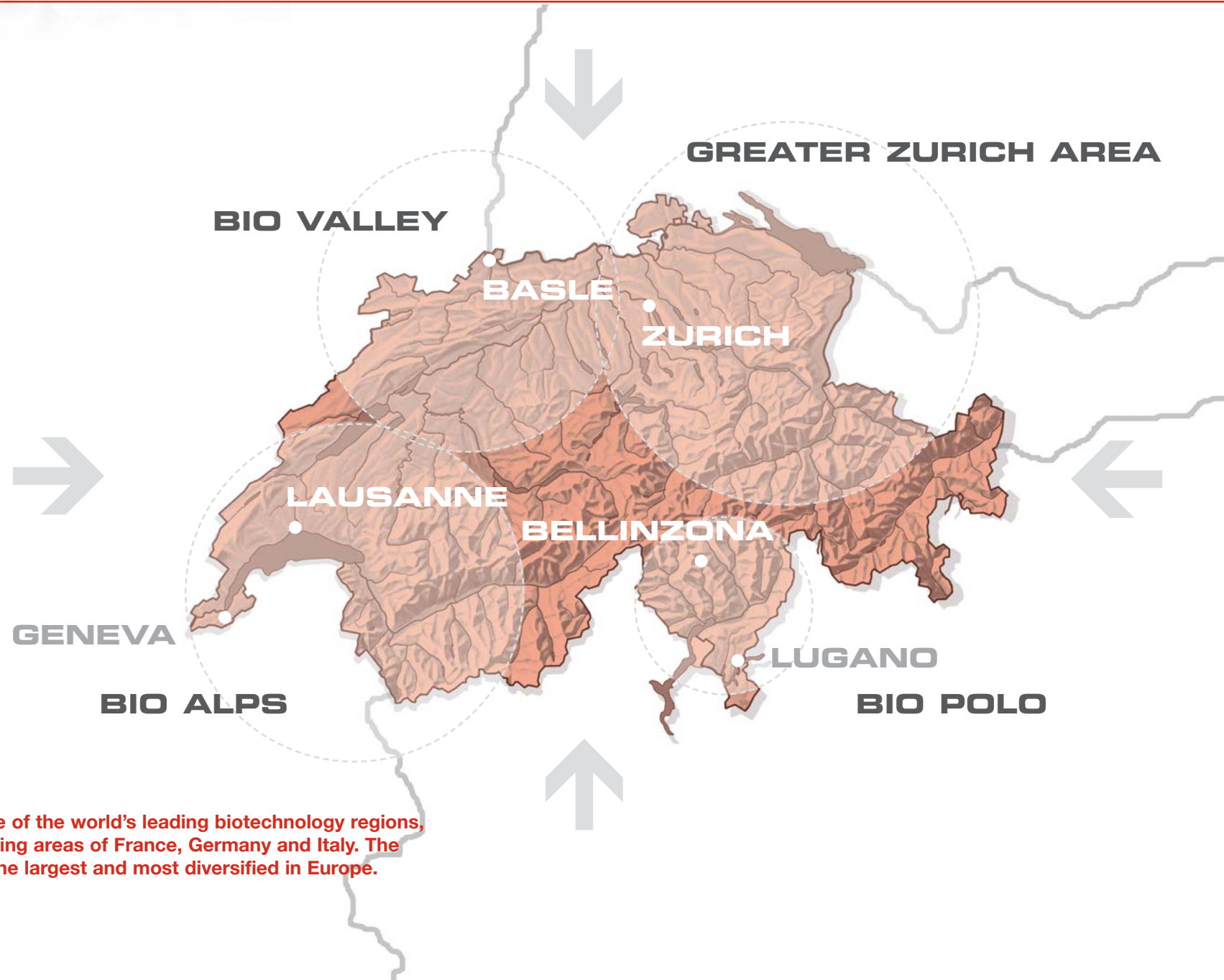




THE NEW EDITION

# SWISS BIOTECH REPORT 2005

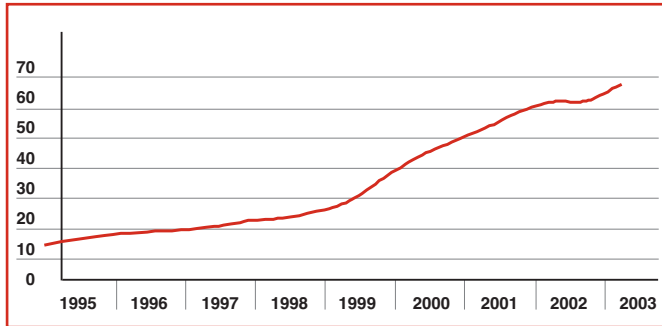


Switzerland lies at the heart of one of the world's leading biotechnology regions, which also includes the neighbouring areas of France, Germany and Italy. The Swiss biotech industry is among the largest and most diversified in Europe.

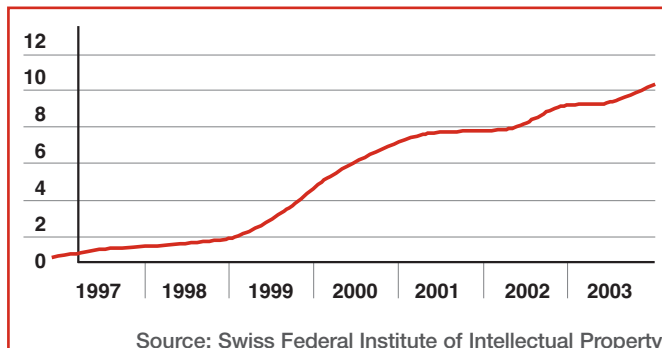
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# 04

# INCREASING NUMBER OF PATENTS



Number of patents/year (patent families) published around the world from Swiss biotech companies (large multinational companies such as Roche,



Source: Swiss Federal Institute of Intellectual Property

Number of patents/year (patent families) from Swiss bioinformatics companies. Please note that

**BIOTECH PATENTS: Patent protection gives companies the competitive edge necessary to survive in today's fast-developing and continually changing marketplace.**

Heinz Müller, Swiss Federal Institute of Intellectual Property\*

There is increasing concern, that the fast-growing number of patents and the broad patent protection on basic discoveries may result in a severe limitation of the protective possibilities of findings from lengthy and costly research and developments in biotechnology. Also, the increase of patenting of upstream discoveries – such as targets for drug intervention – potentially restricts access for those involved with follow-up research.

Furthermore, the danger of a possible infringement of protective rights of a third party rose dramatically during the last few years. Awareness of the intellectual property rights covering the specific field of research and development has therefore become indispensable. A growing number of biotech companies are founded every day around the world and successful organisations are able to protect their investments with intellectual property rights.

Moreover, intellectual property rights rarely seem to preclude the development of innovative and worthwhile projects, while projects involving work protected by older patent rights of a third party are rarely innovative.

The main part of all knowledge in regard of any invention or product is published in patent documents only, not in scientific journals. As a consequence, reading patents often imparts knowledge not otherwise available such as developments in a

particular field or data on specific competitors. Even though all this information is generally accessible to everybody through the internet and for a fee through professional databanks, it needs to be filtered out of an information pool containing more than 50 million patents.

The Swiss Federal Institute of Intellectual Property (IPI) in Bern provides various services for individuals and businesses in this area:

- The IPI is the federal office for patents, trademarks, designs and copyrights and an important platform for intellectual property matters at the international level ([www.ige.ch](http://www.ige.ch)).
- ip-search acts as your partner for worldwide database research on patents, technology and businesses and for professional trademark searches ([www.ip-search.ch](http://www.ip-search.ch)).
- The IPI offers a series of courses on both the protection rights and their information content ([info: training@ipi.ch](mailto:training@ipi.ch)).

\*Heinz Müller is a lecturer in Medical Biochemistry at the University of Basle and an expert in patents and technology.

For further information please visit [www.ige.ch](http://www.ige.ch)



**...in the fortunate position of hosting an extensive high-tech sector. Excellent R&D in public and private research institutions positions Switzerland among the world leaders in innovation.**

With a well-educated and highly skilled workforce, Switzerland is also home to approximately 250 small and medium-sized enterprises active in the field of biotechnology. Having identified biotechnology as a key factor for future development, the Swiss government has undertaken various efforts to create an attractive business environment for this sector. The proximity to Switzerland's prestigious chemical and pharmaceutical companies and to national and international knowledge clusters makes this country an ideal place to set up your biotech business.

What started in the 19th century with Charles Darwin's hypothesis and Friedrich Miescher's discovery has evolved into a new technological approach of utmost ecological, economic and social importance. Even though the expectations of early biotech gurus have as yet remained unfulfilled due to overly optimistic time projections, today's biotech product range indicates a huge technological potential. Medical, pharmaceutical and agricultural applications are only the most visible aspects of modern biotechnology. With the ability to render chemical production more efficient, to clean environmental contamination, or to create plants capable of withstanding harsh environmental conditions, OECD reports cite biotechnology as a path to sustainable production and development.

Technological developments always evolve in a social context. Consider the introduction of the motor car and the scepticism it generated among the public. Particularly in the area of biotechnology, a constant dialogue with the public is essential to foster confidence and, ultimately, widespread acceptance. If we succeed in this, the question will no longer be whether biotechnology is good or bad, but instead which biotech products or services are most beneficial.

Biotechnology enjoys a favourable regulatory and administrative environment in Switzerland. The entry into force on 1 January 2004 of the Federal Act on Genetic Engineering in the Non-Human Domain, will soon be complemented by similar legislation for the human domain. These regulations not only cover current technology, but strengthen the legal basis for further developments in biotechnology. On the administrative side, the federal coordination centre for biotechnology ([www.contactbiotech.ch](http://www.contactbiotech.ch)) provides one-stop processing of notifications and applications for authorisation.

Situated in the centre of Europe, Switzerland is an ideal gateway to the markets of the European Union.

I trust this report will promote further discussions on the many opportunities biotechnology provides to deal with the challenges we face today.



(You may wish to visit the national information platform, [www.swissbiotech.org](http://www.swissbiotech.org), for more information about Switzerland and its biotech industry.)

Joseph Deiss  
Minister for Economic  
Affairs

A handwritten signature in black ink, appearing to read 'Deiss'.

**LOCATION SWITZERLAND Accounting for 79 of the 465 European products in the pipeline, the Swiss biotech industry ranks an impressive second in Europe in terms of revenue and market capitalisation. Switzerland is home to many biotech companies including world leaders who value a business environment supporting solid growth in Europe.**

Switzerland lies at the heart of one of the world's leading biotechnology regions, which also includes the neighbouring areas of France, Germany and Italy. The Swiss biotech industry is among the largest and most diversified in Europe.

#### Why is Switzerland best for locating your business?

- A sophisticated scientific environment with leading-edge competence in life sciences, microtechnology, precision instruments and medical devices

With an annual total expenditure of CHF 8 billion CHF (USD 6.3 billion) in 2004, Switzerland has one of the world's highest levels of research expenditure relative to gross domestic product (2.6%). Over two-thirds of the Swiss research is financed by the private sector. The excellent quality of research is documented by the top rankings of several Swiss universities, as well as the high numbers of publications and of patent registrations.

- A highly skilled and quality-conscious workforce, experienced in precision operations – a world leader in terms of productivity

The dense network of universities and research institutes guarantees biotech companies easy

access to a highly qualified, motivated workforce. Up to 44% of the Swiss working population or 1.7 million persons are active in the science and technology sectors and more than 13'000 thereof are employed in the biotech industries. With an annual average of 1'856 working hours, the labour force in Switzerland works more hours per year than in any other European country.

- A stimulating environment for young, innovative start-ups with science parks and incubators

Backing joint R&D projects of universities and the industry, CTI, the Swiss innovation promotion agency, is a key element in a rapid conversion of state-of-the-art laboratory findings to marketable products. With a network of more than 40 business incubators and science parks, Switzerland provides an excellent infrastructure for young and innovative companies.

- Access to the European market with more than 450 million consumers of products and services from Switzerland

Good contractual relations with the European Union and the central geographical location provide Switzerland-based companies with an excellent platform for accessing the European market. Cooperation with the European Union includes agreements on free trade, the free movement of persons, air and land transport, non-tariff trade barriers, research, government procurement and justice.

These agreements also consolidate the position of Switzerland as a leading financial centre in Europe and beyond.



- Short product registration cycles and easy access to markets for medical devices and innovative drugs

Companies obtain all authorisations and licenses for manufacturing, wholesale and retail operations of pharmaceuticals from the Swiss Agency for Therapeutic Products, Swissmedic ([www.swissmedic.ch](http://www.swissmedic.ch)).

- Swiss legislation is compatible with the European Union but has fewer administrative contact points

Companies using contained genetically modified or pathogenic organisms notify and obtain all the necessary operation licences from the Federal coordination centre for biotechnology ([www.contactbiotech.ch](http://www.contactbiotech.ch)).

- Well-developed network linking public administration, support instruments, research and industry

The Swiss high-tech community is marked by an exemplary and effective cooperation between the Swiss government, research institutes, finance and industry. Institutional links, private-public partnerships and personal networks across borders form an efficient structure to translate new ideas into innovative products.

On the internet portal [www.swissbiotech.org](http://www.swissbiotech.org), a database of over 800 Swiss life sciences and biotech companies provides a free and direct access to these knowledge networks.

- Attractive fiscal system

A very favourable tax environment with moderate overall taxation is a key advantage of a business location in Switzerland.

The maximum corporate tax rate on profit was 16-28% in 2004, which is one of the lowest rates in Europe.

- Wide choice of venture capital and private equity funds

With more than 40 venture capital firms and sector-specific investment funds, Switzerland offers an excellent climate for biotechnology and other life science companies. In 2003 and 2004 Switzerland ranked third in Europe regarding venture capital influx of CHF 125 and 194 million respectively into the country.

For further information please visit  
[www.swissbiotech.org](http://www.swissbiotech.org)  
[www.locationswitzerland.ch](http://www.locationswitzerland.ch)  
[www.swiss-medtech.org](http://www.swiss-medtech.org)



**ERNESTO BERTARELLI,  
CEO SERONO**

Based in Geneva, Serono is the third-largest biotech company in the world. The company's research programmes are focused on reproductive health, neurology, metabolism and growth. Its products are sold in over 90 countries.

**What are the advantages for a global biotech company such as Serono to have its headquarters in Switzerland?**

**Ernesto Bertarelli:** As a centre of first-class scientific research, especially in life sciences, Switzerland has proven to be an excellent location for a global biotech company. There are many examples of fruitful cooperation with Swiss universities or Swiss Federal Institutes of Technology as well as with start-up companies. This favourable environment has been supportive to our growth since we moved our headquarters here in 1977. Nevertheless, the attraction of Switzerland goes beyond purely scientific reasons. I am convinced that the spectacular growth of our company is a result of many political, social, environmental and cultural factors that come together here.

**How is Serono reacting to the consolidation process that is taking place in the European biotech industry?**

**Ernesto Bertarelli:** In the biotech industry, size is not the determining factor of success. Creativity, innovation and dynamism are the keys to discovering new drugs. In fact, if a company becomes too large, the decision-making process can become slow and un-

**Ernesto Bertarelli, CEO Serono: «Creativity, innovation and dynamism are the keys to discovering new drugs.»**

wieldy. At Serono, we strive for the right balance. We are confident in our own internal research and development, but we do seize opportunities to strengthen our discovery capabilities when they present themselves. In 1998, we acquired the Geneva Biomedical Research Institute, a basic-research arm of GlaxoWellcome. In 2003, we acquired the flagship of French genomics, Genset (now called Serono Genetics Institute), and have incorporated its expertise into our R&D. In addition, we collaborate with a very large network of universities, research centres and companies around the world. Recently Serono signed several external R&D collaborations (e.g. ZymoGenetics, Micromet and CancerVax). We have also formed partnerships in areas such as marketing with world-class pharmaceutical companies. A fine example is our co-marketing agreement in the United States with Pfizer for our MS therapy Rebif®. At Serono, we're continuing to invest in the Swiss



**Markus Moser, CEO Prionics:** «The ongoing clustering process creates synergies and strengthens Swiss biotech companies.»

infrastructure, such as our development plans at Corsier or the extended support for Genevas' Life Science incubator 'Ecllosion'.

The biotech sector, which is highly dynamic and competitive, puts a premium on flexibility and continuous innovation. How do you ensure that Serono maintains a competitive edge?

**Ernesto Bertarelli:** At Serono, we cultivate a very competitive and challenging internal culture while at the same time emphasising teamwork. We are guided by a strong vision and the capability to reinvent ourselves to adapt to changing competitive factors. We work in an entrepreneurial spirit in multiple centres of excellence around the world in which people interact and cooperate with one another very effectively. We also collaborate with a very large network of universities, research centres and companies to



**Jean-Paul Clozel, CEO Actelion:** «It is a major advantage to be located in Switzerland, particularly in Basle.»

make sure that our benchmarks are set high.

**How would you rate the Swiss biotech industry in the European context?**

**Ernesto Bertarelli:** With more than 130 companies registered in the Swiss Biotechnology Association, this country has a broad foundation in biotechnology that can be compared favourably with both Europe and the United States. The export-driven economy of Switzerland inherently favours scientific activities and research. It has two well-known universities and Swiss Federal Institutes of Technology of world renown, which have spurred scientific research, creativity and productivity. Evidence of this talent and commitment can be seen in the number of Nobel Prizes awarded to the Swiss. Another factor essential to the expansion of our industry is the excellent level of the Swiss educational system. Serono knows it

can count on the resources, know-how and skills of employees who are well trained, highly motivated and always multilingual.

### **MARKUS MOSER, CEO PRIONICS**

It all began in the summer of 1996, when the University of Zurich launched a research project financed by the Swiss National Science Foundation. The objective was to develop a rapid BSE test – a challenge for Dr Bruno Oesch's research team. They successfully reached this objective by developing the prototype for a rapid and reliable BSE test. Armed with an exclusive licence, Dr Bruno Oesch, Dr Markus Moser and Dr Carsten Korth founded the Zurich-based spin-off company. Today Prionics AG is the world leader in fast and reliable BSE tests.

**Prionics is on the way to becoming an important player in the Swiss and European biotech sector despite its size and its private ownership. Do you think that Prionics will survive as a small private company or will you have to go public or make a trade sale as soon as possible?**

**Markus Moser:** Prionics has been financed exclusively by private investors. We are able to finance our growth with our own revenues. That's why we were in the lucky position not to be forced to make an IPO. Although we haven't planned to go public, we won't exclude this option from our future financial strategy.

**How is Prionics reacting to the consolidation process that takes place in the European biotech industry?**



**Markus Moser:** This process is a proof that Prionics follows a sustainable strategy by concentrating on its core competencies and working in a close international network of prion specialists and neuroscience researchers. The stability of Prionics is also based on the fact that its growth has been financed out of its own resources.

**The biotech sector is highly dynamic. Flexibility and innovation are some of the most important factors in competition. How does Prionics guard against getting lazy?**

**Markus Moser:** Prionics employs a strong team of highly motivated experts from more than twenty different nations. We encourage our employees to act in an entrepreneurial way, taking great personal responsibility for their tasks and cultivating a corporate culture driven by openness and innovation. And last but not least it's also the changing markets that prevent us from becoming lazy.

**How do you rate the Swiss biotech industry in a European context?**

**Markus Moser:** Switzerland has a highly specialised biotech industry with good perspectives for the future.

The ongoing clustering process of this industry in such biotech centres as Schlieren-Zurich creates synergies and strengthens Swiss biotech companies. Due to the high-quality basic research at its universities, its location in the heart of Europe and its strong track record in industrial biotech, Switzerland will continue to play a central role in the future development of biotechnology.

### **JEAN-PAUL CLOZEL, CEO ACTELION**

**Founded by former Roche scientists in 1997, Actelion has written one of the Swiss biotech industry's success stories. After a 2000 IPO, the company was awarded FDA approval for its Tracleer tablets for the treatment of pulmonary arterial hypertension the following year. Tracleer was also approved in Europe in 2002, while Actelion's second product Zavesca got an FDA go-ahead last year. Based in Allschwil (Basle) Actelion showed a profit in 2003.**

**What are the pros and cons of Actelion's Swiss location?**

**Jean-Paul Clozel:** It is a major advantage to be located in Switzerland, particularly in Basle. This region is the heart of the Swiss pharmaceutical industry and provides us with ideal working conditions, facilitating such necessities as the building of new labs, hiring the best workforce or negotiating with the authorities or banks. One disadvantage might be the rather complicated tax system and the Swiss regulations concerning stock options.

**How does Actelion respond to the consolidation process taking place in the European biotech industry?**

**Jean-Paul Clozel:** At the moment we do not see any reason to react to the consolidation process – other than to continue our efforts to be as innovative as possible.

**The biotech sector is highly dynamic. Flexibility and innovation are among the major factors in staying competitive. How does Actelion guard against taking it easy?**

**Jean-Paul Clozel:** Our competitors are permanently challenging us. Our motto is: Innovate or perish. We take this seriously. Actelion has its roots in large-scale pharmaceuticals. While we all appreciate the discipline in such huge organisations, we believe that smaller companies like ours can probably be more innovative.

**How do you rate the Swiss biotech industry in a European context?**

**Jean-Paul Clozel:** I'm not in a position to make qualitative judgments. But the better shape the industry is in, the better it is for us as a company.

**For further information please visit**  
[www.serono.com](http://www.serono.com)  
[www.prionics.ch](http://www.prionics.ch)  
[www.actelion.com](http://www.actelion.com)

# NEW TREATMENTS FOR CNS DISORDERS

11

**ADDEX PHARMACEUTICALS** The Central Nervous System (CNS) drug discovery and development company based in Geneva has only one aim: to revolutionise the treatment of CNS disorders with new and innovative drugs.

The growth of Addex Pharmaceuticals is impressive: Created in May 2002 with CHF 16 million (€ 10 million) of venture capital financing, the company now employs 55 people and in May of last year, closed a Series B venture capital financing round of CHF 50.5 million (€ 33 million), the largest Series B to date in the European biotech sector.

The Series B investors included TVM Techno Venture Management – who led the round, PolyTechnos Venture-Partners, Bio One Capital Pte Ltd, Renaissance PME (Vinci Capital), Initiative Capital, Fulcrum Pharma Development Ltd, and returning lead investors from the Series A, Index Ventures and Sofinnova Partners. «We will use these funds to advance our portfolio of clinical and preclinical compounds», explains co-founder and CEO Vincent Mutel.

How did the young company manage this enormous growth? «From the beginning we have had only one mission: We are going to develop new drugs. This also means our highly qualified scientists not only have a creative approach but also an economic one.»

Addex applies state-of-the-art technologies in biology and chemistry to support its drug development programmes with the objective of reducing time to market and attrition rates. «Furthermore, we have developed a specific know-how for the development



Dr Mark Epping, CSO (left),  
Dr Vincent Mutel, CEO, and  
Tim Dyer, CFO/Business  
Development

of compounds which have modulatory activity on specific CNS targets.» Compounds with modulatory activity are expected to demonstrate equal efficacy to directly acting compounds but have improved side effect and safety profiles. «This gives Addex a competitive advantage in the development of highly innovative drugs for the treatment of a number of CNS indications», Mutel is convinced.

## NEW CLASS OF COMPOUNDS

To date Addex has developed a preclinical pipeline of proprietary compounds that modulate glutamatergic targets in the CNS. This new class of compounds are expected to have greater selectivity, superior drug-ability and in-built safety, giving Addex a competitive advantage in the treatment of schizophrenia, anxiety and Alzheimer's disease. Addex' clinical pipeline includes a dopamine D1-selective antagonist which will begin a Phase IIa study for smoking

cessation in the USA. To generate revenue as soon as possible Addex is establishing research collaborations and licence agreements. In January 2005 the Geneva-based company announced that it had entered into an exclusive worldwide research collaboration and licence agreement with Ortho-McNeil Pharmaceutical, Inc., a Johnson & Johnson company, to discover, develop and commercialise novel compounds allosterically modulating a G-Protein Coupled Receptor for the treatment of anxiety, depression, schizophrenia and Alzheimer's disease. «The initial drug discovery research will be conducted both at our laboratories and at Johnson & Johnson Pharmaceutical Research and Development, a division of Janssen Pharmaceutica NV in Beerse, Belgium», explains the CEO.

For further information please visit  
[www.addexpharma.com](http://www.addexpharma.com)

**THE INNOVATION PROMOTION AGENCY CTI**  
**What role does CTI, the national Innovation Promotion Agency, play within Switzerland's efforts to promote research and technology?**

Next to the Swiss National Science Foundation (SNF), CTI is Switzerland's most important national organisation for the promotion of research. The SNF focuses mainly on fundamental research conducted at universities and Swiss Federal Institutes of Technology. CTI has a dual focus on promoting applied research and development projects (aR&D) with private-public partnership and on establishing and developing start-up companies. In addition to its role as a promoter of innovation, CTI also has the goal of assuring an efficient and results-oriented transfer of knowledge and technology.

**What particular form does this take in the field of biotechnology?**

Since its reorganisation in 2003, CTI has promoted application and transfer-oriented biotechnology projects through its CTI Life Sciences promotion domain. In addition, to support the Swiss biotech scene in a more focused, structural way going beyond specific projects, the strategically aligned CTI Biotech initiative was also launched. This initiative is set up so as to avoid state control, the goal being instead to make targeted use of potential synergies and to provide new impulses for the sector through the dialogue with stakeholders. In the future we want to help to promote and support more and more highly innovative, novel fields of application, strengthening the link between fundamental research and applied R&D. This is where the new CTI Discovery Projects come in, a means for



**Prof. Dr. Oreste Ghisalba, Head of CTI Biotech**

providing support for only selected, highly innovative projects in their early stages that have extremely promising business potential. Assisting start-up companies is also a priority. Here the main objective is to provide scientific coaching and support in locating partners, in project management, and in connecting up with existing networks. These activities naturally are conducted in close cooperation with CTI Start-up.

**What is CTI Biotech's specific mission?**

These strategies and activities represent the primary focus:

- Active involvement in the further structuring of R&D networks like Swiss BiotechNet and Swiss Foodnet.
- Increased cooperation between CTI and SNF to refine and implement innovative research findings

and potential problem solutions from the National Centres of Competence in Research (NCCR) and specific SNF projects in practical applications.

- Support of Swiss academia to ensure an even supply of biotech instructors and researchers.
- Collaboration between CTI and the Swiss Biotech Association (SBA) with the primary purpose of achieving better economic and political positioning for small and medium-sized enterprises in the Swiss biotech sector.

Partnership with other federal agencies and regional organisations to allow national and international activities under the common label of «Swiss Biotech» and publicising of Swiss accomplishments in the field of biotech.

#### **Best Case: Molecular Partners AG**

«We aim to develop revolutionary medical treatments and devices using Designed Repeat Protein (DRP) technology!» – this was the intent proclaimed by Dr Andreas Plückthun, Dr Patrik Forrer, and their enthusiastic team of researchers upon founding the spin-off company Molecular Partners AG in November of 2004.

They had enjoyed prior support by CTI to help them build up their young firm. In collaboration with CTI Start-up, the company concretised its business model and optimised the details of its business plan.

As far back as the CTI coaching process, the two research scientists had submitted an application for a CTI Discovery Project that received prompt approval.

#### **Designed Ankyrin Repeat Proteins – a CTI Discovery Project**

The scientists developed a novel class of receptor proteins, DARPins, with an extraordinary potential to complement or substitute classical antibodies. These recombinant receptor molecules are based on the DRP technology. Repeat proteins constitute, next to antibodies, the most abundant natural protein class specialised in target binding. The DRP technology allows, for the first time, to carry out an evolution of repeat proteins in vitro to adapt their binding properties to any chosen target protein. The new developed specific DARPins possess affinities and specificities of antibodies, but surpass them in recombinant expression yield, protein stability and intracellular efficacy – a true alternative to antibodies.

Molecular Partners AG has won the hearts and minds of the judge's panel at the Swiss Technology Awards with its newly developed biomolecular design and production technology. The young enterprise had the distinction of receiving the prominent Swiss Technology Award on 16 February 2005. [www.molecularpartners.com](http://www.molecularpartners.com)

#### **CTI, the Innovation Promotion Agency: Bringing «Science to Market»**

CTI promotes projects in applied research and development (aR&D) that are carried out jointly by private-sector businesses and academia. The organisation provides financing exclusively for the academia, in the form of salaries for around 1,000 researchers each year. In addition, CTI Start-up supports the establishment of high-potential growth companies having an international focus. By building a bridge between the lab and the market, CTI furthers the innovation process that is a driver of economy.

Businesses benefit doubly from this mission: both from project results and from the supply of qualified, market-oriented R&D professionals. With venturelab, founded in 2004, CTI launched a nationwide entrepreneurial educational and training programme active throughout Switzerland. For the period 2004 through 2007 CTI's funding amounts to approximately CHF 400 million.

For further information please visit:

[www.kti-cti.ch](http://www.kti-cti.ch)

[www.ktistartup.ch](http://www.ktistartup.ch)

[www.venturelab.ch](http://www.venturelab.ch)

**BASIC RESEARCH** For Nobel Prize winner Kurt Wüthrich Switzerland still is a leading country in basic research in the area of life sciences. But there is one problem: the lack of money.

How do you rate Switzerland as a location for basic research in life sciences? Is the country ready for the challenges of the future?

**Kurt Wüthrich:** Switzerland is a small country, but nevertheless offers excellent research programmes in life sciences and other domains. Swiss universities have for the last 30 years been leaders in molecular biology and among them the University and the Federal Institute of Technology (ETH) in Zurich are today top players in the field of structural biology and very strong in protein chemistry.

Does this mean that the conditions for basic research are good enough and Swiss science will remain a world leader?

**Kurt Wüthrich:** There is always something that can be improved... and at the moment no country can ever do enough in the promotion of life science research.

If I compare our basic research to that in the USA or in Japan, Swiss researchers were treated much more generously 30 years ago than today. During the last ten years the financial support for basic research has stagnated in Switzerland, while in the USA and in Japan the budgets have doubled or tripled. Switzerland has to increase its funding for basic research not only in the area of life sciences, in order to remain one of the leaders.

#### **CENTRE OF COMPETENCE IN SYSTEMS BIOLOGY**

Between 2004 and 2007 the Federal Institute of Technology (ETH) in Zurich, the University of Basle and the University of Zurich are establishing a centre of competence in systems biology. It will be the first of its kind in Europe and will represent a milestone in European life sciences basic research.

Systems biology is an emergent field that aims at system-level understanding of biological systems. It is a working together of biologists, computer scientists, chemists, engineers, mathematicians, and physicists who speak and understand the languages of these different disciplines to facilitate the development of new global technologies and to integrate these with the data acquisition, storage, integration, and analysis tools of computational biology and mathematics.

A major challenge is to give the technologists a deep understanding of biology and vice versa. In addition, the technologists, computer scientists and biologists must share a common language. This requires new approaches to describing and teaching biology. Together these technologies must be integrated with biology and medicine.



For the past few years you also have been working in the USA. Are the research budgets higher there because the Government spends a lot of money?

**Kurt Wüthrich:** The system is completely different from ours. Basic research at US universities is much more competitive, because there are far fewer guaranteed funds. Scientists even have to bring in money to build the infrastructure at the research institutes... The overheads are high; at the institute where I am working they run at 87%! I don't say that this is the best solution, but at least it supports competition. Here in Switzerland professorships are funded for ten to 30 years. Until now, this worked out well. But in future we need more money. Maybe we should think also about possible modifications of the system.

Although the financial situation became worse, Swiss scientists are still leading the citation index.

**Kurt Wüthrich:** Yes, and this reflects the high quality of our work. And I repeat it again: To stay at this top level in life sciences, basic research in Switzerland

needs more money. This does not absolutely have to be given by the Government. In the USA, for example, a lot of money is given by private benefactors, in some cases by donations of a few hundred million dollars! Of course, one reason for this lies in the different tax laws; but I am sure we could also do something about this in Switzerland.

Most of the time you were working in Switzerland. Would you have preferred to work in the USA, where biotechnology became a very important industry much earlier than here?

**Kurt Wüthrich:** No, the success that I have had together with my research groups is based on the Swiss system. In the late sixties and in the seventies Switzerland invested a lot of money in biological research, mainly into long-term projects. I remember that in certain universities and in the ETH the faculty was expanded several-fold.

How do you rate Swiss basic research compared to that of other European countries?

#### A NOBEL PRIZE TRADITION

Switzerland has only seven million inhabitants, but boasts various Nobel Prize laureates in life sciences: Werner Arber (Medicine, 1978), Heinrich Rohrer (Physics, 1986), Richard R. Ernst (Chemistry, 1991), Rolf Zinkernagel (Medicine, 1996) and Kurt Wüthrich (Chemistry, 2002). It can also be proud of the worldwide reputation of such scientists as BSE expert Charles Weissmann.

**Kurt Wüthrich:** Switzerland is still at the top. Of course, the UK traditionally has centres of excellence in biosciences. Germany is bigger and the investments of the Max Planck society are unique. But the situation at the universities in Germany is not even as good as that in Switzerland.

#### FACT FILE

**Name:** Kurt Wüthrich  
**Degree:** PhD in chemistry  
**Function:** Professor of Biophysics, Federal Institute of Technology, Zurich; Cecil H. and Ida M. Green Visiting Professor of Structural Biology, The Scripps Research Institute, La Jolla, USA



**NETWORK** Since 1999 Swiss Biotechnet has been bringing together Switzerland's Universities of Applied Sciences and Swiss industry. A success story.

Growth and innovation are the two aims of Swiss Biotechnet. This biotechnology network was founded by a number of so-called Universities of Applied Sciences (UAS) in 1999 to address a lack of innovation in Switzerland. «Switzerland outperforms and outranks other nations in many basic research areas but turning results from research into innovative products is often lacking», says Daniel Gygax, president of Swiss Biotechnet.

The Innovation Promotion Agency CTI of the Federal Office for Professional Education and Technology (OPET) has officially recognised Swiss Biotechnet as

a centre of competences of the UAS. Network projects have been supported by the CTI to the tune of CHF 2 million, per annum and more with Swiss industry investing approximately the same amount. Nevertheless, the network remains dependent on the success of the individual UAS in acquiring and conducting research projects. It is financed primarily through UAS and a programme for research projects accepted by the CTI.

#### **WIN-WIN SITUATION**

Swiss Biotechnet is a virtual and voluntary network but very effective in the promotion of growth and innovation, itself growing organically and building on the success of its partners.



#### **LINKING RESEARCH AND INDUSTRY**

Daniel Gygax studied biochemistry at the University of Basle with postdoctoral studies at Harvard. He then joined Ciba-Geigy AG (Novartis AG) in Basle, where he started his career at Central Research Laboratories. After four years of applied science he became head of Immunoanalytics and pharmacokinetics of the pre-clinical development, contributing together with scientists from Novartis, Genentech and Tanox to the development of the therapeutic antibody Xolair. Four years ago he accepted the opportunity to build up certain areas of research and teaching of biotechnology at the University of Applied Sciences Basle (FHBB). Since 2001 he has been president of Swiss Biotechnet and recently became a member of the Scientific Board of the Swiss Academy of Engineering Sciences.



The result is equally beneficial for the participating universities and industry. Partners from industry gain a simplified access to both basic and innovative technologies available at the UAS. According to their needs, they can join forces in research projects or simply buy customised services. «Industry can test novel ideas using partners in the network and gaining access to their labs, without having immediately to invest heavily in certain technologies on their own», says Gygax. This allows companies to test and analyse biotechnological methods and applications more rapidly and more precisely.

#### THE NET HAS AN IMPACT

As for the UAS, sharing forces in a network allows them to pool their respective competences creating a larger portfolio. «A single university can concentrate on its individual strategic areas, in which it truly has a competitive advantage through excellence.» In this way UAS can make the most of what compared to other universities are still moderate research funds. At present the network concentrates mainly

on three major areas of activity: bioanalytics, production of biomolecules and tissue engineering. Since its foundation it has already successfully conducted several important projects. In these projects groups from partner universities collaborate with high-fliers such as Prionics or Cytos. Top-notch areas such as those of the proliferation of artificial cartilage, prion diseases or food additives are being investigated in close collaboration.

«Our vision is the solution-oriented bringing together of the decentralised excellence of researchers, graduates and students at UAS», says Gygax.

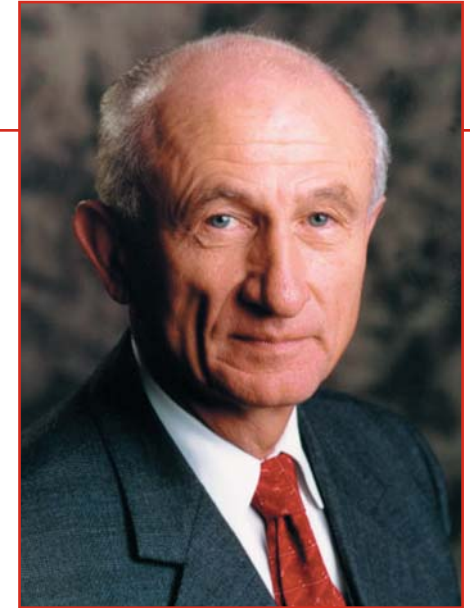
«The network is also intended to play an active role in the coordination and the implementation of education and continuing education at the partner universities.» News of the network's high quality has already been spread by word of mouth.

The Swiss Biotechnet label is widely recognised, especially on the international stage. It opens doors which otherwise would probably remain closed to individual research groups from single UAS. The turnover of corresponding R&D projects has already

reached over CHF 2 million per year. And Daniel Gygax already has a new vision. In future a network is foreseen which will work not only between UAS and industry but also between UAS and other universities.

In a pilot scheme which investigated the transfer of innovation between the University of Applied Sciences Basle and the University of Basle, the project group showed that the partnership between the two institutions can be very fruitful when cultivated carefully and systematically. «The aim of the collaboration was to develop the results of basic research so far that they can become marketable products.» Incidentally: the project was a success.





**HENRI B. MEIER** The Chairman of the Board of HBM BioVentures has a clear opinion on the Swiss biotech industry. There are plenty of innovative ideas, products and start-ups, but a lack of early-stage venture capital institutions.

**Do young biotech companies nowadays still have a chance to find investors?**

**Henri B. Meier:** In Continental Europe young biotech companies are going through an extraordinary hard time – because only a few venture capital institutions exist there that are specialised in early-stage biotech. Europe’s traditional banks provide only credits and loans, not equity capital. The situation in the Anglo-Saxon countries is rather different: There, new finance vehicles for channeling venture capital were created to finance innovation and growth.

**What are the criteria for you to invest in a biotech company?**

**Henri B. Meier:** The most important criteria are the science-based technology, the quality of the lead compound or, in medical technology, the instrument, the quality of the patent, the management and the business plan. The question, whether there are other competitors that work in the same field – possibly with further-advanced projects – is also of great importance and requires a worldwide network.

**There is no lack of competitors and biotech is an extremely dynamic market. How do you find the famous needle in the haystack which would reward investment?**

**Henri B. Meier:** With the explosion of knowledge, the biotech industry indeed belongs to the most dynamic markets. The relationship between good and bad projects, however, is much better than the one between the needle and the haystack,.

Up to now well over 1000 projects were presented to HBM BioVentures and we invested in about 2 to 3% of them. It is an enormous effort to evaluate those projects and it requires tough selection criteria. HBM BioVentures enjoys the privilege of being the leader and having the largest number of specialists in its field in Europe. But at the end of the day also the best projects are based on expectations regarding developments in the future. And because nobody knows the future, the judgment is always based on a mixture of analysis based on the past and intuition which anticipates the future.

**Biotech markets are consolidating. What is the role of the Swiss biotech industry in this process?**

**Henri B. Meier:** With 133 core biotech companies, Switzerland has the highest number of biotech com-

panies per capita in Europe and the Swiss biotech industry the second-highest valuation in Europe after the UK. In the United States it is much easier to get money despite the low rate of savings. But the US industry is disadvantaged because of its limited international experience. Here Switzerland could have an advantage, because Switzerland traditionally has the highest surplus of individual savings – whereas the USA is heavily indebted with insufficient savings. Americans are nevertheless the most active investors in value-creating companies, whereas the Swiss tend to save their money, leaving the active investment and management to others. With a change towards a more active investment approach, which implies conscious risk-taking, Switzerland could play a more important role in the ongoing consolidation process.

## FACT FILE

**Name:** Henri B. Meier  
**Formation:** Dr oec. HSG (University of St Gallen)  
**Function:** Chairman of the Board  
 HBM BioVentures

### SOURCES OF FINANCE FOR BIOTECHS

The Swiss financial community has responded as the biotech sector has grown. The past three years have seen the creation of a number of funds focusing on private equity and venture capital financing. Although the financial community is prudent with investments in economically difficult times, the financing sector remains strong. With more than 40 venture capital firms and sector-specific investment funds, Switzerland offers an excellent climate for biotechnology and other life science companies.

#### A Selection of Venture Capital Funds:

• Adamant Biomedical Investment Ltd.	<a href="http://www.adamantinvest.com">www.adamantinvest.com</a>
• Aventic AG	<a href="http://www.aventic.com">www.aventic.com</a>
• BB Biotech AG	<a href="http://www.bbbiotech.com">www.bbbiotech.com</a>
• CTI Investors Association	<a href="http://www.cti-ia.ch">www.cti-ia.ch</a>
• Gebert Rűf Foundation	<a href="http://www.grstiftung.ch">www.grstiftung.ch</a>
• Genevest	<a href="http://www.genevest.ch">www.genevest.ch</a>
• Nextech Venture Ltd.	<a href="http://www.nextechventure.com">www.nextechventure.com</a>
• New Venturetec	<a href="http://www.newventuretec.com">www.newventuretec.com</a>
• Novartis Venture Fund	<a href="http://www.venturefund.novartis.com">www.venturefund.novartis.com</a>
• Partners Group, Zug	<a href="http://www.partnersgroup.ch">www.partnersgroup.ch</a>
• SECA (Swiss Private Equity & Corporate Finance Association)	<a href="http://www.seca.ch">www.seca.ch</a>
• W.A. De Vigier Foundation	<a href="http://www.devigier.ch">www.devigier.ch</a>

#### A Selection of Equity Funds for Life Sciences:

• Clariden Healthcare Equity Fund	<a href="http://www.clariden.ch">www.clariden.ch</a>
• CS Equity Fund Global Pharma	<a href="http://www.creditsuisse.com">www.creditsuisse.com</a>
• Lombard Odier Inv. Life Sciences	<a href="http://www.lombardodierdarierhentsch.com">www.lombardodierdarierhentsch.com</a>
• Sarasin – Health Sar	<a href="http://www.sarasin.ch">www.sarasin.ch</a>
• Swissca Lux Fund – Sector Health	<a href="http://www.swissca.com">www.swissca.com</a>
• UniSector – BioPharma	<a href="http://www.union-investment.com/ch">www.union-investment.com/ch</a>
• Vontobel Fund – Life & Health	<a href="http://www.vontobel.ch">www.vontobel.ch</a>

For further information please visit  
[www.hbmbioventures.com](http://www.hbmbioventures.com)



**INDUSTRY INSIGHT** The Swiss belong to the champions league in biotech research. This is just one reason why, despite the slump in the Swiss economy, many industry figures show a clear upward trend. Yet numerous start-up companies are still waiting for their big breakthrough.

Jürg Zürcher and Markus Blaser, Ernst & Young\*

It's a fact: the Swiss biotech industry is well established. This particular success story is thanks not only to the two giants Serono and Actelion, or the biotech IPOs of recent years (Cytos, Basilea Pharmaceutica), but also to the numerous SMEs and start-ups, which are founded every year. Generating more than 13,000 jobs and with an estimated total turnover of almost CHF 5.5 billion, the Swiss biotech industry is no longer an exotic by-product of the Swiss economy; it is an industrial sector, which should be taken seriously. And these figures do not even take into account the biotech departments of the large Swiss pharmaceutical groups or agribusinesses such as Novartis, Roche or Syngenta, which have been steadily built up over recent years with enormous financial investment.

Swiss core biotech companies have always focused primarily on red biotechnology (human & animal health) whereas, in comparison with other countries, green (agro & nutrition) and white (environmental & industry) biotechnology remains under-represented, which could present further opportunities for growth.

With its rich tradition in the fields of chemicals and pharmaceuticals, highly trained personnel, excellent basic research, various tax advantages, a legal envir-



**Jürg Zürcher**

onment which tends to be tolerant of the biotech industry and its small geographical scale, Switzerland is an attractive location for biotech companies. This is also evidenced by the fact that various international biotech and chemical companies, such as Biogen Idec, moved their European biotech head offices to Switzerland. According to recent media reports, another major global biotech company will soon be building large production facilities in Switzerland.

### **SWISS BIOTECHS IN THE IPO STARTING BLOCKS**

Not only does Switzerland provide the ideal operating environment for this sector, it is also an attractive financial centre. For example, the Swiss Exchange SWX is one of the leading European exchanges when it comes to the number of listed life sciences companies, second only to the London Stock



### Markus Blaser

Exchange. And last year, the Basle-based company Basilea Pharmaceutica was the first Swiss biotech company in two years to take the IPO plunge. After a lean period of a number of months, Basilea's share price at the start of 2005 finally rose above the IPO issue price, but unfortunately, due to the continuing gloom on the biotech market in 2004, Basilea's lead has not yet prompted other Swiss biotechs to go public. That said a number of Swiss biotechs are still waiting in the starting blocks in anticipation of a favourable IPO window.

### REDUCED RISK TOLERANCE AMONG INVESTORS

Despite its growth, the Swiss biotech sector has been in the grip of a wave of consolidations in recent months. Last year, more than ten small and medium-sized biotech companies were obliged to file for bankruptcy because they had exhausted their finan-

cial resources and were unable to find anyone prepared to make further investments in their technology. This consolidation trend looks set to continue in 2005. Start-ups in particular are currently fighting to survive; in most cases this is due to the fact that they focus solely on the development of a single product, one type of technology or one service, weakening both their innovative strength and their attractiveness to investors, and thus the risk tolerance of the later. In the last two to three years, investors have concentrated increasingly on established biotech companies with later-stage products. And though venture capital continued to pour in during 2004, young start-up companies are once again finding it harder to attract seed money. Although the amounts per deal have increased, the risk tolerance of investors is showing a downward trend. Since the end of the dotcom era, various venture capitalists have withdrawn from the arena or are adopting a wait-and-see attitude to avoid getting their fingers burnt yet again.

Despite this trend towards consolidation, the quality of the Swiss biotech industry is still higher than the sector in Germany or France, where the consequences of their governments' often massive subsidies and the sluggish and inflexible approach of many companies, despite the injections of state cash, tend coming home to roost. But it is not merely thanks to predominantly private financing that the Swiss industry is so strong. Another major asset is the professionally organised approach of transferring technology between colleges and industry – a practice that has been in place for some years now – and the associated networks. Here too, a major role is played by large companies such as Novartis, Roche, Sero and

Syngenta through their ongoing formation of alliances with innovative biotech organisations. For example, co-operation agreements have recently been signed between Roche and the Zurich-based start-up Glycart, Syngenta and Affimed, and Johnson & Johnson and Basilea Pharmaceutica. Such cooperation agreements between major life sciences organisations and biotechs are essential and beneficial to both sides; the large life sciences companies can strengthen or grow their product pipeline in a relatively simple way, and the biotech firms gain access to additional research know-how and global distribution networks.

In the near future, we expect to see an increase both in the importance of alliances and the number of mergers between biotech companies, as demonstrated by the success of the union between the Basle-based MyoContract and Graffinity from Heidelberg to form Santhera Pharmaceuticals in the summer of 2004. Thus critical mass may be attained, encouraging investors to commit once more to the financing of capital-intensive research, and enabling the necessary resources to be pooled.

The development of the Institute for System Biology in Basle together with other initiatives to promote basic research in Switzerland will contribute further to securing Switzerland's place as a leading research location, thus ensuring over the medium term that Switzerland continues to be a breeding ground for more successful biotech start-ups.

\*Jürg Zürcher is Industry Leader for Health Sciences at Ernst & Young Switzerland. He is a Swiss Certified Accountant and partner of the firm. Markus Blaser is a Swiss Certified Accountant specialising in biotech companies and a senior manager at Ernst & Young Switzerland.



**Wulf Haasner, Director Finances and Operations (left), Ulf Grawunder, CEO and co-founder, and Eva-Maria Stegemann, Director 4-Antibody, Jena**

**4-ANTIBODY** The young biotech company based in Basle and Thüringen, focusses on the development and commercialisation of its proprietary technology platform. The technology optimises existing antibodies, but will also be employed for the development of novel antibody-based drug candidates.

Founded in 2000, 4-Antibody is currently focussing on the proof of concept for its proprietary technology platform. One primary objective is to prove the technology by rapidly optimising already existing antibodies with therapeutic potential. The company's proprietary technology platform is based on a defined long-term tissue culture system for primary mouse precursor (preB) lymphocytes. These preB cells maintain their potential to develop into mature B lymphocytes and also into antibody-secreting plasma cells, which can be performed either in vitro or in

vivo. The developed methods allow the genetic modification of long-term proliferating primary preB lymphocytes, such that the cells acquire the potential to develop into human antibody-producing cells (so-called HupreB cells).

### TWO LOCATIONS

«In a next step the technology will also be employed for the development of novel therapeutic drug candidates», says Ulf Grawunder, CEO of 4-Antibody. For this technology platform, the company received the European patent in October 2004. «In order to establish a strong product pipeline, optimised and newly developed therapeutic antibody candidates will rapidly be evaluated in preclinical and clinical testing», explains Grawunder.

In spring 2005 4-Antibody is employing 14 employees, seven of them at the Pharmazentrum in Basle and seven of them at the Bioinstrumentezentrum in Thüringen (Germany). The two sites were established, because the Federal State of Thüringen awarded CHF 1 million non-refundable subsidies to 4-Antibody's R&D projects, after venture capital funds like «Life Sciences Partners» or «Bio Med Invest» and two additional private investor funds provided seed financing of CHF 2.75 million. «At the Pharmazentrum in Basle, we are concentrating on perfecting 4-Antibody's proprietary technology for the development and optimisation of therapeutic antibodies and on establishing a strong product pipeline», says Grawunder. «At our location at the Bioinstrumentezentrum in Thüringen, we focus on extending the scope and efficiency of our proprietary technology by integrating full automation and high-

throughput screening strategies that will eventually be used to develop antibody-based diagnostic systems.»

### DUAL BUSINESS STRATEGY

For gaining revenue streams at different stages of business development and for growing sustainably, 4-Antibody pursues a dual business strategy: on one hand developing a portfolio of own therapeutic antibody drug candidates that can be sold or licensed out to large pharmaceutical companies at various stages of preclinical and clinical testing and, on the other hand, offering 4-Antibody's proprietary technology platform on a fee-for-service basis to (bio-)pharmaceutical companies for the optimisation and development of their own therapeutic antibody products.

The future looks bright for the young company. «In order to develop a strong product portfolio we will foster strategic alliances with academia and biotech companies, which will allow both partners to benefit from scientific and technological synergies», says Grawunder. One cooperation has already been signed. «It is a partner that develops products in the areas of infectious diseases; at the moment I can't say more», says Grawunder. For 2006 he expects the closing of a second round of financing growing the staff to 30 employees in order to continue expansion towards an internationally recognised player in the field of antibody drug development.

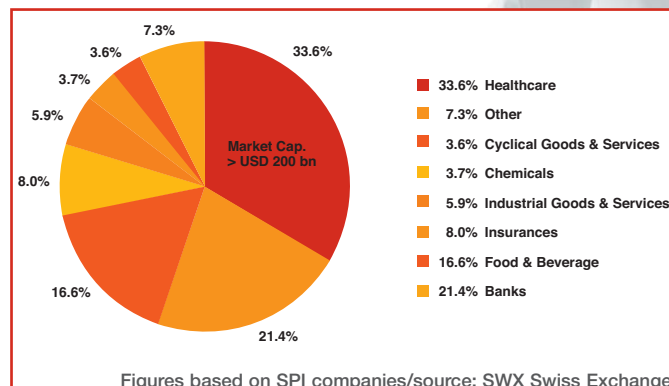
For further information please visit  
[www.4-antibody.com](http://www.4-antibody.com)

**SWX SWISS EXCHANGE** Among European countries, Switzerland has been able to position itself especially well as the home base for various foreign life science and medtech companies by creating an advantageous business environment.

Switzerland is a global leader in cross-border private banking and is one of Europe's leading financial centres for equity-investing institutions. Companies benefit from access to an international financial network, great placing power and the high visibility of listed companies. In terms of investor relations, companies can only gain from Switzerland's geographical location and size. In particular, it is important to be able to reach investors quickly and efficiently. The close attention given by the media, analysts and investors to listed companies makes it easy for market participants to form an opinion on a one-to-one basis and guarantees the necessary flow of information. Switzerland is a centre for sector-oriented institutional investors, especially in biotechnology and other life science sectors. These investors draw on many years of international experience in sector-oriented investing, which makes them particularly stimulating contacts. Finally, Swiss law offers extraordinary growth incentives for local companies. Switzerland's labour law is one of the most liberal in the world, and its tax law – both private and corporate – is very favourable.

#### Key Figures Financial Center Switzerland:

- Population 7.4 m / approx. 340 banks
- Assets managed in Switzerland: CHF 3,386 bn
- Proportion owned by foreign clients: 57%
- Worldwide share of total assets managed abroad: 27%

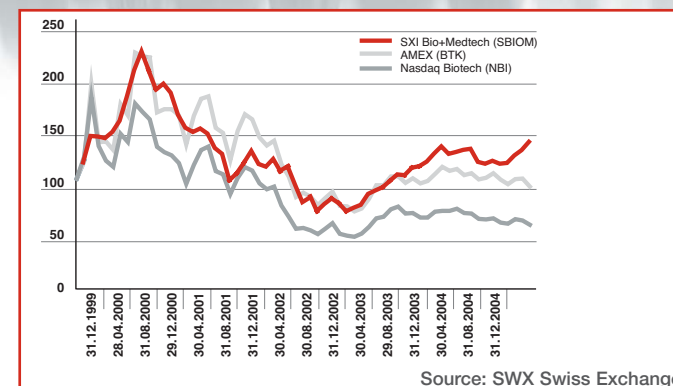


**SWX Industry Breakdown as per 31 Dec. 2004**

#### LIFE SCIENCES AT THE SWX SWISS EXCHANGE

With more than one-third of its total market capitalisation stemming from listed life science companies, the SWX Swiss Exchange is a highly attractive listing platform for domestic and foreign companies in this sector (see pie chart). A listing on SWX affords companies a high degree of global visibility among investors. With the intended purpose to even increase the already high visibility and liquidity in the life science sector, the SWX Swiss Exchange launched two industry-specific indices (SXI Life Sciences® & SXI Bio+Medtech®) in 2004 that reflect the Swiss and foreign companies with a primary listing or sufficient liquidity at SWX. The strong interest in the bio- and medtech sector is best illustrated by a performance comparison (see graph). The companies in the Swiss life science sector are being tracked by approximately 60 banks and various brokerage houses worldwide. Source: Thomson Financial

For further information please visit [www.swx.com](http://www.swx.com)



**Performance Comparison SXI Bio+Medtech®**

#### An IPO at SWX enables life science companies to benefit from:

- continental Europe's most international marketplace
- leading financial centre for equity-investing institutionals
- strong private banking investor base
- high placing power
- high attention for IPOs (and beyond)
- a lively derivative and bond market
- the focus on small and mid caps
- numerous banks with strong research activities
- the multilingual and multicultural Swiss investors
- an attractive and market-oriented regulatory environment due to self-regulation
- the uncomplicated listing procedure
- approval of several accounting standards (US GAAP, IFRS, Swiss GAAP FER)
- short communication paths – high concentration of investors in few locations
- low currency risk (listing in various currencies)

**ROUNDTABLE** Barbara Heller (First Vice President, Bank Vontobel), Jürg Meier (CEO Novartis Venture Fund), Ron Scott (CFO Basilea) and Yvonne Wegmann (Vice President, SWX) discuss the risks for investors.

Biotech is a capital-intensive industry. The drive for many companies to go public is therefore plausible. But an overhasty listing can bear its dangers. Yet, when is the ideal moment for a young company to list on an exchange? Mr Meier, what would be your advice to the start-ups that you look after in their first financing rounds?

**Jürg Meier:** Every start-up should consider quite carefully where it obtains its funding. Not all money is equal. State aid or soft money often do the industry more harm than good. There is money out there for good ideas, and it would be rash to let oneself be swept away by a stock market hysteria. It would be hazardous to go public out of a conviction that there are no alternative ways to raise money.

**Why did Basilea decide to launch an IPO?**

**Ron Scott:** We successfully completed Phase II clinical trials for our lead antibiotic compound that is active against resistant bacteria in February 2004. In addition, we had a dermatology compound active against severe chronic hand dermatitis moving into Phase III and a novel broad-spectrum oral and intravenous antifungal compound moving into Phase II clinical trials. We needed to make sure that we had sufficient funding to continue and not delay our clinical trial programmes. Upon successfully achieving clinical milestones and due to the breadth of our development portfolio, we had sufficient public investor interest to launch an IPO in March 2004.

**And why did you choose SWX Swiss Exchange for the IPO?**

**Ron Scott:** Because Basilea is a Swiss company and we have the most liquidity in Switzerland. It is important to list in the country where you have your major operations as this is where a company will have the most shareholder interest and liquidity. We are fortunate in Switzerland as Swiss investors are very familiar with the healthcare sector.

**Barbara Heller, do you recommend Switzerland as a listing place for biotech companies?**

**Barbara Heller:** The Swiss market has the advantage that a third of total market capitalisation comes from the healthcare sector, including the speciality chemistry sector. This means that you have a large analyst community and an investor community that is familiar with the industry. The biotech companies located in Switzerland have a strong homebase with the SWX Swiss Exchange. So there is no reason for a Swiss company to aim for a primary listing in another country. The situation is different for foreign companies.

**Last year SWX launched SXI Life Sciences® and SXI Bio+Medtech®, two new indices. By doing so, SWX has positioned itself as a centre for life science financing. Were you disappointed that the IPO window did not really open last year?**

**Yvonne Wegmann:** Of course a bigger number would at first sight look better. Still, we had four very successful IPOs at SWX, two of which in the field of life sciences: Basilea raised over USD 160 million and Ypsomed USD 150 million. For 2005, we generally see a positive trend. Thanks to the solid performance of the above-mentioned IPOs, investors are regaining confidence and IPO activity is rising



**Barbara Heller (First Vice President, Bank Vontobel)  
Jürg Meier (CEO Novartis Venture Fund)**

again. Among others, there are several life science and biotech companies waiting to go public.

**So investors and companies are not showing a high aversion to risk any more?**

**Yvonne Wegmann:** Investors tend to be more cautious than they were a few years ago. This makes it more difficult for companies to raise funds in the early stages, at least for the time being. If this trend continues, it could become a serious problem for the industry because the ability to invest in platform technologies is key to innovation and to develop a sustainable product pipeline.

**Jürg Meier:** Another problem I see for early-stage financing is the fact that there are many investors around who are willing to provide money but who then want to exit very quickly because they have lost money in the past. They don't have the patience for a long-term investment.

**A few years ago, banks encouraged too many companies to list, and the stock markets were often accused of being too open to IPO candidates. Are banks being too reluctant now?**

**Barbara Heller:** A company can go public as soon as it has the backing of the market and an IPO makes



**Yvonne Wegmann (Vice President, SWX)**

strategic sense. At the moment, we have a buyers' market. Investors at the public markets define requirements from potential candidates and the valuation they are willing to accept. It would not help anyone to coax companies on to the market too early. So it is really essential that we launch companies that can survive on their own.

On the other hand, this is a sector with a high risk profile and the market here has to understand better that biotech companies need the opportunity to fund their product development via the market, although some companies will probably not survive in their original forms. We have to support the European markets to better understand the risk-reward profile of biotech.

**What are you doing to educate the market?**

**Ron Scott:** We talk about Basilea with investors and analysts on an ongoing basis in the form of roadshows, analysts' meetings, investor meetings, conferences and press releases. Investor relations is important because the key to understanding what kind of risk and potential you have in a biotech company is understanding the company's products.

**Yvonne Wegmann:** Our newly created SXI indices have helped to enhance the visibility of both Swiss

and foreign life sciences and biotech companies at SWX. Due to the long tradition of life sciences and biotech in Switzerland, there is considerable industry expertise among investors, and public companies benefit from broad and profound analyst research coverage. In Switzerland, biotech and pharmaceutical companies can expect a high and fair valuation. Stakeholders should try to further enhance coverage and knowledge among analysts and the press. Also they should encourage companies to emphasise active investor and media relations.

**Jürg Meier:** We try to show investors that the biotech sector has enormous potential. The ultimate value lies in the product. Yet this product might cost CHF 1.7 billion before it is ready for the market. This is why it is important not to have investors who are interested in a fast exit. There is money to be made, but a little patience is needed!

**Barbara Heller:** A few years ago, we decided to make biotech and life sciences a strategic focus of our investment banking activities. We have therefore employed highly qualified people, often with scientific backgrounds.

We are trying to extend the investor group to include small- or mid-cap generalist funds. The problem for these vehicles often is that in terms of market cap, biotech is still not important enough to be considered as a separate sector. Also, to additionally support companies and investors, the bank has built up a very professional corporate finance and research team in life sciences and is supporting important events in the biotech area.

**Let's look into the crystal ball. What is your forecast for the biotech sector in the future?**

**Ron Scott:** There is an increasing demand for new medicines that address unmet medical needs. Pharmaceutical companies are under immense pressure to come to the market with new products. There will be a lot of value created in the biotech sector in those biotech companies that invent and develop products to meet significant medical needs.

**Yvonne Wegmann:** Due to demographic change, the healthcare market will continue to grow. This offers great market potential for biotech companies marketing new treatment models which will bring substantial change to medicine. The biotech industry in Switzerland is in an excellent position. We have several well-established regional clusters providing fertile ground for solid growth of the local industry.

**Jürg Meier:** The biotech industry is set to grow because its products are a major driving force behind progress on treating various illnesses. I hope that we will see a number of IPOs in 2005 and that the major pharmaceutical companies will regain some of their old momentum. This will have an impact on all suppliers to the industry.

**Barbara Heller:** People always tend to compare Europe with the USA. If we do this now, our industry in Europe is some way behind. It will take another five to ten years until we have a biotech industry with a comparable, sustainable critical mass. Therefore, market participants need to be patient. Comparing Switzerland with other countries in Europe, I however think we really have the best foundation on which to further develop what is already a successful industry.

Dr Bo Nilsson,  
VP R&D (left),  
Dr Adrian Weiss, CEO  
and CMO, and  
Dr Zvi Er-el Angelo,  
COO and Regulatory  
Affairs Manager



**ONCORE THERAPEUTICS** The drug development company registered in early 2004 and based in Lugano is focusing on accelerating development of new cancer therapeutics along the regulatory and clinical pathways towards clinical proof of concept and marketing approval.

The medical need for new and improved therapies in cancer can be illustrated by the fact that more than half a million people die each year in Europe and the USA from cancer of the breast, prostate, lung and ovary. Only 20-25% of the cancer patients are cured. There is a huge opportunity for new products to reach an extremely high market. No wonder that there are a lot of companies doing research in this therapeutic area. So does Oncore Therapeutics. The asset of the company is its human capital. The founding team has an exceptional track record in identifying, developing, testing and commercialising successful drugs. They have been responsible for the successful development of four well-known

oncology drugs on the market today, and represent decades of oncological drug development experience as senior executives in leading pharma companies.

#### THE BUSINESS MODEL

Oncore Therapeutics' business model is based on a holding company and separate project companies, thereby offering a unique, dual-mode investment model that carves out a substantial degree of early-stage investment risk. Under this investment strategy, the company will accept project-specific funding, as well as investment in the holding company. The company expects to incubate three project companies in parallel and establish an attractive developmental pipeline. «We expect that exit opportunities will materialise around 2009 with a reasonably high probability for considerable upside to the equity investors», explains Adrian Weiss, co-founder and CEO of the company.

#### FIRST INCOMES BY 2007

Oncore Therapeutics identified a product (code named «INIT») with a novel mechanism of action in oncology therapeutics. «INIT has the potential of a blockbuster drug. The product was selected from a list of some 40 prospective product opportunities that were reviewed by the founding team», says Adrian Weiss. Oncore intends to license INIT from an Ivy League university in the USA and develop it under a separate US-based subsidiary company (i.e.: «The Project Company»). The second product that has been identified by the company is a spin-off from a major pharma (code named «PTA»). It is a second-generation, non-toxic compound for which the first generation was proven clinically efficacious in patients by enhancing the uptake of vinca alkaloids, taxanes, anthracyclines and possibly other commonly used oncology drugs.

Adrian Weiss believes that by the end of 2006 the company will have at least two products in clinical and the third and fourth product by late preclinical. At the moment the company is in the middle of its first financing round over CHF 6 million. Because Oncore Therapeutics is focusing on products that can reach the market within a relatively short time the management is convinced that the company will start having incomes by 2007. «This also because our business model is based on multiple exits.»

For further information please visit  
[www.oncore-therapeutics.com](http://www.oncore-therapeutics.com)



**SWISS BIOTECH ASSOCIATION** Increasing and improving Switzerland's international position as one of the top biotechnology hubs is the main goal of the association for SMEs.

Building on a long tradition and economic strength in life sciences, Switzerland has assembled considerable expertise in bioscience over the last few years. Leading companies in the pharmaceutical industry have scored impressive advances in research and development. «More recently, the macro-view of biotech in this country has resulted in the promising situation where small and medium-sized enterprises are in a position to support major corporations», explains Domenico Alexakis, Executive Director of the Swiss Biotech Association (SBA).

Unitectra – the biotechnology technology transfer agency for the Universities of Bern and Zurich – has identified a considerably higher number of Swiss companies with significant biotech activities than had been publicly assumed. They include a large number of small and medium-sized companies. The firms are spread over 20 of Switzerland's 26 cantons. Greater Zurich's 65 companies total more than 2000 employees while the Lake Geneva Region is home to some 30 companies with 5500 employees. The region of Basle has more than 4000 employees with a company base of around 40. These numbers show a typical pattern of the geographical cluster of biotechnology in this country.

One-third (73) of the companies featured use modern biotechnological methods in R&D and/or production processes. 32 companies work exclusively on genetic engineering. About 10% (28) of the companies specialise in biotechnological equipment. Some 40%

(90) of the companies listed are suppliers with manufacturing facilities in Switzerland or abroad. To give small and medium-sized enterprises active support in all areas of biotechnology, the Swiss Biotech Association was founded in March 1998.

Association membership is open to companies of various sizes concerned with such different aspects of modern biotechnology as R&D, production, marketing and sales, finances, services and consulting. Activities of member companies span different sectors of biotechnology including pharmaceuticals, diagnostics, agriculture, food, environmental biotechnology and speciality chemicals.

## SWISS LIFE SCIENCES DATABASE

«The goal is to increase and improve Switzerland's international position as one of the top biotechnology hubs and to promote Switzerland as an innovative think tank and attractive workplace», says Domenico Alexakis. SBA has promoted the creation of a special «Swiss Life Sciences Database», whose goal is to provide an overview of all the various com-

panies, financing institutions and organisations active in the Swiss biotechnology and life sciences sector. The database is an extended follow-up to the «Swiss Biotechnology Industry Guide» last published in 2001 by Unitectra. The database (developed and managed by Venture Valuation, Zurich) enables a free search on a variety of criteria. So far, the database comprises over 800 entries in connection with the industry. In 2002 the SBA, SWX Swiss Exchange and the regional promotion organisations Bio Alps, Bio Polo Ticino, Bio Valley Basle and Greater Zurich Area founded Swiss Biotech. «This relatively new brand has already had a great impact. The marketing brand has quickly established itself as an unique success catalyst within Switzerland and also on an international level», says Alexakis. The team members use the brand when one or more of the partners want to increase the impact of an event or project. Strategic partnerships such as with seco or other institutions are sought. The latest visual example of the well-balanced relationship is the unique national biotech portal [www.swissbiotech.org](http://www.swissbiotech.org).

Read also the interview page 28



**DOMENICO ALEXAKIS** The Executive Director of the Swiss Biotech Association (SBA) explains, how the association wants to be fit for the future.

**The Swiss biotech sector is very heterogenous. How does the SBA take into consideration the different needs?**

**Domenico Alexakis:** The SBA steers the strategy with its yearly programme to a useful balance between the different needs. For example, only a few conferences and shows are actively supported so that biotech companies and the important supplier sector for biotech are well served. The members from the consulting side enjoy the various platforms created by the SBA and use it for their professional networking. One fact is clear: we need to motivate the youngsters today to study life sciences, creating the talents of tomorrow so that the innovation process in biotech can continue or will be increased. For the SBA it means that a segmented approach to scholars and students is necessary.

**How does the SBA promote Switzerland as an attractive location for biotech?**

**Domenico Alexakis:** The SBA is proud to be a founding member of the Swiss Biotech alliance. This unique team is made up of the four organised geographic biotech clusters from Bio Alps (Bassin Lémanique), Bio Polo Ticino (Southern Region), Bio Valley Basle and Greater Zurich Area. The alliance is completed by the SWX Swiss Exchange. In conjunction with these partners, it is a lot easier to promote the sector on a national and international level. In fact, we are the only country

worldwide which can position «one nation – one biotech cluster». The regional geographical and business specialities make the appearance interesting and varied in form. The SWX Swiss Exchange has put emphasis on the sector early on and is known as one of the best listing places for life science companies.

**What is the added value that the SBA offers to its members?**

**Domenico Alexakis:** The SBA is focusing a lot on added value. We organise discounts for members on biotech conferences, shows, etc., we support the internationalisation process of the companies and we participate in consultation processes with legislation and are building up our lobbying links on national and international levels. Thanks to a CTI project, we currently work on a member portal which should bring a series of services to the member community. The objective is to offer a one-point information platform which reduces the company costs in the information-gathering process. As one of the communication drivers of the industry, we manage and publish fairly regularly company news under [www.swissbiotech.org](http://www.swissbiotech.org). Lastly, we try to identify gaps in the whole value chain.

**How does the SBA support the companies?**

**Domenico Alexakis:** The companies communicate their needs to our board of directors or directly to the executive office. We then discuss the matter and execute a process which in the end goes back to the individual member company or results in a short member information/consultation, etc. The tasks vary from writing a recommendation letter to organising



**Domenico Alexakis**

an SBA event on a particular topic. The variety of the industry is mirrored in the variety of the company needs.

**How does the SBA represent the Swiss biotech sector in the foreign countries?**

**Domenico Alexakis:** A couple of years ago, we got statements such as «We did not know that Switzerland has a biotech sector». Thanks to the Swiss Biotech alliance and the strong governmental positioning by Location Switzerland and KTII/CTI, the sector has made its marks in the last two years. We also work directly with other industry associations such as the Japanese Biotech Association (JBA) or within the membership in Europa Bio.

For further information please visit [www.swissbiotechassociation.ch](http://www.swissbiotechassociation.ch)

**SYMETIS** The Zurich-based company was formed with the objective to produce efficient, living, growing and self-healing cardiovascular implants for congenital malformation using tissue engineering concepts.

Every year about 3500 children in the Western world must have a valve change due congenital malformation. «These children will have to undergo repeated replacement operations by the time they reach an adult body size», explains Jacques Essinger – Symetis Executive Chairman. «The mortality can be as high as 40% and the accrued cost including complications, notwithstanding the impact on the patient's quality of life, is substantial.» There is thus, a real need for a better solution.

«The Symetis valve is produced out of the patient's own cell and based on current in-vivo data. We can reasonably expect such a valve to grow with the patient as a normal tissue, eliminating thus the need for costly and life-threatening reintervention. Furthermore, such a valve should neither require the life-long prescription of blood-thinning medication currently taken by patients with an artificial cardiac valve.»

The company, located at the Technopark in Zurich, was founded in 2001 as a spin-off of the University of Zurich. In September 2004, Symetis consisted of only four employees. Today there are more than 20 seasoned biologists, technicians and tissue-engineering experts tackling the Symetis challenge: bringing the Symetis valve to the clinic.

«The CHF 12 million financing round closed last September was instrumental to the acceleration of Symetis' growth.»

The qualified access to a suitable production facility was on the critical path to bringing Symetis' tissue-engineered heart valve into the clinic. «We had the choice to build our own facility or to gain access to an already built one. We were fortunate to identify in Langenfeld (Germany), shortly after securing our financing, a state-of-the-art GMP-qualified production facility dedicated to human cell growth. It saved us critical time, cash and resources. In addition, a fully trained and competent staff joined us.»

## ONE-PRODUCT STRATEGY

In terms of research the company collaborates with the University of Zurich. «We are leaving the research where it is best done: at the university. Our colleagues at the Zurich Technopark focus on process improvement while our Langenfeld team concentrates on the production processes including quality control, regulatory and validation», says Essinger. He and his team provide a very pragmatic approach. «We are focusing all our efforts on bringing the first tissue-engineered valve conduit to the clinic. Once the reliability of the process will have been established, we will opportunistically sell in selected European countries while building up clinical data to gain regulatory approval in the USA.» Isn't this a little bit risky? «Our product will address a clear medical need and bring a unique solution to pediatric cardiac surgeons. Once the technology will have delivered its promises, many development paths will be possible.»

Until today in modern pediatric cardiac surgery two different materials for prosthetic implants are used: artificial materials like carbon, Dacron or PTFE or biological materials such as non-living, fixed animal



**Founders Prof. Dr Med Gregor Zünd (left), Prof. Dr Med Simon P. Hoerstrup (right), Executive Chairman Jacques Essinger**

or human tissues. These materials are suboptimal for pediatric application due to the following known weaknesses:

- Non-living material with no growth, no potential for regeneration or adaptation
- Dysfunction, degeneration and failure over time
- Lifelong anticoagulation therapy required with increased morbidity and mortality risk
- Infections or inflammations

«Our technology can be a paradigm shift for pediatric cardio vascular surgery», emphasises Essinger. «We could give back to children a normal life while saving the society an important financial cost.»

# 30 MILESTONES IN...

■ marked in red are scientific contributions coming from CH

■ International scientific contributions

■ Infrastructure/political contributions from Switzerland

- >> **1869 Friedrich Miescher (University of Basle) discovers DNS (= nuclein)**
- >> **1933 Thaddäus Reichstein develops new Vitamin C Synthesis Sequence with biological key solution (operated by Roche)**
- >> **1938 Rudolf Signer (University of Berne) develops for the first time DNA in pure form. This serves ultimately for the description of the double helix**
- >> **1951 Thaddäus Reichstein (University of Basle) receives the Nobel Prize for Medicine for the discovery relating to the hormones of the adrenal cortex, their structure and biological effects**
- 1953 James Watson and Francis Cricks describe the double helical structure of DNA, which marks the beginning of the modern era of genetics
- 1955 An enzyme involved in the synthesis of a nucleic acid is isolated for the first time
- 1956 The enzyme DNA polymerase 1 is discovered. It leads to an understanding of how DNA is replicated
- 1958 Sickle cell anemia is shown to occur due to a change of a single amino acid
- 1960 Exploiting base pairing, hybrid DNA-RNA molecules are created
- 1965 Harris and Watkins successfully fuse mouse and human cells
- 1966 The genetic code is cracked, demonstrating that a sequence of three nucleotide bases (a codon) determines each of 20 amino acids
- 1967 The first automatic protein sequencer is perfected
- >> **1967 Discovery of restriction enzymes (by Arber)**
- 1969 An enzyme is synthesised in vitro for the first time
- 1971 First complete synthesis of a gene
- 1972 The DNA composition of humans is discovered to be 99% similar to that of gorillas and chimpanzees
- >> **1975 Vladimir Prelog (ETH Zurich) receives Nobel Prize for Chemistry for his research into the stereochemistry of organic molecules and reactions**
- 1976 The tools of recombinant DNA are first applied to a human inherited disorder
- 1977 First expression of human gene in bacteria
- >> **1978 Werner Arber (University of Basle) receives the Nobel Prize for Physiology/Medicine for the discovery of restriction enzymes**
- 1979 Human growth hormone first synthesised
- 1982 First biotech drug approved by FDA: human insulin produced in genetically modified bacteria
- >> **1984 Niels K. Jerne and Georges J.F. Köhler (then Roche Institute for Immunology in Basle) receive the Nobel Prize for theories concerning the specificity in development and control of the immune system and the discovery of the principle for production of monoclonal antibodies**
- 1984 The DNA fingerprinting techniques is developed by Alec Jeffreys
- 1985 Genetic markers found for kidney disease and cystic fibrosis
- >> **1986 Heinrich Rohrer and Gerd Binnig (IBM Rüslikon) receive the Nobel Prize for Physics for the design of the scanning tunneling microscope**
- 1987 First approval for field test of modified food plants: virus-resistant tomatoes
- 1989 First approval for field test of modified cotton: insect-protected (Bt) cotton

- 1990 The first experimental gene therapy treatment is performed successfully on a 4-year-old girl suffering from an immune disorder
- >> 1991 **Richard Ernst (ETH Zurich) receives the Nobel Prize for Chemistry for his contributions to the development of the methodology of high-resolution nuclear magnetic resonance (NMR) spectroscopy**
- >> 1991 Launching of the Swiss Priority Programme Biotechnology (Swiss National Science Foundation)
- >> 1991 Opening of Tenum, Liestal
- 1993 The Biotechnology Industry Organisation (BIO) is created by a merger of two smaller trade associations
- 1995 The first full gene sequence of a living organism other than a virus is completed, for the bacterium Hemophilus influenzae
- >> 1996 **Rolf Zinkernagel (University of Zurich) receives the Nobel Prize for Medicine for discoveries concerning the specificity of the cell-mediated immune defence**
- >> 1997 Opening of Innovation Centre of North-Western Switzerland, Allschwil
- 1997 First animal cloned from an adult cell: a sheep named Dolly in Scotland
- 1998 Human embryonic stem cell lines are established
- 1998 Scientists at Japan's Kinki University clone eight identical calves using cells taken from a single adult cow
- >> 1998 In March, the Association of Swiss Biotechnology Companies is created (ASBC), later renamed as Swiss Biotech Association
- >> 1999 Swiss National Vote on Gene Technology protects research freedom by two-thirds majority
- 2000 The year generates a record USD 38 billion in new biotechnology investment, including 90 completed initial public offerings
- 2001 First complete map of the genome of a food plant completed: rice
- >> 2001 Swiss BioteCHnet is created. It comprises five Universities of Applied Sciences
- >> 2001 Launching of Biopolo Ticino.
- >> 2002 **Kurt Wüthrich (ETH Zurich) receives the Nobel Prize for Chemistry for his development of nuclear magnetic resonance spectroscopy for determining the three-dimensional structure of biological macromolecules in solution**
- >> 2002 Opening Technology Centre, Witterswil
- >> 2003 Opening Tech Centre, Reinach
- >> 2003 Swiss Biotech – Marketing Alliance is founded (Bio Alps, Bio Polo, Bio Valley Basle, Zurich MedNet, SWX Swiss Exchange and Swiss Biotech Association are founding members)
- 2003 Human genome sequence completed in conjunction with the 50th anniversary of Watson and Crick's discovery of the DNA double helix
- >> 2003 Opening Life Science Incubator «Biotop», Zurich-Schlieren
- >> 2003 [www.swissbiotech.org](http://www.swissbiotech.org) is launched in Bern: it is the first national biotech portal
- >> 2003 Launching of CTI Biotech (part of CTI programme)
- >> 2004 Opening Biopark, Basle
- >> 2004 Opening Life Science Incubator «Ecllosion», Geneva
- >> 2004 Swiss National Vote on Stem Cell-Related Technologies protects research freedom by two-thirds majority

**Many Swiss biotech companies are currently about to take the strategic step of leaving their roots in Switzerland and actively becoming global players.**

Markus Blaser, Ernst & Young

By the end of 2004 the Swiss biotech industry consisted of 223\* companies in total, whereof 90 biotech suppliers and 133 core biotech companies.

Regarding the number of core biotech companies, Switzerland kept its rank as no. 6 in Europe and no. 9 worldwide since 1998. Hence, compared with the size of its population Switzerland has the highest biotech density worldwide. About one-third of all Swiss core biotech companies have been founded before 1995. There has been a steady flow of new biotech foundations ever since the early nineties, not only in times when the IPO window was open, but also throughout the years. This underlines that the biotech industry has developed into a quite mature industry in Switzerland. In fact, by the end of 2004, the industry employed more than 13'000 people.

The financial community has rewarded the generally high quality of the Swiss biotech industry over the past years by considerably and constantly investing into companies with promising projects under way. Even in the harsh time of the post-dotcom era, significant amounts of venture capital flowed into Swiss biotech companies (2001: CHF 106 million, 2002: CHF 132 million, 2003: CHF 125 million, 2004: CHF 194 million). Between 2002 and 2004 Switzerland ranked third in Europe regarding venture capital having flowed into the country.

Regarding its company size the Swiss biotech industry can be split up into three main categories: the

seven public companies with globally active and well-known biotech leaders such as Serono and Actelion and about 20 medium-sized companies with 50 to 100 employees (many of those companies more or less ready for IPO). All remaining companies are still rather small with less than 50 employees.

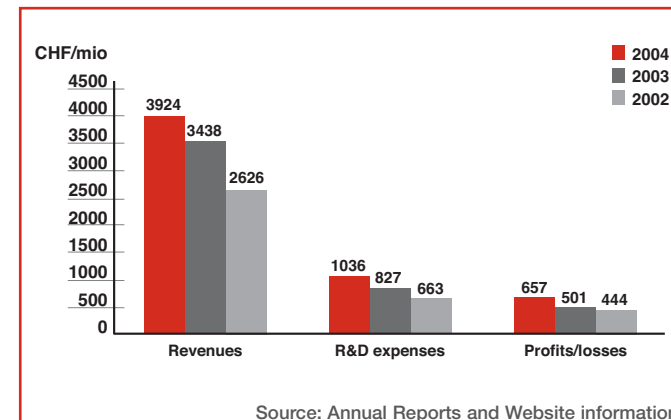
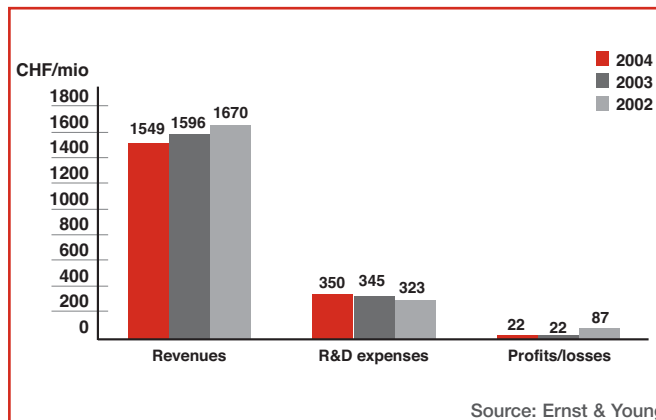
Geographically the majority of Swiss biotech companies are located in one of the three hotbeds in the Arc Lémanique area or in the regions of Basle or Zurich. In all three areas world-class universities and several biotech incubators are located. For many decades, the Swiss industry had a strong position in pharmaceuticals and chemicals. Consequently 85% of the 133 Swiss core biotech companies are active in the field of red biotech (human & animal health) and only 9% in white biotech (environmental & industry) and 6% in green biotech (agro & nutrition). More than 50% of the Swiss core biotech companies are active in either receptor biology/signalling, immunology or screening. Interestingly, the first two areas are those scientific fields where – according to the citation index – Switzerland has the top research position worldwide. This fact indicates that a good number of excellent Swiss scientists have successfully founded their own biotech company and are now transforming their scientific know-how into biotech business.

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

## PRIVATE SWISS BIOTECH COMPANIES PUBLIC SWISS BIOTECH COMPANIES

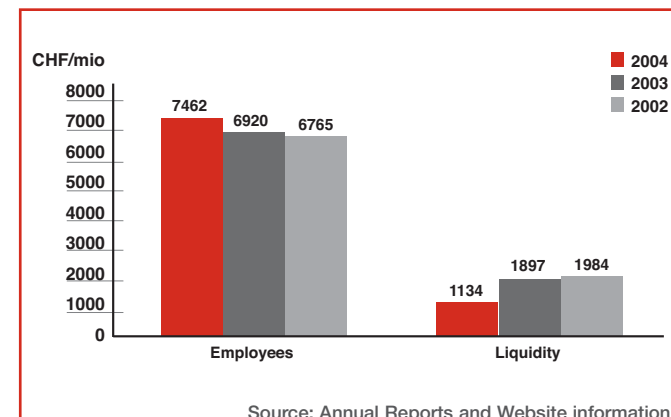
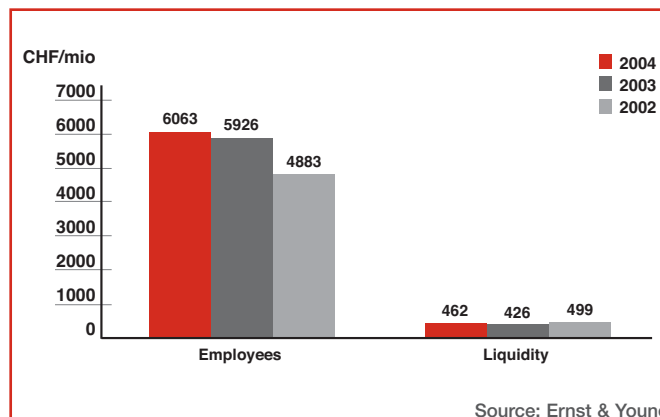
### Revenues, R&D expenses, profits/losses

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### Number of employees, liquidity

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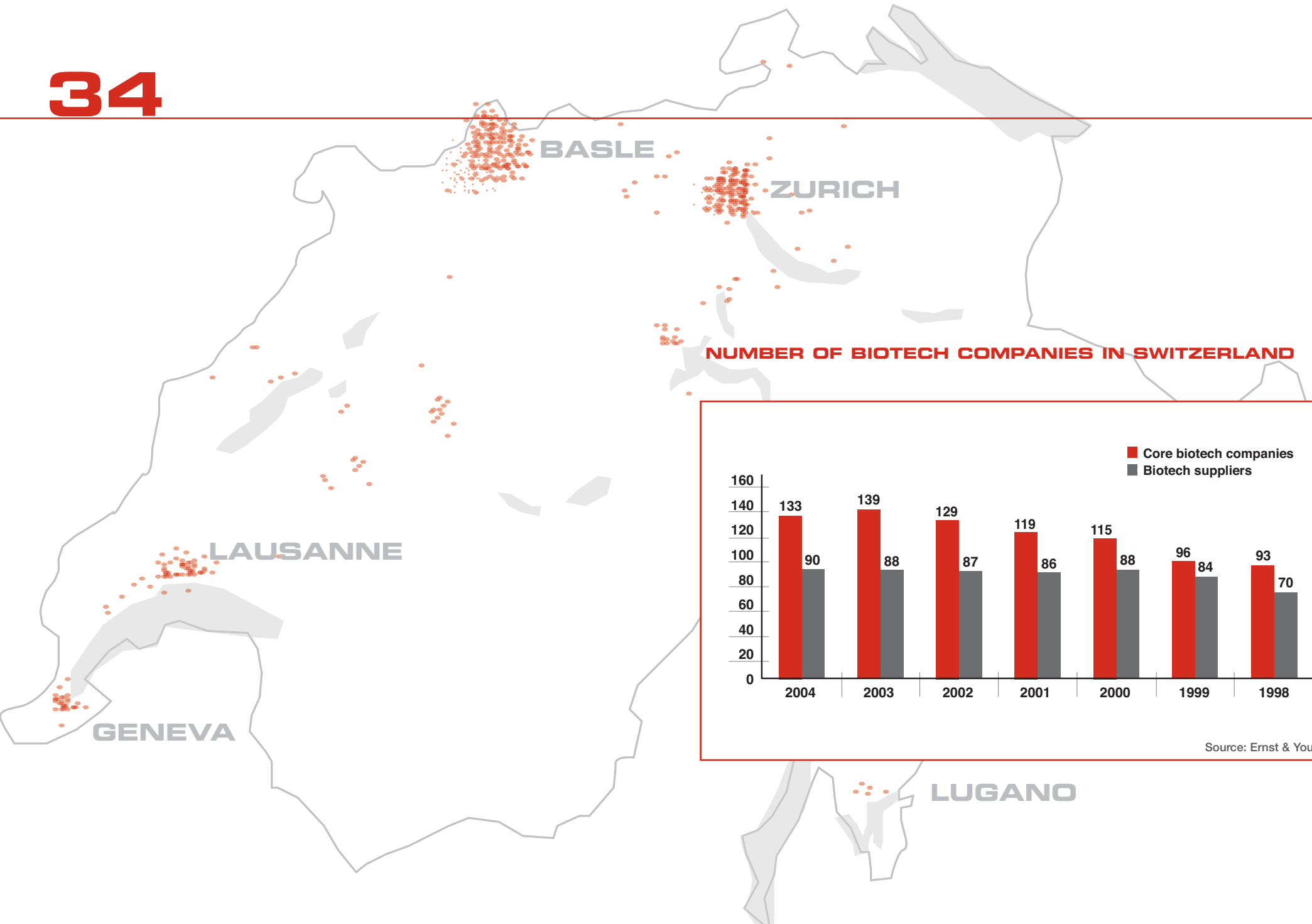


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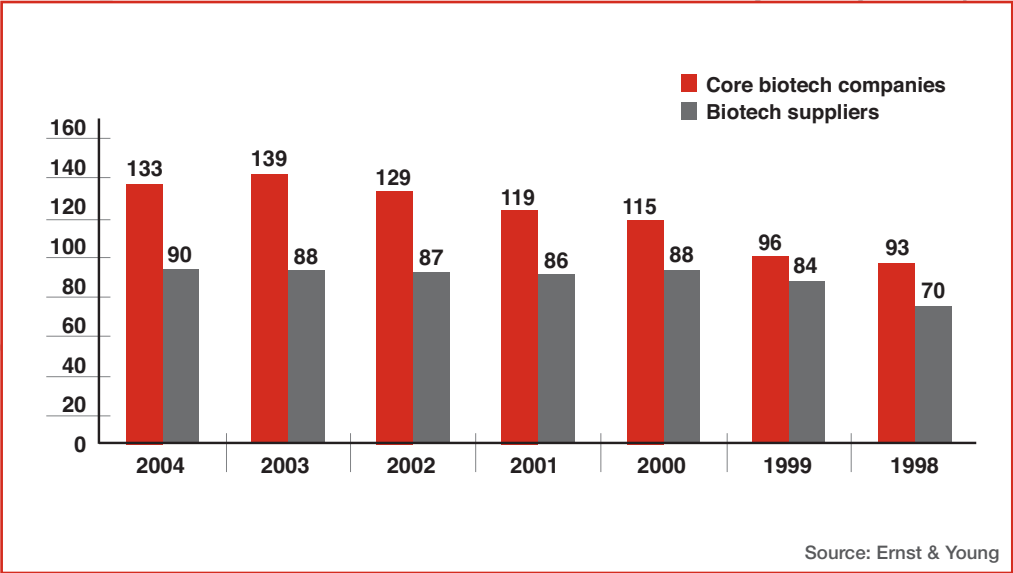
- All figures are headquarter counted
- As some private companies do not disclose financial figures, the above figures represent Ernst & Young's best estimate

#### Please note:

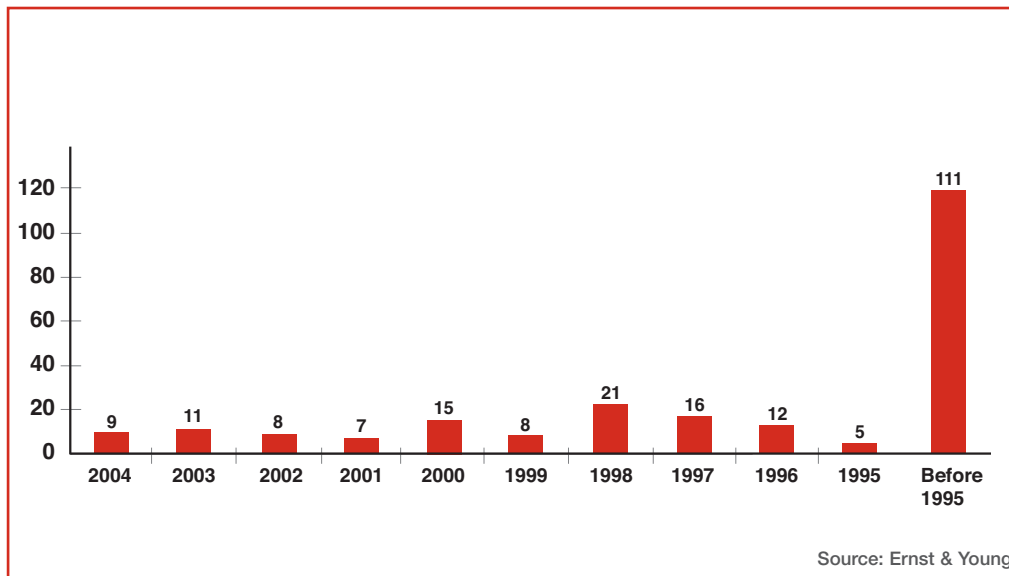
- All figures are headquarter counted
- The 2004 data in this table are based on the information available in early February 2005, when this report was compiled. At this time some of the companies had not yet disclosed the final financial figures for 2004. Therefore, some figures were carefully extrapolated on the basis of newest interim data publicly available (e.g. Q3 2004).



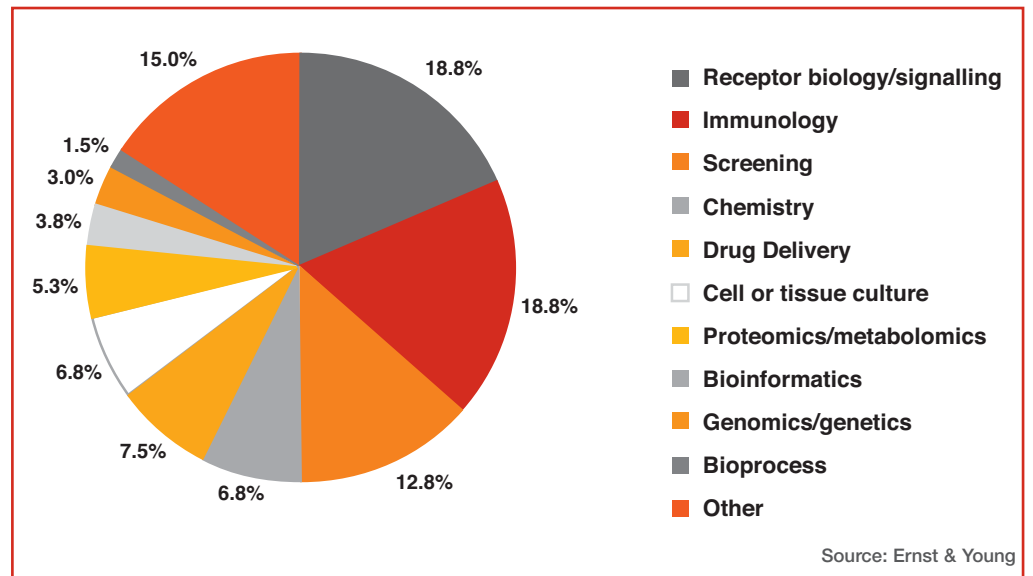
**NUMBER OF BIOTECH COMPANIES IN SWITZERLAND**



## YEAR OF FOUNDATION OF THE 223 SWISS BIOTECH COMPANIES



## LIFE SCIENCE APPLICATION AREAS OF THE 133 CORE BIOTECH COMPANIES



## IMPRESSUM

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