SWISS BIOTECH REPORT

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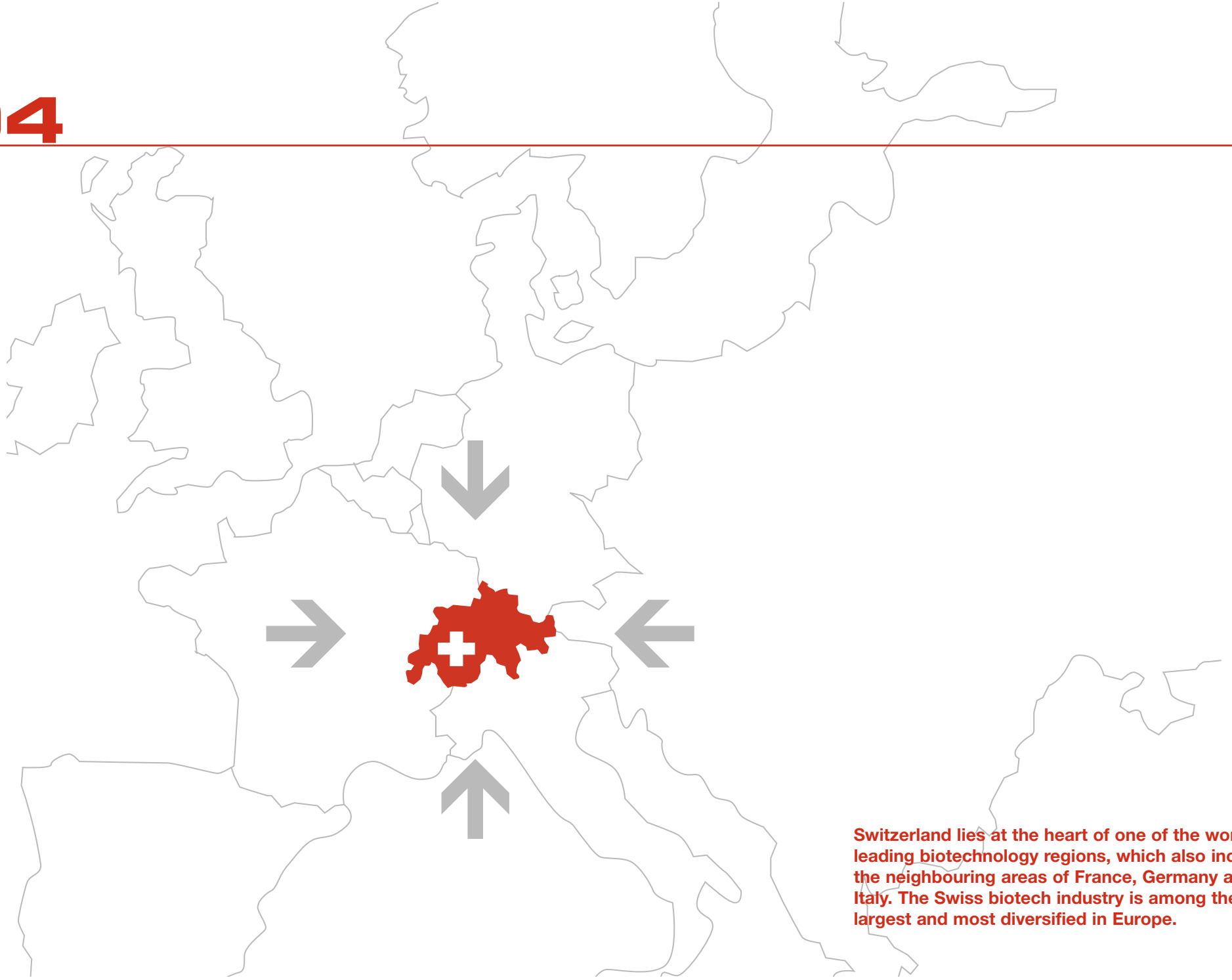


Switzerland lies at the heart of one of the world's leading biotechnology regions, which also includes the neighbouring areas of France, Germany and Italy. The Swiss biotech industry is among the largest and most diversified in Europe.

SWITZERLAND is...

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

What started in the 19th century with the discoveries of Charles Darwin and Friedrich Miescher has evolved into a new technological approach of utmost ecological, economic and social importance. Even though some of the expectations of early biotech gurus have 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 the most visible parts of modern biotechnology. They render chemical production more efficient, help in cleaning up environmental contaminations, and enable food-processing plants to operate according to high environmental and hygienic standards. OECD reports call biotechnology a pathway to sustainable production and development.

Technological developments always evolve in a social context. Consider the introduction of the motor cars and the scepticism it caused among the public.

Particularly in the area of biotechnology, a constant dialog with the public is essential to foster confidence and, ultimately, wide-spread acceptance. If we succeed in this, the question will no longer be whether biotechnology is good or bad, but which biotech products or services are most beneficial.

Biotechnology enjoys a favorable regulatory and administrative environment in Switzerland. The entry into force of the federal law on nonhuman gene technology on January 1st, 2004, will soon be complemented by similar regulations in the human sector. These regulations not only cover current technology, but strengthen the legal basis for further development of biotechnology. On the administrative side, the federal co-ordination centre for biotechnology (www.swissbiotechnet.ch) provides one-stop processing of notifications and applications for authorisation.

Situated in the centre of Europe, Switzerland is an ideal gate-way 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 for more information about Switzerland and its biotech industry.)

Joseph Deiss
President of the Confederation and
Minister for Economic Affairs

06 A PRIME BUSINESS LOCATION FOR...

LOCATION SWITZERLAND The Swiss biotech industry is high in the ratings accounting for 79 of the 456 European products in the pipeline, and 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 rapid, 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.

The following are key reasons for locating your business in Switzerland:

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

  With an annual overall expenditure of CHF 10.7 billion (USD 5.7 billion) in 2002, Switzerland has one of the world's highest levels of research expenditure relative to a gross domestic product (GDP) of 2.6%. The excellent quality of research at Swiss universities combined with effective guidelines and processes for technology transfer, make Swiss universities attractive partners for the private sector, which finances over two-thirds of Swiss research.

- A highly skilled and quality-conscious workforce.

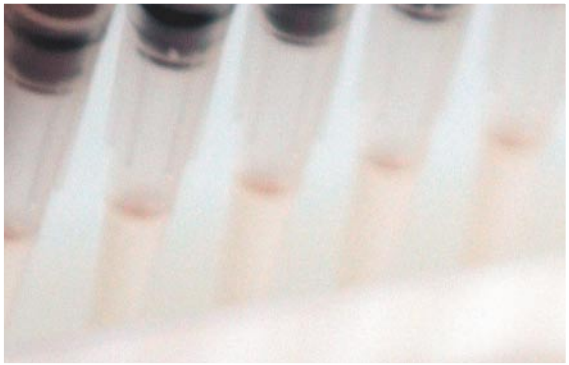
  Workforce-experienced in precision operations – a world leader in terms of productivity, Switzerland has a unique vocational-training system which guarantees a highly qualified workforce for all levels of employment. With an annual average of 1,856 working hours, the labour force in Switzerland works more hours per year than that of any other European country.

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

  The Swiss Agency for therapeutic products Swissmedic is the centre of competency for the pharmaceutical industry in Switzerland. It is responsible for the authorisation and market monitoring of pharmaceuticals and grants licences for manufacturing, wholesale and retail operations. Swissmedic guarantees that your enquiries will be efficiently dealt with. For further information and the necessary forms please consult its website: www.swissmedic.ch.

- Access to the European market with more than 360 million consumers of products and services.

  The European Union is one of Switzerland's most important trading partners: three-fifths of our exports go to EU countries and four-fifths of our imports come from there. Switzerland also has close contractual ties with the European Union. 1972 saw the conclusion of the Free Trade Agreement, and seven bilateral agreements were signed in 1999. These agreements cover the areas of the free movement of persons, overland transport, air transport, agriculture, research, technical barriers to trade and public procurement. Further bilateral negotiations are under way. Swiss-based business, therefore, has an excellent platform for accessing the European market.



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

  Switzerland has created a biotech-promoting legal framework which is compatible with EU regulations. The Federal coordination centre for biotechnology provides all the necessary information on regulations and requirements. It also facilitates an efficient procedure for notification and licence application.

- A well-developed network linking public administration, support instruments, research and industry.

  Close and exemplary cooperation between the Swiss Government, research institutes, finance and industry: Personal networks across boarders, private-public partnerships, institutional links between industries, research and finance are typical elements of the Swiss high-tech community. To get an overview of these networks, visit the Swiss Biotech website www.swissbiotech.org.

- Generous tax incentives for companies and low payroll taxes.

  The tax environment is a key factor in deciding on a business location in Switzerland. Switzerland offers a very favourable tax environment with moderate overall taxation. The average corporate tax rate on profit was 24.5% in 2003, 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.

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

  With a network of more than 40 business incubators and science parks, Switzerland has an excellent infrastructure for young and innovative companies. A dense network of universities and research institutes guarantees a constant exchange of ideas and easy access to a highly qualified, motivated workforce.

For further information please visit
www.swissbiotech.org
www.locationswitzerland.ch

ERNESTO BERTARELLI, CEO SERONO

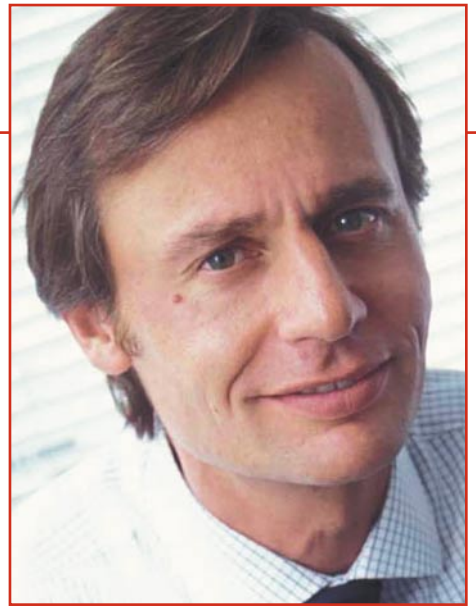
Based in Geneva, Serono is the third largest biotech company in the world. The company's research programmes are focused on reproductive health, neurology, metabolism and growth. Its products are sold in over 90 countries.

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 polytechnic institutions 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 unwieldy. At Serono, we strive for the right balance. We are confident in our own internal research and



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

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. More recently, we acquired the flagship of French genomics, Genset, 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 to complement our in-house capabilities. We have also been able to form 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®.

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?

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

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 make sure that our benchmarks are aimed high.

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

Ernesto Bertarelli: With more than 100 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

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

Switzerland inherently favours scientific activities and research. It has two well-known universities and polytechnic institutes 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 Fund. 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?

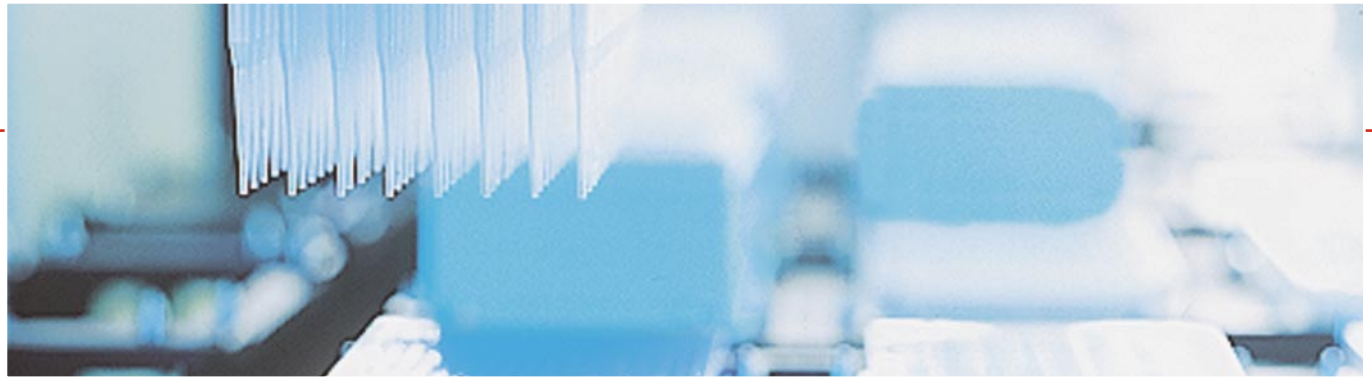
Markus Moser: Prionics employs a strong team of highly motivated experts from more than twenty different nations. We encourage our employees to act in an entrepreneurial way, taking great personal responsibility for their tasks and cultivating a corporate culture driven by openness and innovation. And 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 (Basel) 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 Basel. 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 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 judgment. 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
www.prionics.ch
www.actelion.com

THE INNOVATION PROMOTION AGENCY CTI. As far as biotechnology is concerned, Switzerland is known to offer fertile ground for R&D and the subsequent formation of promising biotech companies. It is one of the most attractive places to live and work offering a wide and competent scientific network based on prestigious institutes of higher education (universities, Swiss Federal Institutes of Technology, Universities of Applied Sciences) and both world-scale companies and innovative SMEs. To date there are over 7000-8000 jobs held in the industrial biotech sector and the number is growing.

As the Innovation Promotion Agency, it is CTI's aim to ensure the transition from science to market, exploiting the high potential in scientific expertise and commercialisation capacity which can be found in Switzerland.
We do this with the following strategies:

CTI Life Sciences
Funds innovative projects carried out by higher education in cooperation with industrial partners eager to exploit the results and contribute to the growth of the Swiss biotech industry (CTI funds 50% of the entire project costs in form of salaries paid to employees of higher education, the industry bearing the other 50%, 10% in the form of cash).

CTI Biotech
Promotes the Swiss biotech industry by further optimisation of know-how and technology transfer, facilitates and optimises the economic exploitation of innovative techniques and products emerging from basic and application-oriented biotech R&D.

Partnership with the Swiss BioteCHnet
CTI-sponsored R&D network of five Universities of Applied Sciences.

Microsystems
Amongst other activities, those promotion areas support technology projects at the cutting edge of biotechnology.

CTI Start-up
CTI Start-up promotes the immediate application of scientific and technological know-how obtained by researchers and entrepreneurs and accompanies and coaches start-ups to make them fit and attractive to investors. CTI Start-up also promotes widespread cooperation with various partner organisations (universities, technoparks, funding partners, seco, etc).

CTI successes: more than beer and bread
CTI is proud to illustrate just one of the many successful projects that have been funded up to now. This example concerns the project series initiated and conducted by a promising CTI start-up company called Dualsystems Biotech AG in cooperation with researchers of the Institute of Veterinary Biochemistry and Molecular Biology of the University of Zurich. This alliance entailed not only successful licensing but also the commercialisation of now widely applied products (yeast strains, plasmids, cDNA libraries and such kits as the DUALmembrane screening system) and services (like the TAMYTH System).

Membrane Proteins account for a third of all proteins in a human cell. Many of those play a role in the development of neural diseases, cancer, arthritis and infectious diseases. The screening for appropriate drug candidates acting on those disease-related target proteins is normally very time-consuming and

CTI BIOTECH START-UPS

AQUA+TECH Specialties SA	www.aquaplustech.ch
Arbomedics GmbH	
Athelas S.A.	www.athelas.com
Bitplane AG	www.bitplane.ch
CELLnTEC Advanced Cell Systems	www.cellntec.com
Cistronics Cell Technology GmbH	www.cistronics.ch
Covalys Biosciences AG	www.covalys.com
CYTION	www.cytion.com
Dualsystems Biotech AG	www.dsbiotech.ch
ESBATech AG	www.esbatech.com
Frimorfo Inc.	www.frimorfo.com
GLYCART Biotechnology AG	www.glycart.com
Gnothis SA	www.gnothis.com
Herbonis AG	
MyoContract Ltd.	www.myocontract.com
The Genetics Group	www.the-genetics.com
Thera Strat AG	www.therastrat.com
PolyGene AG	www.polygene.ch
Semasopht	www.semasopht.com

has a relatively low output. A more specific approach was developed by Prof. Dr Igor Stagljar who created a new variant of the so-called Yeast-Two-Hybrid System; by means of which, interactions between proteins in the cell membrane can be identified and better analysed. This new screening technology offers a quick, reliable and low-cost method to detect pre-stages of new drugs and pathogenic genes. With the founding of Dualsystems Biotech AG, which successfully passed the CTI start-up process, this know-how could be commercially exploited. The CTI Start-up label (CTI award rendering the start-up company eligible for venture capitalists) was awarded in 2001. CTI has also paved the way for numerous other Swiss biotech start-ups which have received the CTI label (see non-exhaustive list above).

For further information please visit www.kti-cti.ch

ANTIBODY THERAPEUTICS: SETTING A BENCHMARK 13

GLYCART The young biotech company based in Zurich focusses on the development and commercialisation of a new generation of antibody products based on its proprietary Glycomab technology.

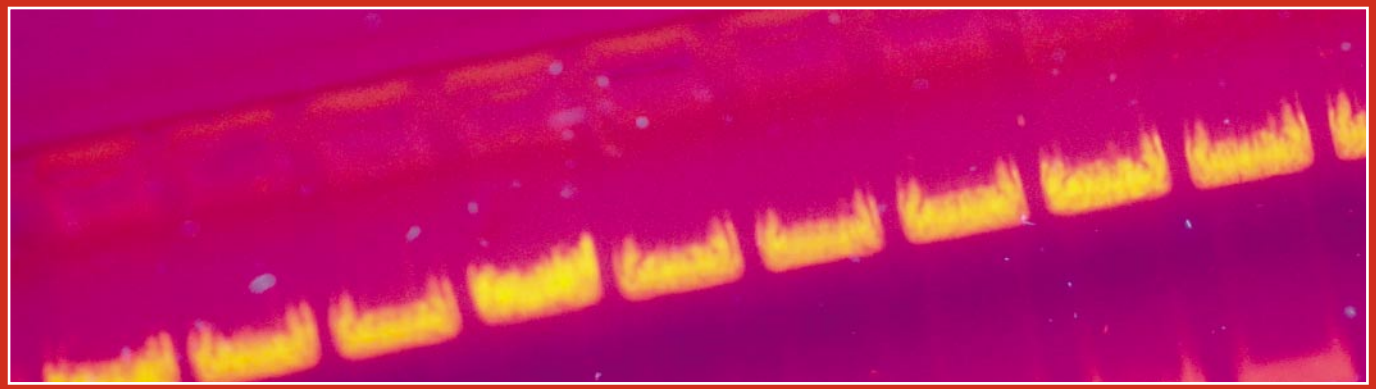
The first impression one gets while entering the company's building is that of spacious rooms with high ceilings. «We are here in a former warehouse that could be rebuilt into state-of-the-art laboratories and office rooms at only moderate cost», explains CEO Joël Jean-Mairet. At the moment, all fifteen co-workers aim for one goal: to prove, that Glycart's technology will set a benchmark in the field of antibody therapeutics.

Glycart was founded by Joël Jean-Mairet, Pablo Umaña and late Professor Jay Bailey in September 2000 as a spin-off company from the Swiss Federal Institute of Technology in Zurich. «We participated in the business plan competition Venture 2000 convinced of our business opportunity. We were pleased to score among the top ten. This in turn led to the foundation of Glycart and to a CHF 3 million seed round with Novartis Venture Fund and a Swiss private bank.»

Until 2002, Glycart had its premises within the Federal Institute of Technology in Zurich. Since 2003, the company has its own premises at the new and emerging biotech cluster in the suburbs of Zurich. The company anticipates a smooth increase in its workforce in 2004 from 15 to 23 people. «We want to be careful and flexible, rather than growing too fast. Everything that does not belong to our core competences will be outsourced to external partners», is how Jean-Mairet explains the company strategy.

Broad technology platform

And the strategy seems to fit. In autumn 2003 the management announced the closing of the company's series A financing, raising CHF 18 million. It was the quality of the antibody technology and the pipeline of promising product candidates that attracted the investors. Glycart is developing its own Glycomab-based antibody portfolio by in-licensing and acquiring antibodies at an early stage of development and applying its proprietary technology to them. This fully developed, broad technology platform increases the specific biological activity of therapeutic monoclonal antibodies for target cell ablation. The distinct hallmarks of this technology are: a high relevance for therapeutic efficacy, industrial scale applicability, broad patent protection and an extensive body of proof, including external validation. Taking advantage of its broad technology platform, Glycart is also establishing collaborations and partnerships with biotech and pharmaceutical companies to enhance the efficacy and utility of its antibody drug candidates. During 2004, Glycart expects to sign its first alliance with a big pharmaceutical company and generate clinical proof of concept in cancer patients, comparing a marketed drug with the same drug using Glycart's technology.



Dr Pablo Umaña, CSO (left), and Dr Joël Jean-Mairet, CEO, the two co-founders of Glycart

For further information please visit www.glycart.com

14 «SWITZERLAND IS STILL…

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.

NATIONAL CENTRES OF COMPETENCE IN RESEARCH IN LIFE SCIENCES

Projects	Leading house
Molecular oncology – from basic research to therapeutic approaches	ISREC, Epalinges
Frontiers in genetics – genes, chromosomes and development	University of Geneva
Molecular life sciences – three-dimensional structure, folding and interactions	University of Zurich
Neural plasticity and repair	University of Zurich

Source: www.snf.ch/en/rep/nat/nat_ccr.asp

For the past few years you also have been working in the USA. Are the research budgets higher there because the Government spreads 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?

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.

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.

FACT FILE

Name: Kurt Wüthrich
Degree: Ph.D. 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

For further information please visit www.mol.biol.ethz.ch/wuthrich/

BRIDGING THE GAP BETWEEN...

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, 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.

The result is equally beneficial for the participating

LINKING RESEARCH AND INDUSTRY

Daniel Gygax studied biochemistry at the University of Basel with post-doctoral studies at Harvard. He then joined Ciba-Geigy AG (Novartis AG) in Basel, where he started his career at Central Research Laboratories. After four years of applied science he became head of Immunoanalytics and pharmacocinetics of the preclinical 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 Basel (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.

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.

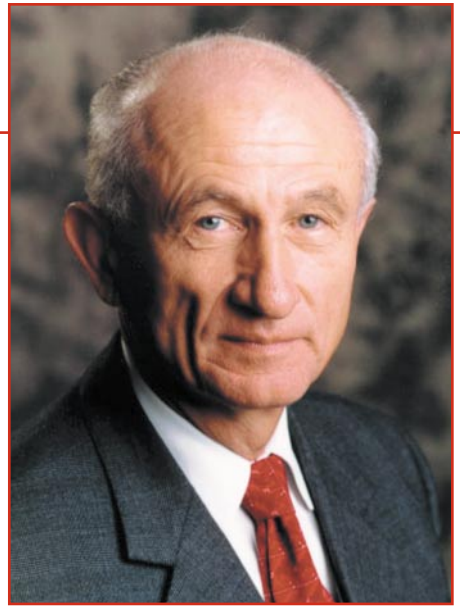
«Our vision is the solution-oriented bringing together of the decentralised excellence of researchers, graduates and students at UAS», says Gygax.
«The network is also intended to play an active role in the coordination and the implementation of education and continuing education at the partner universities». 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.

For further information please visit www.swissbiotechnet.ch

18 EARLY-STAGE COMPANIES:...



HENRI B. MEIER The former CFO of Roche and today's Chairman of the Board of HBM BioVentures has a clear opinion on the Swiss biotech industry. There are plenty of innovative ideas, products and young companies, but also a lot of problems because of the lack of early-stage venture capital institutions.

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

Henri B. Meier: Yes, they do. But especially in Continental Europe young biotech companies are going through an extraordinary hard time – because only a few venture capital institutions exist there. Europe's traditional banks provide only credits and loans, not equity capital. The situation in the Anglo-Saxon countries is rather different: There, innovations were always financed by venture-capital companies.
Just think of Genentech, Amgen, Cisco or Intel – all of them fruits of venture capital. Since the mid-nineties venture capital companies have been set up in Continental Europe, but only few of them focus on early stage biotech companies, a field which requires a time horizon of 10 to 12 years. The profit/loss profile is much higher and entrepreneurship is required.

And how is the situation in Switzerland?

Henri B. Meier: In Switzerland there are a lot of qualified young people with good ideas who are working in the van of scientific progress. There are also experienced entrepreneurs who know how to organize resources and build a new company. But Switzerland has only a few venture capital companies and even fewer which focus on a sector like biotech/pharma. Venture capital for early-stage companies hardly exists in this country, investments tending to be made abroad. Economic growth in Continental Europe and in Switzerland itself requires new investments into innovative high-growth sectors. Without a drastic change of law (tax law, pension funds, state pensions) I see no chance that our huge amount of available capital will be diverted into innovative, sustainable and value-creating activities.

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 procedure and the quality of the instrument. Furthermore we look at 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.

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 its explosion of knowledge, the biotech industry indeed belongs to the most dynamic markets. The relationship between good and bad projects is much better than the one between the needle and the haystack, however.
Up to now about 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 requires tough selection criteria. HBM BioVentures enjoys the privilege of 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 pure expectations regarding developments in the future. And because nobody knows the future, the judgment is always based on a mixture of analysis and intuition.

Which Swiss biotech companies are attractive for investors?

Henri B. Meier: In the public sector Actelion, Berna and Cytos; in the private sector Basilea, Arpida, Prionics, Glycart, Debiopharm, and as an investment that covers the entire sector, HBM BioVentures.

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

Henri B. Meier: With 133 private and six public companies, Switzerland has the highest number of biotech companies per capita in Europe and the Swiss biotech industry the second highest valuation in Europe after the UK.
Switzerland's advantage in biotechnology is based on its many strong research institutions and the traditional pharmaceutical industry, which has originated several successful spin-offs.
At the moment, the USA lead in the consolidation process, because in the States it is much easier to get money despite the low rates of saving. But the US industry is disadvantaged because of its limited international experience. Here Switzerland could have an advantage! And Switzerland traditionally has the highest surplus of individual savings – whereas the USA are a heavily indebted country with insufficient savings. Americans are nevertheless the most active investors in value-creating companies, whereas Swiss investors tend to save their money, leaving the active management to others. With a change towards a more active investment approach, which implies conscious risk-taking, Switzerland could play an important role in the ongoing consolidation process.

HBM BIOVENTURES

HBM BioVentures Ltd is a holding company established under Swiss law, domiciled in Baar, Switzerland. The company invests primarily in later-stage private equity, but also in publicly traded companies in the biotechnology, emerging pharmaceutical, medical technology and related industries, located mainly in Western Europe and the USA. While most investments are made in companies directly, some take place through specialised, regional early-stage investment vehicles.

FACT FILE

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

For further information please visit www.hbmbioventures.com

20 CORNERSTONES FOR BIOTECH SUCCESS...

UPCOMING KEY ISSUES With fundraising on the public equity markets currently almost down and roughly 20 private companies competing on average for the attention of one venture capitalist in Europe, it is crucial for biotech companies to find the right long-term strategy in order to survive financially.

Jürg Zürcher and Markus Blaser, Ernst & Young*

The European Community Biotech Finance Forum for the year 2004 estimates a funding gap in the unquoted biotech sector in Europe of about EUR 1 billion. Many early-stage biotech companies thus feel trapped, fighting for the crumbs falling from the table. To nevertheless be ready to attract new venture capitalists, biotechs must take steps early on and actively. Some of the most important key success factors in order to attract venture capital include the following:

STRATEGIES FOR EARLY-STAGES COMPANIES

- Robust business plans: The core document to attract and convince venture capitalists is still a business plan, which transparently and fundamentally covers all scientific and financial perspectives. Business plans should regularly be critically reviewed by independent third parties to evaluate their current relevance and updated if necessary.

- Concentrate on products and deliverables: Most venture capitalists themselves are under significant pressure to bring their investments to profitability over the mid to long term. It is more important than ever to set out a clear – and preferably early – path to revenues.

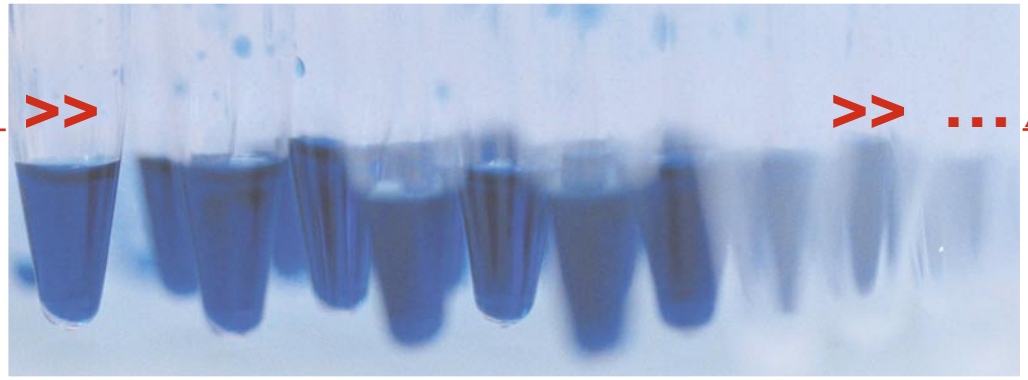
- Sufficient projects to make success likely: Unfortunately, too many one-product companies still exist. This creates a large risk for the company. If the necessary technology for product differentiation is not on hand, it should be in-licensed or acquired by a merger with another company.

- Develop critical mass: To reach the critical mass, ambitious biotech companies should not shy away from combinations with other market players in order to reach a more attractive size. Financing generally gets easier if a biotech company can demonstrate a strategic cooperation with a public pharma or biotech company.

- Quality of management: Many investors today are only ready for a financial commitment when the line management, the board of directors and the scientific board have an excellent reputation and can demonstrate many years of experience and a successful management track record.

- Exercising all possibilities to generate one-time or recurring revenues: Biotech companies have traditionally waited to the last possible instant to license their own developments. Due to the currently dried-up capital environment many biotech companies now try to negotiate earlier milestone and royalty payments. This generally leads to lower amounts paid out.

- Early application of various exit strategies: Until 2001, the IPO was the most attractive exit strategy. Today, however, the business plans of biotech companies must cover all realisable options. This could include a trade sale or a merger with other biotech companies, or even a license deal with a pharma or other biotech company.



STRATEGIES FOR IPO-READY COMPANIES

If the next IPO window were to open tomorrow, it is estimated that a good number of Swiss biotech companies would be immediately planning to jump to the stock market. This rush could hinder many companies from reaching their intended market capitalisation. Hence, in order to be first in the starting gate, it is important for all IPO-ready companies to stay trim and fit:

- Under-promise and over-deliver: The main expectation of investors is that the milestones listed in the business plan are met on time and according to specification. Covering up bad news is not valued, as shown by prominent examples in the recent past. In this respect, to regularly convince potential investors and other stakeholders of the suitability of the chosen business model, biotech companies should not underestimate the amount of work needed to keep a quality business plan up to date.

- Preserve cash: Biotechs should focus on core programme and value-driven activities and should shelve or postpone any non-core programmes that drain cash. Furthermore the company should find ways early to conserve cash (e.g. leasing contracts, stringent cost management, outsourcing of non-core activities, etc.).

- Control costs: Companies should have implemented at least a fundamental cost accounting whereby they can identify, calculate and measure the major cost drivers. Specialists estimate that with a clear, result-oriented project planning, the cost of a biotech project from the preclinical phase until phase II can be reduced by up to 25%. An effective cost controlling itself is, with sufficient liquidity reserves, a key success factor to remain ready for an IPO.

STRATEGIES FOR PUBLIC COMPANIES

Some observers suggest that worldwide many public biotech companies which undertook an IPO before the bursting of the bubble in 2001 were brought to market too soon and now must pay the price of diminished investor confidence. This leads to the question: What possibilities exist for listed biotech companies to win investor confidence?

- Actively engaging the investors: Capital market specialists increasingly place a lot of weight on an active, targeted and transparent communications environment as a key success factor in winning and maintaining investor confidence. Although the majority of European public biotech companies still employ fewer than 100 people and thus do not have the requisite personnel resources to develop a large public relations department, they should nevertheless assign sufficient personnel resources to establish professional information sources.

- Regular revision of the business model: The current crisis in the equity markets is also a chance for listed biotech companies to reach out to their peers, whether with mergers, strategic alliances or in licensing of technologies. This offers, in spite of the difficult financing environment, the possibility to grow or receive additional financing. Therefore, business models must be flexible enough to be revised when promising opportunities show up. Recent examples for such business model adjustments are the mergers of Berna Biotech with Rhine Biotech and Modex with Isotis, followed by the merger with GenSci.

- Maintain correct and transparent bookkeeping and accounting: Most biotech companies have to handle various complex accounting issues like revenue recognition or the capitalisation of development projects. Although all companies listed at the SWX must use either International Financial Reporting Standards (IFRS) or United States generally accepted accounting principles (US GAAP), a correct and transparent accounting system serves as an important calling card to outsiders. Usually it pays off to adapt to one of these international accounting standards as early as possible.

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

22 SCOUTING IP OPPORTUNITIES

Fabio Cavalli, CEO Mondobiotech

MONDOBIOTECH To catalyse dealmaking between academia and industry is one of the main goals of the young biotech company based near Lugano. For this the company scouts IP opportunities, builds integrated business networks and enhances clinical trial opportunities.

«There are a lot of scientists with brilliant ideas but the problem is that these ideas never reach the patients», says Fabio Cavalli, CEO of Mondobiotech, because of problems with patenting, dealmaking between academia and industry or due to a lack of network. It is the aim of the Mondobiotech team to change this situation.
And the concept is quite simple: The company builds the bridge between academia and industry. «We are developing and commercialising innovative therapy concepts by alliances with biopharma companies in order to license these concepts at defined development stages in several therapeutic areas such as respiratory diseases, and infectious diseases.»

Founded in 2000, the company is privately held and lives completely from cash flow generated by its own activities. «We are completely financed by our excellent network, based mainly on long-standing contacts and on trust. And we got the money because our concept is very focussed and simple.» Also because the international management of Mondobiotech has a wide experience in finance, science and business, which Cavalli sees as «a very important mixture for surviving in a harsh environment».

At the moment the company has a staff of 12 people housed in a building near the Lugano airport. But the alliances are spread around the world. «Our world is www.mondobiotech.com, the location doesn't matter.»

Until now Mondobiotech has out-licensed products at advanced clinical stages to InterMune Inc. for the treatment of idiopathic pulmonary fibrosis and severe bronchial asthma. From the current pipeline Vasoactive Intestinal Peptide is ready for out-licensing for the treatment of primary pulmonary hypertension. For the Swiss market Mondobiotech has in-licensed Amphocil for the treatment of invasive aspergillosis.

The company is not only implementing strategic partnerships with top pharmaceutical companies, but also setting up collaborations with scientific institutions in biotechnology and medicine. «It is our goal to create an international pool of competence and coordinate the efforts towards solving unmet medical needs», says Fabio Cavalli.

VERY FLEXIBLE BUSINESS MODEL

Recent developments in the pharmaceutical industry benefit the strategy and the aims of Mondobiotech. More and more, big pharma companies are concentrating on marketing activities and not on research and development. «In 2002 they bought a good 50% of the products from outside. This means: Big pharma companies need alliances for success and in-sourcing partners with new know-how and scientific approaches to shorten time to development and to market». And Fabio Cavalli is very keen as to the future. «We are growing with our strategic partners in a global pharmaceutical business, because we focus on niche markets.
Our business model makes us very flexible and able to respond rapidly to technological changes. With this in mind we hold a refocussing meeting via telephone with the key people around the world every Tuesday. Otherwise we would get lost in the flood of great ideas and projects that we discover all over the world.»

For further information please visit www.mondobiotech.com

«THE INDUSTRY IS DIFFERENT... >>

ROUNDTABLE Jürg Meier (CEO Novartis Venture Fund), Wolfgang Renner (CEO Cytos), Dominik Escher (CEO ESBAtech), Frances Bornstein (Vice President SWX), Marcel W. Schmid (Managing Director, Investment Banking UBS Switzerland) and Ronald Sauser (Managing Partner Corporate Finance, Ernst & Young) discuss the financing problems of young biotech companies and the risks for investors.

Just a few years ago investors were still lining up to pour their money into the biotech business. Today there is already talk of dying companies in the biotech industry. In some countries and areas there were even given subsidies or soft money. Was this more harm than good to the industry?

Jürg Meier: The money that was sometimes given away en masse most definitely did the industry more harm than good. Germany is a good example of this. Luckily, there was not such a huge flow of gifted funds in Switzerland. The problem with these gifted funds is that they are seldom real presents. Usually they are long-term loans with little or no interest and mature when the company is sold or when it changes its name or merges with another company. A merger or a sale may then quite easily fail. This is counterproductive.

Wolfgang Renner: Subsidies like these don't make sense, they attract the weakest projects that in other places do not get funded. When the supply of soft money ends, these companies are in big trouble. In the end it is the taxpayer who pays the bill.

But it is extremely difficult for start-ups to obtain funds. Mr Meier, are providers of venture capital investing in anything at all anymore?

Jürg Meier: Firstly, we like company in investing. We don't want to invest alone. The main problem for many investors is the extremely long liquidity lock-up period. So investors prefer to put their money into companies when they know that they will have a product on the market in the near future.

ESBAtech has concluded its second financing round. What were your experiences, Mr Escher?

Dominik Escher: Compared with 2000 and 2001, times have changed radically. Particularly in platform technologies in the early stage and in drug discovery. Some investors now prefer to run a higher risk and invest more money in one-product companies in phase II than in a company, which is still in a relatively early stage but offers a range of technologies or applications. I very much hope that the pendulum will swing back the other way somewhat, because innovation will be at risk if investment in platform technologies ceases.

Cytos solved its financing problem by floating the company on the stock exchange.

Wolfgang Renner: At the beginning of 2002, when we had just completed the third round of financing, the public markets plummeted. We expected that the private equity markets would follow a few months later, what actually happended. So the solution was to raise money by taking over a company with significant cash reserves but no operative business. This allowed us to raise capital and put us in a position to access the public equity markets, which improved before the private equity markets. Usually the money that is invested in the biotech industry flows first into the large and profitable companies and then into the smaller companies and into the private equity sector.

Not all companies have been as lucky as Cytos. What would you advise a company to do that can't go public yet?

Wolfgang Renner: Be very prudent in cash management. Never get below 18 months of cash, your ability to raise money may depend on so many factors over which you have no control.

Did the banks send too many companies onto the stock market during the boom?

Marcel W. Schmid: I think it's just the perspective that has changed. During the boom, investors were more focused on the fruit that was hanging from the trees – stock markets were rising. But they didn't see the ladder needed to harvest the fruit. Today the sentiment has changed and investors are more cautious.

Are the banks being too careful now?

Marcel W. Schmid: Investors have to have a realistic picture of a company. It is in the interest of both the company as well as the investors that the company has a good start in the public market and performs well afterwards. To address this point, a good amount of time is spent on the aspects of the going public as well as the being public during the preparation phase.

Ronald Sauser: I think it has definitely become more difficult to obtain equity today and a distinct cautiousness can be clearly felt. On the other hand, there is investment pressure in private equity. Here you can see an ongoing urge to invest in quality companies.

The stock markets were often accused of being too open to IPO candidates. Is the SWX less inviting today, Mrs. Bornstein?

Frances Bornstein: Generally speaking, there are certain formal requirements that must be met by a company seeking to be listed. Furthermore, the investors determine which companies they consider attractive and viable investments. This is mainly a question of assessing the risk/return potential. In this connection, it should be noted that the appetite for risk is cyclical, which is why risky investments become more attractive during a boom.
As far as the biotech securities listed on the SWX are concerned, even during booms we only saw companies going public that were in the product development phase. And the recent Ernst & Young report shows that, compared to other stock exchanges, many companies listed on the SWX have products in clinical phases II and III. This increases the attractiveness of the SWX as a listing place for European biotech companies. This correlates with the growing interest of foreign institutional investors. Both companies and investors are demanding concentration and comparability. In order to meet this demand more successfully, we will be launching a new index that will serve as a platform for companies and a benchmark for investors.

Is Switzerland such an interesting location for biotech investors because it is also a healthy location for the biotech industry?

Frances Bornstein: The strong local biotech industry, the proximity to big pharma, the research centres, the professional financial environment and the presence of large and specialised investors and their specific knowledge of the industry and their long history in public and private life science investing, all this is important and reinforces the Swiss biotech cluster. We must, however, be aware of the importance of a well-functioning capital market for biotech companies and as a locational factor for industry.

What advantages does an IPO have today for a biotech company compared with a trade sale?

Marcel W. Schmid: Every case needs to be looked at individually. Some companies may have the potential to be attractive self-sustaining public companies. For them, an IPO brings cash, means to new financing opportunities and an acquisition currency. Today the maturity of the companies that are planning an IPO has definitely improved because of the tough phase we've been going through. Other companies may be making progress but they might be too small or they do not have the management team in place. For them, and their investors, a sale may be preferable.

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Ronald Sauser: In the past, a lot of companies went public even though there were no benefits in doing so, neither in terms of becoming better known nor in terms of capital. All that came of it was the cost.
A lot of water will have to flow under the bridge before it will really be an advantage to the investor who wants to make his exit from the stock exchange. Today, an IPO is just not on the seller's agenda. There is usually more to be had from a trade sale.

Jürg Meier: From the point of view of a venture capitalist, making an exit by selling or merging is of course more favourable, because the venture capitalist can get his hands on money quicker that way. If a biotech company goes public too early, it still makes losses for a long time. The average investor does not understand why he hears four times a year that the company is running at a loss, even though this is not the same as when an SME is in the red.

Frances Bornstein: Due to the long development periods and the disparate financing cycles, the biotech industry needs not only an exit, but also a well-established point of access to the capital market. The transactions of the past show that such a point of access is available in Switzerland.

Cytos is listed on the stock exchange. Where do you see the advantage, Mr Renner?

Wolfgang Renner: Clearly in financing.

Is going public an option for ESBAtech?

Dominik Escher: If you are backed by venture capital, you have to provide your investors with an exit plan. At the moment we are looking at an exit in three to five years. And by this we mean both a trade sale or an IPO. It depends on how product development continues as to which of these two options is better for our company. Of course the hurdles are a lot higher today if you choose an IPO. You have to be on the verge of breaking even or at least be able to show that you are heading in that direction.

What are the risks for investors today? Are they made aware of the risks at all?

Jürg Meier: On the one hand, there are the risks of failing to achieve technological and innovative success and the management risks, i.e. whether these people are really capable of running a company. On the other hand, the financial risk has clearly risen. That's why a lot of investors are moving back to early and cheaper investments. These have a higher technology risk, but also a low pre-money value and therefore a lower financial risk.

Frances Bornstein: On the regulatory side, we must set internationally accepted standards that are tailored to the various needs and geared toward continuity rather than individual cyclical phases. As far as marketing is concerned, our strategy is to promote expertise and comparability.
Expertise is very important in connection with financing biotech. This is why our strategy has always been to foster the specific know-how of all market players. For example, we organised a seminar with Novartis Venture Fund which gave a wide spectrum of investors the opportunity to gain a better understanding of product development cycles and the related risks and valuation. Lately we offered also a basic course in biotechnology for finance experts, where they spent a week in class and in the laboratory.

4 5

Wolfgang Renner: If you want to be at all credible, you can't avoid making investors aware of the industry risks. The managers of the nineties who skimmed over things like these have certainly had their time. Today's investors are much more conscious of the fact that it takes a long time to get a biotech product to the market and that there is a considerable risk associated with this process. So, talk about it and make sure people understand where they put their money in.

Marcel W. Schmid: When a biotech company goes public, investors are buying into its potential and the management team's ability to deliver. The scientific risk should also not be underestimated. That said, it makes the industry so different from many others. Investors get relevant information from the listing prospectus as well as other sources like internet or media.

1 Ronald Sauser (Managing Partner Corporate Finance, Ernst & Young)
2 Frances Bornstein (Vice President, SWX)
3 Dominik Escher (CEO, ESBAtech)
4 Wolfgang Renner (CEO, Cytos)
5 Jürg Meier (CEO, Novartis Venture Fund)

26 MAKING RESEARCH ON DRUG TARGETS EASIER

COVALYS With ready-to-use kits based on a revolutionary technology (the SNAP-tag), the start-up company based near Basel wants to make research on drug targets easier.

For Christoph Bieri, today CEO of Covalys, the first encounter with the technology which is now at the base of his company was a revelation. «When Kai Johnsson and myself discussed his invention, we immediately realised that it had considerable commercial potential», he recounts. It was in early 2002 and Bieri worked in a small biotech company in Lausanne when he heard about Johnsson's work. In June, Johnsson, Bieri and five others founded Covalys. «Although the technology comes from EPF Lausanne, we are not a typical university spin-off», says Bieri. «Our founder team already combines substantial technical and business experience. The strong team is our key strength as a company.»

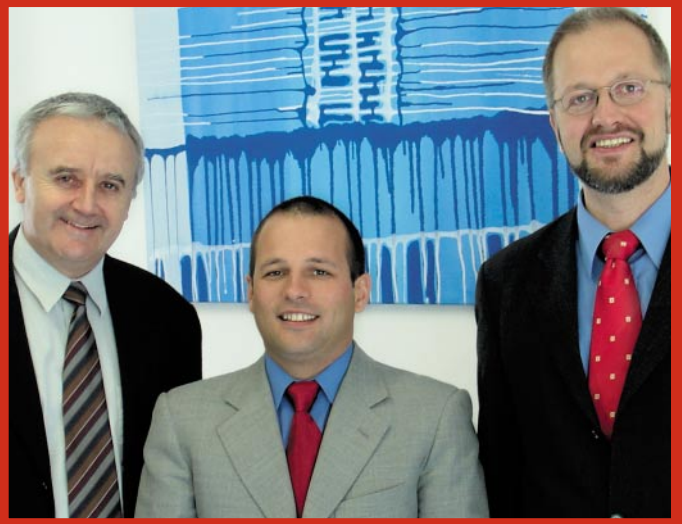
SUCCESSFUL FINANCING ROUND

Shortly after its foundation the company was awarded a grant by the «Swiss Start-up Foundation» to support the launch of its operations. And a few weeks later it was awarded the «CTI Start-up Label». This label grants Covalys permanent eligibility for research grants by the Commission for Technology and Innovation (CTI).
The first products, ready-to-use kits based on Covalys' proprietary SNAP-tag technology, will be on the market 2005. The kits will facilitate the labelling of proteins, a critical step in drug discovery. Further applications will target protein immobilisation (for example to biosensor surfaces) and protein purification. The young company that is based in Witterswil, south of Basel, closed its first finance round in October 2003. Although it is a harsh environment for venture financing, the young company raised CHF 3 million from Swiss venture capitalists and a private investor. «Team, technology, business model», explains Bieri the main success factors for the financing round».

REVOLUTIONARY TECHNOLOGY

The SNAP-tag combines very high selectivity with a stable (covalent) interaction between tag and substrate (label, surface or polymer). It allows the attachment of almost any chemical substance covalently and with high specificity to a protein. And the relatively small SNAP-tag can be expressed in E. coli, yeast and mammalian cells.
«In contrast to all other protein tags, the SNAP-tag combines stability, specificity and versatility», explains Bieri. «It is very easy to apply, very fast, not toxic and allows to use a broad variety of labels and immobilisation supports.»

The SNAP-tag can also be used to covalently immobilise fusion proteins to substrates, such as polymers or metal supports (such as in biosensor applications). Covalent immobilisation leads to ultrastable base lines in a very broad range of experimental conditions. Moreover, the high selectivity of the SNAP-tag allows the direct immobilisation of fusion proteins from crude cell extracts, avoiding laborious purification steps. A further application of the product is in protein purification. The stable, selective interaction of the SNAP-tag with its substrate may be used for one-step purification of fusion proteins. «Proteins build the machinery of life. Therefore, they are the focal point of drug discovery. The common goal is to obtain detailed knowledge on the molecular causes of diseases. This will enable the development of new and better drugs», says Bieri. And because proteins aren't easy to purify, label and immobilise, the Covalys kits will find a market. «It is our aim to sign a contract in 2004 with a technology company which will distribute our kits», explains Christoph Bieri the next milestone in company development.



Dr Michel Crevoisier, Head Supply Chain Management (left), Dr Christoph Bieri, CEO, Dr Andreas Brecht, CTO, the management team of Covalys (right)

For further information please visit www.covalys.com

ONE VOICE FOR SUCCESS

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 (77) of the companies featured use modern biotechnological methods in R&D and/or production processes. 33 companies work exclusively on genetic engineering. About 10% (29) of the companies specialise in biotechnological equipment. Some 39% (88) 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 size 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 companies, 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 technology transfer company of the Universities of Bern and Zurich. 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. In cooperation with the lead partner seco and other contributors, the project was conceptualised and implemented within a record time.

Dr Reinhard Glück, President of the Swiss Biotech Association: «We define ourselves as an association of companies aimed at attracting international attention by the launching of joint campaigns.»

«WE WOULD LIKE TO OFFER ADDED VALUE AT MOST FAVOURABLE CONDITIONS»

REINHARD GLÜCK The president of the Swiss Biotech Association has ambitious goals: Beside marketing and lobbying, the association wants to provide its members with such services as job search, support in intellectual property questions or a contract research organisation.

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

Reinhard Glück: As founding member of the brand Swiss Biotech we work with partners to create visibility for our members. This enables the companies to present and advertise themselves as an integrated whole all over the world. The various clusters in different regions of Switzerland are still very important and helpful. We therefore collaborate with the local organisations to reach additional companies and stakeholders. They have much more experience and impact in such fields as taxes or working permits.

So the Swiss Biotech Association is a pure marketing organisation?

Reinhard Glück: No, not exclusively. We define ourselves as an association of companies aimed at attracting international attention by the launching of joint campaigns. In order to ensure the flow of information, SBA is member of BIO and Europa Bio. We take part in biotech fairs and conferences and carry out a certain amount of lobbying. Additionally, we try to present biotechnology to a wide community transparently and understandably. With biotechnology it is almost the same as with the railway in the olden days: It was rejected due to lack of knowledge.

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

Reinhard Glück: We support small and medium-sized companies in the biotech sector in networking and many other fields. This helps them in concentrating on their main task: corporate growth.

How do you support the companies?

Reinhard Glück: We help them find people with top qualifications at a moderate price or facilitate their access to databases and library information. Additionally, our members have a great need for support in the field of intellectual property. We will provide service in this sector to a moderate price in the near future. Another aim is to provide our members with a Contract Research Organisation (CRO) at prime costs in the next years. This would be my favourite aim since the small companies would save a lot of money with our help. In general, small companies have enough money for preclinical trials but not enough for clinical trials. Providing them with a CRO would enable them to present a first practical proof of their concept in human trials.

When in the future will the SBA provide this service?

Reinhard Glück: We would like to provide the job exchange, the library and the services in the field of intellectual property next year. If we manage to set up the project of the CRO in the next three years, this would be a great success.

How is the Swiss biotech sector represented by the association in the foreign countries?

Reinhard Glück: Mainly via the fairs. Our members are automatically admitted to the European association. This means that our members, even the smallest company, have an awareness on a European level.

FACT FILE

Name: Reinhard Glück
Formation: Ph.D. in Microbiology and Immunochemistry
Function: Chief Scientific Officer of Berna Biotech Ltd., President of the Swiss Biotech Association

For further information please visit www.swissbiotechassociation.ch

BIOINFORMATICS SEARCHLIGHT MADE IN GENEVA

GENEBIO The life sciences sector has generated a huge amount of data. So much data that researchers today are concerned with how to sort, analyse, process and understand the wealth of information available to them. GeneBio, an innovative bioinformatics company based in Geneva, develops and distributes bioinformatics tools, software and databases to help scientists find the proverbial needle in the haystack: the relevant knowledge from the data available.

«Everything has been thought of before, the challenge is to rethink it», this quote of Johann Wolfgang Goethe clearly summarises GeneBio's development strategy. Due to the considerable rate at which data is accumulated, today's life science industry is in what could be considered a knowledge-limited rather than an information-limited era. «The industry is now facing the ever-growing challenge of transforming these masses of heterogeneous information into integrated and structured knowledge», says Nasri Nahas, CEO of GeneBio. «The challenge is to put together the right information in a contextualised manner, to allow research scientists to corroborate those separate pieces of information, and thus to generate pertinent biological knowledge.»

GeneBio's constant goal is to propose innovative products in the bioinformatics field, rather than providing «yet another» solutions that only marginally differ from other offerings on the market. «We try to offer both off-the-shelf products well suited for the general needs of the market as well as customised services to meet special clients and partners needs.» GeneBio came into existence due to a crisis in funding for the development of the renowned Swiss-Prot database. This crisis saw the emergence in 1997 of the Swiss Institute of Bioinformatics (SIB) which had been granted funding by the Swiss Federal Government on the understanding that the institute would commercialise some of its developments to generate further revenue. To this end, GeneBio was created and started its activities in 1998 as the SIB's exclusive representative with the responsibility of gathering license fees from for-profit companies and organisations for their access to and use of the SIB databases. However, since then GeneBio's activities and interests have grown in scale and scope. «Since its inception, our company has evolved from its initial mandate to commercialise databases and other products developed by the Swiss Institute of Bioinformatics into a truly multifaceted bioinformatics company offering a broad spectrum of original solutions that shape heterogeneous information into relevant biological knowledge.»

MAINTAINING THE START-UP MENTALITY

GeneBio proposes an innovative approach to deal with biological information, considering it as dynamically networked in mechanism-dependent scenarios. «We make the most of our scientists' know-how in protein annotation to develop innovative solutions that refine and rationalise biological knowledge for research in the life sciences, through the linking of genomics, proteomics, clinical and other data.» In particular, the company strives to identify and cross-link context-sensitive information that characterises protein structure, function and modifications.

«Today we work with a hand-picked team of scientific, commercial and administrative experts», explains Nasri Nahas. «Our goal at GeneBio is to maintain our flexible and dynamic start-up mentality and to remain small in size whilst developing a big company outlook on our activities and market by entering and developing collaborations with large key players in the industry.» An element of GeneBio's long-term growth strategy is to seek strong partnerships with leading academic and commercial organisations. Therefore, GeneBio closely collaborates with high-quality academic institutes, notably the SIB, on upstream research and with leading players in the proteomics market, such as Amersham Biosciences and Bruker Daltonics, on downstream commercialisation and market positioning of its products. «This deep networking strategy allows us to continuously focus on our core competencies and to provide the market with the appropriate tools developed for their current needs and enriched by unsurpassed applied research.»

For further information please visit www.genebio.com

Nasri Nahas, CEO (left), and Prof. Ron Appel, Chairman of the Board and Scientific Founder.

30 MILESTONES IN BIOTECHNOLOGY

	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 enzymie 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 Werner 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
	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 receives the Nobel Prize for Medicine**
	1979	Human growth hormone first synthesised
	1982	First biotech drug approved by FDA: human insulin produced in genetically modified bacteria
	1984	The DNA fingerprinting technique is developed by Alec Jeffreys
	1985	Genetic markers found for kidney disease and cystic fibrosis
>>	**1986**	**Heinrich Rohrer receives the Nobel Prize for Physics**
	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 R. Ernst receives the Nobel Prize for Chemistry**
>>	**1991**	**Launching of the Swiss Priority Programme Biotechnology (Swiss National Science Foundation)**
	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 receives the Nobel Prize for Medicine**
	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 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**
>>	2002	**Kurt Wüthrich receives the Nobel Prize for Chemistry**
>>	2003	**Swiss Biotech – Marketing Alliance is founded**
		(Bio Alps, Bio Polo, Bio Valley Basel, 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 Cricks discovery of the DNA double helic
>>	2003	**Life Science Incubator in Zurich-Schlieren opened**
>>	2003	**www.swissbiotech.org is launched in Bern; it is the first national Biotech portal**
>>	2003	**Launching of CTI Biotech (part of KTI/CTI programme)**

Source: SBA 2004

USEFUL ADDRESSES ON BIOTECHNOLOGY IN SWITZERLAND:

CAST	www.cast.epfl.ch
CEST Center for Science and Technology Studies	www.cest.ch
Education and Technology	www.bbt.admin.ch
Interpharma	www.interpharma.ch
Osec Business Network Switzerland	www.osec.ch
Swiss Biotech	www.swissbiotech.com
Swiss National Science Foundation SNF	www.snf.ch
Swiss Science and Technology Council	www.swtr.ch
SWX Swiss Exchange	www.swx.com

Swiss Private Equity and Corporate Finance

Association SECA	www.seca.ch
SwissParks.ch – Club of Swiss Technology Parks	www.swissparks.ch

Technology Transfer Agencies

ETH transfer	www.transfer.ethzh.ch
EPFL SRI	www.epfl.ch/sri/
PACTT (University of Lausanne and CHUV)	www.pactt.ch
Unitectra (Universities of Bern and Zurich)	www.unitectra.ch
Unitec (University of Geneva)	www.unige.ch/unitec
University of Basel	www.zuv.unibas.ch/wtt

32 APPENDIX: FACTS AND FIGURES

Two recent biotech mergers – IsoTis with GenSci and Actelion with Axovan – had a prominent involvement of dynamic and growing Swiss biotech companies showing that 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 2003 the Swiss biotech industry consisted of 227* companies in total, whereof 88 biotech suppliers and 139 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 throughout the years. This underlines that the biotech industry has developed into a quite mature industry in Switzerland. In fact, by the end of 2003, 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 area, significant amounts of venture capital flew into Swiss biotech companies (2001: CHF 106 million, 2002: CHF 148 million, 2003: CHF 130 million). In 2002 and 2003 Switzerland ranked third in Europe regarding venture capital flown into the country.

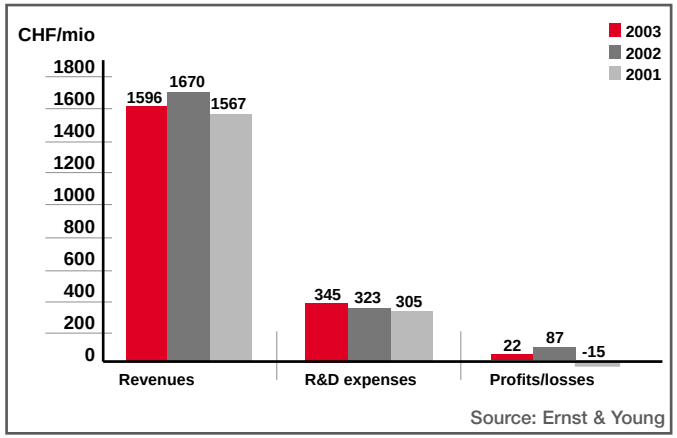
Regarding its company size the Swiss biotech industry can be split up into three main categories: the six public companies with globally active and well-known biotech leaders such as Serono, Actelion and Berna Biotech and about 20 medium-sized companies with 50 to 100 employees (many of those companies 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 Basel 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 86% of the 139 Swiss core biotech companies are active in the field of red biotech (human & animal health) and only 8% in grey biotech (environmental & industry) and 6% in green biotech (agro & nutrition). Almost 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.

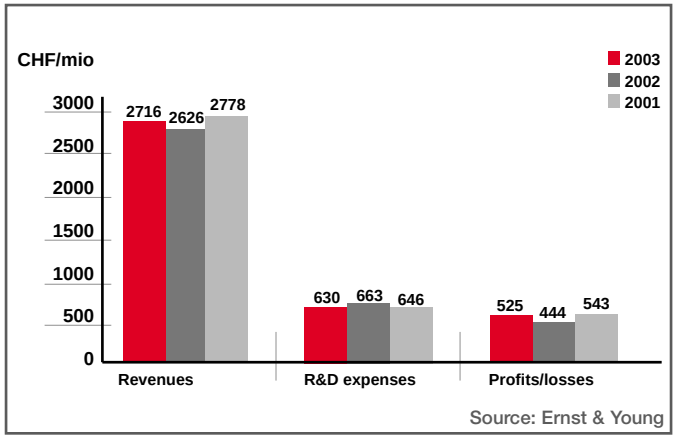
* ELISCO's, meaning Entrepreneurial Life Sciences Companies. These are companies that use modern biological techniques to develop products or services to serve the needs of human healthcare or animal health, agricultural productivity, food processing, renewable resources or environmental affairs. Not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

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

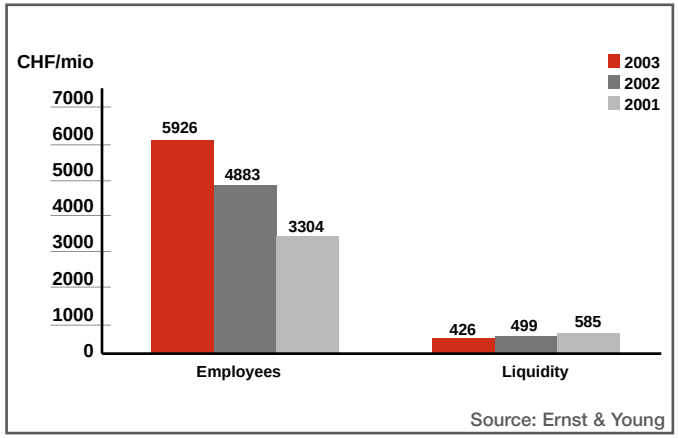
PRIVATE SWISS BIOTECH COMPANIES

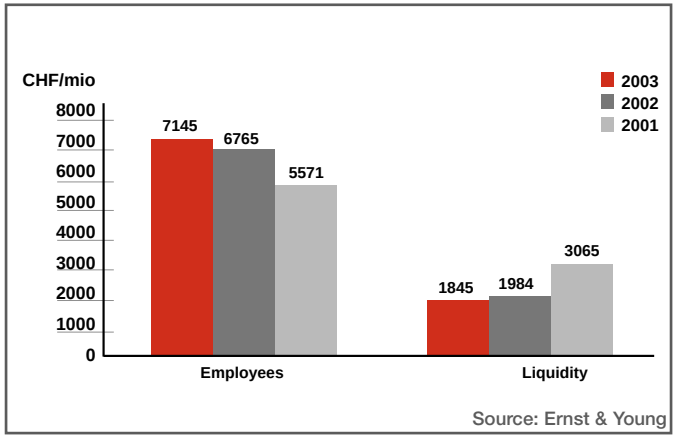


PUBLIC SWISS BIOTECH COMPANIES



Number of employees, liquidity >>





Please note:

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

Please note:

- All figures are headquarter counted
- The 2003 data in this table are based on the information available in early February 2004, when this report was compiled. At this time some of the companies had not yet disclosed the final financial figures for 2003. Therefore, some figures were carefully extrapolated on the basis of newest interim data publicly available (e.g. Q3 2003).

BASEL

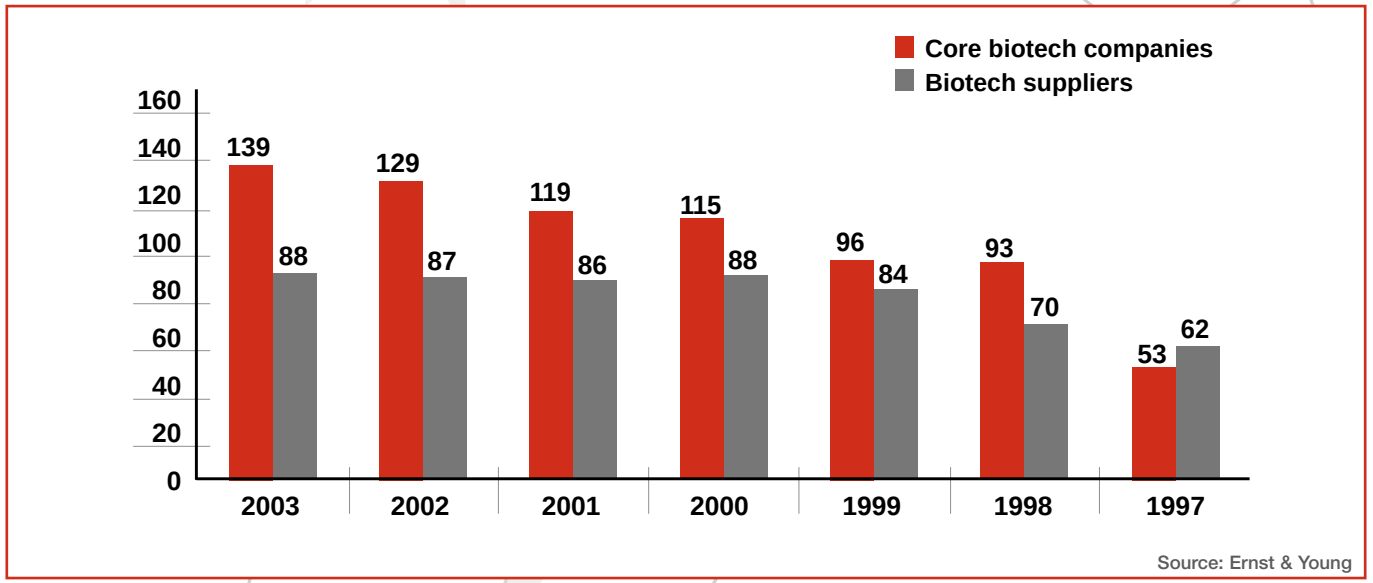
ZURICH

LAUSANNE

GENEVA

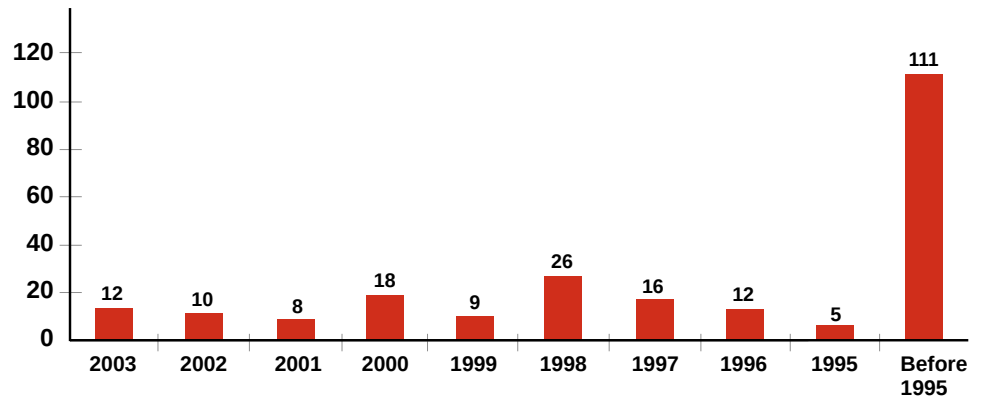
LUGANO

NUMBER OF BIOTECH COMPANIES IN SWITZERLAND



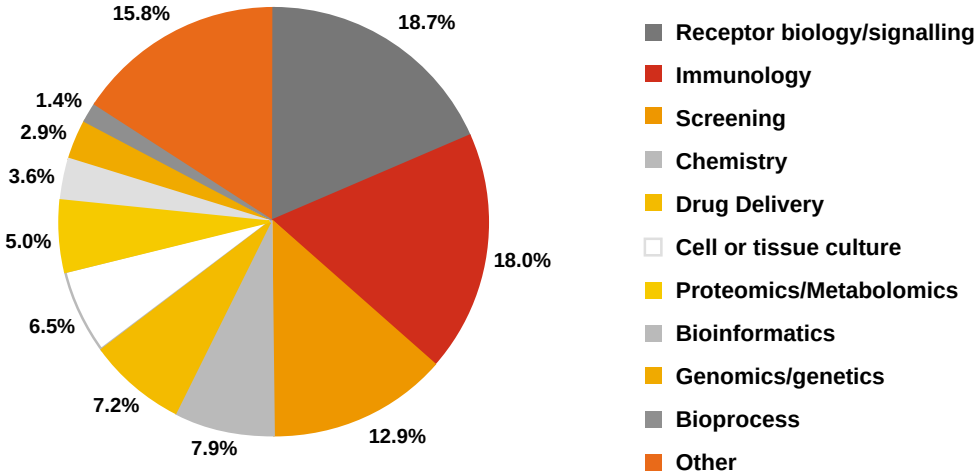
Source: Ernst & Young

YEAR OF FOUNDATION OF THE 227 SWISS BIOTECH COMPANIES



Source: Ernst & Young

THERAPEUTIC AREAS OF THE 139 CORE BIOTECH COMPANIES



Source: Ernst & Young

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ERNST & YOUNG

SWX SWISS EXCHANGE

Staatssekretariat für Wirtschaft
Secrétariat d'Etat à l'économie
Segretariato di Stato dell'economia
State Secretariat for Economic Affairs
seco

KTI/CTI THE INNOVATION PROMOTION AGENCY

SWISS BIOTECH