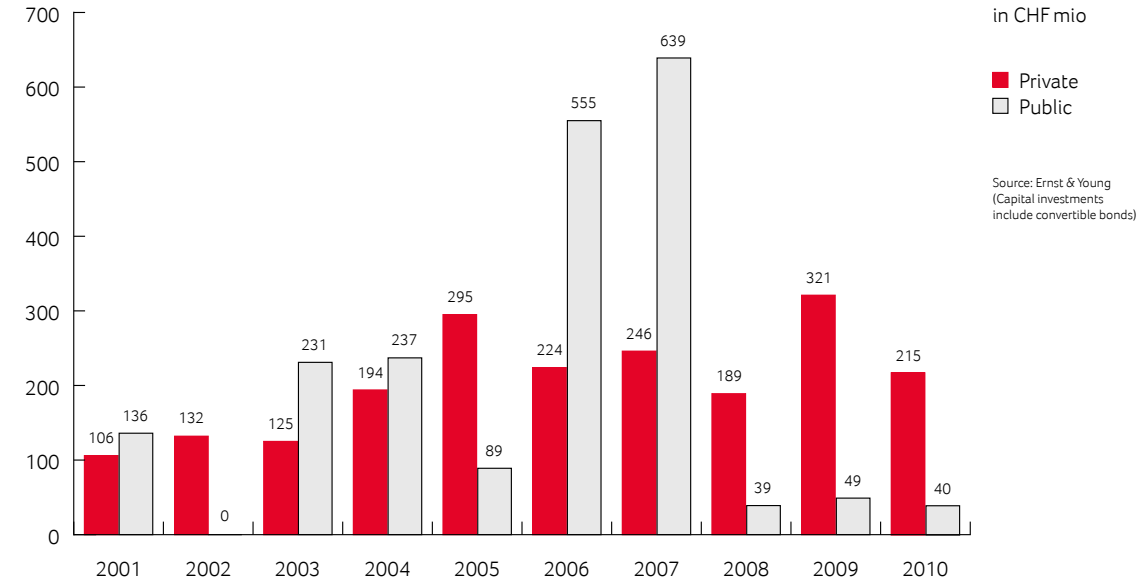


Notes

– The 2010 data in this table are based on the information available in early March 2011, when this report was compiled. At this time some of the companies had not yet disclosed the final financial figures for 2010. Therefore, some figures were carefully extrapolated on the basis of newest interim data publicly available (e.g. Q3 2010).

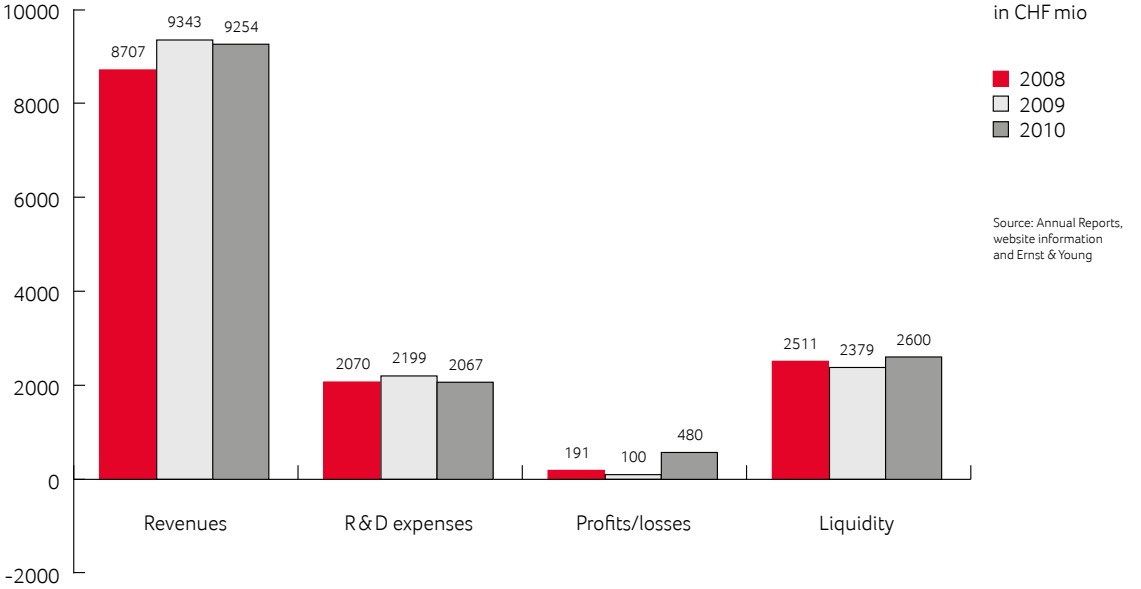
– Merck Serono's operations (a division of Merck Germany) which are operationally headquartered in Switzerland remain in the data analysis with regard to revenues, R&D expenses and employees. The data presented are based on actual figures publicly available or careful estimates.

Capital investment in Swiss biotech companies



Source: Ernst & Young
(Capital investments
include convertible bonds)

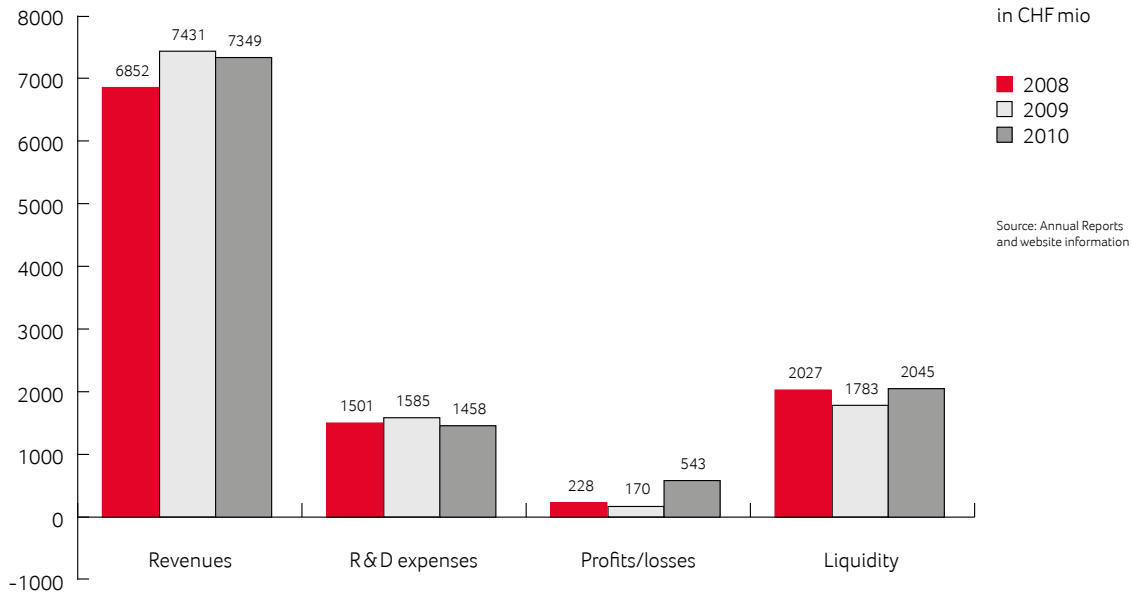
Total Swiss biotech companies



Source: Annual Reports,
website information
and Ernst & Young

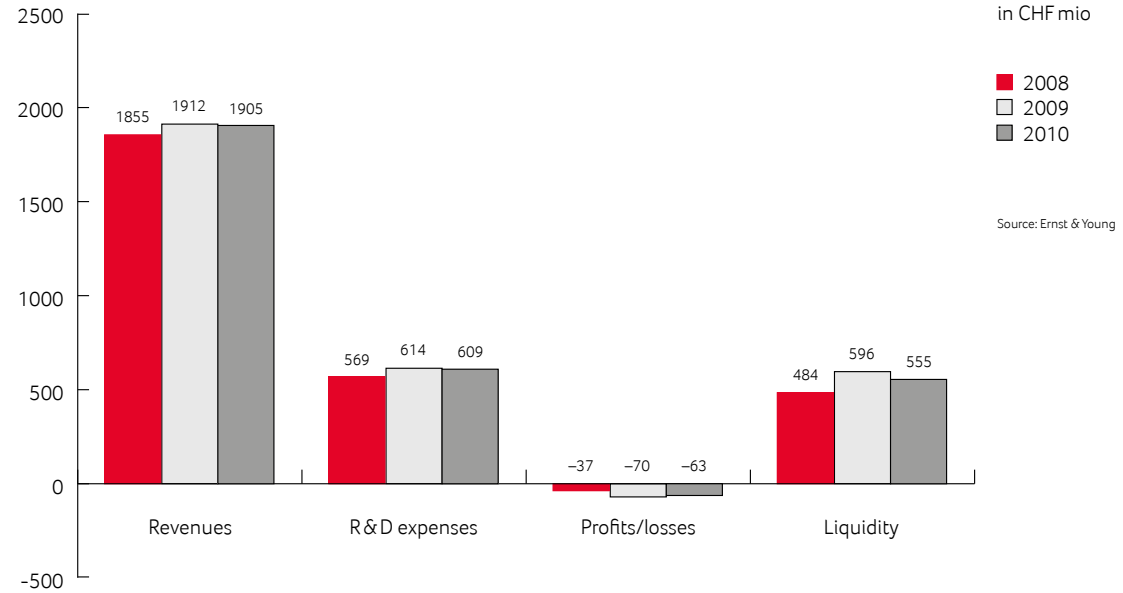
– Financial figures of Lonza's business sectors "Biosience" and "Biological Manufacturing" are included for all years presented based on actual figures publicly available or carefully estimated. Lonza's Bioscience and Biological Manufacturing business sectors are presented due to Lonza's transformation into a life science company and its inclusion into the ICB Biotech Sector and the SXI LIFE SCIENCE® and SXI Bio+Medtech® indices at the SIX Swiss Exchange.
– As some private companies do not disclose financial figures, the figures represent Ernst & Young's best estimate.
– All figures are headquarter-counted.

Public Swiss biotech companies



Source: Annual Reports and website information

Private Swiss biotech companies



Source: Ernst & Young

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