

Swiss Biotech Report 2015

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Editorial

Switzerland's success has been built on a combination of internationalism and 'Swissness'.

Ideas become innovation through the open-mindedness of the Swiss people. From tourism to life sciences, many economic ventures started with brainstorming and evolved through the sharing of thoughts and ideas with visitors from abroad who enjoy the Swiss countryside and engage with local people.

Biotechnology is a truly global industry. In recent decades, Switzerland has harvested success by managing to balance the creativity, investment and discipline that, if well executed, naturally lead to innovation.

This 2015 edition of the Swiss Biotech Report explains how and why Switzerland is so well positioned internationally. All of the contributions and contributors have as their goal the further strengthening of the biotech industry and the ecosystem of research and economy.

The biotechnology sector is a prime example of what 'Swissness' stands for and what Switzerland can deliver internationally.

The steering committee

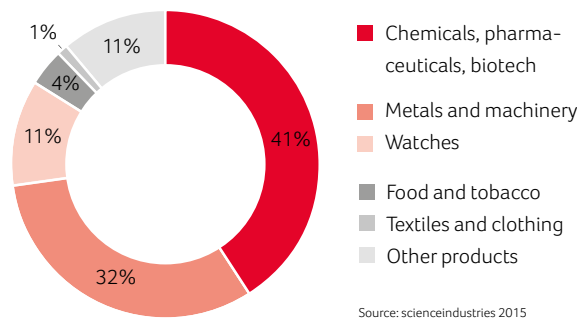
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International relationships – Made in Switzerland

Switzerland takes up just 0.01% of the earth's land mass and makes up just 0.1% of the world population! Despite this, Switzerland is the world's 19th largest economy measured by nominal GDP, the 8th largest in terms of GDP per capita and the 36th largest in terms of purchasing power parity.

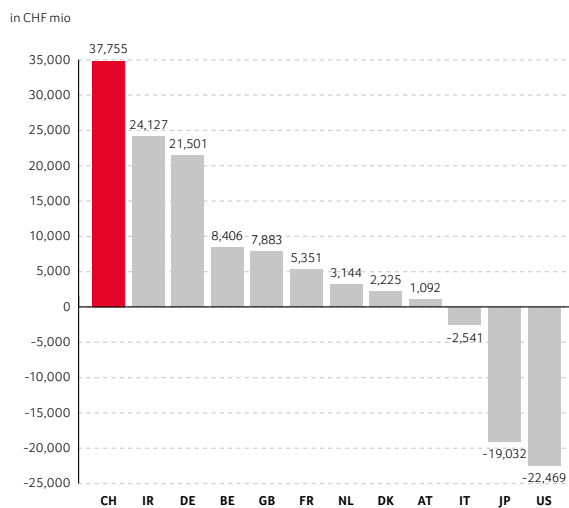
Being a smaller country Switzerland has to look beyond its borders. An eye for exports and a commitment to international relationships have contributed to its becoming the world's 15th largest exporter of goods. Between 2005 and 2013 exports doubled on the back of strong growth in the sales of precision engineering, chemicals and pharmaceutical and biotech products. The chemical, pharmaceutical and biotech industry accounted for 41% of total Swiss exports in 2014, making it Switzerland's largest export sector. 83% of these exports were contributed by pharmaceuticals, with a significant proportion of biotech products.

Figure 1: Proportion of total Swiss exports 2014



The pharmaceutical trade balance of key countries demonstrates the importance of the Swiss life sciences industry for the Swiss economy itself but also as global provider.

Figure 2: Pharmaceutical trade balance 2012¹



¹ According to SITC 54 Classification.

Source: Interpharma, based on UN Comtrade database, 2014

Driving growth

To better understand this success story for Switzerland in general and life sciences in particular, one only needs to look at the experience of the Swiss Biotech Report partners. Their contributions to this report add a narrative to the facts and in doing so highlight the liberal entrepreneurial spirit that illuminates Swiss research and delivers the 'Made in Switzerland' economic success.

Multinationals drive prosperity

Switzerland is home to several large multinational corporations which provide services and produce various goods for export. And some of the largest Swiss companies such as Nestlé, Novartis, Syngenta or Roche are active within life sciences and act globally. For many of these multinationals, Switzerland is the hub of their global network of R&D collaborations and manufacturing sites.

Find out from the Swiss business association for chemistry, pharma biotech – scienceindustries – what makes Switzerland so attractive when it comes to the production of high-value biotech goods. >> [page 13](#)

Economy and finances

Switzerland is primarily a private-sector economy with low tax rates by Western standards. It is a relatively easy place to do business, currently ranked 28th out of 178 countries in the *Ease of Doing Business Index*. And the slow growth that Switzerland experienced in the 1990s and the early 2000s has brought greater support for economic reforms and harmonization with the EU.

The life sciences industry has special economic significance in Switzerland. It makes up more than a third of the total market capitalization of the SIX Swiss Exchange and Switzerland's publicly listed life science companies account for approximately 40% of the life sciences market capitalization across Europe's major stock exchanges.

With the IPO of Molecular Partners in November 2014, SIX Swiss Exchange has welcomed another biotech firm to its life science cluster. One of the most striking aspects of this IPO was the high demand recorded in the domestic investor base. Check out the SIX Swiss Exchange report for greater insights into local investors' appetite for biotech stocks >> [page 15](#)

The Swiss biotech landscape is also a very good soil for venture capitalists and other industry-focused investors. Therefore, it is not surprising that Swiss biotech companies are able to continuously attract new funds, as demonstrated in the E&Y facts and figures. >> [page 29](#)

Education and research

Education in Switzerland is very diverse because the Swiss constitution delegates authority for the school system to the cantons. Education and research account for about 11% of the federal budget before national defense and agriculture. However, industry contributes the most to research funding.

There are both public and private (including international) schools in Switzerland. The starting age for primary school is about six years, but most cantons provide a free 'children's school' from four to five years of age. Traditionally, the first foreign language taught in school was one of the other national languages but since 2000 a number of cantons have introduced English first.

The Swiss Confederation, the cantons and professional organizations all contribute to the high standard of vocational education and training. Around two-thirds of young people in Switzerland benefit from this solid foundation. Swiss tertiary-level education is comprehensive. Switzerland has 10 cantonal universities (kantonale Universitäten), two federal institutes of technology (ETH Zürich and EPF Lausanne), universities of applied sciences (Fachhochschulen), teacher training colleges (pädagogische Hochschulen) and various specialised institutions. (www.sbf.admin.ch).

Switzerland has a reputation for being a leading player in research and innovation. This is regularly reflected in its high ranking in innovation surveys. One of the government's goals is to guarantee that researchers in Switzerland have access to international research programmes and infrastructure. The international co-operation pursued by the Swiss funding agencies can be regarded as an integral part of Switzerland's foreign policy. The Swiss National Science Foundation (SNSF) focuses on developing the added-value that international co-operation offers Swiss academic research. Find out how SNSF helps to raise scientific capabilities in developing and transition countries and supports cooperation with emerging, industrialized and European countries. >> [page 7](#)

The Commission for Technology & Innovation (CTI) backs market-oriented R&D, entrepreneurship, and the creation and development of start-up companies. Learn how it helps to optimize knowledge and technology transfer through the use of national thematic networks. >> [page 9](#)

From invention to innovation

Today's research world has the global connectivity to enable international collaboration amongst specialists. Especially in the world of life sciences and biotechnology, the key to success is finding the right intellectual partner to develop new ideas which enable sustainable economic growth.

Biotechnet is a network of academic institutions that regularly holds international courses. Find out how it supports the transfer of knowledge to fresh young talent and helps to identify new specialists for companies at home. >> [page 8](#)

Successful high-tech companies, such as those in life sciences, depend on the recovery of high product development costs. And this pushes them, rather early on in their development, towards internationalization with the goal of increasing turnover and thereby recovering investments.

Switzerland has one of the highest biotech patent outputs per capita in the world and the Swiss Federal Institute of Intellectual Property is a critical partner in this process. Find out why Swiss biotech companies are so well protected and the reasons for the strong internationalization of the Swiss biotech sector. >> [page 11](#)

Figure 3: Distribution of biotech patent applications per capita in the world.



Note: The stronger the yellow it denotes a larger number of applications per capita. Very low application numbers are shown in white.

Networks a necessity for success

The success of Swiss companies is based on a close-knit network of research and development centers supported by prestigious universities, highly specialized SMEs and strong multinational companies. >> [page 14](#)

And then there is the Swiss Biotech Association (SBA) that supports the industry in developing international business under the umbrella brand Swiss Biotech™. Partners and institutions are working together on interesting projects that build profile for this important biotech brand. >> [page 8](#)

Switzerland is one of the world's smaller countries but in terms of economic performance it is something of a giant. It has one of the world's largest economies and wealthiest societies and much of this is down to its intellectual capital, precision manufacturing and international engagement.

This report goes some way to explaining why 'Made in Switzerland' is a watchword for quality and no more so than in the field of biotechnology where it has true international class.

International cooperation a prerequisite to research

Swiss National Science
Foundation (SNSF)

The Swiss National Science Foundation (SNSF) undertakes a multitude of international activities. Its prime focus is to remove obstacles to international co-operation and facilitate cross-border collaboration between research groups.

At the heart of the SNSF's activities is the added value that international co-operation represents for Swiss research and the needs of researchers. SNSF's international activities and programs pursue two main goals:

1. Increase scientific capabilities in developing and transition countries to an international level and give Swiss researchers access to research groups in those countries
2. Support existing co-operation with emerging, industrialized and European countries, facilitate new initiatives and secure access to European Framework Programs and other international research programs for Swiss researchers

Some of the international programs are being conducted in collaboration with the Swiss Agency for Development and Cooperation, for instance SCOPES (Scientific co-operation between

Eastern Europe and Switzerland) and r4d (Swiss Program for Research on Global Issues for Development). The latter aims to reduce poverty and protect public goods in developing countries. In addition to these programs, the SNSF is also involved with the bilateral programs of the Swiss federal government. These programs aim to promote and strengthen scientific co-operation with non-European countries that show high or promising research potential. The SNSF is implementing joint research projects for seven of the priority countries, namely Brazil, China, India, Japan, Russia, South Africa and South Korea.

Acceptance of the referendum against mass immigration on 9 February 2014 resulted in Switzerland being temporarily excluded from European research funding. To safeguard competitiveness and performance, as well as the international nature of research and innovation in Switzerland, the SNSF has been offering 'Temporary Backup Schemes' as a substitute for the funding schemes of the European Research Council (ERC). These schemes match the aims, scope and funding levels of the ERC's Starting Grants and Consolidator Grants. More than 250 researchers jumped at the opportunity and applied for these grants. In November 2014, 27 outstanding young researchers received an SNSF Starting Grant. And in February 2015, 21 proposals for SNSF Consolidator Grants were chosen for funding.

Figure 1: Map of scientific collaborations from 2005 to 2012, computed by Olivier H. Beauchesne & Scimago Lab, data by Scopus.



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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 nano-sciences 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 800 million each year. The SNSF finances over 3,400 projects involving 14,000 researchers each year. For further information visit www.snsf.ch.

Switzerland 2i – innovation and internationalism



Domenico Alexakis,
Swiss Biotech Association



Daniel Gyax,
biotechnet Switzerland and
University of Applied Sciences
of Northwestern Switzerland

Internationalism and innovation are the 2 i's which are of the utmost importance to the future of Switzerland. The 'Made in Switzerland' label inspires trust, confidence and a sense of quality worldwide.

The academic world is connected globally and this paves the way for international collaboration amongst specialists in their fields. In the world of life sciences and biotechnology, the key to success is finding the right intellectual partner to work with on the development of new ideas which can enable sustainable growth of the economy. In industry, the stakes are similar. Multi-national companies operate all over the world. Meanwhile at a national level, smaller companies (SMEs) are continually working to convince customers that they have the best products and solutions. This management philosophy and drive to succeed can ensure that SMEs will survive and prosper in the long term.

Innovation comes from two different sources. Firstly, by listening to the customers, attentive sellers and researchers will find new angles to improve a product or indeed innovate something brand new. Secondly, by feeding back the insights to in-house research teams or to academic institutions active in the specific focus field, companies can identify new and profitable research areas to explore.

biotechnet Switzerland (a network of academic institutions) regularly holds international education courses. Its aim is to

support the transfer of knowledge to fresh young talent. The courses also help in identifying new specialists for companies at home. Many talented individuals take on an interim role at a university before entering the working world.

SBA (Swiss Biotech Association) runs various programs to support the industry in developing international business opportunities. Because the operational resources are insufficient to achieve this easily, SBA initiated the Swiss Biotech™ brand in 2003. Under the guidance of SBA, many partners and institutions carry out interesting projects that continuously support and build this important umbrella brand.

Lacking raw materials, Switzerland has to rely as much as possible on constant innovation and internationalisation to underpin growth. This is not only true in the field of life sciences but also for the Swiss economy as a whole. One of the major, and internationally-admired pillars of the Swiss system in addressing this challenge, is the education process. The so-called 'Dual Way' – apprenticeship and academic education – ensures that professionalism is guaranteed at all levels of the value system.

In fact, the Swiss Federation generates considerable interest in other countries who want to learn more about the Swiss strategic approach. Every country understands that a skilled workforce is one of its most important economic assets. Today, even more so than some 20 years ago, political systems are actively engaged in realising a 'knowledge society' and winning the 'fight for talent'. And these key areas are the two top priorities of the Swiss Biotech™ mission.

The situation with the European Research Framework 'Horizon 2020' is not yet solved for two of the seven programs, important to the industry. SBA is working hard at a political level to improve the situation for SMEs. Together with partner organisations, SBA is taking measures to inform the members and industry on the implications of the 'unpegging' of the CHF and Euro following the decision made by the Swiss National Bank mid January 2015.

As of 2013 the National Thematic Network Swiss Biotech™, led by biotechnet Switzerland and the Swiss Biotech Association, aims to foster transfer activities in biotechnology.

The Swiss Biotech Association (SBA) was founded in March 1998 and today there are over 235 companies in 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 further information visit www.swissbiotech.org.

biotechnet Switzerland is the network of the Swiss Universities of Applied Sciences (FHNW, HES-SO, ZHAW), the research institutions CSEM, Empa and the Swiss Center for Regenerative Medicine at the University Hospital and University Zurich. biotechnet Switzerland 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.

Short outline of CTI's national and international activities



Oreste Ghisalba,
Commission for Technology
and Innovation (CTI)

As the Swiss Confederation's innovation promotion agency, the Commission for Technology & Innovation (CTI) lends support to market-oriented R&D projects, to entrepreneurship, and to the creation and development of start-up companies. CTI helps to optimize knowledge and technology transfer through the use of national thematic networks.

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.

CTI Entrepreneurship, the Swiss federal training programme, offers tailor-made modules to promote entrepreneurial thinking among young scientists, upcoming entrepreneurs and business people. These training modules provide the knowledge, skills and methodology needed to establish a new company and successfully transform promising business ideas into marketable products and services. Entrepreneurs from new knowledge-intensive and technology-based companies with considerable market potential can also benefit from professional coaching. CTI Entrepreneurship is coordinated via the portal www.cti-entrepreneurship.ch.

The CTI supports the transfer of knowledge and technology between higher education institutions and industry in a targeted and result-oriented manner. In addition, innovative Swiss businesses and researchers are put in touch with development opportunities through access to international programs and networks such as EUREKA, ERANet and EU FP7/Horizon 2020, or European Technology Platforms (ETP).

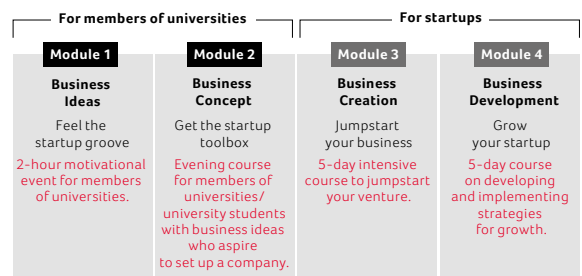
CTI Start-up and CTI Entrepreneurship: New developments

By opening up the organization of modules for new entrants, the CTI is also changing its support philosophy. It is replacing the top-down approach with one that works from the bottom-up by involving local partners who are deeply rooted in their own ecosystems. CTI has appointed the providers for the first two modules of CTI Entrepreneurship. Module 1: Business Idea will continue to be run by IFJ Institut für Jungunternehmen, while three regional consortia will be responsible for Module 2: Business Concept.

Modules 1 and 2 of CTI Entrepreneurship include awareness-raising events and semester courses. These courses are designed for students, including post-graduates, who are interested in acquiring entrepreneurial independence. In 2015,

Module 1 will include 24 forums at universities and eight forums at events organized by the Swiss National Science Foundation (SNSF). Module 2 includes a total of 20 semester courses at universities in the three regions. Courses begin spring 2015.

Figure 1: The 4 modules of CTI Entrepreneurship



Source: CTI 2015

Module 2 will be run by three consortia:

- Zurich / Eastern Switzerland Region:
Headed by Technopark Zurich/ZHAW
- Central Region (including Ticino):
Headed by University of Bern/University of Applied Sciences Northwestern Switzerland
- Western Region (including Valais):
Headed by EPFL Innovation Park

The three regional consortia, now in a slightly different composition, have already successfully organized the courses for Module 3: Business Creation and Module 4: Business Development of CTI Entrepreneurship. These course modules, put out to tender and awarded in 2012, were up and running by the beginning of 2013.

New Swiss Innovation Map

The new Swiss Innovation Map, launched in 2014 as a collaboration between CTI, State Secretariat for Economic Affairs (seco), the Swiss Federal Institute of Intellectual Property (IPI), Swiss Federal Office of Energy (SFOE), and the Federal Office for the Environment (FOEN), brings together research institutes and companies and provides a compact overview of federal support measures aimed at improving the transfer of knowledge and technology. It enables Swiss SMEs and other interested parties to gain a quick overview of the innovative capacities of public research facilities and the private sector.

The Innovation Map (accessible via www.kti.admin.ch) already contains over 1,000 SMEs, large-sized companies, research institutes, networks, and private and public funding programs. Users can view the actual locations of the various participants on the map. This facilitates the search for groups of potential partners such as SMEs or innovation mentors. Using specific selection criteria one can easily identify the relevant players and potential cooperation partners within a given area – regionally and nationally. In cooperation with the University of St. Gallen, the data will be updated at six-month intervals.

In addition to CTI, there are many other public and private organisations supporting innovation. The Swiss Innovation Map provides SMEs with a list of the various support measures arranged according to theme and sponsor.

CTI international life sciences activities: ERANET Synthetic Biology (ERASynBio)

Synthetic biology is an emerging and promising research area with the potential to have a strong impact on future innovation and technological progress that is beneficial for the economy and for society as a whole. It sits at the intersection of engineering, bioscience, chemistry, and information technology. Due to its truly interdisciplinary character it is expected that synthetic biology will have applications across several industrial sectors including biomedicine, industrial biotechnology, agriculture, bioremediation, bioenergy and biosensors.

Switzerland, and in particular the Federal Institute of Technology Zurich (ETHZ), was one of the pioneers in European synthetic biology. It successfully participated in many of the early calls of the European Union Framework Programme 6 (FP6) and later in FP7, advised the EU Commission in 2004–05, hosted the first conference on synthetic biology in Europe (Synthetic Biology 3.0) in 2007, and offered the first European class in synthetic biology to students in 2006. Since then, the topic has captured the imagination of many scientists in Switzerland. Their areas of specialization range from metabolic engineering to nanotechnology, from genetic circuits to expanding biochemistry into novel realms. The result is the creation of one of the largest and most vibrant synthetic biology communities in Europe. The Department of Biosystems Science and Engineering D-BSE of ETH Zurich in Basel is home to many exciting developments in synthetic biology: the first mammalian oscillator (Fussenegger); cellular automata to calculate the cancerogenic state of cells (Benenson); cyborg cells (Khammash); and the ETHZ iGEM teams (Stelling & Panke). (www.bsse.ethz.ch)

Synthetic biology in Switzerland benefits from a powerful industrial cluster of pharmaceutical and chemical firms, a well-funded national research system, and excellent universities including the Swiss Federal Institutes of Technology (ETH Zurich and EPF Lausanne), research universities in Basel, Lausanne and Geneva, and additional national research initiatives such as SystemsX.ch (www.systemsx.ch) in systems biology.

CTI is the official Swiss funding partner for ERASynBio which was initiated in 2012 within EU FP7. This ERANET follows a transnational and multidisciplinary approach and operates under the following definition:

'Synthetic Biology is the engineering of biology: the deliberate (re)design and construction of novel biological and biologically based parts, devices and systems to perform new functions for useful purposes, that draws on principles elucidated from biology and engineering.'

This definition is fully in line with Swiss views and perspectives of synthetic biology. So far, Swiss researchers from EPFL, ETHZ, University of Zurich and Swiss companies are participating in four well-funded ERASynBio projects: SynPath, MirrorBio, INTENSIFY and RETROBIO. INTENSIFY and RETROBIO are coordinated by the Swiss academic partner.

Alongside the two joint calls, several supporting measures were initiated by ERASynBio to support the development of high quality synthetic biology research. One major effort was the development of a strategic vision entitled 'Next steps for European synthetic biology'. This is accompanied by a series of targeted recommendations to do with ethics, governance, measures in public dialogue, and social science research topics related to synthetic biology. They are designed to empower national and international funding organizations, policy bodies and other stakeholders. (www.erasynbio.eu)

From 2015 onwards, ERASynBio will operate as a self-sustainable initiative. This means without the financial support of the European Union but with most ERA-NET partners, including Switzerland, continuing their collaboration on into the next phase. It is the major aim of the self-sustainable ERASynBio initiative to continue joint activities like joint calls for proposals in the field of synthetic biology. The next joint call on synthetic biology will presumably be published at the beginning of 2016. This call will mainly be supported by the ERASynBio partners, but will also be open to other funding organizations interested in participating. It is the aim of the sustainable ERASynBio initiative to further support joint activities that focus on transnational coordination, capacity building, sharing resources and facilities, enhancing interdisciplinary activities and overcoming fragmentation in the field of synthetic biology.

The innovation promotion agency Commission for Technology and Innovation (CTI) is active in three funding areas: R&D project funding, Start-up and Entrepreneurship and KTT Support. From 2013 to 2016 it is also promoting research into energy. For further information visit www.kti-cti.ch.

Patent literature reflects international focus of Swiss biotech



Heinz Müller,
Patent Expert,
Swiss Federal Institute
of Intellectual Property (IPI)

Successful high-tech companies, such as life sciences companies, depend on the recovery of high product development costs. This pushes them into internationalization with a view to increasing turnover and recovery of investments. In particular, owing to the small size of Switzerland and thus the very limited market for such high-tech products, the country's biotech companies tend to market their products outside the country of origin.

Given the Swiss economy's high dependence on exports this may not seem surprising. However, other countries such as Germany are also export-oriented and probably face the same degree of internationalization in regard to their biotech sector. In contrast, the situation in countries such as the USA, which are not per se export-oriented, may be quite different.

Statistical analysis of patents can help answer some of the questions concerning economically important parameters for measuring a nation's innovativeness or the internationalization of certain industry sectors. The annual reports on innovation such as the *WEF Global Competitiveness Report*, the *Global Innovation Index* and the European Commission's *Innovation Union Scoreboard*, all use statistics about patents (among other parameters) to measure the innovativeness of countries. In fact it has long been recognized that the internationalization of a company is significantly mirrored in its portfolio of patents. In most cases, patent protection in different countries reflects the importance of these markets or the blocking of competitors in these jurisdictions.

It is also a well-known fact that the number of patent applications is an early indicator of an upcoming trend. Interesting to note therefore that despite the recent rebounding of the worldwide biotech industry, the number of biotech patent documents published worldwide between 2011 and 2014 registered a slight annual decrease of 1% to 4%. At the European Patent Office it fell 18% in 2011 and 4% in 2014. The USA saw a contraction of 2% in 2011, 10% in 2012 and 2013, and then steady development in 2014. The number of patent documents containing at least one Swiss applicant increased 9% in 2011 and 3% in 2012 but there was a fall of 3% in 2013 and 15% in 2014.

These figures may indicate that the worldwide hype around biotech is over and the industry has become more mature and steady. Furthermore, the focus has shifted somewhat away from 'patenting everything' towards 'patenting the right thing' and consequently saving time and money. Switzerland contributed about 3% of all biotech patent families worldwide but remains in first place when it comes to biotech patents per capita (see Fig. 1 and 2).

Figure 1: Share of biotech patent families as % of total, 2012

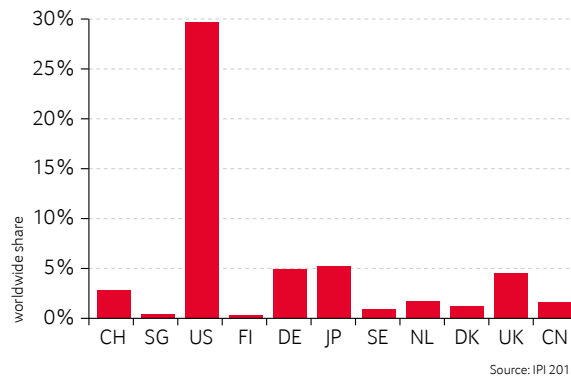
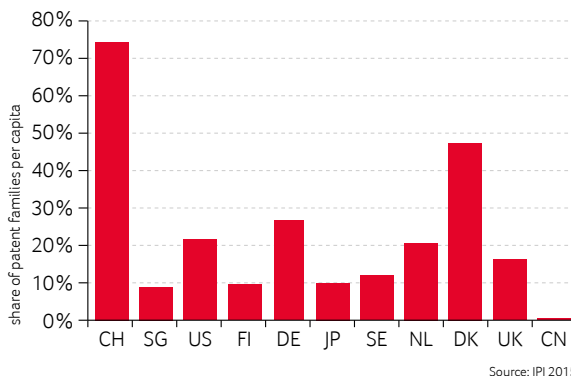


Figure 2: Share of biotech patent families per capita (per 1 mio inhabitants), 2012

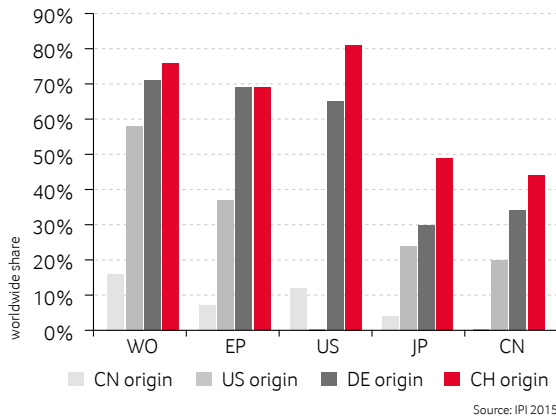


Nevertheless, internationalization remains a factor in the on-going globalization of industry. It can be measured by counting the foreign patent applications originating from a specific country.

A count of the worldwide biotech patent documents published between 2008 and 2012 resulted in about 165,000 patent families. Patent families are made up of patents in different jurisdictions that disclose the exact same invention; the number of patent families is therefore equivalent to the number of inventions. The country of origin on these documents was analyzed and it was found that at least one patent applicant or patentee was either from the USA (US origin), Germany (DE origin), China (CN origin) or Switzerland (CH origin). The patent families created along these lines were then analyzed and the PCT (Patent Cooperation Treaty) applications, the EPO (European Patent Office) patents and the patents from USA, Germany and China were counted.

Figure 3 shows the filings of these patents either internationally (WO/PCT), at the European Patent Office (EP), in the USA (US), in Japan (JP) or China (CN). Numbers for the applications of US patents in the USA and Chinese patents in China are not shown in order to avoid overloading the chart. In the USA, China and Japan, Switzerland shows the strongest application activity of all coun-

Figure 3: Protection of biotech inventions in different jurisdictions



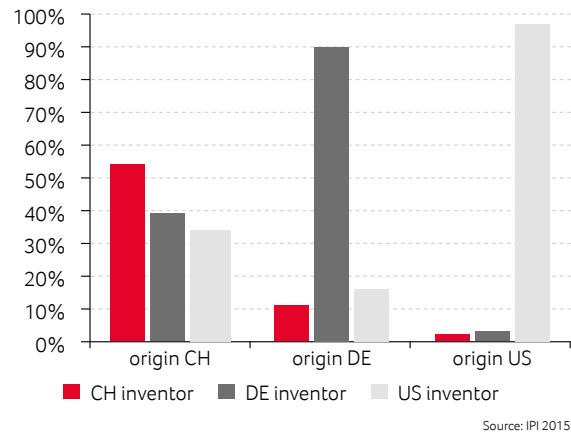
Note: The graph depicts patent applications from a specific country (% of all patent families from this country) at the different jurisdictions.

tries analyzed. Furthermore, international and European applications are very prominent for Switzerland, followed by Germany.

This clearly shows that for Switzerland and Germany the international protection of biotech inventions is an important issue, with Switzerland focusing more on the Far East than Germany. It is interesting to note that over 75% of all biotech patent applications from Switzerland used the PCT route (WO) and more than 80% were also submitted to the US authorities. For the USA, international protection does not seem to play such an important role, while China is still concentrating on the domestic market for biotech products. These findings suggest that countries depending on high-tech exports have a stronger international focus than those countries which have a large enough home market or are not yet active in the high-tech sectors.

Another way of looking at the internationalization of the biotech sector is to check how many inventors from different countries are on one particular patent document from one country. This type of analysis might indicate either that a particular company from one country with a patent has a R&D unit outside their home country or that many highly-qualified foreigners are working at a unit in the company's home country. Figure 4 describes this type of internationalization. Patent documents of Swiss origin (at least one assignee from Switzerland) list only about 55% Swiss inventors (CH inventor), about 40% of the listed inventors are from Germany (DE inventor) and approx 35% from the US (US inventor). In contrast, on the patent docu-

Figure 4: Internationalization of the workforce in biotech industry



Note: The nationality of the inventors on the patent applications was analyzed (in % of total patent numbers from a specific country) versus the origin of the applicant.

ments of German or US origin (at least one DE or US assignee) over 97% and 90% of the listed inventors originate from the US and Germany respectively. This shows very clearly that a large portion of the inventors in Swiss companies are hired from countries other than Switzerland. This indicates once again the advanced internationalization of Swiss biotech companies; not only are foreign markets well protected by Swiss company patents, but the work force in these companies is also very international.

One reason for this might be that not enough well-educated people can be hired from Switzerland because of its relatively small size. It is certainly not due to an insufficient education system or poor quality of higher education, since Swiss universities rank 3rd in the world when it comes to the impact of scientific publications in the life sciences sector. Moreover, the education system is thought to be one of the best in the world.

In conclusion, this survey indicates that the Swiss biotech companies are very well positioned internationally. The coverage of the main markets with patent rights is much broader than in other high-tech countries such as the USA or Germany, and the markets in East Asia are considered more fully. Furthermore, due to the relatively small size of Switzerland and the high demand for specialists, a large part of the workforce present in the Swiss biotech industry (around the world) does not originate from Switzerland. Again, this trend is much more explicit than in other high-tech countries.

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.

Global network and local production drive success



Jan Lucht,
scienceindustries

Life sciences and biotechnology play a central role in Switzerland's economic success. The chemical, pharmaceutical and biotech sector is the country's largest export industry. For many multinational companies, Switzerland is the hub of their global network of research collaborations, R&D and manufacturing sites. Due to its locational quality, Switzerland is an attractive place for the production of high-quality, high-value biotech goods.

The economic importance of life sciences applications is ever increasing. This is true even for companies with a variety of production methods that are not typically considered dedicated biotech. To a varying degree, virtually all of the top ten member companies in scienceindustries, the Swiss association of the chemical, pharmaceutical and biotech industries, employ biotechnology in their businesses.

A classic example is Sika, a manufacturer of specialty chemicals for construction. This is not a sector one would immediately think of in connection with biotechnology. However Sika is a member of a strategic research alliance that is developing the use of enzymes to convert lignin, a waste material from cellulose production, into components of concrete admixtures. If successful this will enable a switch from petrol-based, to more sustainable and renewable, raw materials.

For other members of scienceindustries, biotechnology sits at the very heart of their business. Roche is a case in point. Its worldwide biopharmaceutical manufacturing network, including important production plants in Switzerland, hosts about one quarter of the global production capacity for biologics. This makes Roche the world's largest biotech company.

About three quarters of Roche's pharmaceutical sales and most of its diagnostic tests derive from biotech products, and novel biotech-based treatments for serious diseases figure prominently in its R&D pipeline. A global network of collaborations is also important, with about one third of Roche's products deriving from partnerships with basic research institutions, small biotech companies and other organizations from all over the world.

scienceindustries' member companies are tightly integrated into the global economic networks. About two thirds of their global turnover is derived from outside of Europe and only a small proportion (2%) comes from Switzerland itself.

Production in Switzerland

The importance of Switzerland as a center for production is illustrated by the fact that in 2014, chemical, pharmaceutical and biotech companies accounted for 41% of total Swiss exports. This makes it Switzerland's largest export sector (see Fig. 1, p. 5). Pharmaceuticals, with a significant proportion of biotech products, contributed 83% to this figure.

Why do global companies choose Switzerland as a biotech production location?

Switzerland offers an attractive mix of advantages as evidenced by Merck Serono. The Merck Serono Biotech Center (MSBC) in Corsier-sur-Vevey, Switzerland, is one of seven global biotech manufacturing sites. It is considered one of the largest and most technologically advanced biotech centers in the world. Here, the active ingredient for multiple sclerosis treatment is produced using state-of-the-art facilities. Recently the MSBC was expanded to increase and extend production capacities which include new biotech pharmaceuticals like biologicals for cancer therapy.

Jens Regelin, head of the Merck Serono Biotech Center, explains the decision to create a biotech facility on this scale in Switzerland. He notes that production conditions are highly important because the production process in itself is part of the product. This applies not only to the cell culture but also to the purification of the therapeutic protein, using state-of-the-art utilities systems, cleanrooms and fully compliant quality systems. Essential requirements for this are highly skilled and trained employees, the right know-how, and the very best raw materials.

Regelin points out that in Switzerland the company also has good access to important regulatory bodies, proximity to the most prestigious academics and universities, a reliable political environment and good access to the sales markets and distribution channels. According to Regelin, all of these factors speak for a location in Switzerland.

scienceindustries – The Swiss Business Association Chemistry Pharma Biotech
scienceindustries supports some 250 member companies by fostering an innovation-friendly environment in Switzerland, a competitive production and business framework, attractive market conditions and by facilitating worldwide market access. For more information visit www.scienceindustries.ch.

Switzerland: strategic business location for life sciences



Liv Minder,
Director Investment Promotion,
Switzerland Global Enterprise

Switzerland is one of the strongest biotechnology locations in Europe. Swiss companies are leaders in many areas and attract capital and researchers from around the world. Success is based on a close-knit network of research and development centers supported by prestigious universities, highly specialized SMEs and strong multinational companies. As well as being an attractive place for international specialists to live, Switzerland also offers modern infrastructure, a beneficial funding environment and access to a highly qualified workforce.

There are various reasons why a company should consider Switzerland as its gateway to Europe and location for research and development. Key amongst these are: the attractive education and research environment for highly skilled people; a liberal business environment; and constant improvements to the business and research environment.

Attractive for education and research

Effective knowledge and technology transfer through applied research and development, and the close cooperation between universities and the private sector, result in a high level of research productivity in the biotech sector. Switzerland is one of the world's leading countries in terms of the number of products in the research pipeline. Substantial private investments are made in research and development. In 2012, Swiss companies spent CHF 12.8 billion in this area, of which 47% percent (more than CHF 6 billion) was in the pharmaceutical, chemical and biotech sectors. The strong presence of life sciences companies, including financially sound, leading pharmaceutical companies such as Roche and Novartis, opens up numerous possibilities for IP marketing, whether through licensing, patent sales, or strategic partnerships.

Liberal business environment

Switzerland is the global leader in attracting highly-qualified specialists from abroad (source: *IMD Competitiveness Yearbook*) thus enabling easy talent recruitment. Start-ups and spin-offs are supported by the top-quality infrastructure provided by technology and innovation parks and research institutions such as Campus Biotech Geneva, EPFL Innovation Park Lausanne, Bio-

Hamilton Company chooses Switzerland as strategic business location for life sciences

Hamilton Company is a global enterprise with headquarters in the USA and Switzerland and subsidiary offices throughout the world. Among the products developed by Hamilton are sensors for biotechnical production of medicines, food manufacture, and wastewater treatment. In Switzerland, Hamilton found an innovative place with internationally experienced staff, necessary for its global distribution. Other advantages included a moderate tax burden, reasonable land prices and the fast and convenient connection to Zurich's airport.

Technopark Zurich and Biopôle Lausanne. Access to the most important export markets is easy thanks to free-trade agreements with the EU and 38 other countries, including China. This generates annual savings of EUR 192.5 million on pharmaceutical and chemical exports to Germany, France, Austria and the United Kingdom alone. Furthermore, Switzerland has the third largest network of bilateral investment treaties (after Germany and China).

There is minimal bureaucracy and simple procedures. For example, licensing applications to handle GMOs in containment are regulated by a single central authority, the Federal Coordination Center for Biotechnology. And due to international recognition of its high quality standards, Switzerland is well suited as a strategic early adopter test market for the launch of new biotech drugs.

Constant improvement in the research and business environment

The government is planning to set up a national innovation park – Swiss Innovation Park (www.swissinnovationpark.ch) – aimed at enhancing Switzerland's leading position as an innovation and research venue through various hubs and network locations. The first centers will open at the start of 2016.

In mid-December 2013, the Federal Council introduced a master plan for the promotion of biomedical research and technology. It aims to ensure that Switzerland remains an attractive location for research in the biotech sector.

The Swiss parliament has requested the government to develop proposals for the establishment of a 'Future Fund' (www.zukunftsfondsschweiz.ch). This would involve pension funds investing venture capital in promising sectors of the economy, including biotech.

Switzerland Global Enterprise (S-GE) works all over the world to support entrepreneurs and promote Switzerland as a business location. Its role as a center of excellence for internationalization is to foster exports, imports and investments, to help clients develop new potential for their international businesses and to strengthen Switzerland as an economic hub. S-GE is a strong and trusted partner for its clients, the cantons and the Swiss government, with a global network of experienced advisers and experts. For further information visit www.s-ge.com.

Gearing up for growth: Molecular Partners powers Swiss biotech's rise



Andrea von Bartenwerffer,
Senior Relationship Manager, Issuer Relations
SIX Swiss Exchange AG
(moderator)



Seraina Benz,
Relationship Manager, Issuer Relations
SIX Swiss Exchange AG
(moderator)

At last it seems that the biotech rally on the US exchanges has spilled over in to Europe with the sector showing strong signs of revival. Compared to previous years, the number of biotech IPOs in 2014 almost tripled and the public funds which poured into the sector were up by more than 100% on 2013 and 2012. Nevertheless, some European companies, lured away by higher valuations of US-based biotech, chose a listing on the NASDAQ. These firms by far underperformed their US peers, unable to jump on the bandwagon as they continue struggling to achieve a high level of visibility on the US market.

Switzerland has also seen a biotech IPO. The listing of Molecular Partners raised CHF 106.2 million from private and institutional investors. With 51% of demand driven by Swiss investors, this transaction demonstrates a remarkably strong domestic appetite and raises the prospect of Swiss investors warming up to biotech stocks once again. Another sign of the sector's strength is the performance of the SIX Swiss Exchange's specialized sector indices. The SXI Life Science and the SXI Bio+Medtech indices rose by 33% and 37% respectively in 2014 with gains three times larger than the general market's.

Against this backdrop we invited some sector experts to shed light on the current biotech environment with a specific focus on the IPO as a financing option as well as the challenges a biotech company faces throughout its financing life cycle.

Participants:



Andreas Emmenegger
CFO
Molecular Partners



Jean-Philippe Tripet
CFA, Chairman and
Founder, Aravis



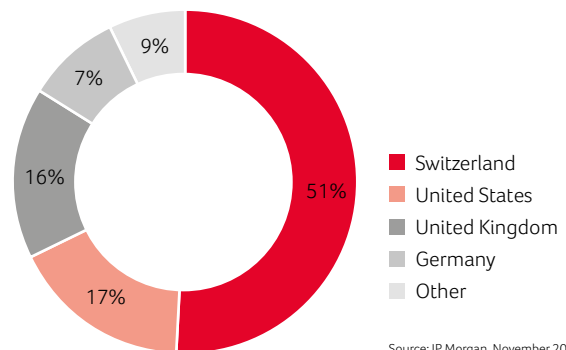
Marc Klingelfuss
Deputy Head of
Corporate Finance
Bank Vontobel

SIX Swiss Exchange: Mr Emmenegger, in view of your recent listing on SIX Swiss Exchange, has the IPO always been the ultimate goal of your company?

Emmenegger: Our goal is to become a sustainable biopharmaceutical company with marketed products that treat patients

who have severe or life-threatening diseases. To reach this goal we need access to the capital market, i.e. the IPO was a financing event. Developing drugs is very capital intensive. One single drug costs over CHF 1 billion in R&D and this process can easily take 15 years until a drug reaches the market.

Figure 1: Molecular Partners' IPO Investor Demand



SIX Swiss Exchange: Generally speaking, do young science companies still consider an IPO as the culmination of their corporate development?

Emmenegger: It all depends on the goal, vision and capital needs of the company. If the vision is to build a long term sustainable organization then the IPO is the only viable option to get the company funded. This is not the case if the goal is to generate a fast exit, e.g. through a company trade sale.

Tripet: On the contrary, I view an IPO as the start of the growth story with a broader investor base and less cyclical opportunities to finance. To be able to grasp such an opportunity, the company going public must have broad and very well defined sources of growth and be able to communicate the way to visible and positive cash flows. However, for most private companies at early stages, M&A is often the better way to grow.

Klingelfuss: The basic condition for a successful biotech IPO is the presence of advanced product candidates, i.e. at least one candidate in Phase III. Furthermore, a diversified pipeline in different stages of clinical trials and destined for various areas of application is perceived positively. Partnerships with large pharma companies are another important element. And last but not least, the market potential of the preventable and treatable diseases is crucial.

SIX Swiss Exchange: At which stage in their financing life-cycle do biotech companies face most issues with regards to raising funds?

Tripet: All the statistics, and not just from Switzerland, show that first seed rounds of financing (around CHF 1-3 million) are fairly "easy" (in reality raising money is never easy!). Getting to the next stages is usually much more capital intensive, with financing needs of between CHF 10-30 million being a very big

step in the life of a company. Only professionally organized investors, mostly venture funds and a few angels, are able to actively syndicate such larger rounds in Switzerland. A recent survey by the University of Geneva has shown that the average time to close a fundraising round is 18 months and the company death rate during this period is very high. For this reason, this phase is often referred to as the 'valley of death'. In our view, the current environment is even tougher for start-up companies as many venture funds have a very difficult time raising money themselves. The venture sector is often viewed as not being an asset class and not offering a clear enough risk-return proposition to institutional investors. On top of that, Swiss-based funds tend to be too small for larger institutions. This has resulted in the amount of venture money being halved since 2000. Foreign funds have taken a certain share, but the market has shrunk by about 25% or CHF 100 million per year.

Emmenegger: In my view, this varies from company to company. It was different in each of the three biotech companies I have been involved with over the past ten years. Generally speaking I would say that very early stage money (e.g. seed) is the most challenging to get for two reasons. Firstly, at this stage the assets and/or technology are not validated and very often the founders simply lack the commercial mindset and expertise to raise money. Secondly, in Europe there has been a lack of early-stage capital available. However, I have seen a positive trend over the last couple of years. Thanks to many good exits, the VCs' hunger to invest in early-stage firms seems to be on the up again.

Klingelfuss: After transitioning through the seed stage and valley of death, delays and setbacks in clinical development are to be expected with biotech companies and should be taken into account as much as possible when devising a financing plan. On the one hand, raising equity through an IPO, and later through capital, increases as a listed company requires a certain level of corporate development (IPO-readiness and milestone achievements after the IPO). On the other hand, the capital market environment has to be suitable for public transactions of this kind. In times of high volatility or after significant setbacks, previously listed biotech companies will face recapitalization by specialized investors (private equity funds, family offices, etc.) using PIPE (private investment in public equity) transactions.

SIX Swiss Exchange: Do you see any viable initiatives in Switzerland that address these various challenging phases?

Klingelfuss: Switzerland offers in many ways, ideal conditions for young life science companies. These include the academic environment with leading universities in different parts of the country. The life science sector represents more than a third of the total market capitalization of SIX Swiss Exchange with pharmaceutical multinationals such as Novartis and Roche and Actelion accounting for some of the leading pharma/biotech companies in Europe. In addition, there are specialized institutional investors and funds like HBM Bioventures and BB Biotech

who manage billions of assets as well as longstanding track records in investment experience and performance. There are several regions where life science R&D, know-how and operations are concentrated. One of the world's fastest growing clusters is located in western Switzerland where Campus Biotech is currently being developed and is located in the highly diversified life science cluster BioAlps. The visibility of Switzerland as a business location is continually growing by means of regular competitions and awards aimed at young high growth companies.

Tripet: Fortunately, the problem has been recognized both at the political level (Motion Graber, interpellations Derder) and at the private level with associations like SECA (Swiss Private Equity & Corporate Finance Association) and CTI Invest joining forces to support a new fund to fill the CHF 100 million gap we referred to above. On the political side, the Motion Graber has the objective to encourage and help pension funds invest in Swiss early-stage companies. Within the space of one year, the motion has been recommended for approval by the National Assembly, the State Assembly and the State Government, leading to the creation of a working group to define how this can be done. The private initiative Swissfund has now matured into a professionally run project that aims to pool CHF 300-500 million from various institutional investors. This size will enable larger institutions to invest in early-stage companies. Early market feedback is positive. The collaboration between the working group and the Swissfund is active and the progress rapid. We expect a transition to reality in 2015.

Emmenegger: Business plan competitions such as Venture and DeVigier certainly help a lot when it comes to turning ideas into realistic and professional business plans. This in turn increases the chance to trigger the interest from early stage investors. What is often underestimated is the pool of capital from private investors. Getting access to these people needs a strong and trustworthy network.

SIX Swiss Exchange: Once the decision had been made to go public, why should a company list on SIX Swiss Exchange?

Emmenegger: Switzerland has one of the world's most sophisticated and established pharma and biotech industries. For that simple reason SIX Swiss Exchange can be an obvious choice. Further, for a company like Molecular Partners with its roots and laboratories in Switzerland it makes sense to go for the domestic choice. As we have seen in our IPO, Swiss-based investors have a substantial appetite for investing in biotech.

Tripet: For a Swiss company, there is a clear 'local hero' effect, as shown again by the Molecular Partners IPO. It has to do with press coverage, quality of the banks running the book and importantly professional analysts that do understand how to value such emerging companies. Post-market liquidity and financing opportunities are also a proven plus when it comes to the Swiss market. However, it must be said that discussions within

boards of Swiss private companies that have a high proportion of non-Swiss board members tend to prefer the better known NASDAQ market in the USA. The number of companies who made the step is still limited but US banks and lawyers are very actively pitching to potential candidates in Switzerland. The shrinking of the Swiss-based venture scene is in this regard a risk for the Swiss community.

Klingelfuss: An IPO in Switzerland enjoys undisputedly high levels of visibility which brings advantages as well as disadvantages for young companies with risky business models. If the company has its headquarters in Switzerland and runs its R&D facilities mainly there, an IPO on SIX Swiss Exchange is always the preferred option in our view. Due to the sector's strength there has been a tendency in the past years for life science companies in neighboring countries to come to Switzerland for an IPO rather than Swiss companies going abroad for a listing. However, an IPO in Switzerland tends only to take place in the later stages of corporate development when the company has already reached the point at which a free float capitalization of at least CHF 100 million can be expected. Smaller companies are generally either sold by their owners or supplied with sufficient funds by their shareholders, or industrial cooperation partners, to enable them to reach the required size.

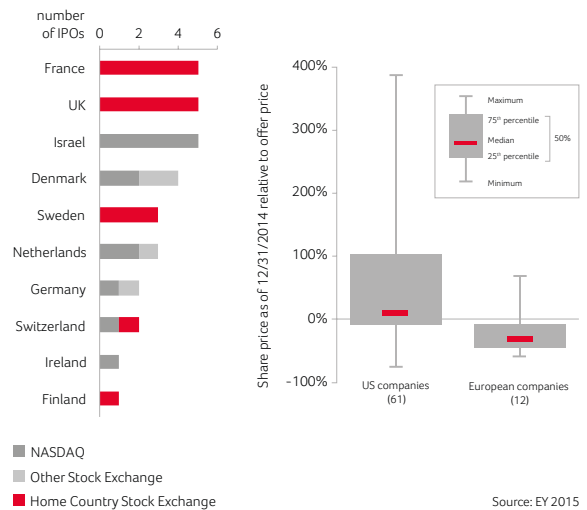
SIX Swiss Exchange: **The IPO of Molecular Partners has clearly shown that there is strong investor appetite for biotech stocks. In your opinion, how sustainable is this investor demand and can other biotech companies benefit from this in the future?**

Emmenegger: It all boils down to the success of drug products. In the USA, I would say that the biotech industry is going through its best time ever. For the last two years the IPO window of opportunity has been wide open and the number of drugs being approved by the FDA has gone up. In Europe the situation has also improved but not nearly so much as in the USA. I am convinced that if companies deliver to their promises, investor appetite for biotech will continue to grow in Switzerland and Europe.

Tripet: Molecular Partners was the fourth largest biotech IPO worldwide in 2014 and should be regarded as an exception not the rule. Biotech IPOs are notably cyclical and the money can dry out very fast when risk factors affecting the general market sentiment increase. Timing for biotech financing is essential and windows of opportunity to go public are usually limited in time.

Klingelfuss: This will be highly dependent on the IPO candidates. We hope that Molecular Partners will be a catalyst in this regard. Often newly listed biotech companies have a specific trading pattern for a certain time span after the IPO: the liquidity of the stock is very low and its volatility rather high. This tends to change once a steady news flow underpins the equity story which was communicated to investors at the time of the IPO.

Figure 2: Performance of US based vs. foreign biotechs on NASDAQ



Note: 52% of a total of 31 European biotech companies went public on a foreign stock exchange (39% on NASDAQ) and the performance of European companies on NASDAQ post-IPO was worse than performance of US-based companies.

The confirmation of the investment case usually positively impacts investor confidence in the stock and the sector as a whole.

SIX Swiss Exchange: **What effect do you expect from increased investor demand for the biotech sector, including public as well private companies?**

Emmenegger: More good ideas get turned into real business, creating a more attractive working place and always with the ultimate goal of helping patients.

Tripet: In Switzerland we did not see biotech or medtech IPOs for five years, but a number of highly attractive Swiss-based firms should make the most of today's positive momentum and go public on SIX. The main drivers will be reasonable valuations and the possibility of reaching the required financing level. The investment banks in Switzerland, in particular UBS and Credit Suisse and their smaller peers Vontobel, ZKB and Bank am Bellevue, offer local companies an excellent support. Initiatives like Swissfund will enable the growth of companies in emerging sectors such as the Internet, digital mobile and software, consumer goods, and medical and functional foods. These can provide a rich new pipeline of growth companies that are attractive for public investors.

Klingelfuss: Over time there could be a shift from private financing to raising equity on the capital market. While the former has always worked well, the capital markets have been inaccessible to biotech companies for several years.

SIX Swiss Exchange: **In the recent past, banks have been reducing their sell-side research coverage. Now this trend seems to be in reverse with Vontobel and other banks hiring**

life science research analysts again. In your view what are the reasons that prompted this decision?

Klingelfuss: Vontobel has always attached great importance to the sector and has as a consequence maintained its capacities for research, IPOs and capital increases. However, natural fluctuations are to be expected which may lead to analysts taking up management positions in life science companies and excellent researchers being hired for the equity research business. Moreover, from time to time there are shifts between the sell and buy side. For companies that fall below a certain minimum size, and whose stocks are no longer a viable investment for institutional investors due to their illiquidity, research coverage can no longer be justified after a certain amount of time.

Tripet: If a bank wants to be in a syndicate that takes a company public, the ability to provide research is an essential criteria when it comes to the board of directors having to pick one versus the other. Banks that only provide generalist or second-hand research will have a hard time competing. Maintaining research quality implies a certain trading volume, hence hiring analyst is a proof that banks believe in SIX generating enough volume to sustain the research effort.

Emmenegger: Over the last few years Swiss biotech has seen a number of exciting exits through trade sale or now with our IPO.

This was important to give back confidence after the difficult times the Swiss biotech industry went through from 2007. Further, very generally speaking, a zero interest environment stimulates the appetite to invest in equity.

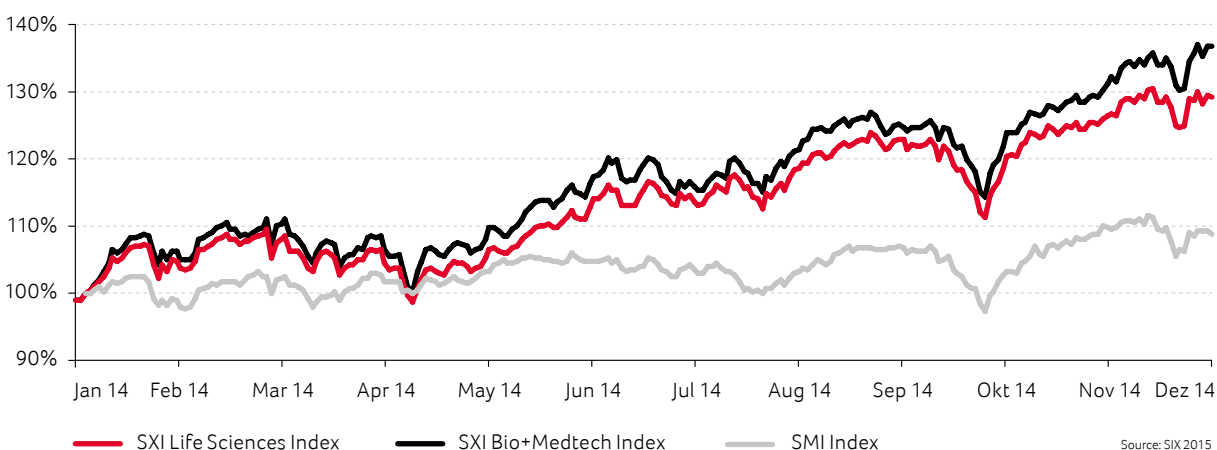
SIX Swiss Exchange: How is Switzerland positioned compared to other European countries when it comes to the provision of research coverage for life science companies?

Emmenegger: I think, together with the UK, we are the best positioned. We have a high quality analyst expertise for life sciences.

Tripet: To lead syndicates there are a few banks in London that have expert research comparable to US-based peers. We are not quite on that level in Switzerland. The Swiss banks are however closer to the companies and the market. London also sees a number of specialized 'boutique' firms that we are missing in Switzerland. France and Germany are trying to attract companies but the research is often very locally focused and liquidity historically less than perfect.

Klingelfuss: In the life science area, Switzerland occupies a leading position in Europe and therefore research coverage of the sector is high on the priority list of investment banks' research departments.

Figure 3: Performance comparison of the SIX specialized Life Sciences Indices vs Swiss blue chip index SMI in 2014



SIX Swiss Exchange – Focus on Life Sciences

SIX Swiss Exchange is the leading independent exchange in Europe. We connect companies from around the world with international investors and trading participants and create particularly market-oriented framework conditions for listing and trading in our highly liquid segments Equities, Bonds, ETFs, ETPs, Sponsored Funds and Structured Products and Warrants. SIX Swiss Exchange is an ideal listing location for companies of every origin, size and sector. With the world's fastest trading technology X-stream INET as well as the most advanced connectivity options, we offer our trading participants excellent trading conditions. We maintain a close dialogue with both our domestic and foreign customers, working intensively with them to create optimal conditions for their success. Furthermore, we offer them access to a strong global network. SIX Swiss Exchange is proud to win the «Exchange of the Year» category at the Global Investor/ISF Investment Excellence Awards 2014. For further information visit www.six-swiss-exchange.com/profile.

Year in review

(selection of events in 2014)

Trigger	Company/Institution	Description
January 2014		
Patent issued	Syngenta (SYNN)	Syngenta received a patent for variety corn line NPIC3821.
Capacity expansion/Facility improvement	Infors	Infors opened new offices in the US. On 1 January 2014, it acquired the INFORS HT part of its former distributor – including its production site and a team of 19 employees.
Positive study results	Shield Therapeutics	Shield announced positive top-line data from the pivotal Phase 3 programme of ST10 for the treatment of iron deficiency anaemia (IDA) in inflammatory bowel disease (IBD).
License agreement	Epirus Switzerland	Epirus and Ranbaxy have signed a licensing agreement for BOW015 for multiple markets including India, selected South East Asian markets and North Africa.
Milestone achievement	Spinomix	Spinomix and Debiopharm have announced the successful achievement of a second development milestone on Spinomix' two proprietary technologies.
Financing	AC Immune	AC Immune raised CHF 20 million and initiated world's first anti-pTau vaccine trial for Alzheimer's disease.
Financing	Evolva (EVE)	Evolva announced its plan to set up a Level-1 American Depositary Receipt (ADR) programme.
Collaboration agreement	Lonza (LONN)	Lonza and Index Ventures announced an exclusive agreement for development and cGMP production for all biological products in companies where Index is the major investor.
Patent issued	Lonza (LONN)	Lonza received a patent for 'Process for the Preparation of 4-Azasteroids' by the Indian Patent Office.
Patient enrolment	Debiopharm Group™	Debiopharm completed the recruitment of patients for its Phase 3 clinical study in Central Precocious Puberty (CPP) with triptorelin 22.5 mg.
Collaboration agreement	Lonza (LONN)	Lonza established an agreement with Pharmacyclics to support the commercial and clinical production of its oral oncology drug, IMBRUVICA™.
Collaboration agreement	Dualsystems Biotech	Dualsystems collaborated with Institute for Biopharmaceutical Research to validate the CaptiRec Triceps/Ligand Receptor Capture Technology.
License agreement	Selexis	Opthea signed a cell line development commercial license agreement with Selexis for wet Age-Related Macular Degeneration (wet AMD) product.
Patent issued	Anergis	Anergis has been granted a patent on its key technology, the Contiguous Overlapping Peptide (COP) technology, from the Japanese Patent Office.
Study initiation	PIQUR Therapeutics	PIQUR launched a Phase 1 study with its lead compound PQR309 and successfully completed a Series A financing round.
Regulatory authorization	Santhera Pharmaceuticals (SANN)	French ANSM granted Santhera a cohort ATU, a temporary authorization, for use for Raxone® in the treatment of Leber's Hereditary Optic Neuropathy (LHON).
Regulatory authorization	Finox Biotech	Finox announced that the CHMP adopted a positive opinion on the company's Marketing Authorization Application for bemfola.
Regulatory authorization	AmVac	AmVac received marketing authorization for its Gynevac vaccine by the Ministry of Health of Georgia.
Positive study results	Cytos Biotechnology (CYTN)	Cytos and Singapore's A*STAR announced that their influenza vaccine (gH1-Qbeta) met its primary end point for immunogenicity in the Phase 1 clinical trial.
Patent extension	Therametrics (TMX)	Therametrics announced the expansion of the patent protection coverage for 11 of the company's medicinal product candidates in Japan.
Product approval	Actelion (ATLN)	Actelion announced that following approval by the EU Commission, Opsumit® is available for prescribers in Germany from 1 February 2014.
February 2014		
Product launch	Lonza (LONN)	Lonza launched Rômacil™ V multifunctional cosmetic ingredient (fragrance providing beneficial secondary effect as a broad-spectrum antimicrobial).
Marketing/Distribution agreement	EffRx Pharmaceuticals	EffRx signed distribution agreements with leading local pharmaceutical companies in Italy, Spain and Portugal for Binosto®, EffRx's innovative osteoporosis medication.
Product launch	Lonza (LONN)	Lonza launched Laraquat™ specialty conditioning polymer based on a natural extract from larch trees for hair care applications.

Financing	Anergis	Anergis announced the closing of a financing round totaling CHF 8 million. The financing was co-led by Sunstone Capital, BioMedInvest and Renaissance PME/Vinci Capital.
Collaboration agreement	BioVersys	BioVersys and SARomics Biostructures have collaborated in an international project on microbial antibiotic resistance supported by the European initiative EUROSTARS.
Product approval	Actelion (ATLN)	Actelion announced the approval of Opsumit® 10 mg for the treatment of pulmonary arterial hypertension (PAH) by the Therapeutic Goods Administration (TGA) of Australia.
Study setback/ Discontinuation	Addex Therapeutics (ADXN)	Addex announced that overall data from a Phase 2a clinical study does not support the further development of ADX71149 in anxious depression.
Collaboration agreement	Evolva (EVE)	Evolva collaborated with L'Oréal for the co-development of novel biosynthetic production routes for an undisclosed ingredient with broad applications in the cosmetics industry.
Acquisition	Debiopharm Group™	Debiopharm Group™ acquired Affinium's antibiotic clinical assets and platform to identify and develop targeted antibiotics.
Study initiation	Kareus Therapeutics	Kareus received approval from US FDA for its Investigational New Drug KU-5039, treating insulin resistance and diabetes, to initiate Phase 1 clinical trials.
Start-up	Nestlé Skin Health	Nestlé announced the creation of Nestlé Skin Health focused on skin health needs with a scientifically-proven broad range of innovative products.
Financing	Asceneuron	Asceneuron received a research grant by CurePSP to study the role of O-linked protein glycosylation in the spread of tau pathology.
Patent issued	Covalx	The European Patent Office granted a European Patent to CovalX AG for new cross-linking reagents to characterize protein-protein interaction by mass spectrometry.
Acquisition	4-Antibody	Agenus acquired 4-Antibody, a private Swiss biopharmaceutical company.
Product approval	Actelion (ATLN)	Actelion announced that SwissMedic approved Opsumit® (macitentan) for PAH patients within Switzerland.
Product launch	Bühlmann Laboratories	Bühlmann launched a home testing device for Intestinal Bowel Disease (IBD) patients.
Financing	NovImmune	Novimmune closed a Series B financing round for CHF 60 million. London-based Rosetta Capital Limited led the round with participation of new private as well as existing investors.
Financing	Covagen	Covagen announced it has added Baxter Ventures as an investor in its Series B financing round raising the total to CHF 44.9 million.
Financing	Amal Therapeutics	Amal raised a seed round from Boehringer Ingelheim Venture Fund and High-Tech Gründerfonds.
Patient enrolment	Auris Medical	Auris announced enrolment of first patients in a European Phase 3 study of AM-101 in treatment of acute Peripheral tinnitus.
Restructuring	Bucher Biotec	The Swiss representation of the dispensing product portfolio (Fritz Gyger AG Dispenser – CERTUS & HANDY) of Fritz Gyger has been transitioned to Bucher Biotec.
Collaboration agreement	Covalx	CovalX and ASPEC Technologies have entered in an agreement that will allow the CovalX products to penetrate the greater China markets.
Financing	Evolva (EVE)	Evolva successfully completed its placement of shares. It sold 27,000,000 new shares via an accelerated bookbuild process by way of a private placement.
Regulatory authorization	Actelion (ATLN)	Actelion's novel antibiotic cadazolid receives US FDA Qualified Infectious Disease Product designation for the treatment of Clostridium difficile-associated diarrhea
Regulatory authorization	Basilea Pharmaceutica (BSLN)	Basilea announced that the US FDA designated isavuconazole as a Qualified Infectious Disease Product (QIDP) for the treatment of invasive mucormycosis.
Financing	Santhera Pharmaceuticals (SANN)	Santhera raised CHF 1 million in a private placement with IGLU Group AG, Switzerland.
Patient enrolment	Xeltis	Xeltis finished enrolment in a five-patient feasibility study of implantable products intended to enable spontaneous growth of natural, healthy heart valves and vessels.
Agreement modification	Basilea Pharmaceutica (BSLN)	Basilea and Astellas Pharma modified their isavuconazole license, co-development and co-promotion agreement. Basilea gained full rights in all markets outside US and Canada.
Product launch	Diagnoplex	Diagnoplex and Unilabs have launched Colox®, a noninvasive screening test for colorectal cancer in the Swiss market.
March 2014		
Product launch	Biognosys	Biognosys introduced new multiplexed MRM Assay Panel for depleted plasma – PlasmaDeepDive™ which enables quantification of 100 proteins.
Marketing/Distribution agreement	ChromaCon	Athena Enzyme Systems entered a partnership with ChromaCon and KNAUER for the distribution of the Contichrom® Chromatography Instruments.
Milestone achievement	Evolva (EVE)	Evolva announced that Roquette Frères confirmed the achievement of the second R&D milestone in their collaboration.

Positive study results	Santhera Pharmaceuticals (SANN)	Santhera announced positive safety and efficacy data from Expanded Access Program (EAP) for Leber's Hereditary Optic Neuropathy (LHON).
Financing	Debiopharm Diagnostics	Immunexpress Group and Debiopharm Diagnostics have announced securing of USD 6 million from a financing round, led by Debiopharm.
Financing	Evolva (EVE)	Evolva announced that Credit Suisse exercised in full the over-allotment option of 4,050,000 shares at the placement price of CHF 1.37 per share.
Capacity expansion/Facility improvement	Debiopharm Group™	Debiopharm announced its plan for expansion and optimization of its activities at the industrial development and production facility in Martigny (Switzerland).
Patient enrolment	Auris Medical	Auris announced enrolment of a first patient in a North American Phase 3 study of AM-101 in treatment of acute peripheral tinnitus.
Collaboration agreement	Biognosys	Biognosys and Functional Genomics Center Zurich have announced the collaboration on a large-scale testing of SpectroDive™ software.
Research grant	NBE-Therapeutics	NBE-Therapeutics received a second CHF 1.0 million CTI grant for a three-year R&D collaboration with the FHNW School of Life Sciences.
Study setback/Discontinuation	Actelion (ATLN)	Actelion announced setback in the Phase 4 COMPASS-2 event-driven study in symptomatic pulmonary arterial hypertension (PAH) patients already treated with sildenafil.
Acquisition	Prionics	Prionics has been acquired by Thermo Fisher Scientific. This acquisition will help Thermo Fisher Scientific to expand its animal diagnostics business.
Collaboration agreement	EffRx Pharmaceuticals	EffRx established a collaboration with Kadmon Corporation under which EffRx will generate effervescent formulations of products to be developed by Kadmon in adult and pediatric orphan indications.
License agreement	Lonza (LONN)	Lonza and BioWa have entered into a licensing agreement with arGEN-X BV.
Patent issued	Santhera Pharmaceuticals (SANN)	The US Patent and Trademark Office issued a notice of allowance for a Santhera patent which protects the use of the oromucosal administration route for fipamezole.
Collaboration agreement	InSphero	InSphero collaborated with the NIH's National Center for Advancing Translational Sciences to identify anti-cancer agents with cytotoxic activity in 3D culture models.
Collaboration agreement	Therametrics (TMX)	Therametrics announced the creation of a new European-wide consortium for developing the bioinformatic project DRUG&DROP.
Product launch	CELLnTEC Advanced Cell Systems	CELLnTEC launched the new range of Prime Media designed for specialty cultures such as selection of progenitor cells, differentiation in 2D or 3D, co-culture, and ageing.
Regulatory authorization	Finox Biotech	Finox announced that the European Commission granted Marketing Authorization for bemfola, a recombinant follicle stimulating hormone used for the treatment of infertility.
Product launch	Genedata	Genedata announced the release of Genedata Biologics™ 4.0, the latest version of its enterprise workflow support and data management solution for biologics R&D.
Certification	Qvanteq	Qvanteq, a developer of novel bioactive stents, completed ISO13485 certification under the guidance of the notified body DEKRA.
April 2014		
Award	Integra Biosciences	Integra received a Red Dot Design Award for its innovative VIAFLO ASSIST – a new laboratory device that enables the pipette's protocols to be performed automatically.
Patent issued	Neurotune	Neurotune has been issued a US Patent for 'Modified agrin-fragment capable of restoring muscle strength for use as a medicament'.
Research agreement	Debiopharm Group™	Evotec announced a research collaboration and licensing deal with Debiopharm to develop compounds against solid tumors and leukemias with defined genetic alterations.
Collaboration agreement	Flamentera	Flamentera signed an agreement with ImmunogenX to acquire rights to CypCel diagnostic for celiac disease management.
Financing	PIQR Therapeutics	PIQR closed a Series A extension round of CHF 18 million. This round brings the total funding of the Series A to CHF 32 million.
Financing	ProteoMediX	ProteoMediX announced the successful closing of a Series B equity financing round. The company raised CHF 3.2 million from existing and new investors.
Positive study results	Gene Signal International	Gene Signal announced positive results from a Phase 2a study in psoriasis demonstrating that topical application of aganirsen reduced the size of psoriatic lesions.
Positive Results	Genkyotex	Genkyotex announced the publication of data showing that GKT137831 was able to reverse lung fibrosis associated with aging in a new model.
Collaboration agreement	Lonza (LONN)	Lonza and AMYRA Biotech have announced an agreement for the development and manufacture of AMYRA's two proprietary enzymes targeting gluten.
License agreement	Syngenta (SYNN)	Syngenta announced an agreement with Cellulosic Ethanol Technologies to license its ACE (Adding Cellulosic Ethanol) technology, a new process for ethanol plants.
Study setback	Cytos Biotechnology (CYTN)	Cytos announced that the Phase 2b study of CYT003 in patients with moderate to severe allergic asthma did not achieve a statistically significant reduction of the ACQ score.

Collaboration agreement	Biocartis	Invetech and Biocartis have entered in a collaboration agreement to support development and manufacture of Evaluation™, Biocartis' advanced multiplex platform for analysis of a broad range of protein and nucleic acid-based biomarkers.
Financing	Epirus Switzerland	Epirus closed a USD 36 million Series B financing round led by Livzon Mabpharm
Certification	Lonza (LONN)	Lonza's facility in Singapore received Good Manufacturing Practice (GMP) certification from the Singapore Health Sciences Authority (HSA).
Product launch	Bühlmann Laboratories	Bühlmann launched its brand new stool extraction device CALEX® Cap. Its features include ease of use for laboratory personnel and patients, application as primary tube for all ELISA robots on the market and an optimized sample dilution for maximum efficiency in stool extraction.
Patent issued	Cardiolynx	Cardiolynx has been issued US patent for nitrate and diazeniumdiolate derivatives of pioglitazone.
Patient enrolment	Anergis	Anergis announced the completion of 196 subjects in the long-term efficacy trial of its birch pollen allergy vaccine AllerT with results expected in the third quarter of 2014.
Regulatory authorization	Lonza (LONN)	Lonza announced that its Lonzagard® R-82 family of disinfectants is now EPA approved to combat Carbapenem-Resistant Enterobacteriaceae (CREs).
Financing	CRISPR Therapeutics	CRISPR, a biopharmaceutical company focused on the gene-editing technology CRISPR-Cas9, raised USD 25 million in a series A investment from Versant Ventures.
Financing	SomPharmaceuticals	SomPharmaceuticals, a biopharmaceutical company developing novel therapies for rare diseases, announced today the closure of its Series A financing.
May 2014		
Marketing/Distribution agreement	Bucher Biotec	Bucher Biotec has been selected by IntelliCyt as its exclusive distributor for Germany and Austria.
Study initiation	Covagen	Covagen initiates phase 1b/2a study of bispecific anti-TNF/IL-17A FynomAb COVA322.
Restructuring	Cytos Biotechnology (CYTN)	Cytos announced shutting down of its key operational activities related to the development and manufacturing of CYT003.
Research agreement	Debiopharm Group™	Debiopharm and Yale University have signed a research agreement for the discovery and development of inhibitors for Macrophage Migration Inhibitory Factor.
Patent issued	Pevion Biotech	Pevion Biotech and Istituto Superiore Di Sanita have been issued a US Patent for 'Truncated Secretary Aspartyl Proteinase 2'.
MAA application	Santhera Pharmaceuticals (SANN)	Santhera filed Marketing Authorization Application in the European Union for Raxone® in the treatment of LHON.
License agreement	AC Immune	AC Immune and Piramal Imaging have entered in an out-licensing agreement for the development of Tau protein diagnostics in Alzheimer's disease.
Positive study results	Gene Signal International	Gene Signal and the Dept. of Ophthalmology, University of Cologne Medical Centre, Germany announced positive data from the I-CAN study of aganirsen eye drops (GS-101).
Product launch	Quartz Bio	Quartz Bio released a software package in the Comprehensive R Archive Network (CRAN).
Positive study results	Telormedix	Telormedix announced that it successfully completed a Phase 2 trial of Vesimune (TMX-101) in CIS (carcinoma in situ) of the bladder.
Study initiation	ADC Therapeutics	ADC Therapeutics announced the movement of antibody drug conjugate ADCT-401 for prostate cancer into human clinical trials with partner MedImmune.
Patent issued	Cardiolynx	Cardiolynx has been issued a US Patent for Valsartan derivatives carrying nitrogen oxide donors for the treatment of vascular and metabolic diseases.
Milestone achievement	Evolva (EVE)	Evolva and Cargill have announced the achievement of a technical milestone in their joint development program, Stevia.
Positive study results	Santhera Pharmaceuticals (SANN)	Santhera reported positive outcome for Catena®/Raxone® in Phase 3 Duchenne Muscular Dystrophy (DMD) trial supported by additional respiratory function data.
Capacity expansion/ Facility improvement	CSL Behring	CSL Behring announced construction of a recombinant production site in Lengnau, Switzerland to produce proteins to treat immune deficiency diseases.
Positive opinion	Octapharma	European Medicines Agency adopted positive opinion on Octapharma's human cell line recombinant human FVIII (Nuwiq®) in children and adults with haemophilia A.
Collaboration agreement	BioVersys	BioVersys entered in a collaboration with GlaxoSmithKline to develop a preclinical candidate against tuberculosis (TB), funded by the Wellcome Trust.
Marketing/Distribution agreement	Debiopharm Group™	Debiopharm and Orient EuroPharma have entered in a distribution agreement for the commercialization and promotion of Pamorelin® in South East Asia.
Collaboration agreement	Genedata	Genedata Biologics has been integrated with GlaxoSmithKline's Biopharm Discovery workflows across multiple Biopharm R&D groups and sites.

Product launch	Insphero	Insphero launched 3D Insight™ human and rat pancreatic microislets for diabetes and toxicity research.
Product launch	Evolve (EVE)	Evolve announced the start of commercial production of its resveratrol ingredient. It is the only resveratrol product made by fermentation.
Positive study results	Philochem	Philochem reported progress on its 'armed antibodies' in clinical development in advanced stage metastatic melanoma.
June 2014		
Marketing/Distribution agreement	EffRx Pharmaceuticals	EffRx signed two new distribution agreements that will bring its osteoporosis treatment, Binosto®, to strategic markets in Russia, CIS countries and Africa.
Collaboration agreement	Evolve (EVE)	Evolve, Malaysian Biotechnology Corporation and Universiti Malaysia Pahang have collaborated to establish a centre of excellence for Malaysian natural products.
Product launch	Biosafe	Biosafe launched SepaMax multiprocessing device, increasing efficiency and opening the door to address various challenges in cord blood banking activity.
Regulatory authorization	Santhera Pharmaceuticals (SANN)	Santhera announced that the European Medicines Agency (EMA) validated its Marketing Authorization Application (MAA) for Leber's Hereditary Optic Neuropathy (LHON).
Orphan drug designation	EffRx Pharmaceuticals	The US Food and Drug Administration (FDA) granted orphan drug designation to EffRx's EX404, for the treatment of pediatric polycystic ovary syndrome (PCOS).
Positive study results	Epirus Switzerland	Epirus announced clinical data from a Phase 3 study of the efficacy and safety of BOW015, a biosimilar infliximab, in patients with active rheumatoid arthritis (RA).
Capacity expansion/Facility improvement	Lonza (LONN)	Lonza announced investment plans for technology and facility improvements to its Antibody Drug Conjugate (ADC) clinical manufacturing facility in Visp, Switzerland.
Study initiation	Basilea Pharmaceutica (BSLN)	Basilea announced initiation of Phase 1 combination study with its Gram-negative antibiotic BAL30072 and meropenem.
Milestone achievement	Numab	Within a collaboration Numab discovered novel anti-TNF molecules meeting predefined stability and potency criteria, which triggered a milestone payment of CHF 3.3 million.
Positive study results	Actelion (ATLN)	Actelion announced that the event-driven Phase 3 GRIPHON outcome study met its primary efficacy endpoint in 1,156 pulmonary arterial hypertension patients.
Collaboration agreement	Biocartis	Biocartis and Abbott will jointly develop and market multiplex companion diagnostics tests.
Study initiation	AmVac	AmVac announced the initiation of a Phase 3 trial with its lead vaccine Gynevac for the treatment of Bacterial Vaginosis.
Study initiation	Debiopharm Group™	Debiopharm announced the initiation of a Phase 1 study of Debio 1450, an IV/oral potent antibiotic active against Staphylococcal infections
Milestone achievement	Debiopharm Group™	Debiopharm and TCG Lifesciences Limited have announced that they have reached the first research milestone and entered into lead optimization phase for novel antibiotics.
Collaboration agreement	Selexis	Selexis and Cook Pharmica have established a customized drug development and manufacturing services platform for biologic drugs.
Product launch	Bucher Biotec	Bucher Biotec introduced the new Seahorse XFp Extracellular Flux Analyzer Proven XF technology.
Study initiation	Basilea Pharmaceutica (BSLN)	Basilea announced the initiation of a Phase 2a study with oncology drug candidate BAL101553.
Research grant	Biocartis	Biocartis received a grant of EUR 1.7 million from the Flemish Government to further enhance the capabilities of its flagship platform Idylla™.
Collaboration agreement	Debiopharm Group™	Within two discovery programs Debiopharm and Nobelex Biotech will develop antibiotics targeting Neisseria gonorrhoeae and enteric species.
Regulatory authorization	Lonza (LONN)	The Finnish Food Safety Authority (EVIRA) approved the use of Lonza's MemreePS™ beyond dietary supplements in the EU.
July 2014		
Study initiation	GlycoVaxyn	GlycoVaxyn announced the initiation of a Phase 1 clinical trial in collaboration with Janssen for a vaccine against extra-intestinal pathogenic Escherichia coli.
Positive study results	Molecular Partners	Molecular Partners announced results from the Allergan-sponsored, double-masked stage 3 Phase 2 study of the DARPin abicipar pegol, for wet age-related macular degeneration.
Financing	Transcure Biociences	TransCure bioServices raised EUR 0.7 million in a round dominated by business angels from the Rhône-Alpes Region, France.
Financing	Sophia Genetics	Sophia Genetics raised USD 13.75 million in Series B financing in a round led by Dr Mike Lynch's Invoke Capital, Endeavour Vision and Swisscom.

Application submission	Basilea Pharmaceutica (BSLN)	Basilea's partner Astellas submitted isavuconazole US NDA for the treatment of invasive aspergillosis and invasive mucormycosis.
Collaboration agreement	InSphero	InSphero and Protea Biosciences announced a collaboration that will use Protea's LAESI® 3D mass spec technology to characterize InSphero 3D InSight™ Microtissues.
Positive interim study results	Addex Therapeutics (ADXN)	Addex announced positive results with ADX71441 (GABAB receptor positive allosteric modulator) in preclinical models of nicotine addiction.
Positive study results	Redbiotec	Redbiotec announced that it further validated its complex Cytomegalovirus (CMV) antigens in two new in vivo (mouse) studies.
Merger	Therametrics (TMX)	THERAMetrics announced its up-merger with Pierrel Research International and establishment of a new company THERAMetrics (Switzerland) GmbH.
Orphan drug designation	Basilea Pharmaceutica (BSLN)	Basilea reported that isavuconazole received orphan drug designation in Europe for the treatment of invasive mold infections.
Study setback	AC Immune	Crenezumab from AC Immune and Genentech posted mixed results in a midstage study, missing its coprimary endpoints but performing well in patients with milder symptoms.
Regulatory authorization	Basilea Pharmaceutica (BSLN)	Basilea reported that isavuconazole received Qualified Infectious Disease Product (QIDP) designation from US FDA for the treatment of invasive candidiasis.
Research agreement	Mymetics	Mymetics signed an exclusive agreement with Australia-based Imugene to manufacture and develop its cancer immunotherapy HER-Vaxx.
Product approval	Octapharma	Octapharma announced that octagam® 10% obtained FDA approval, expanding its portfolio of immune globulin therapies.
Study initiation	Santhera Pharmaceuticals (SANN)	Santhera repositioned Omigapil in Congenital Muscular Dystrophy (CMD) and initiated a clinical development program with public-private partners.
Marketing/Distribution agreement	Basilea Pharmaceutica (BSLN)	Basilea entered into an agreement with Quintiles for the commercialization of Zevtera®/Mabelio® (ceftobiprole medocartil) in Europe.
Acquisition	Butalco	Butalco has been acquired by Lesaffre, a France-based company that develops baker's yeast and yeast extracts.
Research grant	Amal Therapeutics	Amal and TransCure bioServices have obtained a European Eurostars grant of EUR 1.07 million for their project HuVac.
Acquisition	PaxVax	PaxVax announced that it acquired the oral typhoid vaccine Vivotif® from Crucell Switzerland, as well as its manufacturing facility in Thörishaus, Switzerland.
Collaboration agreement	Redbiotec	Redbiotec and GE Healthcare have collaborated to advance cytomegalovirus vaccine development and manufacturing.
August 2014		
Acquisition	Evolva (EVE)	Evolva acquired UK-based Prozarix, a leading in-silico modelling company that focuses on small molecule identification, design, biosynthesis and function.
Positive study results	NovImmune	Novimmune reported successful completion of Phase 1 trial for NI-0101, a potential personalized medicine for rheumatoid arthritis.
Product approval	Octapharma	European Commission published approval of Octapharma's human cell line recombinant FVIII (Nuwiq®) across all age groups in haemophilia A.
Acquisition	Swiss BioAnalytics	Swiss BioAnalytics has been acquired by the Synlab Group. It will become part of the Synlab Pharma Institute.
Collaboration agreement	Actelion (ATLN)	Actelion and PatientsLikeMe have collaborated to build an online portal for Cutaneous T-Cell Lymphoma patients.
License agreement	Evolva (EVE)	Evolva entered in a contract agreement with US Defense Threat Reduction Agency (DTRA). Under this, US DTRA will fund preclinical work on Evolva's antibiotic GC-072.
Financing	Santhera Pharmaceuticals (SANN)	Santhera received CHF 13.4 million through sale of treasury shares.
Positive interim study results	Stemedica International	Stemedica revealed first results of an intravenous administration of allogeneic, human, ischemia-tolerant mesenchymal stem cells (itMSCs) in a pre-clinical animal model of Alzheimer's disease.
MAA application	Basilea Pharmaceutica (BSLN)	Basilea announced that the European Medicines Agency (EMA) accepted its isavuconazole Marketing Authorization Application (MAA) for review.
Acquisition	Covagen	Covagen has been acquired by Cilag GmbH International, an affiliate of the Janssen Pharmaceutical Companies of Johnson & Johnson.
September 2014		
Certification	Sophia Genetics	Sophia Genetics obtained a CE-IVD mark for the clinical use of an Next Generation Sequencing bioinformatic pipeline for genetic testing of Familial Mediterranean Fever and Hypercholesterolemia.
Positive study results	GeNeuro	GeNeuro announced positive results from a one-year, open-label extension of a Phase 2a study. GeNeuro tested its monoclonal antibody GNBAC1 in 10 multiple sclerosis patients.

Financing	Biocartis	Biocartis announced completion of an EUR 64.5 million equity fundraising, one of the largest private rounds in the European life sciences industry in recent years.
Regulatory authorization	Debiopharm Group™	Debiopharm's innovative antibiotic Debio 1450 received Qualified Infectious Disease Product (QIDP) Designation from the FDA.
Financing	Mycartis	MyCartis, a joint venture of Biocartis' Swiss business unit Evaluation™ with Pronota completed an EUR 15 million equity round.
NDA filing	Basilea Pharmaceutica (BSLN) Ltd.	Basilea announced that FDA accepted filing of isavuconazole NDA for the treatment of invasive aspergillosis and invasive mucormycosis.
Research grant	ProteoMediX	ProteoMediX received a CHF 1.6 million CTI grant to develop a prognostic test to assess prostate cancer (PCa) aggressiveness together with ETHZ, USZ and FHNW.
Collaboration agreement	Redbiotec	Redbiotech collaborates with Duke University to study immune responses against complex Cytomegalovirus (CMV) antigens.
Product launch	Biognosys	Biognosys released Spectronaut™ 6.0 software for analysis of Hyper Reaction Monitoring (HRM) data enabling reproducible and accurate quantification of 1000s of proteins.
Positive study results	Delenex Therapeutics	Delenex announced new clinical data showing biologic activity of DLX105 upon topical application onto psoriatic skin.
Product launch	Biocartis	Biocartis launched its molecular diagnostics platform Idylla™, whose first test identifies cancers driven by the BRAF oncogene.
Product launch	Symetis	Symetis received CE mark approval for transfemoral transcatheter aortic heart valve system and launched the product with first commercial implantations.
Pipeline expansion	Delenex Therapeutics	Delenex developing treatments for dermatological diseases announced its pipeline expansion with two PENTRA®Bodies targeting interleukin-17A and interleukin-1.
Financing	Therametrics (TMX)	THERAMetrics announced the completion of its capital increase at 63.9% of the total offering.
Positive study results	Anergis	Anergis reported positive long-term efficacy results with its lead compound AllerT, a novel birch pollen allergy vaccine.
Financing	Finox Biotech	Finox raised capital to the amount of CHF 20 million through its majority shareholder, additional existing shareholders and employees.
Award	InSphero	InSphero has been recognized as the #1 company in the Top 100 Swiss Startups Rankings.
Award	Malcisbo	Malcisbo been ranked amongst the "Top 100 Swiss Startups".
Award	Qvanteq	Qvanteq has been ranked amongst the "Top 100 Swiss Startups" for the 4 th time in a row.
Financing	Cardiorentis	Cardiorentis received a EUR 45 million investment from overseas investment firm Healthcare Royalty Partners in order to finance the registration for its heart drug.
Patent issued	Telormedix	Telormedix obtained European patent for its lead product Vesimune (TMX-101) and its use for the treatment of bladder cancer.
License agreement	Rhizen Pharmaceuticals	Rhizen Pharmaceuticals announced an out-licensing agreement for TGR-1202, a PI3K-delta inhibitor to TG Therapeutics.
License agreement	ChromaCon	ChromaCon entered into a licensing agreement with LEWA and LEWA Process Technologies to enable further development of their manufacturing technologies.
Financing	Mymetics	Mymetics' promising HIV vaccine candidate obtained funding to begin study at Texas Biomedical Research Institute.
License agreement	Genedata	Genedata announced that the FUNGITECT consortium chose Genedata Selector as its host-pathogen data analysis platform for next-generation sequencing (NGS) data.
October 2014		
Patent issued	BioLingus	Biolingus drug delivery patent has been granted in the US as well as Australia.
Patent issued	Lonza (LONN)	Lonza has been awarded a patent for the ability of ResistAid® larch arabinogalactan to enhance the adaptive immune response.
Product launch	Sophia Genetics	Sophia Genetics launched a unique CFTR IVD solution allowing clinicians to run full cystic fibrosis analysis in a single NGS experiment.
Award	Asceneuron	Asceneuron won the Universal Biotech Innovation Prize 2014. The prize aims to acknowledge the most innovative early stage projects in life sciences.
Marketing/Distribution Agreement	Bachem	Bachem and GlyTech have entered in a co-promotion agreement for GlyTech's glycosylation technology.
Positive study results	Debiopharm Group™	Debiopharm announced progress of its Phase 1 study of Debio 1450, a highly potent anti-infective agent selectively active against Staphylococcus species.
Award	InSphero	InSphero named the winner of the 2014 ACES Life Sciences Award. The award recognizes entrepreneurship in university and public research institutes.
Patent issued	Pevion Biotech	Pevion Biotech has been issued US Patent for 'Multiepitope Vaccine for Her2/neu-Associated Cancers'.

Certification	NBE-Therapeutics	NBE-Therapeutics received the CTI-label from the Swiss Commission for Technology and Innovation.
Certification	NeMoDevices	NeMoDevices received the Certificate for a Quality Management System according to ISO 13485.
Award	Swiss Institute of Bioinformatics (SIB)	Professor Ron Appel was honoured with the BioAlps Award 2014 to recognize his major contribution to the creation and successful development of the SIB.
Collaboration agreement	BeFutur (Suisse)	Artificial Life and BeFutur will co-operate in stem cell research, regenerative medicine and product and vaccine development.
Collaboration agreement	Cardioentis	Cardioentis entered in an agreement with F. Hoffmann-La Roche to establish the therapeutic efficacy and safety of Ularitide for acute heart failure (AHF).
Collaboration agreement	Addex Therapeutics (ADXN)	Addex and the Charcot-Marie-Tooth Association (CMTA) will evaluate the pharmacology of ADX71441 in preclinical models of Charcot-Marie-Tooth 1A disorder (CMT1A).
Collaboration agreement	Quartz Bio	Quartz Bio and MedBiomix Partners have announced a collaborative network alliance providing healthcare professionals with advanced data-driven solutions.
Agreement modification	Lonza (LONN)	Lonza and Bristol-Myers Squibb Company have announced a multi-year expansion of their existing biologics manufacturing agreement.
November 2014		
Collaboration agreement	Lonza (LONN)	Lonza and Celladon Corporation have entered in an agreement for the commercial production of MYDICAR® (AAV1/SERCA2a).
Product approval	Octapharma	Octapharma's Nuwiq® received approval from Health Canada for treatment and prophylaxis of bleeding with haemophilia A (congenital factor VIII [FVIII] deficiency).
Product approval	Octapharma	Octapharma's Nuwiq® received approval from Australia's Therapeutic Goods Administration for treatment in previously treated patients with haemophilia A.
Award	CRISPR Therapeutics	Dr Emmanuelle Charpentier, a co-founder and advisor to the Company, has been awarded the 2015 Breakthrough Prize in Life Sciences.
Award	PIQUR Therapeutics	PIQUR won the Northwest Switzerland Young Entrepreneurs' Award. This award honors innovative companies in the northwest region of Switzerland.
Study initiation	Oncoethix	Oncoethix announced that the first patient has been enrolled in an international, open-label, non-randomized, multicenter Phase 1b trial of OTX015 in advanced solid tumors.
Regulatory authorization	Polyphor	The US FDA designated Polyphor's POL7080 as a Qualified Infectious Disease Product (QIDP) for the treatment of Ventilator-associated bacterial pneumonia.
Study initiation	Genkyotex	Genkyotex announced the completion of patient enrolment into its Phase 2 trial of GKT137831 in diabetic nephropathy.
Finance	Histide	Histide, a biotech company pioneering a new class of non-mutagenic extracellular technology, announced the closure of a CHF 4.5 million series A financing round.
Patent issued	ChromaCon	The Japan Patent Office granted ChromaCon full protection of its CaptureSMB® process technology for the capture of monoclonal antibodies and IgG plasma proteins.
Patent issued	Viroblock	Viroblock was issued US Patent for 'Composition for Inactivating an Enveloped Virus'.
Positive study results	Basilea Pharmaceutica (BSLN)	Basilea's oncology drug candidate BAL101553 induced significant anti-tumor effect in treatment-refractory tumor models.
Patient enrolment	Qvanteq	Qvanteq enrolled the first patient in the First in Man clinical study QUEST I to assess feasibility and safety of the Qstent, a bioactive, coating-free coronary stent.
Study initiation	Santhera Pharmaceuticals (SANN)	Santhera and Parent Project Muscular Dystrophy (PPMD) have teamed up on a benefit/risk study in Duchenne muscular dystrophy.
Collaboration agreement	EyeSense	EyeSense entered in a strategic partnership with Lee's Pharmaceutical Holdings Limited to develop and commercialize continuous blood glucose monitoring systems.
Research grant	NBE-Therapeutics	NBE-Therapeutics participates in a CHF 6 million SystemsX project to study synergies between NBE's antibody drug conjugate-based therapy with other immune-therapeutic interventions.
Financing	Virometix	Virometix closed an extension to its recent financing round. The start-up will use the proceeds for the development of its vaccine candidates for infectious and viral diseases.
December 2014		
MAA application	Actelion (ATLN)	Actelion submitted a centralized Marketing Authorization Application to the European Medicines Agency for selexipag in the treatment of pulmonary arterial hypertension.
Agreement modification	BioVersys	BioVersys and Enamine have announced extension of drug discovery collaboration to address multidrug-resistant bacterial infections.
Collaboration agreement	GeNeuro	GeNeuro entered into a strategic partnership with Servier to develop and market GNbAC1 in Multiple Sclerosis (MS).
Financing	Xeltis	Xeltis announced that it raised EUR 27 million in a Series B financing. Life Sciences Partners and Kurma Partners led the round.

Financing	Anergis	Anergis announced the closing of a Series B financing round totaling EUR 12.1 million. The financing was jointly led by existing investors Sunstone Capital, BioMedInvest and Renaissance PME as well as new investor WJFS, Inc.
Milestone achievement	BioVersys	BioVersys and Université de Lille have achieved the first milestone in tuberculosis collaboration with GlaxoSmithKline
Positive interim study results	Vaximm	Vaximm announced follow-on data from the first clinical trial of its investigational oral T-cell vaccine VXM01.
Financing	Molecular Partners (MOLN)	Molecular Partners announced that the total offer size of the IPO amounts to CHF 106.2 million, of which gross proceeds from the primary shares issued are CHF 104.1 million.
Orphan drug designation	Telormedix	US FDA granted orphan drug designation to Telormedix's lead product Vesimune for the treatment of carcinoma in situ (CIS) in the bladder.
License agreement	Molecular Partners (MOLN)	Molecular Partners announced that Janssen Biotech, exercised an option to secure exclusive rights to a multi-specific DARPin program.
Collaboration agreement	Lonza (LONN)	Lonza entered into two collaboration agreements with the Medicen Paris Region Innovation Cluster and the BioPmed Innovation Cluster to help support small biotechnology companies that are developing novel therapeutics.
Study initiation	Anergis	Anergis started the Phase 2 trial designed to finalize the dose selection for the Phase 3 study of AllerT.
Positive interim study results	Neurimmune Holding	Neurimmune announced study results observed in a prespecified interim analysis of the Phase 1b trial conducted by its collaboration partner Biogen Idec, Cambridge.
Acquisition	Evolve (EVE)	Evolve announced the completion of the acquisition of Allylix, after which Allylix will be a wholly-owned subsidiary of Evolve.
License agreement	Addex Therapeutics (ADXN)	Addex Therapeutics received USD 0.7 million from Janssen Pharmaceuticals following the amendment of their mGlu2PAM research collaboration and license agreement.
Acquisition	Evolve (EVE)	Emergent BioSolutions Inc. acquired Evolve's anti-bacterial programme, the EV-035 series.
Research agreement	Lonza (LONN)	Lonza and AdAlta have entered into a strain development agreement for AdAlta's alternative scaffold proteins, called i-bodies.
Acquisition	Oncoethix	OncoEthix has been acquired by Merck, providing it the rights to an investigational, novel oral BET (bromodomain) inhibitor, OTX015.
Patent issued	Anergis	Anergis has been granted US patent for its patent covering composition and methods of use of its ragweed allergy product AllerR.
Product approval	Basilea Pharmaceutica (BSLN)	Swissmedic approved Basilea's Zevtera® for the treatment of community-acquired pneumonia and hospital-acquired pneumonia, excluding ventilator-associated pneumonia.
License agreement	NovImmune	NovImmune granted Tiziana Life Sciences an exclusive license for the clinical development and commercialization of foralumab, a CD3 receptor monoclonal antibody.
Application submission	Actelion (ATLN)	Actelion submitted a new drug application to the US FDA seeking approval for selexipag (Upravi®) for the treatment of patients with pulmonary arterial hypertension (PAH).
License agreement	ARIAD Pharmaceuticals	Ariad granted Angelini exclusive rights to commercialize Iclusig® (ponatinib) for the indications approved by the European Medicine Agency (EMA) in Central and Eastern Europe.

Disclaimer:

This information was selected and compiled on the basis of publicly available information only. We therefore cannot guarantee that all events are included in the above summary for 2014.

Swiss biotech at a glance



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The global boom in the biotech sector – 63 IPOs in the USA, 41 new FDA-approved products and 82 new EMA-accepted medicines – was mirrored in Switzerland with two biotech companies going public. Furthermore, the top performers at SIX Swiss Exchange were two biotech companies. Actelion was the best-performing stock in the Swiss Market Index (up 53%) and Santhera was the best one in the Swiss Performance Index (up 2186%).

Revenues defy global headwinds

The industry achieved total revenues of more than CHF 4.9 billion compared to CHF 4.7 billion in 2013.

Financing somewhat easier

Financing continued its positive trend in 2014. With a total CHF 719 million raised (up 72% on 2013), the capital situation can be considered as very good. CHF 246 million was raised by public companies (up 237% on the previous year). The significant increase resulted mainly from the IPOs of Auris Medical at NASDAQ (CHF 52.2 million) and Molecular Partners at SIX (CHF 106.2 million), both executed in the 2nd half of 2014. The three largest private rounds were achieved by the following companies: Biocartis with CHF 77 million (series F), NovImmune with CHF 60 million (series B) and Cardiorientis with CHF 54 million (series B).

On the plus side, it is worth mentioning that several early-stage companies were also able to raise significant funds. Three investments led by Versant Ventures stand out: Anokion (CHF 33 million), CRISPR Therapeutics (CHF 22 million) and PIQUR Therapeutics (CHF 18 million). Interesting to note that there are fewer active Swiss venture capitalists but some foreign investors have stepped in to fill the gap. Also noteworthy was the fact that Nextech Ventures raised the first USD 40 million of its planned USD 100 million Oncology IV Fund which is expected to close sometime in 2015.

Public markets, products, clinical development

The year 2014 started off with the CHMP approval of Bemfola from Finox, Spinomix and Numab followed shortly after with announcements of milestone achievements in the clinical development. The same happened on the public company side with Actelion, Basilea, Evolva, Santhera and Molecular Partners. Basilea received the approval of Zevetra by Swissmedic shortly before Christmas whereas Actelion received the Swissmedic approval for Opsumit in August and announced the filing of selezipag (Uptravi) with EMA and FDA in December. In addition, some of the private companies announced progress in the clinical development.

Mergers & acquisition again a key driver for business growth

In 2014, Swiss biotech companies continued to be on the radars of large multinationals. In August, Covagen in Schlieren was acquired by Johnson & Johnson in a deal worth more than USD 200 million. In December, Oncoethix in Lausanne was acquired by Merck Sharp Dome in a deal with an upfront payment of USD 110 million and an additional upside of up to USD 265 million.

Evolva in Reinach was active as acquirer. In the summer it acquired Prosarix, a leading in silico (computational) modelling company based in Cambridge, UK. In December it added Allylix, a US company also active in the nutraceuticals field. Both acquisitions were executed as share-deals.

Collaborations

The trend of entering into collaboration agreements continued in 2014, highlighting just how essential collaborations are to the existence of many biotech companies. Some selected examples are:

- BioVersys participating in an international EUROSTAR project
- Biognosys collaborating with the Functional Genomics Center in Zürich
- Cooperations between Biocartis and Abbott, ADC Therapeutics and MedImmune, Redbiotec and GE Health as well as Selexis with Cook Pharmica

The wide spread of collaborations provides further evidence of the strength of the Swiss biotech sector as a whole.

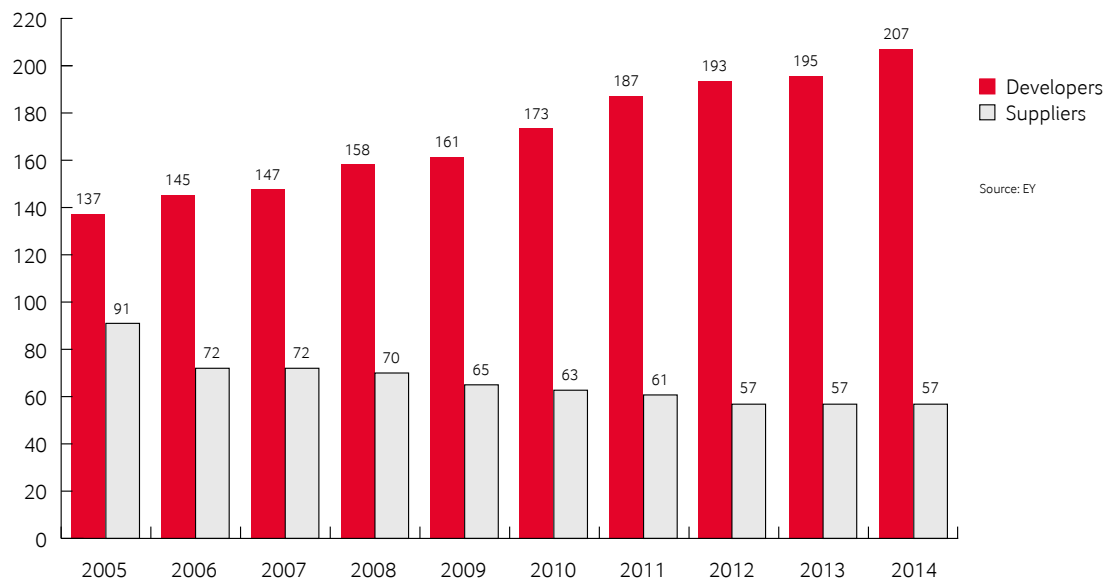
Additional noteworthy transactions and events featuring Swiss biotech companies in 2014 are included in the 'Year in Review' summary. >> page 19

About Ernst & Young

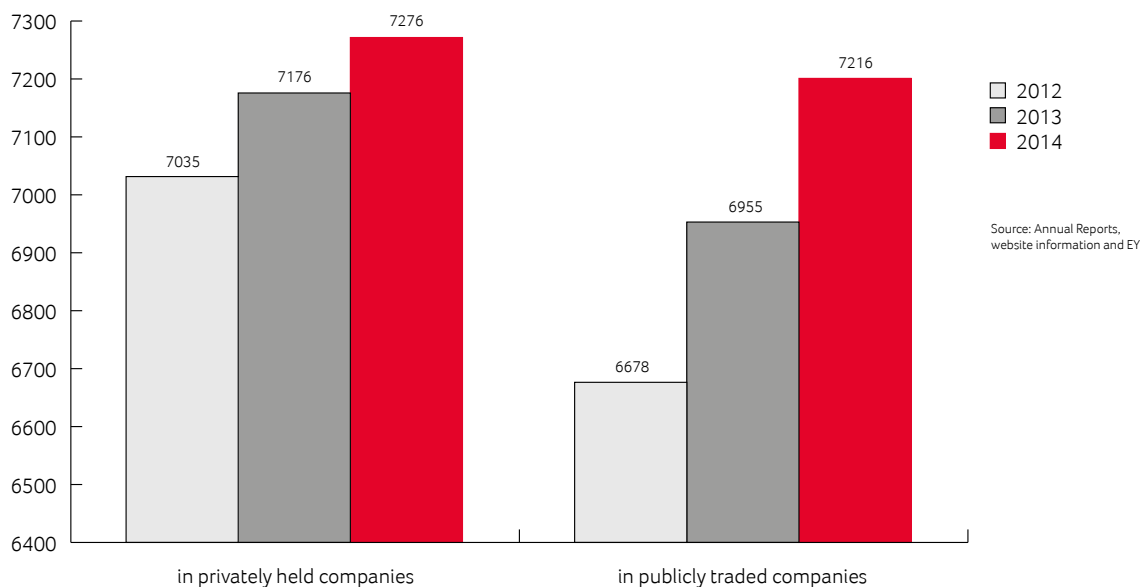
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Facts & figures

Number of biotech companies in Switzerland



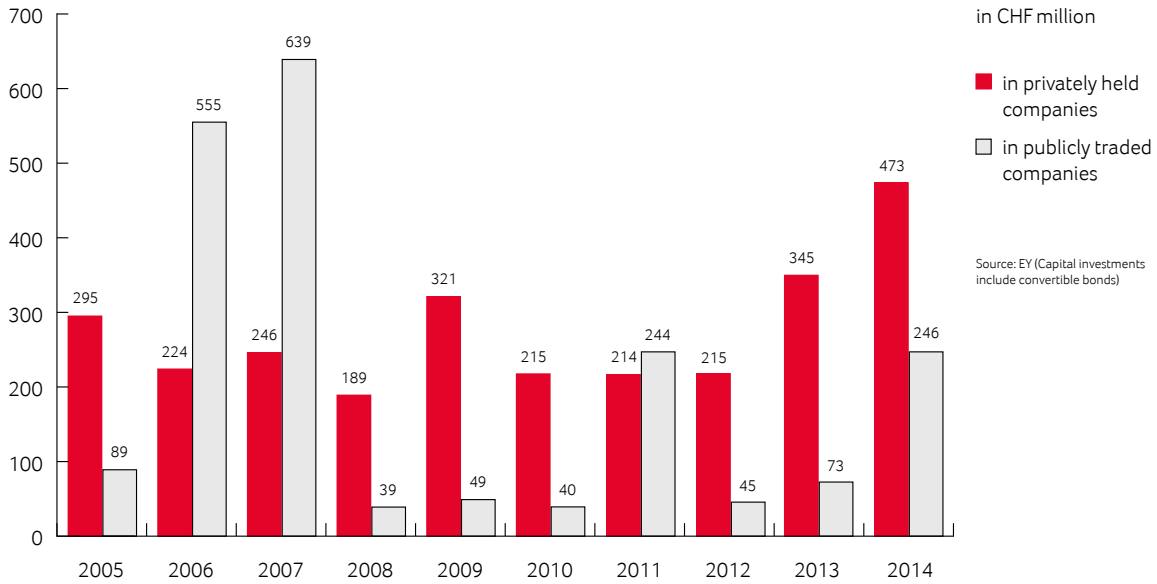
Number of employees



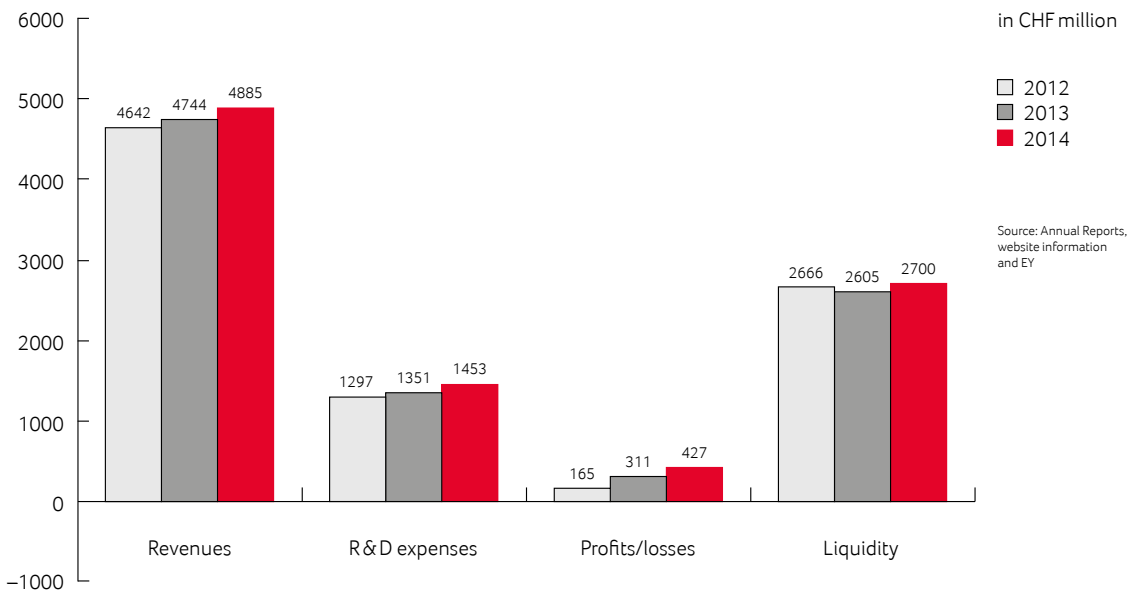
Notes

- The 2014 data in this table is based on information that has become available until March 2015 when this report was compiled. At this time, some of the companies had not yet disclosed their final financial figures for 2014. Therefore, some figures were carefully extrapolated on the basis of the latest interim data publicly available (e.g. Q3 2014).
- Selected financial figures for biotech activities of Lonza’s business segment “Pharma & Biotech Market Segment”, which has been established as part of the reorganization at Lonza, are included for 2014. For the previous periods presented, Lonza’s “Bioscience” and “Biological Manufacturing” are included based on actual figures publicly available or careful estimates. Lonza’s “Pharma & Biotech Market Segment” respectively “Bioscience and Biological Manufacturing business sectors” are presented due to Lonza’s transformation into a life sciences company and its inclusion into the ICB Biotech Sector and the SXI LIFE SCIENCES® and SXI Bio+Medtech® indices at the SIX Swiss Exchange.

Capital investment in Swiss biotech companies

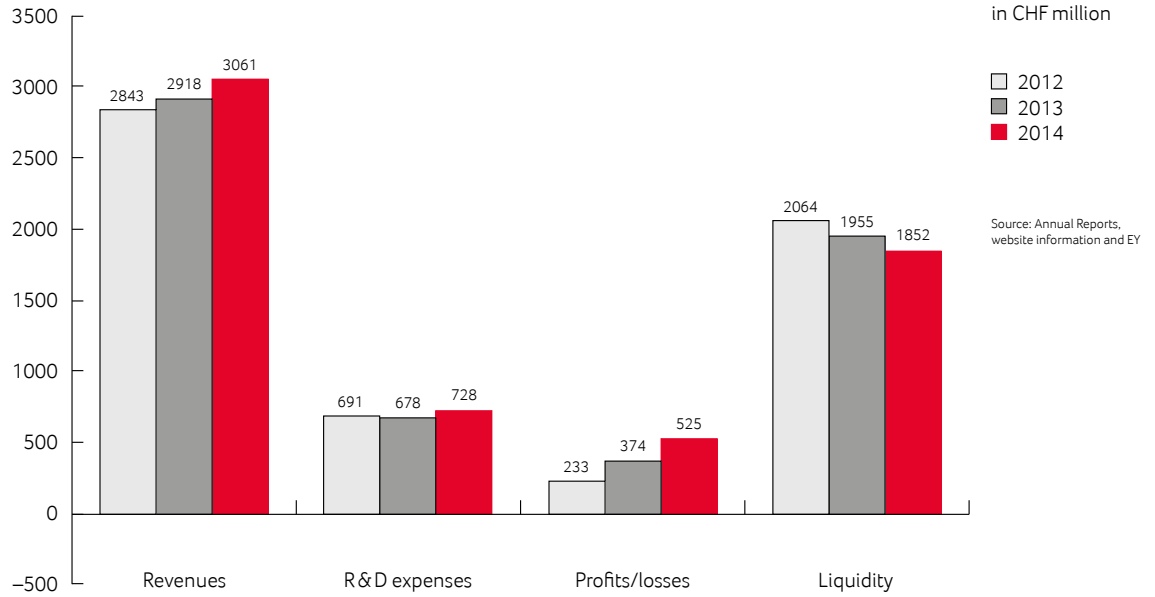


Total Swiss biotech companies

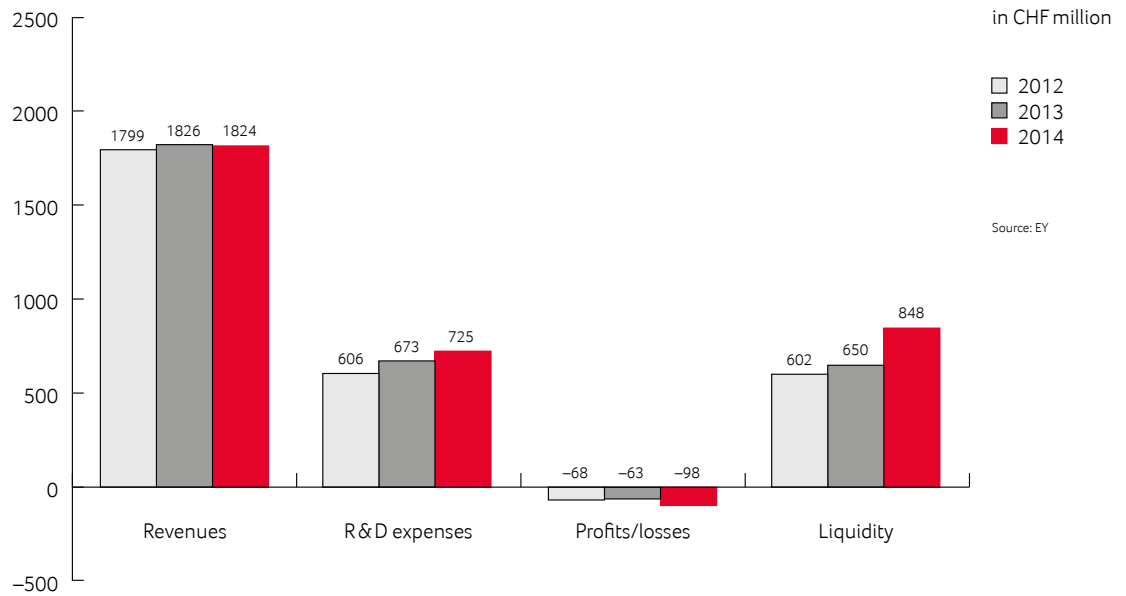


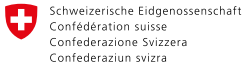
- As some privately held companies do not disclose financial figures, the figures above represent EY's best estimate.
- All figures are headquarter-counted and do not include data from pharma companies such as Novartis and Roche.

Publicly traded Swiss biotech companies



Privately held Swiss biotech companies





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