Swiss Biotech
Report 2012

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Editorial

This year's Swiss Biotech Report is a personal delight for me since it focuses on those factors that are key for a successful research career in biotechnology in Switzerland. Exciting, far-reaching personal visions, very high motivation and skills in the art are crucial for each member of the research community, both in industry and academia.

It all starts with a solid education program. Switzerland is in the top rank internationally for education in the life sciences. The early motivation of young people to study natural sciences is paramount for well-qualified future professional generations. Over recent years we have increased the activities for procuring outstanding young talent.

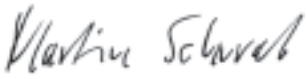
As a result, the Swiss economy can count on a very highly educated workforce supporting research, development and production in different biotechnological and biomedical domains, various markets and different application fields. The functioning network and collaboration between academia, industry – developers, suppliers and manufacturers – financing institutions and service providers is key to a successful economic system.

Our academic system is world-class and we do our best to further strengthen this top position.

Our national research agency system is designed to create knowledge through basic research and, where appropriate, develop the findings into patents and economic success. Many start-up companies are created via this route every year.

The principle of creating value is strongly embedded in the Swiss mentality. These competences will help sustain the global success of Swiss Biotech™ in the future.

Enjoy reading all about it in the Swiss Biotech Report 2012!



Martin E. Schwab
Professor and Chair of Neuroscience
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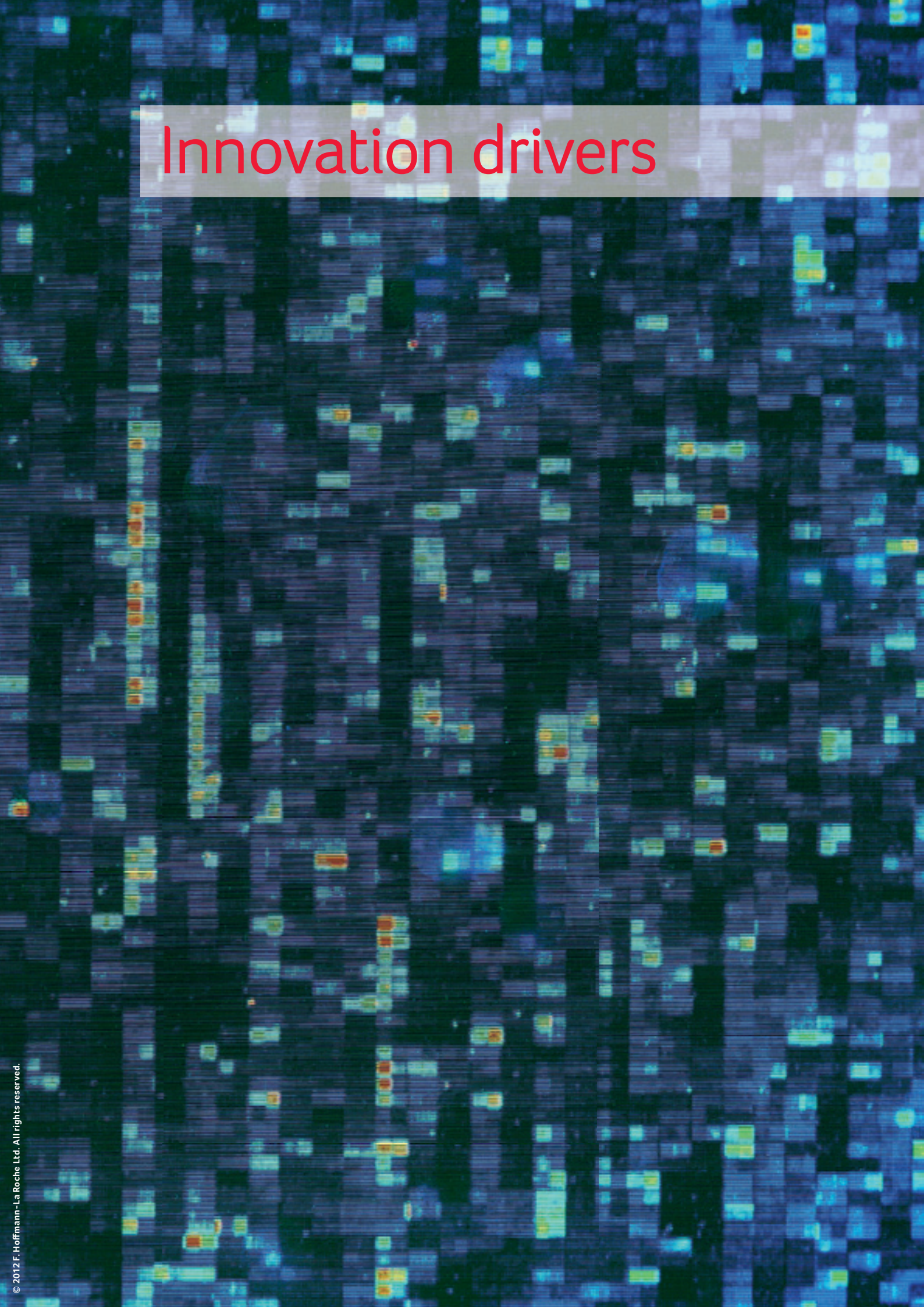
Innovation drivers



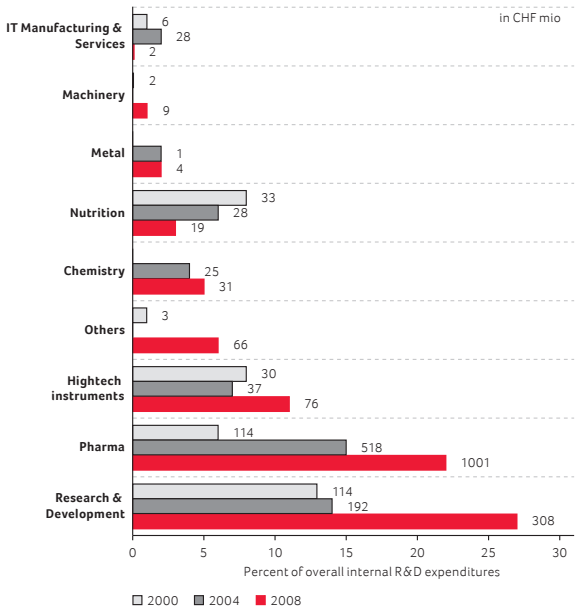
Swiss biotech – creating value from innovation

The Swiss biotech industry has developed over the past decade into an important pillar of the economy. With home-based multinationals and vibrant SMEs (small and medium sized enterprises), it ranks among the top ten biotech industries around the globe and is Europe's innovation leader. Switzerland is home to 249 companies, three quarters of which are core biotech companies with solid research programs, while the remaining quarter form a strong base of biotech suppliers. As a whole, the branch employs more than 19'000 people.

Collaborations and alliances: succeeding together

"When the knowledge base of an industry is both complex and expanding and the sources of expertise are widely dispersed, the locus of innovation will be found in networks of learning, rather than in individual firms." This statement of Walter W. Powell, professor of sociology at Stanford University, may particularly be true for biotechnology, an enabling technology in a variety of industrial sectors (Figure 1), where the most fascinating developments are made at the interfaces of different disciplines.

Figure 1: Intramural R&D expenditures for biotechnology by industry sector



Source: bfs, economiesuisse

Swiss biotech companies are well aware that intellectual and human capital and alliances are amongst their most valuable resources. This research-based and innovation-driven industry is fuelled by the intellectual capital produced by its employees, since highly-skilled staff are absolutely essential for succeeding in such a competitive national and international market. Alliances and collaborations give companies access to complementary resources and knowledge. These are essential for biotech companies, as timely access to knowledge or resources represents a key success factor. Apart from scientific knowledge, innovative approaches to founding research, experience with regulatory approval and registration processes, successful marketing and distribution schemes can be found in networks and public/private interfaces. These have become of the utmost importance in the increasingly complex and dynamic biotech business, and in a difficult economic climate at global and European levels.

Biotech education and research: excellence attracts talent

Both basic and applied research in biology, biotechnology and process engineering are excellent and well established at Swiss universities and universities of applied sciences. The Swiss Confederation has supported biotechnology developments for years, whether through the Swiss National Science Foundation SNSF, the most important Swiss agency promoting scientific research, or the new curricula of studies at our Swiss Federal Institutes of Technology in Zürich (ETHZ) and Lausanne (EPFL). The universities Bern, Basel, Fribourg, Geneva, Neuchâtel, Lausanne and Zürich as well as the universities of applied sciences in Muttenz, Sion and Wädenswil make a fundamental contribution in producing the qualified and competitive manpower that the Swiss biotech industry needs to maintain its leading position worldwide.

Swiss biotech research is perfectly integrated in the European scene. Swiss scientists participate successfully in EU research and cooperation programs, such as the European Union Framework Programme (EU-FP) for Research and Technological Development, the European Technology Platforms (ETP) or the European Cooperation in Science and Technology (COST).

These high standards in education and research – together with a comprehensive social security system, political and economic stability, and an above-average quality of life – are also important in attracting the best students and scientists from across the globe and will continue to represent essential factors in driving innovation in the biotech sector and important reasons why Switzerland is an attractive location for life science companies.

Linking science and business: from discovery to innovation

The effective and consistent transfer of knowledge and technology between the public and private sectors is essential for unlocking the huge commercial potential in academic research. The Federal Commission for Technology and Innovation (CTI), a unique Swiss entity, supports R&D project collaboration between academia and industry, generating commercial value out of university findings. Besides pursuing optimal knowledge and technology transfer, CTI uses thematic networks to help

researchers with brilliant ideas create their own start-ups by coaching them in how to turn their ideas into commercially successful products and services.
Over 40 technology parks and numerous business incubators throughout the country, many of them with excellent resources for biotech start-ups, provide the infrastructure for supporting the transition between research and market. A few of these parks offer direct access to investors and funding bodies.
The Swiss Technology Transfer Association (swiTT) has also played a major role in supporting the interaction between public research and industry. With over 100 members, mostly professionals working in technology transfer at public research institutions or employed in the private sector, swiTT makes its contribution by providing coaching and training and by disseminating know-how for seamless technology transfer. Among other services, swiTT operates the swiTTlist, a unique portal listing current technologies available from Swiss public institutions for licensing and further development by industry. The annually published swiTTreport is the most comprehensive analysis of technology transfer activities of over 30 swiTT member institutions.
A highlight in 2011 was the winning of the Biotechnica award by Unitectra, the technology transfer office of the universities of Bern, Zürich and Basel, a further milestone for professional technology transfer in Switzerland.

Industrial biotechnology: sustainability with commercial potential

Switzerland has become one of the global leaders in the development and production of biopharmaceuticals, vaccines and diagnostics (red biotechnology), with 85% of all Swiss biotech companies playing an active role in this field. However, agricultural (green) and industrial (white) biotechnology may also have a lot of growth potential.
In spite of a still limited, albeit rapidly growing, market share, industrial biotechnology is expected to be one of the strongest driving forces behind the world's transition to more sustainable production and to represent a huge commercial potential for Swiss industry. Switzerland, as a location of a strong and export-oriented life sciences and material sciences industry (over 98% foreign revenues) and innovative and excellent academic facilities, is ideally suited to take the lead in the development, application and transfer of this technology. However, a long-term strategy, favorable regulatory framework conditions, as well as a close and open dialog between industry and academia, managers and researchers, but also between private and public sectors, will be essential to make industrial biotechnology the next Swiss success story.
In 2011, scienceindustries and the Swiss Biotech Association (SBA) together with numerous representatives of Swiss academia and industry have joined forces to raise awareness of, and develop supporting measures for, industrial biotechnology. A first step in this long-term commitment was the submission of a proposal for a new National Research Program (NRP) on "Industrial Biotechnology: Cleantech by Biotech" to the Swiss National Science Foundation (SNSF).

Capturing opportunities in challenging times

The global economic framework in 2011 was not entirely favorable and will remain challenging. Although making forecasts for particular sectors is difficult, the State Secretariat for Economic Affairs (SECO) has downgraded its growth forecast for 2012 to 1.8%. The slowed economy in the EU and the overvalued Swiss franc have put a strain on Swiss industry. Yet, precisely in these challenging times, the development of business and sustainable economic links with emerging markets like India, Russia, China, the Gulf States and Brazil, as well as the investment in new applications with high commercial potential (i.e. industrial biotechnology) may represent a great growth opportunity for the Swiss biotech sector and a unique chance to build sustainable success.

Anna Bozzi, scienceindustries
Cathy Kroll, Swiss Biotech Association

scienceindustries – The Business Association of the Industries of the Future
scienceindustries is the Swiss business association of the chemical, pharmaceutical and biotech industry. scienceindustries supports the innovation strategies of its over 250 member companies by consistently dedicating itself to obtaining internationally exceptional regulatory framework, nationally and internationally. For more information visit www.scienceindustries.ch.

The Swiss Biotech Association (SBA) was founded in March 1998. Today more than 220 companies represent the national association. SBA is the industry association of small and medium-sized enterprises active in all areas of biotechnology as well as a highly respected networking platform for the multinational companies active in the sector. For more information visit www.swissbiotech.org

Government funds for capacity building

Two institutions provide support for basic and applied research respectively: The Swiss National Science Foundation (SNSF) and the innovation promotion agency Commission for Technology and Innovation (CTI).

Let's start by building a scientific base

On the basis of its federal mandate, the SNSF supports all basic research, but also provides funding for co-ordinated research with clearly defined goals for a limited period. The National Centres of Competence in Research (NCCRs) are aimed mainly at strengthening research structures. They promote long-term research projects in areas of vital strategic importance for the development of science in Switzerland, for the economy of the country, and for Swiss society. Each Centre of Competence is under the directorship of a university or other recognized research institution, allowing research groups based at the home institution to network with other teams working throughout Switzerland. Biotechnology and life sciences more generally are core themes within many of the 27 current NCCRs.

The output of the years 2001–2011 is impressive: Numerous books and peer-reviewed scientific papers have been published, including 1612 in the *"Neuro"* domain and 880 in *"Genetics"*. Various patents have resulted from the research, including 50 from *"Neuro"*, 23 from *"Genetics"* and 20 from *"Structural Biology"*. The excellent results have led to cooperation with industry and mobilized third-party funding to the tune of over CHF 36 million. Perhaps the most gratifying impact is the number of start-ups founded during this time and which are still in business; especially Molecular Partner AG in Zürich, a privately owned biopharmaceutical company that is pioneering the development of a novel class of targeted protein therapeutics termed DARPins.

New programmes launched in 2011 deserve a closer look, as the most exciting developments are emerging at the interfaces of disciplines. One example of these fascinating topics is the *"NCCR TransCure"*, which aims to integrate physiology, structural biology and chemistry in order to develop new therapeutic strategies for treating the most important diseases.

It is a fact that intelligent robots will play an increasing role in improving quality of life. The *"NCCR Robotics"* develops new, human-oriented robotic technology.

"NCCR Kidney.CH" is the first research network in the world to explore the physiological processes in healthy and diseased kidneys across a broad thematic spectrum.

The aim in *"NCCR Must"* is to open up new perspectives for the study of molecular systems and time-resolved investigations in physics, chemistry and biology.

By visualizing and controlling biological processes using chemistry, researchers in *"NCCR Chemical Biology"* can develop innovative techniques based on small molecules and proteins in order to obtain new information about cellular processes and control them in-situ.

Table 1: NCCRs with a focus in life sciences

NCCR Title	Duration	Home Institutions	4 Year's Budget (mio CHF)	Homepage
Chemical Biology: Visualisation and Control of Biological Processes Using Chemistry	2011–2014	University of Geneva, EPF Lausanne	27.3	www.nccr-chembio.ch
Kidney.CH: Kidney Control of Homeostasis	2011–2014	University of Zürich	28.0	www.nccr-kidney.ch
MUST: Molecular Ultrafast Science and Technology	2011–2014	ETH Zürich, University of Bern	37.9	www.nccr-must.ch
Robotics: Intelligent Robots for Improving the Quality of Life	2011–2014	EPF Lausanne	30.2	www.nccr-robotics.ch
SYNAPSY: Synaptic Bases of Mental Diseases	2011–2014	EPF Lausanne, Universities of Lausanne and Geneva	43.9	www.nccr-synapsy.ch
TransCure: From Transport Physiology to Identification of Therapeutic Targets	2011–2014	University of Bern	26.5	www.transcure.org
Genetics: Genes, Chromosomes and Development	2001–2013	University of Geneva	28.3	www.frontiers-in-genetics.org
Molecular Oncology: Basic Cancer Research	2001–2013	EPF Lausanne	32.7	www.nccr-oncology.ch
Neuro: Neural Plasticity and Repair	2001–2013	University of Zürich	84.3	www.nccr-neuro.uzh.ch
Structural Biology: Three Dimensional Structure, Folding and Interactions	2001–2013	University of Zürich	27.8	www.structuralbiology.uzh.ch

The *"NCCR SYNAPSY"* combines neuroscience with psychiatry to discover the neurobiological mechanisms underlying mental and cognitive disorders to acquire a better understanding of the origin of these illnesses.
Six of the eight new NCCRs involve the life sciences – a very strong message for Swiss science and industry!

...then transform the results into success in the market

Complementing the SNSF's activities, CTI, the Swiss innovation promotion agency, supports R&D projects, entrepreneurship and the development of start-up companies. CTI helps optimize knowledge and technology transfer through the use of thematic and regional networks and platforms.
In July 2011, the CTI introduced the CTI voucher programme as a new element of innovation promotion. The idea behind this pilot project is to help Swiss-based SMEs and start-up companies improve their innovation capacities. The programme also significantly reduces the amount of time needed for applied research findings to be transformed into marketable products and services. As with standard projects, CTI and the implementation partner each contribute half of the costs of the innovation project, with CTI covering the costs of the chosen research partner. With CTI vouchers, however, it is the implementation partner who looks for the research partner and helps set both the timetable and milestones for the innovation project.
The pilot phase of the voucher programme – which focused particularly on life sciences – closed in December 2011. It met with strong demand, and all vouchers were issued within a short period. By 31 December 2011, the CTI had recorded 41 project requests for public funds of CHF 13 million. Of these, 24 applications for CHF 9 million originated from the life sciences domain. Altogether, the CTI listed 15 granted vouchers for CHF 5.1 million from public funds, including 13 for CHF 4.7 million in life sciences, where the approval rate was 54%.
In order to counter the negative effects of the strong Swiss franc, the Federal Council and the Swiss Parliament decided on compensatory measures and approved a special stimulus package at the end of September 2011. From this stimulus package CTI received an additional CHF 100 million for innovation project funding. CTI immediately launched a special innovation programme and a call for project proposals. The deadline for submission of project applications was 15 December 2011. The goal of this special innovation programme was to enable companies whose profit margins have been affected by exchange rate conditions to quickly work on innovation projects with recognised research institutes under advantageous conditions.
The result was overwhelming: within the space of just two months, CTI received 1064 applications (including 219 in life sciences) for over CHF 532 million. All in all, the CTI approved 246 requests. Each application was reviewed by a team of specialists, and only high-quality proposals were approved. Considering the short time at their disposal, the CTI experts had to process applications on a first-come, first-served basis, which is why hundreds of applications could not even be considered. These applicants are being invited to resubmit their project proposal within the ordinary project promotion programme in 2012. This heavy demand proves that the CTI special innovation programme answers the needs of both companies and research institutions. The allocated project funding mainly concerned projects promising a quick impact on the market or a risky undertaking that a company would not have realized under normal conditions. In the life sciences area, some 69 projects were funded with CHF 33.6 million, much more than is normally the case for an entire year.
"The tremendous response to the CTI special innovation programme attests that Switzerland is one of the world's most innovative countries", states Walter Steinlin, CTI President. "I believe that the approved projects will provide fresh impetus, and I encourage those who missed out to reapply now within the CTI standard project promotion programme in 2012."

Urs Christ, Swiss National Science Foundation (SNSF)
Oreste Ghisalba, Commission for Technology and Innovation (CTI)

The Swiss National Science Foundation (SNSF) is the most important Swiss agency promoting scientific research. As mandated by the Swiss Federal Government, SNSF supports all basic research in all scientific disciplines, from philosophy and biology to the nanosciences and medicine. The focus is on the scientific assessment of projects submitted by researchers. The best applicants are funded by the SNSF to the tune of around CHF 760 million each year. The SNSF supports some 7,000 researchers annually, of whom at least 5,500 are aged 35 years or under. www.snf.ch

The innovation promotion agency Commission for Technology and Innovation (CTI) supports R&D projects, entrepreneurship and the development of start-up companies. CTI helps optimize knowledge and technology transfer through the use of thematic and regional networks and platforms. Support is generally available for R&D projects relating to scientific innovations in all disciplines. Project proposals are submitted using the bottom-up principle and are mainly selected on the basis of their innovativeness and market potential. www.kti-cti.ch

FNSNF
Fonds national suisse
Schweizerischer Nationalfonds
Fondo nazionale svizzero
Swiss National Science Foundation

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs FDEA
Commission for Technology and Innovation CTI
Innovation Promotion Agency

Patent output as a measure of innovation competitiveness

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

Inventions and innovations are critical factors in promoting economic growth, creating jobs, and maintaining competitiveness in a globalized economy. One important rationale for patents is that they stimulate economic and technological development by creating the financial motivation for inventions and innovations. That is why patents are traditionally associated with driving the innovation output. In particular, start-ups benefit greatly from the possibility of obtaining patent protection, which attracts the capital needed for these newcomers' survival and success.

Patents play an increasingly important role in global business strategies. This has resulted in a rapid growth of worldwide patent filings from both businesses and public research organizations. In most of the recently published innovation and competiveness indices such as the WEF Global Competitiveness Index, the Innovation Union Scoreboard and the INSEAD Global Innovation Index, Switzerland has been doing very well. Indeed, patents are one metric that is used in all publications for determining innovative capacity, and particular emphasis is placed on the number of patents issued and the origin of patent applications. All indices use the number of patents per capita as one of the indicators for competitiveness.

Various studies have demonstrated that patents are significantly more important to pharmaceutical and biotechnology companies than to any other high-tech industry. As the costs involved in developing a single drug are enormous and constantly increasing, and while drug imitation is comparatively cheap, the biotech field is a perfect playground for free riders. Protecting the innovations in this field is therefore of great concern.

Biotechnology invention statistics

According to a statistical analysis of the Swiss biotechnology sector, the number of patent applications per capita has been steadily increasing between 2000 and 2010. An in-depth review of the Swiss biotechnology patent landscape has been undertaken with a view to determining and analysing the different types of technologies for which patent protection is requested. Patent documents published from 2008 through 2010 were first categorized by the invention stated in the first claim (Fig. 1). The first claim usually contains the broadest scope and the most important aspects of the invention. During the above-mentioned three-year period, the first claims in about half of all the patent documents concerned a product, while the other half concerned either a method for manufacturing a product, or a method for diagnosis, measurement or analysis. About 30% of the patent documents with a method in their first claim dealt with a production method for a given product, while 70% were concerned with a method for diagnosis, measurement or analysis.

Figure 1:
First claims in biotech patent applications from 2008–2010

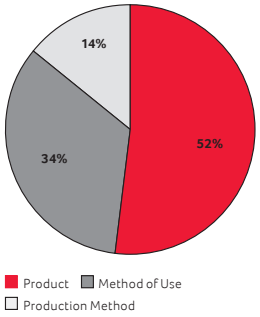
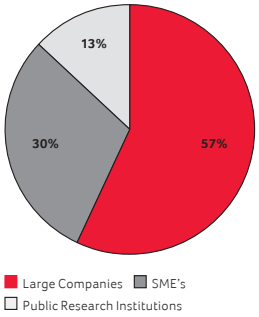


Figure 2:
Applicant types in biotech patent applications from 2008–2010



Categorizing the patent applicants

A second statistical analysis aimed to determine the types of applicant originating from Switzerland. Three main categories were considered: large companies, small and medium-sized enterprises (SMEs) and public research institutions (Fig. 2). Although there is no official definition of SMEs in Switzerland, they are generally considered to employ fewer than 250 people, while large companies are defined as employing more than 250 employees. Public research institutions are defined as being subsidized with government funds and/or receiving financial support from foundations. During the period under review, about 60% of all biotechnology patents were filed by large companies, 30% by SMEs and 10% by public research institutions. Overall, there was no difference between large companies, SMEs, and public research institutions in respect of the percentages of patents with a product versus a method in the first claim. This may reflect the fact that public research institutions and SMEs in Switzerland are often sub-contractors or suppliers to large companies, which highlights another measure of competitiveness, i.e. the knowledge and technology transfer from public research institutions and SMEs to large companies. Similar percentages of patent applications for manufacturing methods as well as for methods for diagnosis, measurement or analysis were calculated from filings by all three categories of applicants.

Mapping the Swiss biotechnology landscape

In a third analysis, a patent landscape map was created on the basis of the full text of all Swiss biotechnology patent documents during 2008–2010 (Fig. 3). Landscape maps are created through a linguistic analysis and the positioning of patents on a map according to their linguistic relatedness. Thus, the more closely related patents are, the nearer they are to each other on

the map. Groups of closely related patents are then pictured as elevations on the map, whereas patents that are only loosely related are represented as flat country or sea. This facilitates the identification of technology areas and patent relatedness. Patents from large Swiss companies were found in every area of the map, which shows that these companies are more or less active in all technical areas of biotechnology. The highest elevations (accumulation of patents with the lexemes of "insect, seed, plant") did not reveal any patents from public research institutions and only very few patents from SMEs. This area on the map seems to be highly dominated by Syngenta, with their seed technologies in particular. The second elevation where no patents from public research institutions and SMEs were found was characterized by the lexemes of "lactobacillus, bifidobacterium, neutral". Nestlé is clearly most active in this technology area, although other large companies were also identified in this cluster. Furthermore, in one elevated area "vaccine, immunogenic, adjuvant" patents could be found from large companies and SMEs only, but not from public research institutions. The company which is most active in this area is Novartis. Additionally, two elevations were identified where large companies and public research institutions were active, but where no patents from SMEs were present: "strand, region, phosphoramidate non-natural base" and "hepatitis virus, strand, representative". In both of these areas, patents from Hoffmann-La Roche and Novartis were most prevalent. It seems that, even though only large companies are active in all technology areas, SMEs and public research institutions are also actively patenting in most of the promising technology fields, or even in niches not covered by the big companies. This result clearly confirms that Switzerland offers a diverse biotechnology landscape, with a high level of involvement and interactivity between all partners regardless of their mission, organizational size or structure.

Figure 3: Patent mapping of Swiss biotech patents from 2008–2010

Note: Patents from SMEs are displayed as red dots, patents from public research institutes as blue dots, white dots display areas with patent applications from SMEs and public research institutions.

The Swiss Federal Institute of Intellectual Property is the official government body for intellectual property rights in Switzerland and is responsible for examining, granting and administering these rights. The Institute's services also include tailor-made searches for trademarks and patent information and training courses on various aspects of intellectual property. For further information visit www.ige.ch.

biotechnet Switzerland – pleasure in the job puts perfection in the work

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

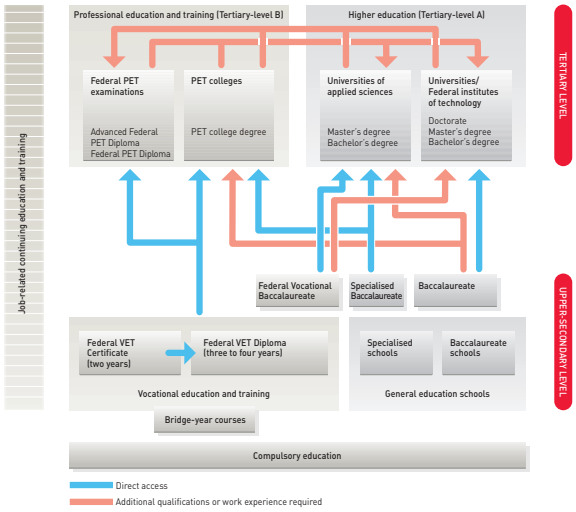
These words of the Greek philosopher Aristotle are more topical than ever. Jasmine Audemars, chairwoman of the Audemars Piguet Foundation recently called to mind how the successful watchmakers in the Jura Mountains have always made the most sophisticated clock mechanisms by nurturing a real passion for their masterpieces.

In his book "The Craftsman", the American sociologist Richard Sennet calls for the reimagining of the Enlightenment, not in terms of ideas but rather of the way in which craftsmen learned to work. He moves for the restoration of the values of individual work and the creation of a working environment where human beings like to do the best at their job.

Enthusiasm is contagious

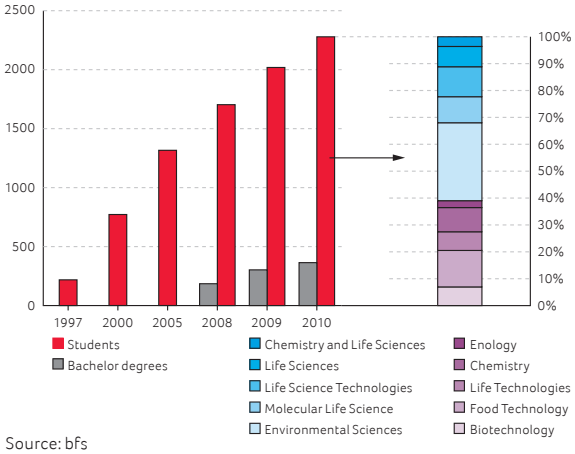
As this craftsmanship represents an attitude, we at *biotechnet* think that young people should be given sufficient time and space to develop their mental, physical and emotional abilities. Mastership is the result of concentrating on the essential things in life. Our bachelor and master graduates in biotechnology have learned important techniques and know how to incorporate them in a specific context. Capable of enhancing the value chain with their special skills, they are ideally qualified for the manpower market. Such professionals are able to reproduce complex operations, to repair and to improvise, taking pride in their performance and their expertise. They are the guarantors for enabling the Swiss life sciences sector to meet with success even in economically difficult times.

Figure 1: Switzerland's dual education system



Source: BBT

Figure 2: Development of students and bachelor numbers and specializations within life sciences.



Source: bfs

All kinds of "biotechnologists" with a Bachelor or Master of Science in Life Sciences from the Universities of Applied Sciences (UAS) take on demanding project management tasks in the pharmaceutical, chemical, food and cosmetics industries. They are responsible for implementing laboratory processes in industrial production. Master's degree programs in Biotechnology are offered at the Swiss Federal Institute of Technology in Zürich, where students acquire solid scientific training in Systems Biology, Synthetic Biology and Biotechnology. Electives provide a deeper understanding of topics specific to biotechnology and extend the students' knowledge in related areas. At the Swiss Federal Institute of Technology in Lausanne, students can complete a Master of Science in Molecular and Biological Chemistry, Chemical and Biochemical Engineering, Life Sciences and Technology, or in Bioengineering, where it is ranked in 3rd place worldwide.

One network, different orientations

As regards the internationally recognized UAS, each school has its own particular orientation. The ZHAW School of Life Sciences and Facility Management is a centre of expertise in the fields of nutrition, health, society and the environment. Its Master of Life Sciences sets priorities in Pharmaceutical Biotechnology, Chemistry for the Life Sciences, Food and Beverage Innovation and Natural Resource Sciences. In Pharmaceutical Biotechnology the spectrum ranges from drug targeting via the design of the expression system, the cultivation and processing steps through to the production and diagnostics of biologically active molecules.

"Talented, competent and inspired people are the key success factor both in economic competition and social change."

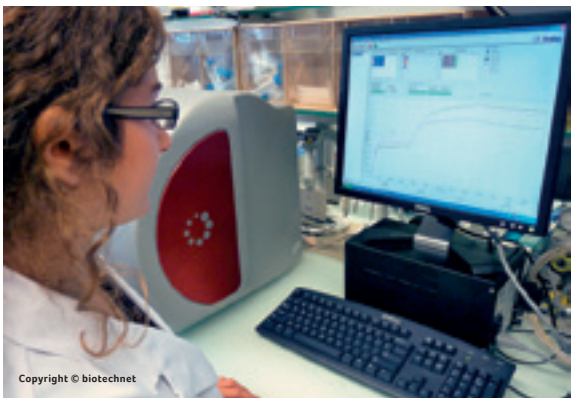
Christoph Mäder, president, scienceindustries

At the UAS Western Switzerland (HES-SO), the areas of specialization are Industrial Life Sciences (chemical development and production, bioconversions and bioprocesses, analytical sciences and natural product chemistry), Food, Consumer Health and Enology (including food safety management), and Applied Environmental and Natural Resources Sciences.
The School of Life Sciences FHNW at the UAS Muttenz has a privileged position as it is located at the heart of Switzerland's chemical industry, which is placed at the top of the research-focused life sciences rankings, together with the areas of New York and Boston. Its Master of Science in Life Sciences sets priorities in Molecular Technologies (synthesis and analysis of active compounds and their analysis in biological systems) and in Therapeutic Technologies (pharmaceutical technologies and medical engineering for disease treatment). The start of a new focus area is expected to emerge in the course of 2012 in the form of Environmental Technologies, i.e. science-based strategies and environmental technologies in industry.

Feeling the pulse of industrial needs

In response to the urgent demand for scientific staff in micro- and nanotechnology, an extra vocational Master's program was developed in a joint project organized by ZHAW, Empa St. Gallen, NTB Buchs and the Fachhochschule Vorarlberg.
In a transnational strategy, a Master of Science in Biotechnology is offered by the Universities of Strasbourg, Basel and Freiburg.

At the request of their industrial partners, the UAS also organize special training events. The HES-SO initiated a three-day summer school in Sion, offering an introduction to ethics, especially bioethics. The international relationships of the FHNW Muttenz have resulted in student exchanges with Palermo University, Linköping University in Sweden, Fachhochschule Innsbruck and Harvard University. For the Basel-based company Roche, a course on the *Cultivation of animal cells in single-use bioreactors* was arranged at the ZHAW in Wädenswil, as well as an FMH training course in phytotherapy and neural therapy. The ZHAW Institute of Biotechnology maintains excellent relationships with the Institute of Chemical Technology in Prague. Joining forces, in June 2011 the researchers organized their 5th Czech-Swiss Symposium in Prague and agreed on a future student exchange for master's degree students and post-docs.
Students today can choose from a wide range of professional options and universities with high academic standards, all pursuing the same goal, outlined by the French poet and journalist Anatole France: "The whole art of teaching is only the art of awakening the natural curiosity of young minds for the purpose of satisfying it afterwards."



biotechnet Switzerland, the network of the Swiss Universities of Applied Sciences (UAS) and Empa's biomaterials group, is the one-stop shop for innovation in technology where companies – especially small and medium-sized ones – can easily find the specialist contact person for a specific development. For further information visit www.biotechnet.ch

More than ever, life science researchers need bioinformatics expertise and support

Prof. Ron Appel
Executive Director
SIB Swiss Institute of Bioinformatics

When SIB was founded in 1998, bioinformatics was still in its infancy. Since then, new techniques such as next-generation sequencing have revolutionised the life science research activities, and the amount of data generated is daunting. Bioinformatics support has become indispensable to any life science research project. This is why SIB can count on an ever-growing number of research and service groups. SIB started its venture with barely a handful of groups and totals 31 groups today, with a possible eight additional ones this year. Often acting behind the scenes, bioinformatics experts nonetheless form the backbone of important life science breakthroughs.

An amazing venture that started 25 years ago

The venture of Swiss bioinformatics began in the early 1980s with proteome and protein bioinformatics and was followed, in 1986, by the creation of Swiss-Prot, a database dedicated to protein sequences following the original idea of Prof. Amos Bairoch. The database was an immediate huge success amongst life science researchers. And when it faced a major crisis ten years later due to the non-renewal of its funding, an open call for support received amazing support worldwide, both from researchers and the media. The SNSF subsequently granted additional funding for two years to help Swiss-Prot find a long-term solution, which was achieved in 1998 with the creation of the SIB Swiss Institute of Bioinformatics. In June 2011 Swiss-Prot celebrated its 25th anniversary, and the database is now, more than ever, an indispensable resource for life science researchers the world over, who consult it as naturally as we would use a dictionary. Over the years many other resources have emerged from the database, and these offshoots are gathered today on ExPASy, SIB's bioinformatics resource portal, which offers some 160 tools for supporting life science research. These resources cover a wide range of areas and include proteomics, systems biology, imaging and drug design, to name only a few. Apart from tools such as Swiss-Model (server for modelling three-dimensional protein structures) and STRING (Search Tool for the Retrieval of Interacting Genes), which have proved their sustainability over the years, SIB continues to widen its range of resources, for example with the recent development of neXtProt, a knowledge platform dedicated to human proteins.

No research project without bioinformatics

Not only do these resources reflect SIB's important development, they also mirror the reality of today's life science research. Data sequencing is becoming faster and cheaper, resulting in increased data production, and this trend will undoubtedly continue. But the quantity of data alone is not a guarantee of progress. Data need to be stored in a sustainable way so that they can be accessed but, more importantly, they require meticulous annotation – and this is where the expertise of the Swiss-Prot and neXtProt annotators makes the difference. This said, the SIB has more than one string to its bow and represents more than just the creation and maintenance of databases. Indeed, it gathers experts in a varied number of bioinformatics fields, who are involved in an increasing number of academic and industrial projects. Often acting behind the scenes, SIB scientists support huge life science research projects by annotating key proteins, developing algorithms and providing statistical expertise. And Vital-IT – SIB's high-performance computing and competence centre – is increasingly in demand by scientists around the Lake Geneva region.

"The Swiss Institute of Bioinformatics' work, and in particular Swiss-Prot, has been an invaluable resource for the work of myself and my colleagues both here at New England Biolabs and throughout the world."

Richard J. Roberts, Chief Scientific Officer, New England Biolabs, Nobel Prize in Physiology or Medicine 1993

Looking to the future

SIB also plays a major role in training the next generation of bioinformaticians. In this respect, SIB has incorporated the promotion and coordination of bioinformatics education into its mission. The expertise of SIB members is used in a variety of courses, workshops and seminars. Always looking to the future, SIB is also a major player in ELIXIR, the pan-European initiative to operate a sustainable infrastructure for managing and safeguarding biological information in Europe. SIB is to act as Switzerland's node and will share its experience and expertise as one of the leading bioinformatics institutes on the international scene.

Modelled on Switzerland's federal structure, the SIB Swiss Institute of Bioinformatics is organised as a federation of bioinformatics research groups from leading Swiss universities and the Swiss Federal Institutes of Technology. SIB comprises 31 world-class research and service groups with over 480 researchers in Basel, Bern, Fribourg, Geneva, Lausanne and Zürich. It has a long-standing tradition of producing state-of-the-art software for the life science research community, as well as carefully annotated databases including UniProtKB/Swiss-Prot, the world's most widely used source of information about proteins. For further information visit www.isb-sib.ch, www.expasy.org

Economic output

Year in review – Swiss biotech (selection of events in 2011)

Trigger	Company/Institution	Description
January 2011		
Financing	Vaximm	Vaximm closed a CHF 7.8 million funding round with investors BB Biotech Ventures, Merck KGaA, Sunstone Capital, Merck Serono Ventures and BioMedPartners.
Marketing Authorization	Prionics	Prionics received marketing authorization for its Tuberculin PPD kit (intradermal skin test for bovine tuberculosis) in the UK, Ireland and the Netherlands.
Collaboration Agreement	Helsinn Healthcare	IS Pharma entered into a strategic alliance with Helsinn. The two companies will ally in cancer and supportive care.
Regulatory Clearance	Ares Life Sciences	Ares Life Sciences and Stallergenes published the needed regulatory filings for the takeover offer.
Collaboration Agreement	Biocartis	Biocartis entered into a strategic agreement with Janssen Pharmaceutica to co-develop assays.
Merger	Synosia	Biotie and Synosia signed a combination agreement. The combined entity includes a pipeline of nine clinical-stage drug candidates and operations in Finland, the US and Switzerland.
License Agreement	Selexis	Selexis and Neogenix Oncology entered into a license agreement to commercialize NPC-1C. Terms of the agreement were not disclosed.
Financing	Diagnoplex	Diagnoplex closed a CHF 10 million series A financing extension with Debiopharm Group. Additional investors were Novartis Venture Fund, NeoMed and Initiative Capital Romandie.
Orphan Drug Designation	Octapharma	The FDA granted Octapharma orphan drug exclusivity for Wilate, a replacement therapy for von Willebrand disease (VWD). VWD is an inherited bleeding disorder.
Patent Protection	Anergis	Anergis received the notice of allowance of its key technology patent (Application n° 10/799,514) from the US Patent Office.
Share Repurchase Program	Lonza (LONN)	Lonza decided to purchase up to one million own shares (1.89% of its share capital) within a period of one year.
Program Discontinuation	Actelion (ATLN)	Actelion and GSK discontinued the clinical development of almorexant. The decision followed a review of data from additional clinical studies.
February 2011		
Expansion	Solvias	Solvias relocated from Basel to Kaiseraugst into a new office and laboratory building.
Financing	Dualsystems Biotech	Dualsystems Biotech obtained funding from Swiss Mäxi Foundation to investigate the molecular mechanisms underlying fibrodysplasia ossificans progressiva.
Shareholder Attack	Actelion (ATLN)	Hedge fund shareholder Elliott Advisors called for Actelion's management to abandon its plan to stay independent and requested the resignation of Chairman Jean-Paul Clozel.
Collaboration Agreement	Debiopharm Group™	Debiopharm will pay up to USD 25 million in R&D milestones to Marina Biotech on a preclinical program for an RNAi-based therapy against non-muscle invasive bladder cancer.
Patent Protection	Santhera Pharmaceuticals (SANN)	United States Patent and Trademark Office and the Canadian Intellectual Property Office granted Santhera patent protection for the use of omigapil for the treatment of congenital muscular dystrophy until 2027 and 2026, respectively.
Collaboration Agreement	Lonza (LONN)	KaloBios Pharmaceuticals signed a research and commercial agreement with BioWa and Lonza.
Collaboration Agreement	GeneBio	AB SCIEX and GeneBio announced their intention to co-market joint solutions for rapid screening of large sets of molecules.

Research Grant	Newron (NWRN)	Newron is to receive a total payment of EUR 3.7 million under the Italian government R&D support program, as part of a EUR 5 million grant for innovative R&D.
Collaboration Completion	Santhera Pharmaceuticals (SANN)	Santhera announced that the transition of the fipamezole program back from Biovail was successfully completed.
Expansion	Carbogen Amcis	In compliance with the latest ICH guidelines, the company has installed new stability chambers at the operations in Hunzenschwil, Switzerland.
Research Grant	Cytos (CYTN)	Cytos Biotechnology will receive EU funding to work on novel vaccine approaches for emerging viral diseases.
Research Grant	Neurotune	Neurotune will be leading a consortium of research teams in the Eurostars DISARCO project (immunoassay for the diagnosis of sarcopenia). The consortium has received EUR 720,000.
Research Collaboration	Givaudan (GIVN)	Givaudan will develop a derivative of Biofene™ (farnesene) using Amyris's bio-based technology and production platform.
Positive Study Results	Evolva (EVE)	In pre-clinical efficacy data Evolva demonstrated that EV-077 reduced clinical disease scores in a similar manner to Tamiflu.
March 2011		
Study Launch	Auris Medical	Auris Medical started a phase II clinical trial with AM-101 for the treatment of acute inner ear tinnitus (TACTT1 study). AM-101 is a receptor antagonist.
Financing	Malcisbo	Malcisbo secured CHF 2.4 million in the first round of financing from ZKB.
Research Collaboration	Galderma Pharma	AstraZeneca and Galderma entered into an R&D collaboration to develop new treatments for dermatological conditions including psoriasis, acne and atopic dermatitis.
Orphan Drug Designation	Mondobiotech (RARE)	Mondobiotech received the FDA Orphan Drug Designation for the treatment of sarcoidosis. Sarcoidosis is a multisystemic disorder of unknown cause.
Financing	Addex (ADXN)	Addex announced that the zero-coupon mandatory convertible notes (MCN) were converted into ordinary shares. The MCN held by Biotechnology Value Fund represents 17% of the outstanding share capital.
Study Launch	Lumavita	Lumavita entered into phase I with LMV-601, a small molecule against the human papilloma virus (HPV).
Acquisition Update	Ares Life Sciences	Ares Life Sciences, holding 73.18% of Stallergenes shares, launched a mandatory takeover offer for all remaining outstanding shares.
Stock Exchange Index Inclusion	Evolva (EVE)	Evolva shares will be included in the Swiss Performance Index (SPI) starting 4 April 2011. The shares have exceeded the 20% free float hurdle since the partial release of the lock-up agreement in December 2010.
Regulatory Clearance	Evolva (EVE)	The FDA cleared Evolva's Investigational New Drug application for EV-077 in influenza.
Study Launch	Addex (ADXN)	Addex started a phase IIa clinical trial of ADX71149 for the treatment of schizophrenia. Addex will receive a EUR 2 million milestone payment from Ortho-McNeil-Janssen Pharmaceuticals, now Janssen Pharmaceuticals, Inc.
Financing	Anergis	Anergis closed a series A financing round raising CHF 18 million. Vinci Capital-Renaissance, BioMedInvest and Sunstone Capital were the lead investors. Esperante, Initiative Capital Romandie and private investors joined in the round.
Expansion	Lonza (LONN)	Lonza will invest GBP 16 million to further develop its Slough manufacturing facility.
Financing	Mondobiotech (RARE)	Mondobiotech announced the terms of a share capital increase. The increase is related to the authorized share capital. Mondobiotech has received commitments for 164,489 offered shares (total amount of CHF 8.06 million).
Study Launch	Addex (ADXN)	Addex initiated a phase IIa clinical trial to evaluate dipraglurant (ADX48621) in patients with Parkinson's disease. The U.S. and European study is supported in part by a grant from the Michael J. Fox Foundation for Parkinson Research.
Collaboration Agreement	Newron (NWRN)	Newron entered into a collaboration agreement with Merck Serono. Newron will receive a development license for two clinical-stage compounds (pruvanserin and sarizotan). Merck will retain buy-back options for each compound.

Award	Actelion (ATLN)	Actelion received the "Prix Hermès de l'Innovation" in the category "improvement in the conditions of human life" for its innovative research work in children with pulmonary arterial hypertension.
Award	Genedata	Genedata received the 'Topics Award 2011' from the Japan Society for Bioscience, Biotechnology and Agrochemistry.
Collaboration Agreement	Cytos (CYTN)	Cytos entered into an R & D agreement for the preclinical development of a malaria vaccine with the Walter Reed Army Institute of Research (WRAIR).
Financing	BioVersys	BioVersys raised CHF 2.5 million in a seed financing round. EVA was the lead investor, the other shareholders are associated to the BioValley Business Angels Club BioBAC.
April 2011		
Acquisition	Evolva (EVE)	Evolva acquired its R & D partner Abunda Nutrition in return for 25 million Evolva shares (around CHF 40 million). Furthermore, additional shares will be allotted if certain milestones are achieved.
Publication	Santhera Pharmaceuticals (SANN)	Santhera published details on the mode of action of idebenone (brand name Catena®) in PLoS ONE (Public Library of Sciences ONE).
Inauguration	Technologie Park Basel	The Technologie Park Basel started its operation as the home for technology startups.
Collaboration Agreement	Syngenta (SYNN)	Syngenta and Bayer CropScience announced a co-development agreement on an HPPD herbicide tolerance trait for soybeans.
License Agreement	Cell Culture Technologies	Cell Culture Technologies and the Swiss Federal Institute of Technology (ETH Zürich) signed a License and Technical Assistance Agreement.
Distribution Agreement	Lonza (LONN)	Lonza and Roche entered into a co-exclusive distribution agreement for the marketing of Roche's MycoTOOL mycoplasma polymerase chain reaction assays.
License Agreement	Debiopharm Group™	Debiopharm and Aurigene signed an agreement for the development and commercialization of Debio 1142, an inhibitor of an undisclosed oncology pathway.
Collaboration Agreement	Friedrich Miescher Institute for Biomedical Research (FMI)	The FMI assumed the status of an "affiliated institute" of Basel University to strengthen their existing cooperation.
Milestone Achievement	4-Antibody	4-Antibody successfully achieved a first milestone in its collaboration with Boehringer Ingelheim.
License Agreement	Lonza (LONN)	Lonza and Organobalance signed a global license agreement to develop and market probiotics.
Study Completion	Molecular Partners	Molecular Partners completed two phase I/IIa clinical trials with MP0112, a molecule targeting VEGF-A. The DARPin molecule was shown to be safe and well tolerated in wet age-related macular degeneration and diabetic macular edema.
May 2011		
Financing	Delenex Therapeutics	Delenex obtained an additional series A financing of CHF 16.7 million (total series A financing of CHF 30.2 million).
Court case	Actelion (ATLN)	A jury awarded Asahi Kasei Pharma up to USD 547 million in compensatory damages. The case concerns the dispute involving the license and development agreement between Asahi and CoTherix (now Actelion).
License Agreement	Debiopharm Group™	Debiopharm and Yale University announced an exclusive license agreement for the development and commercialization of Debio 1036, an inhibitor for autoimmune and inflammatory diseases.
License Agreement	Molecular Partners	Allergan and Molecular Partners entered into a license agreement for MP0112 for the treatment of retinal diseases. Molecular Partners will receive an up-front payment of USD 45 million and additional payments of up to USD 375 million.
Shareholder Attack	Actelion (ATLN)	Elliot's request for information was addressed by the Board of Directors.
Positive Study Results	Santhera Pharmaceuticals (SANN)	Santhera presented positive data from a study evaluating Catena for the treatment of Friedreich's ataxia. The findings indicated that Catena can offer therapeutic benefit to pediatric patients by improving overall neurological function.

Milestone Payment	AC Immune	AC Immune received a milestone payment from Genentech (Roche Group). The milestone was reached upon the first patient being dosed with the anti-Abeta antibody MABT5102A under a phase II clinical trial in patients with mild to moderate Alzheimer´s disease.
Positive Study Results	Santhera Pharmaceuticals (SANN)	Santhera Pharmaceuticals presented first analyses of the 2-year open-label study (DELPHI-E) evaluating Catena® for the treatment of Duchenne muscular dystrophy.
Collaboration Agreement	Dualsystems Biotech	Dualsystems entered into a collaboration agreement with PTC Therapeutics.
Drug Filing	EffRx Pharmaceuticals	The New Drug Application (NDA) for the company's lead development program EX101 has been accepted for filing by the US Food and Drug Administration.
Expansion	Lonza (LONN)	Lonza plans to invest CHF 24 million to expand its cytotoxic manufacturing capabilities in Visp, Switzerland. Cytotoxic APIs are commonly used in oncology therapeutics.
Research Grant	ChromaCon	Merus and ChromaCon announced a EUREKA Eurostars grant of EUR 1.8 million to discover and develop antibodies for the treatment of metastatic breast cancer.
FDA Warning Letter	Octapharma	The FDA issued a Warning Letter as a result of a manufacturing site inspection at Octapharma's Stockholm facility.
Share Sales	Evolva (EVE)	Evolva's core shareholders agreed to extend the coordinated sale of their shares. The process should increase the free float.
Subsidiary	Otsuka Pharmaceutical	Otsuka has established Otsuka SA in Geneva as the company's base for central operations in connection with its global tuberculosis (TB) program.
Innovation Network	Dualsystems Biotech	Thirteen proteomics service and product providers formed the Proteomics Innovation Network. The mission will be to generate "from sample to discovery" solutions.
CE Mark	Nano Bridging Molecules	Nano Bridging Molecules received CE Mark (Conformité Européenne) approval for its SurfLink® Dental product.
Orphan Drug Designation	Mondobiotech (RARE)	Mondobiotech obtained FDA Orphan Drug Designation for the product candidate DasKloster0014, used for the treatment of hepatocellular carcinoma.
Expansion	Lonza (LONN)	Lonza is to expand the viral-based therapeutics business in Houston, Texas. Construction and validation are expected to be completed in 2012.
License Agreement	ChromaCon	Roche Diagnostics purchased an MCSGP-unit and obtained rights to use ChromaCon's MCSGP technology.
Positive Study Results	Actelion (ATLN)	Actelion's CRTH2 antagonist met the primary endpoint in a phase II study for seasonal allergic rhinitis.
License Agreement	Glenmark Pharmaceuticals	Glenmark Pharmaceuticals out-licensed its monoclonal antibody GBR 500 to Sanofi to develop the molecule for Crohn's disease and other inflammatory conditions. Combined upfront and potential milestone payments could total USD 613 million.
Positive Study Results	Phytoceuticals	Phytoceuticals presented promising clinical and scientific data on "1 PRIMARY WOUND DRESSING®".
Collaboration Termination	Mondobiotech (RARE)	Mondobiotech and Lung Rx terminated the license agreements on the Aviptadil platform and on Secretin.
Collaboration Agreement	4-Antibody	4-Antibody entered into an R&D alliance with the Ludwig Institute, New York on molecular targets which are important in the suppression of the immune response in cancer.
Financing	GenKyoTex	GenKyoTex raised CHF 18 million in a series C financing led by Edmond de Rothschild Investment Partners. Proceeds will be used for the clinical development of the lead compound GKT137831 for the treatment of diabetic nephropathy.
Distribution Agreement	GeneBio	John Wiley & Sons announced a global non-exclusive distribution agreement with GeneBio SA.
Marketing Authorization	Octapharma	The European Commission adopted the EMA's recommendation to lift the suspension of the marketing authorization of octagam and octagam 10%.
June 2011		
Collaboration Agreement	Biolytix	Biolytix and fish4future® developed a process to prove and guarantee the traceability of sustainably cultivated seafood all the way to the consumer.

Positive Study Results	Santhera Pharmaceuticals (SANN)	Santhera presented efficacy data for Catena® in a rodent animal model of Leber's Hereditary Optic Neuropathy (LHON)]. Catena® demonstrated protection from retinal ganglion cell death and other LHON-typical retinal pathologies.
Expansion	Lonza (LONN)	Lonza will invest CHF 10 million to expand its biopharmaceutical development services in Singapore.
Collaboration Agreement	SIB Swiss Institute of Bioinformatics	The University of Geneva (UNIGE), Geneva University Hospitals (HUG) and the SIB Swiss Institute of Bioinformatics announced the creation of a strategic collaboration with Roche in translational medical research.
Integration	Bachem (BANB)	Bachem completed the integration of Sochinaz SA, Vionnaz, into Bachem AG.
Collaboration Agreement/ Financing	Kareus Therapeutics	Kareus entered into a drug development alliance with Quintiles. Quintiles made an undisclosed USD million investment in Kareus.
Milestone Payment	Evolva (EVE)	Evolva received its first milestone payment from Roche for the achievement of purified active compounds on targets in oncology and infectious disease.
Research Grant	AmVac	AmVac obtained a EUR 2.6 million grant from the Bundesministerium für Bildung und Forschung (BMBF) for the project "GerontoSHIELD".
Provision Reporting	Actelion (ATLN)	Actelion recorded a provision of USD 577 million (CHF 485.2 million) in the second quarter financial statements in regard to the dispute with Asahi Kasei Pharma Corp.
Study Launch	Basilea (BSLN)	Basilea announced the start of the first clinical study with the anti-cancer drug BAL101553.
July 2011		
Restructuring	Addex (ADXN)	Addex announced its intention to cut its headcount by about 25% and restructure the company to realize annual savings of approximately CHF 8 million.
Acquisition Completion	Evolva (EVE)	Evolva completed the acquisition of Abunda Nutrition started in April, 2011.
Acquisition	Lonza (LONN)	Lonza and Arch Chemicals signed an acquisition agreement. Lonza started a cash tender offer for all Arch Chemicals shares. The offer represented a 36.7% premium. Arch Chemicals' enterprise value would be USD 1.4 billion.
Drug Filing	Newron (NWRN)	Newron submitted to the FDA an IND application for NW-3509. The compound is being developed for schizophrenia therapy.
Study Completion	Evolva (EVE)	Evolva completed the phase I clinical study of EV-077. The compound is developed for the treatment of diabetes.
Collaboration Agreement	Redbiotec	Redbiotec entered into a perennial collaboration agreement with an undisclosed large pharmaceutical company for the manufacture of a viral protein complex using the rePAXtechnology.
Milestone Achievement	Lonza (LONN)	Cellectis and Lonza reached a milestone in the development of a bioengineered cell line (CHO-K1SV GS).
Marketing Authorization	Santhera Pharmaceuticals (SANN)	Santhera announced that the EMA validated the MAA for idebenone in the treatment of Leber's Hereditary Optic Neuropathy (LHON). Santhera received Orphan Drug Designation for idebenone for treatment of LHON in 2007.
Manufacturing Agreement	Lonza (LONN)	Genesis Biopharma and Lonza signed a manufacturing agreement for Contego, a cell therapy product candidate for the treatment of metastatic melanoma.
Strategic Partnership	Debiopharm Group™	INC Research and Debiopharm announced a strategic partnership. INC Research is to manage clinical studies and agreed on a framework partnership.
License Agreement	Selexis	Selexis and CSL Limited entered into a commercial license agreement for the production of an undisclosed antibody with Selexis' SURE technology.
August 2011		
Platform Launch	GeneBio	The SIB Swiss Institute of Bioinformatics and GeneBio launched neXtProt. This is a public knowledge platform on human proteins.
Positive Study Results	Actelion (ATLN)	Actelion met the primary endpoint with the S1P1 receptor agonist in a phase IIb study in patients with relapsing-remitting multiple sclerosis.
Manufacturing Agreement	Bachem (BANB)	Bachem renewed the supply agreement with AstraZeneca. AstraZeneca will acquire the peptide active ingredient goserelin for the next seven years.

Expansion	Lonza (LONN)	Lonza announced an investment of CHF 5.8 million in a formulation plant for Meta metaldehyde. The construction of the formulation plant will take place in Visp, Switzerland.
Financing	Evolva (EVE)	Evolva entered into a standby equity distribution agreement with YA Global Master SPV Ltd. YA Global will provide up to CHF 30 million in equity financing over a 3 year period.
Re-approval	Octapharma	The Therapeutic Goods Administration approved octagam for resupply in Australia. Octapharma was able to identify the root cause of the unexpected increase in thromboembolic events observed in the 3rd quarter of 2010.
Collaboration Agreement	4-Antibody	4-Antibody signed a collaboration agreement with Human Genome Sciences (HGS) to discover and develop antibodies. Financial terms of the deal were not disclosed.
Restructuring	Cytos (CYTN)	Cytos was forced to lay off the majority of its employees (over 70 people). Ten people will be retained for an ongoing lead program.
Sale Process Termination	Evolva (EVE)	Evolva announced that one of the parties to the coordinated sale agreement gave notice of its intention to end its participation in the coordinated sale process.
Patent Protection	Santhera Pharmaceuticals (SANN)	Santhera obtained the US patent protection for the use of Catena in the treatment of muscular dystrophies. The patent protection in the US lasts until 2027.
Study Report	Actelion (ATLN)	Actelion reported on the exploratory phase II study with macitentan in patients with idiopathic pulmonary fibrosis. The primary endpoint was not met.
Restructuring	Santhera Pharmaceuticals (SANN)	Santhera announced its intention to concentrate on Catena and the late-stage pipeline in order to secure greater financial flexibility. It plans to restructure.
September 2011		
License / Manufacturing Agreement	Pevion Biotech	Pevion granted CSL a right of first refusal to an exclusive license for the commercialization of its Candida vaccine in Australia and New Zealand. Both companies also signed a supply agreement for virosomal vaccine components from CSL to Pevion.
License Agreement	Lonza (LONN)	Oxford BioTherapeutics and Lonza entered into a non-exclusive license agreement providing OBT access to Lonza's GS Gene Expression System.
Rights Return	Addex (ADXN)	Addex regained its rights to metabotropic glutamate receptor 4 (mGluR4) from Merck due to further pipeline prioritization.
Joint Venture	Lonza (LONN)	Shanghai Fosun Pharmaceutical and Lonza founded a joint venture company in Shanghai in order to research and develop generic drugs.
License Agreement	Debiopharm Group™	Debiopharm and Ascenta Therapeutics entered into an exclusive license agreement for the development and commercialization of AT-406.
Study Launch	Basilea (BSLN)	Basilea initiated a phase I study with BAL30072, an active ingredient against multidrug-resistant Gram-negative bacteria.
Collaboration Agreement	Numab	Sucampo and Numab entered into an R&D collaboration. Numab will receive up to CHF 5 million as collateral for a loan from a third party.
Share Capital Increase	AmVac	AmVac increased its share capital to CHF 520,108.52. The company issued new shares with a nominal value of CHF 0.01 to its current shareholders.
Introduction Single Share	Mondobiotech (RARE)	Mondobiotech announced the creation of a single share type. The company's unchanged share capital will consist of 68,917,580 registered shares with a par value of CHF 0.01 each.
Secondary Listing	Lonza (LONN)	Lonza submitted an application for a secondary listing on the Singapore Exchange. The first trading day occurred on October 21, 2011.
Milestone Payment	4-Antibody	4-Antibody announced the successful completion of a second milestone in its collaboration with Boehringer Ingelheim.
Manufacturing Agreement	Lonza (LONN)	Lonza announced a new manufacturing agreement with Pasteuria Bioscience to produce Pasteuria spores in Lonza's biochemical plant in Kourim, Czech Republic.
Study Launch	NovImmune	NovImmune initiated a proof-of-concept study with NI-0801, a fully human antibody in patients with PBC. This is a chronic inflammatory, debilitating condition of the bile ducts that leads to liver cirrhosis and eventually to liver failure.

Award	BioVersys	BioVersys was awarded the "Life Sciences Prize 2011", an award under the patronage of the Swiss Biotech Association and BioValley Basel.
Acquisition	Newron (NWRN)	Biotie Therapies and Newron Pharmaceuticals signed an agreement for Biotie to acquire Newron in a transaction valued at EUR 45 million.
Strategic Alliance	Lonza (LONN)	Mesoblast Limited and Lonza entered into a strategic alliance for the production of stem cell products.
Study Launch	Octapharma	Octapharma launched an international clinical study phase III for Wilate, a medicine designed to prevent excessive intra- and post-operative bleeding in pediatric and adult patients with Type 3 von Willebrand disease.
Anniversary	BioAlps	The BioAlps cluster celebrated its 10th anniversary.
Positive Study Results	Biopartners	Biopartners and LG Life Sciences presented positive phase 3 results demonstrating 24-month efficacy and safety in children with growth hormone deficiency (GHD) for LB03002, a once-a-week, sustained-release recombinant human growth hormone (hGH).
License Agreement	ChromaCon	ChromaCon and Knauer GmbH entered into a license and collaboration agreement. ChromaCon grants marketing rights for the Contichrom lab.
October 2011		
Research Grant	Pevion Biotech	Pevion will participate in the EUR 30 million EU vaccine research project "Advanced Immunization Technologies" (ADITEC).
Collaboration Agreement	Redbiotec	Redbiotec entered into a collaboration with Merck Sharp & Dohme. It will apply its technology platform rePAX to an undisclosed discovery area.
Award	Unitectra	Swiss technology transfer organization Unitectra won the 2011 "European Biotechnica Award".
Positive Study Results	Pevion Biotech	Pevion's ongoing clinical study of its therapeutic Candida vaccine PEV7 showed high levels of specific antibodies and a 100% mucosal immune response rate.
Expansion	Cerbios	Cerbios approved the investment of several million CHF in the modification and improvement of the existing biotechnology manufacturing facility for GMP cell cultivation.
Positive Study Results	Santhera Pharmaceuticals (SANN)	Santhera Pharmaceuticals presented data from the 2-year open-label study (DELPHI-E study) evaluating Catena® for the treatment of Duchenne muscular dystrophy.
Global Rights Return	Newron (NWRN)	Newron announced that Merck Serono returned the global rights to safinamide. Merck Serono's decision was due to a re-prioritization of its R&D pipeline.
Provision Reporting Correction	Actelion (ATLN)	The court granted Actelion's motion for a new trial on compensatory damages unless Asahi consented to a reduction of the jury award by a further USD 99.2 million.
Positive Study Results	Basilea (BSLN)	Basilea concluded the second phase I study with the antibiotic BAL30072 for the treatment of multidrug-resistant Gram-negative infections.
Development Agreement	Lonza (LONN)	Lonza entered into a development and manufacturing agreement with Genmab. Lonza will produce an antibody drug conjugate (ADC) targeting tissue factor (protein involved in tumor signalling and angiogenesis).
Acquisition Rejection	Newron (NWRN)	Biotie Therapies decided not to acquire Newron after Merck KGaA returned the global rights for safinamide to Newron. The return of the rights by Merck Serono constitutes a Material Adverse Effect, giving Biotie the right to terminate the Merger Plan.
November 2011		
Re-approval	Octapharma	The FDA cleared the way for the U.S. market return of octagam to treat disorders of the immune system.
Regulatory Clearance	Evolva (EVE)	Evolva received regulatory clearance to progress EV-077 into phase IIa for the treatment of diabetes complications.
Award	BioVersys	BioVersys received the 2011 "Swiss Technology Award", Switzerland's leading technology award.
Refinancing	Cytos (CYTN)	Cytos failed to obtain sufficient votes to pass the convertible bond restructuring proposal.
Award	Augurix Diagnostics	Augurix received the 2011 "Debiopharm/Valais Award" for its point-of-care diagnostic test for the early detection of celiac disease.
Financing	Mondobiotech (RARE)	Mondobiotech signed a loan facility granted by its largest shareholder BioPharma Invest. BioPharma Invest can convert the loan into shares.

Financing	Lonza (LONN)	Lonza announced the pricing of its dual tranche CHF 350 million straight bonds. The proceeds will be used for refinancing part of the bridge loans in relation with the Arch Chemicals acquisition.
Financing	Biocartis	Biocartis completed a USD 100 million series C equity fund raising. Investors were Debiopharm, Philips, J & J, the Wellcome Trust, Korys, Valiance, Biovest as well as certain members of the senior management team.
Court Appeal	Actelion (ATLN)	Actelion announced its intention to appeal the entire verdict in the case of Asahi Kasei Pharma Corp. vs. Actelion by the California Courts. The action arises from a dispute involving the license and development agreement between Asahi and CoTherix.
Restructuring	Mondobiotech (RARE)	Mondobiotech announced its intention to implement certain restructuring measures. The Viglio office is to be closed by the end of 2011.
Regulatory Clearance	Pharmida	Pharmida received Swissmedic approval to start a first-in-human clinical trial with insulin-coated gold nanoparticles
Expansion	Biopôle	The Biopôle park started construction of its fifth building B4. It will accommodate new companies from spring 2013.
Shareholder Base Extension	Basilea (BSLN)	The extraordinary general meeting called by the main shareholder HBM BioVentures extended the Board by three members' to eight.
Research Result	Addex (ADXN)	Addex scientists discover the glucagon-like-peptide-1 (GLP-1) induced interaction between GLP-1 and gastric inhibitory peptide (GIP) receptors .
December 2011		
Collaboration Agreement	Redbiotec	Redbiotec entered into a cooperation with Intercell. Redbiotec will apply its technology platform rePAX to an undisclosed discovery area.
Regulatory Clearance	Xeltis	Xeltis announced conditional approval by the Paul Ehrlich Institute (PEI) in Germany to commence the first clinical study of its tissue-engineered cardiovascular grafts.
Financing	Actelion (ATLN)	Actelion launched a straight bond in the amount of CHF 235 million.
Milestone Payment	Evolva (EVE)	Evolva received a second milestone payment in their collaboration with Roche. Evolva created compounds with promising activity against viruses and proteins.
Collaboration Agreement	Molecular Partners	Molecular Partners entered into a research collaboration with Janssen Biotech (J&J). The agreement covers a partnership for DARPin products for immunological diseases with potential payments of up to USD 800 million.
Refinancing	Cytos (CYTN)	Cytos obtained the additional votes to pass the convertible bond restructuring proposal. It was able to refinance convertible bonds of CHF 1.225 million by entering into a mandatory convertible loan agreement in the same amount.
Acquisition Rejection	Actelion (ATLN)	Actelion rejected the option to acquire Trophos S.A. Trophos' olesoxime phase III results did not reach the primary endpoint.
Study Opening	NovImmune	NovImmune and Genentech initiated a first-in-human study with anti-IL-17 (NI-1401, RG7624), a fully human monoclonal antibody.
Expansion	Lonza (LONN)	Lonza launched a plasmid DNA production platform for microbial derived biopharmaceuticals.

Disclaimer:
This information was compiled on the basis of publicly available information only. We therefore cannot guarantee that all events are included in the above summary for 2011.

Switzerland – the innovative business centre with a future

Nicole Berner,
Project Manager Communications
and Marketing
Osec

Anyone visiting Switzerland immediately realises that the country has much more to offer than cheese, chocolate, watches and beautiful mountains. Switzerland is a highly innovative and competitive place for business whose numerous advantages attract many foreign companies.

Switzerland is a country offering a wide variety of attractive locational advantages. This applies in particular to research and innovation, labour conditions, infrastructure, its central location in Europe, economic policy environment and quality of life. It is one of the most attractive places for business in the world, as demonstrated by numerous rankings that measure competitiveness, innovation and national stability.

The country has a tradition of commercial and industrial diversification. All our industries offer a combination of innovative power and outstanding competitive expertise. Among the leading European business locations, Switzerland shows the greatest growth in innovation and attributes this growth to its strength in international patent registration and the creation of new knowledge, also shown by the number of protected patents, trademarks and designs. High employment rates in skill-intensive industries such as life sciences, biotech and medical technology contribute to our innovative power, as do exports of high-tech products, especially by small and medium-sized enterprises (SME).

Swiss companies have a high level of productivity and employ highly qualified skilled personnel. Businesses and universities in Switzerland both attract the best minds from within the country and from abroad. The vocational training system also provides skilled workers with the latest knowledge and practical experience.

Switzerland's attractiveness as a business location is also the result of a targeted economic policy. Working in close cooperation with industry, science, research and the cantons, Switzerland creates the framework conditions for a strong economic environment at the federal level. Industry thrives on its ability to rapidly turn inventions and patents into market-ready innovations. The country has caught up enormously in this area and has been strategically supporting clusters for years. This includes support for networks of producers, suppliers, research institutions (e.g. universities), service providers (e.g. engineering firms) and affiliated institutions (e.g. chambers of commerce). A "cluster" in this sense means a critical mass of companies in close proximity to each other whose activities are interrelated and mutually complementary across one or more value-added chains.

All in all, Switzerland is one of the most competitive business locations in Europe, a place where entrepreneurial initiative and establishment from abroad are honoured.

Support for overseas investment

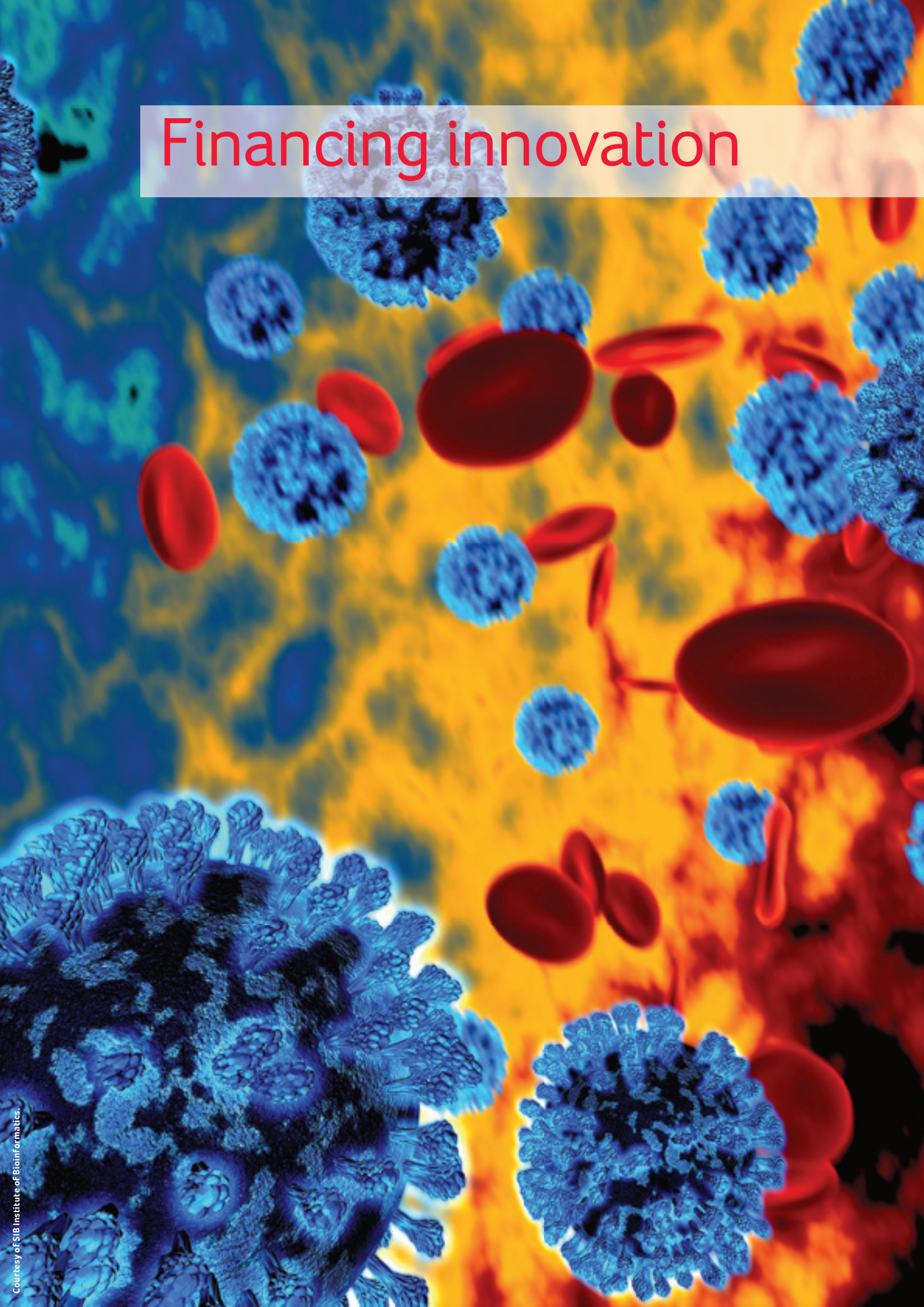
Working closely with industry and the cantons, Switzerland fosters optimal conditions for a strong economic environment. For example, Osec, the organisation for promoting foreign trade, works together with the cantons, on behalf of the government, to coordinate measures designed to encourage overseas investment and support companies through the Swiss trade and investment promotion programme. Osec acts as the contact between foreign and cantonal authorities. Together with its partners, it provides companies with non-bureaucratic and efficient help in choosing a location and starting up in business.

SWISS Pavilion – the trade fair cooperation

Osec is organising a SWISS Pavilion at various international trade fairs. The individual participations will be realised in cooperation with the Swiss Biotech Association, Swiss Biotech and the Swiss Business Hubs. The events include: BioPharma Asia Convention, BIO International Convention and BIOTECHNICA. For more information about SWISS Pavilions: www.osec.ch/swisspavilion

Osec – the competence centre for Swiss foreign trade promotion.
Osec informs, advises and supports firms in their international business ventures. To this end, it networks companies, specialists as well as private and public organisations all over the world. As well as advancing exports, Osec also promotes Switzerland as a location and undertakes import promotion activities for the benefit of selected developing and transitional countries. Furthermore, Osec maintains a global network of 18 Swiss Business Hubs abroad and specialists (Pool of Experts) with various competencies in the fields of exports and internationalisation. For more information about Osec visit www.osec.ch.

Financing innovation



Courtesy of SIB Institute of Bioinformatics.

SIX experts' exchange – the challenges in financing biotech

Andrea von Bartenwerffer,
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SIX Swiss Exchange AG
(moderator)

Jakob Dynnes Hansen,
Chief Financial Officer
Evolva Holding SA

Dr. Peter Johann,
Managing General Partner
NGN Capital LLC

Simon Nebel, PhD, MBA,
Managing Partner
Aravis SA

von Bartenwerffer: How has the typical IPO profile of a biotech company changed over the past few years?

Nebel: The market clearly requires a more mature and balanced pipeline these days than it did only a couple of years ago. This trend will most probably not change in the immediate future as today's biotech investors have a clear understanding of product development attrition rates and are aware that a company valuation is heavily driven by its most advanced product. As such, companies end up in a situation with a binary outcome i.e. either the most advanced compound hits the relevant milestone or, if not, the valuation ebbs away.
Hansen: It seems clear that nowadays a company with compounds more than 2–3 years from market should not even consider an IPO.
Johann: Robust clinical data are required, paired with a pipeline, or at least a second product following the lead compound, to avoid binary risks. Consequently the median age of companies filing for an IPO has increased, as has the amount of private capital required to reach this stage. But it is not only related to the IPO, potential acquirers also tend to wait for more data once a product has entered clinical development.

von Bartenwerffer: Is the "one-compound" company dead? What does the model of the future look like?

Johann: One-product companies are not dead per se, since they can target an exit towards pharma. Such companies might need to go through clinical PoC or even through successful pivotal studies. Project financing is a big theme right now, with the hope of selling a company/project with clinical PoC.
Nebel: An alternative would envisage a business strategy where companies partner out their assets before entering the clinical phase while at the same time heavily investing in their platform. This approach would lead to a generation of an increasing stream of pre-IND phase compounds for supplying the pipelines of the global pharmaceutical industry, which is increasingly focusing on earlier phase acquisition and R & D.

von Bartenwerffer: How do the IPO profiles of European/Swiss and American biotech companies differ?

Johann: In the US one can still target an IPO at the pre-clinical or early clinical stage, it is a matter of the story, management and investor relations behind the story creating the risk appetite. In Europe such a risk culture is largely missing, and public investors are even more risk averse. Therefore an IPO, if possible at all, will likely be possible for mature companies only.
Hansen: This is also because, historically, US biotech companies have been better financed before the IPO and therefore often have a broader pipeline and a more mature technology platform compared to their European peers.

von Bartenwerffer: Do listed companies need to buy other companies for diversification reasons?

Johann: For companies with a single marketed product it makes sense to add products that the sales force can promote to leverage the investment. They could add mid- to long-term value, especially if they are just sitting on a royalty stream. It may work as long as the companies stay focused, but adding a new indication area is a stretch.
Hansen: I also see a significant potential for consolidation of European biotech companies that are not sustainable on their own. But one should not forget that merging two companies each with a negative cash flow will only increase the funding requirements.

von Bartenwerffer: Despite the crisis, it is still possible to raise substantial sums through financing rounds.
In what respect do those companies that found financing differ from the other companies?

Hansen: In general, they either have a technology platform that has already delivered proof of concept (both scientifically and commercially) and/or products in areas with major commercial potential.
Johann: As well as a management that has demonstrated its ability to deliver. A very important factor is also the ability of the existing investor syndicate to make a substantial contribution.

Nebel: There seems to be a simple equation: Products = Cash. According to BioCentury, public biotech last year raised just over $ 40 billion in cash. Two thirds of the money was raised by companies with a market cap above $ 5 billion. Companies without any products on the market or in registration raised only $ 4.4 billion.

von Bartenwerffer: What is the success factor for continuing to attract financing?

Johann: In the end it comes down to factors like: attractive products/pipeline, track record, convincing data, experienced management, existing syndicate with commitment to continued funding, indication of interest by potential partners/acquirers.
Nebel: Remaining companies willing to develop a product further can only raise money by accepting heavy dilution. So in the end it is cheaper to license out ownership of single products early on and let the high cash need of later developmental stages be covered by either big biotech or pharma.

von Bartenwerffer: Do venture capitalists need to rethink their financing approach or model?

Johann: Several concepts are currently being introduced: project financing using an incubator with an experienced development team up to a pre-defined milestone. Spin-out projects with or without a development team from big pharma, sometimes with pre-agreed buy-back terms in case of success, but there is still the typical and successful early stage venture model for financing innovation used by some funds with the financial power to participate in later rounds, with the typical later stage investors coming in at Ph II in biotech or, for growth capital, in devices after CE marking or PMA.
Hansen: The VC model still works. The investors can still do a proper due diligence, and they employ experts. On that basis they can make well-founded investment conclusions, support the company in terms of strategy and contacts, and, thanks to their size, they are able to offer diversification to their own investors.
Nebel: Platform companies with proven disruptive technologies are in a strong position to become more sustainable businesses. They can avoid the high cash needs of clinical trials, while receiving non-dilutive cash to further develop their research capabilities. Big pharma is reducing internal discovery efforts, so if such a company can repeatedly deliver good IND candidates then the chances of them becoming a partner of choice and developing into a steady business are not too bad.

von Bartenwerffer: Many VCs opt for a dual-track exit process and often get better valuation or choose the trade sale route. How would you change the IPO process to make it more attractive again?

Hansen: The IPO process as such is not an issue – it is the limited prospects for doing IPOs. Therefore, VCs have increasingly had to look to the trade sale as the exit. In addition, trade sales are often more attractive because they avoid further dilution and potential price fluctuations leading to unknown returns.
Johann: Another reason is that there are many public investors with a short-term horizon. Near-term milestones are essential for an IPO. An IPO can still be attractive if valuations are reasonable and thus provide an upside for all participants, producing the cash reach to additional value inflection points that can no longer be achieved with private rounds.

Everything you need to know about a listing

The new Going Public Guide describes the process and the advantages of a listing on SIX Swiss Exchange.

SIX Swiss Exchange – Focus on Life Sciences
Companies active in the globally oriented biotech sector aim to benefit from the unique focus on the life sciences sector in SIX Swiss Exchange. Around one third of the total market capitalization on SIX Swiss Exchange is attributable to this sector, making it the European leader: with around 40% of European life sciences market capitalization, it has grown to become the most important marketplace in Europe. In addition, listed companies benefit from excellent visibility among investors and the media, as well as broad coverage by analysts specializing in the sector. Investors are multilingual and multicultural; since Switzerland is geographically easily accessible and investors are concentrated in a small number of locations, companies benefit from short communication paths when addressing their investors. For further information visit www.six-swiss-exchange.com

Swiss biotech in review

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Senior Manager,
Assurance Services,
Ernst & Young AG

The Swiss biotech sector reflected the four seasons during 2011. Sun, wind, rain and snow could be observed throughout the year. Companies were able to deliver very positive news but also had to report various forms of setbacks.

Revenues – remarkable considering the Euro zone crisis

The industry achieved total revenues of CHF 8.7 billion compared to CHF 9.3 billion in 2010.

This result must still be considered good, especially taking into account the significant foreign exchange impact caused by the weakening US dollar and euro. Applying constant exchange rates, the revenue would have been at the level of 2010.

Financing – significant increase with uneven distribution

Financing was no easier in 2011 despite the fact that the total amount of capital raised reached the level of almost CHF 0.5 billion. Half of the stake was raised by Actelion through the issuing of a straight bond in early December. Another substantial capital stake was raised by Biocartis (CHF 88 million), while a handful of companies managed to raise funding in the range of CHF 10–20 million. Also noteworthy is the fact that a number of younger companies were able to raise some capital (i.e. BioVersys, Malcisbio).

Besides the classic financing through fundraising, several Swiss biotech companies were again able to enter into lucrative collaboration arrangements that enable(d) them to gain access to fresh money as well as strategic partnerships. Selexis with Neogenix Oncology, Redbiotec with Intercell and Molecular Partners with Janssen Biotech are just a few examples of newly established collaboration agreements. However, some of these are associated with potential triple-digit million payments if all milestones are achieved, and any successful commercialization is normally expected to occur at least a decade after contract signing.

Public markets/products/clinical development

At the start of 2011, the attack of a hedge fund against Actelion's BoD and management was dominating the biotech news flow. However, all of the corresponding requests submitted at the AGM failed to receive the necessary backing of the shareholders. Another battle for the Swiss biotech giant took place in a Californian court room, where a jury verdict ended with a requirement to pay an amount of over US$ 400 million for various damages. However, Actelion is appealing this verdict.

Four other SIX-listed biotechs had to announce restructuring measures for various reasons during the summer and fall of 2011. Addex, Cytos, Mondobiotech and Santhera announced reductions in their headcounts in order to save costs and thus extend their cash reach. In addition to its reorganization, Cytos also had to restructure its convertible bond in order to guarantee the going concern of the company.

However, Actelion and Santhera were also among those companies reporting positive results from the clinical development programs. Others, like AC Immune (milestone reached, resulting in a significant payment by Genentech), Basilea, Evolva and Molecular Partners also reported further advances in their development programs.

What is hoped to be another new hotbed of innovation opened its gates in early summer in Basel, with the inauguration of the Basel Technology Park. The park is backed by various public bodies (canton of Basel-Stadt, SECO and the foundation for the working environment Basel) and is already home to several biotech companies.

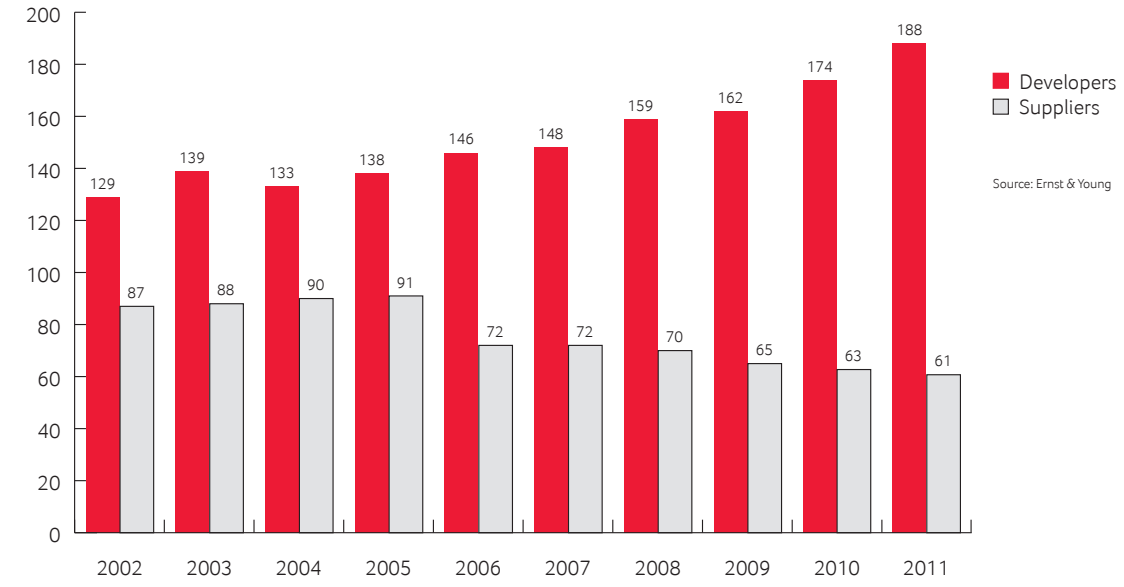
Deals – mergers & acquisitions as a key driver for business development and growth

In 2011, a certain amount of deal activity was noted in Switzerland, although none of the transactions was executed at the "big league" level. The year started off with Biotie's acquisition of the Basel-based Synosia Therapeutics. Further acquisition news emerged from Evolva, which took over San Francisco-based, nutrition-focused Abunda. In executing this transaction Evolva was able both to expand its technology platform end enter into the field of nutrition, placing the combined company in the spotlight for new potential stakeholders like Nestlé.

However, not all transactions were completed successfully. Biotie's announced acquisition of the SIX-listed company Newron was stopped during the due diligence process.

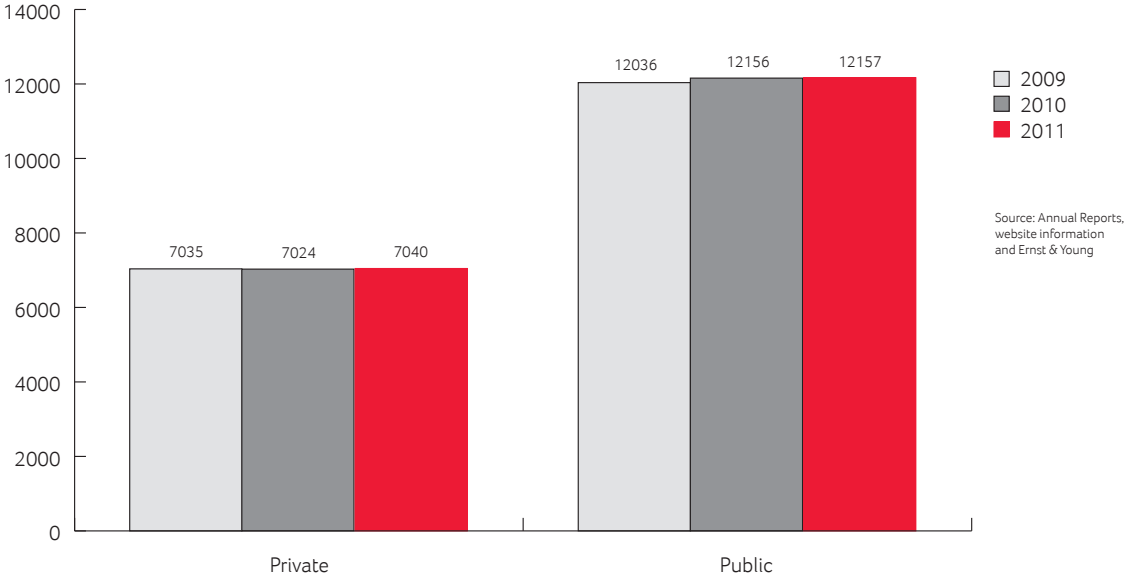
Facts & figures

Number of biotech companies in Switzerland



Source: Ernst & Young

Number of employees



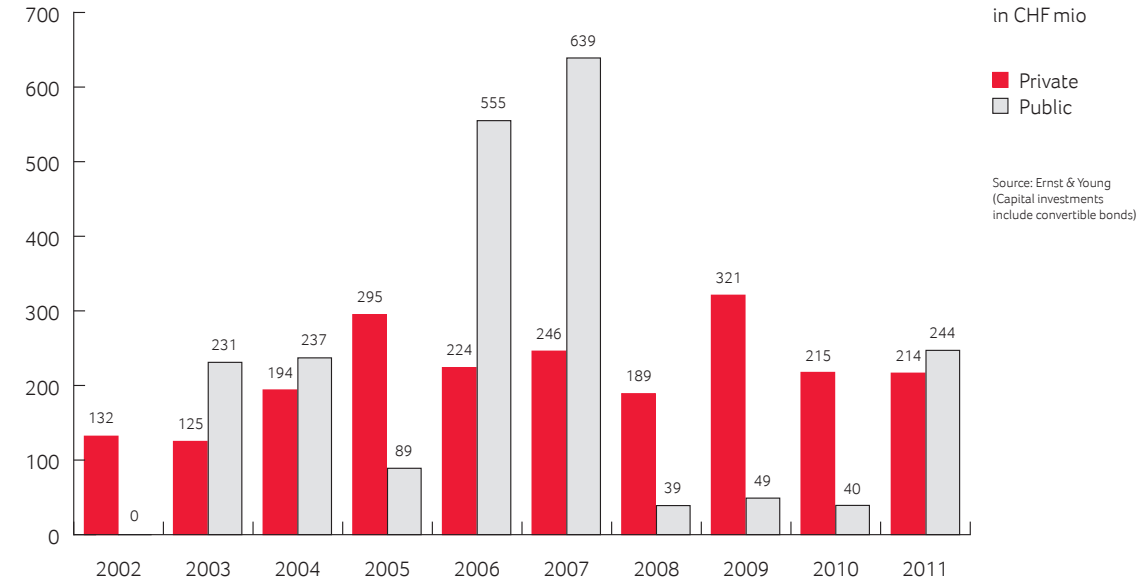
Source: Annual Reports, website information and Ernst & Young

Notes

– The 2011 data in this table are based on the information available in early March 2012, when this report was compiled. At this time some of the companies had not yet disclosed the final financial figures for 2011. Therefore, some figures were carefully extrapolated on the basis of newest interim data publicly available (e.g. Q3 2011).

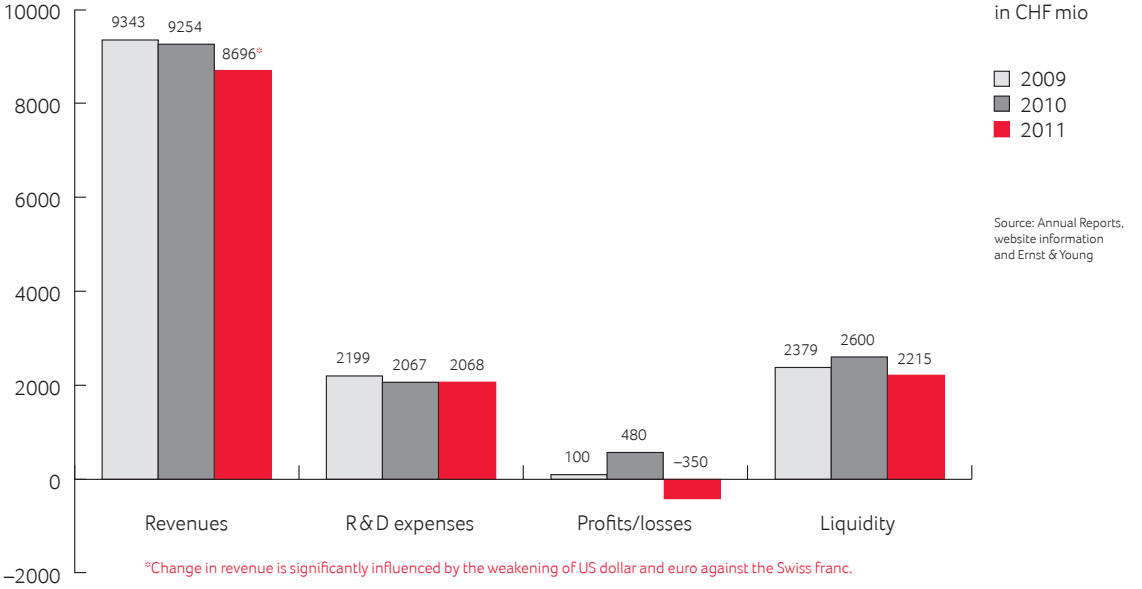
– Merck Serono's operations (a division of Merck Germany) which are operationally headquartered in Switzerland remain in the data analysis with regard to revenues, R&D expenses and employees. The data presented are based on actual figures publicly available or careful estimates.

Capital investment in Swiss biotech companies



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

Total Swiss biotech companies

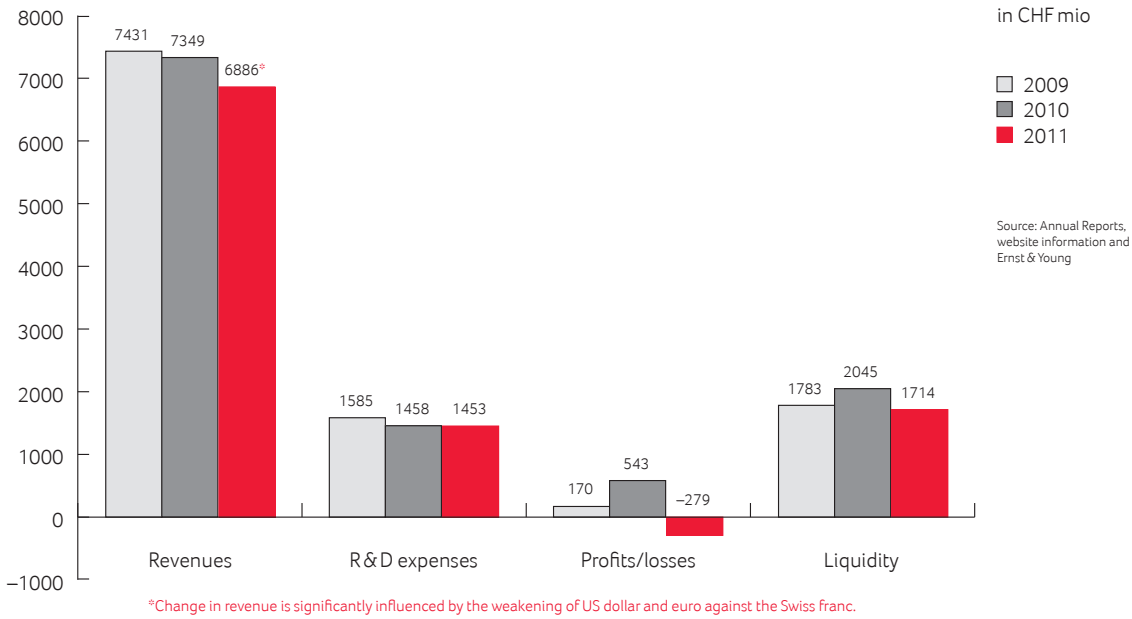


Source: Annual Reports,
website information
and Ernst & Young

*Change in revenue is significantly influenced by the weakening of US dollar and euro against the Swiss franc.

– Financial figures of Lonza's business sectors "Bioscience" 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.

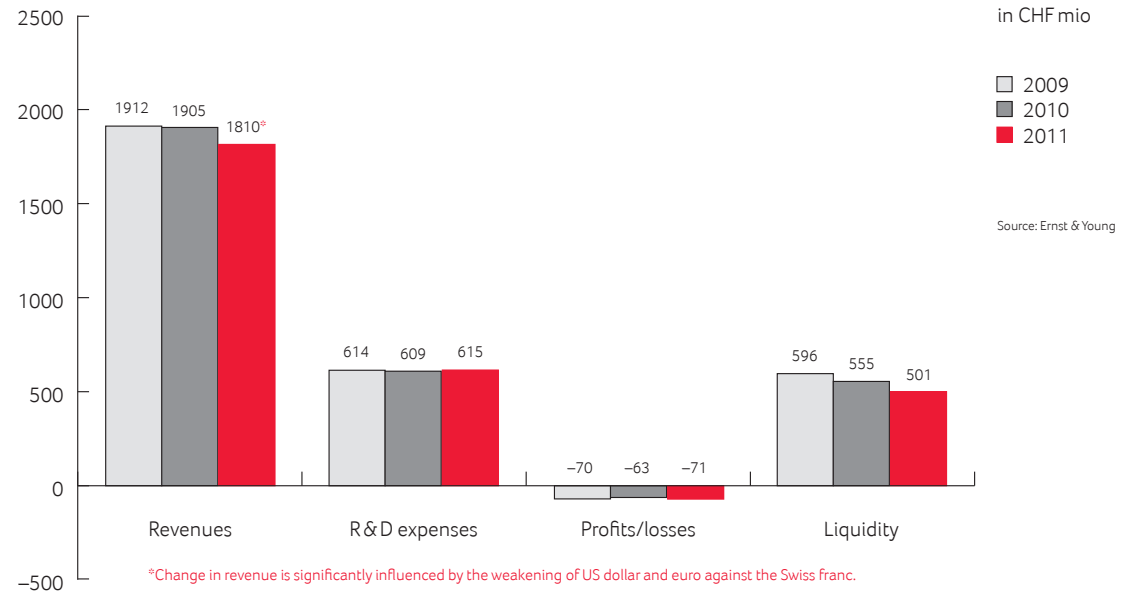
Public Swiss biotech companies



Source: Annual Reports, website information and Ernst & Young

*Change in revenue is significantly influenced by the weakening of US dollar and euro against the Swiss franc.

Private Swiss biotech companies



Source: Ernst & Young

*Change in revenue is significantly influenced by the weakening of US dollar and euro against the Swiss franc.

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