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# Executive Summary

In the Verzasca valley in the South of Switzerland, the African and European continental plates clash in a battle that created the Alps. The waters of the river Verzasca have stripped away the rock to tell this story while creating calm places that refresh visitors from around the world. This is a metaphor for the Swiss medtech industry. But here, a tireless flow of ideas continuously reshape processes and techniques. New facts are laid bare and give rise to products that soothe and relieve the suffering of people all over the world.

In his article on Swiss medtech clusters on page 6, Peter Biedermann describes the confluence of disciplines that merge into the Swiss medtech river. From pharma to watch making, Swiss traditional industrial expertise is required to turn the research output of the universities and colleges into products that can be tested in hospitals. On page 26, Prof. Lütolf, Prof. von Schulthess and Prof. Zünd of the University Hospital Zurich debate the pros and cons of a good average and the short distances from the lab to the clinic – unique features of the Swiss landscape.

The Verzasca offers a fascinating alternation between wild water and crystal clear pools. Swiss medtech is a surprisingly dynamic environment yet it remains reassuringly transparent. The actors involved are remarkably reliable. In the interview on page 14, Baxter's European president, Peter Nicklin, discusses the attractiveness of the location Switzerland. He praises the political stability that is so often taken for granted. In his opinion, even within the EU, not all countries offer the level of predictability that is so essential to doing business. And few countries match the high level of administrative transparency found in Switzerland.

Feeding the medtech river is a highly liquid financial centre. Dr Yvonne Gunsch-Wegmann of SWX Swiss Exchange describes the background conditions in her article on page 30. Heinrich Christen of Ernst & Young takes up the story as the river crosses the borders. On page 32, he looks at the international networks and global character of the Swiss medtech industry.

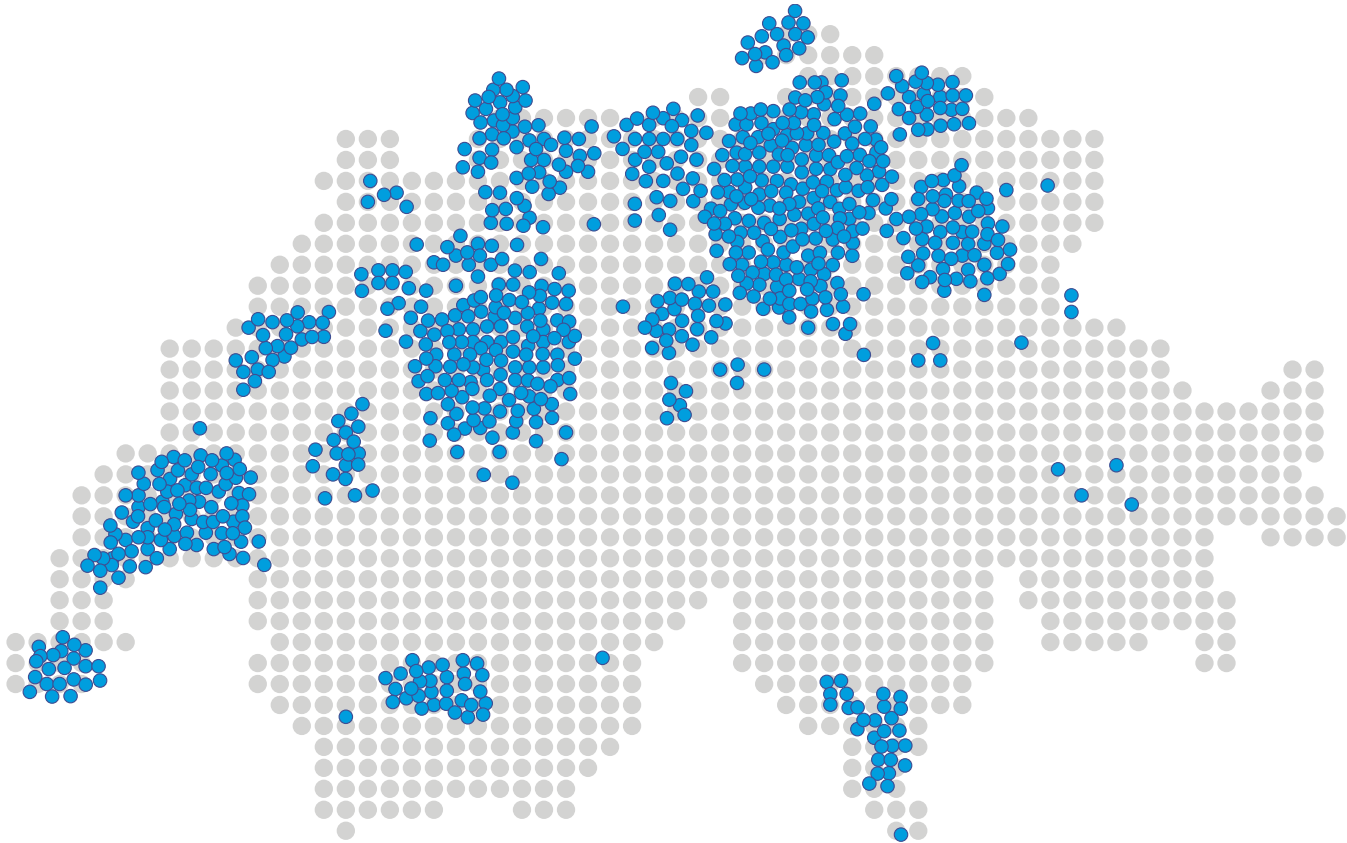
Perpetually cold and in places dangerous, the Verzasca waters do not welcome swimmers. But many organisations like CTI introduced on page 12 exist to encourage and support new firms or investors. The Swiss medtech industry is a generally welcoming river. While Switzerland poses some unique challenges, the opportunities are great. As every trout fisherman will confirm, the best fish are caught in the faster waters.



# Switzerland – the Medtech Country



# Highest Density of Medtech Companies in Switzerland



● Medtech Suppliers and Manufacturers

Medical technology in Switzerland has a great heritage as well as a promising future. Government attention in recent years has resulted in the launch of special medtech programmes while many cantons have made medtech the focus of their innovation policies. Rightly so, for medtech has short R&D cycles and requires a convergence of future-critical knowledge and technologies. Furthermore, it serves a growing global market. The Swiss medtech sector comprises around 700 firms that are wholly or partly focused on medical technology. Of these, 300 manufacture their own products – either under their own brand or as an OEM. With 70% of goods produced being shipped abroad and only 30% being sold in the home market, Switzerland is a net medtech exporter. An estimated 45,000 people are employed in the sector. While that is only 1.4% of the national workforce, they produce 5.0% of the total CHF 197 billion exports (2007).

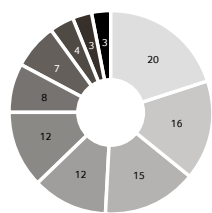
Medtech is one of the fastest growing Swiss sectors. The annual growth rates in the past two years reached up to 25–30%. The average growth rates of the past 15 years lie between 6–8%. This growth has translated into an increased market share of the growing global market for medical products from 2.5% in 1991 to 4% in 2001. Studies suggest that therapy systems, implants and prosthetics are the fastest growing fields, and these are focus areas of many Swiss companies. Furthermore, most of the sector is well prepared to exploit the coming opportunities in the knowledge- and technology-based economies of the future.

### Large International Medtech Firms Producing in Switzerland

Company	Sub-market	Employees in CH
B. Braun	Orthopaedics, Hospital aids	750
DePuy, J&J	Orthopaedics	2,000
Haag-Streit	Ophthalmology	280
Mathys	Orthopaedics	230
Medtronic	Active and passive implants, vascular diseases and diabetes	1,000
Roche	In-vitro diagnostics	1,750
Smith & Nephew	Orthopaedics	350
Sonova/Phonak	Hearing aids	920
Straumann	Dental implants	740
Stryker	Orthopaedics	600
Synthes	Orthopaedics	2,660
Ypsomed	Injection systems	1,000
Zimmer	Orthopaedics	1,000

Source: Medical Cluster

### Market Segments of the Swiss Medtech Industry



Electromedical instruments	20%
Aids for disabled	16%
Dental products	15%
Hospital hardware	12%
Implants	12%
Disposables	8%
Surgical instruments	7%
Diagnostic devices	4%
Diagnostic and therapeutic radiation devices	3%
Ophthalmology	3%

Source: Medical Cluster

### Number of Medtech Employees in Europe

Country	Employees	% of European Total
Germany	110,000	25.0
United Kingdom	60,000	13.6
Switzerland	45,000	10.2
France	40,000	9.1
Italy	29,800	6.8
Ireland	26,000	5.9
Spain	25,400	5.8
Romania	15,000	3.4
Sweden	15,000	3.4
Denmark	14,000	3.2
Czech Republic	12,760	2.9
Netherlands	9,500	2.2
Poland	8,700	2.0
Austria	6,000	1.4
Belgium*	5,500	1.3
Hungary	4,250	1.0
Finland	3,000	0.7
Portugal	3,200	0.7
Greece	2,500	0.6
Slovakia	2,200	0.5
Slovenia*	1,240	0.3
Norway	500	0.1
Total Europe	439,550	100.0

\* Covering only those employed by Eucomed member companies of the relevant national association

Source: Eucomed / Medical Cluster

## The Interplay of Classic Swiss Industrial Disciplines in Medtech

Medtech operates at the interface of electronics, machine-making, pharma and biotechnology. Switzerland has extensive experience and expertise in all these fields. Swiss industry is renowned for investing large amounts in research and development. Given the country's lack of substantial natural resources, this is an essential economic survival strategy.

The intensive collaboration between university institutions and industry is a further characteristic of medtech in Switzerland and considered one of the key success factors. To ensure that the results of pure and applied research find their way into commercial products, the Swiss Government created the CTI Medtech initiative in 2000 as part of its research funding programme. Today the CTI and the SNF Swiss National Fund form two pillars of research funding with the latter focussed on pure research and the former dedicated to the support of applied research and development in the technical universities and colleges.

## Swiss Medtech in the International Context

According to Eucomed, the total European sales of medical devices and aids amounted to EUR 64 billion in 2005. This makes Europe the second largest market behind the USA (EUR 79.4 billion) in a global business worth EUR 187 billion. Within Europe, Germany is by far the largest market with 31% of sales. Switzerland seems to play a minor role with only 2% of the sales until you examine the importance of Switzerland as a production site for medical technology devices. Switzerland is among the few countries whose medtech exports (CHF 10 billion) significantly outweigh their imports. Along with Ireland, it has also increased its share of the growing global medical technology market. The employment figures also show the significance of the sector. Of 440,000 people working in European medtech, 10.2% are in Switzerland – more than in France, Spain or Italy which all are much larger countries.

The excellent conditions such as the flexible supply of skilled labour, strong research institutes and a good supply of investment capital make Switzerland an attractive location for global firms. Many US-based and other international corporations like Baxter, Medtronic or Stryker have chosen Switzerland for their European headquarters. Besides the central location, benefits include a multilingual population and a fairly deregulated employment market that welcomes foreigners. While coordinating international activities from their Swiss base, many notable firms also produce complex instruments and devices in Switzerland in knowledge-intensive processes. Furthermore, several Swiss companies have risen to become the leading player in their niche. While these companies tend to stick to their core competences, a fine web of highly specialised vendors and contract research partners has developed. Many of them are so strong in their field that their products and skills are now in demand far beyond the national borders. Swiss vendors are present at all the relevant international trade shows and benefit from the excellent reputation of Swiss precision engineering and the brand "Swiss made".

# Competition and Cooperation – Swiss Medtech Companies Unite Forces

**Medical Cluster.** At the moment, many medtech firms in Switzerland are growing at a phenomenal rate. Both vendors and manufacturers face the challenge of reorganising to enable growth while struggling with a scarcity of qualified personnel and suitable production capacity. In recent years, the fight for the best specialists and the most reliable vendors in the Swiss precision industry has been intense. Nonetheless, among particularly the medtech firms there is a laudable willingness to unite and cooperate with various partners to solve common problems and promote the Swiss location advantages.

Some ten years ago, the concentration of medtech enterprises in the Bern region sparked the creation of the Medical Cluster. The excellent research facilities, the easy access to university hospitals and the local microtechnics expertise of the watch and robotics industry created ideal conditions for medtech to flourish. With this strong home base, the Cluster was able to expand activities to create a national umbrella organisation.

Today, the Medical Cluster brings together manufacturers, suppliers, service providers and research and development firms from all over Switzerland. It offers individual support to both established companies and start-up businesses, providing platforms and assistance to ensure that medical technology in Switzerland continues to enjoy the optimum conditions for growth. The main accents are on:

- Supporting innovation throughout the value chain, from research to production to market
- Optimising knowledge and technology transfer
- Expanding the opportunities for initial and continuing education in the medtech sector
- Providing support for innovative young enterprises

To efficiently attain these objectives the Medical Cluster has links with the Swiss public authorities, various partner organisations and the established medtech community in Switzerland. Together with the Swiss Life Science Marketing Alliance as strategic partner, the Medical Cluster offers the following benefits for firms:

- A single brand for all communication of Swiss medtech abroad
- A web portal covering the whole Swiss medtech scene
- Joint exhibition stands for Swiss medtech companies at international shows
- Periodic studies about the Swiss medtech scene
- Professional knowledge and technology transfer through the Trust – Competence Centre for Medical Technology CCMT
- Initiation and support for the creation of Bachelor and Master studies in medical technology
- Expert seminars on medical technological themes
- Supporting development and realisation of product innovation as well as start-ups through comprehensive innovation management
- Organisation of company visits as best practice examples and organisation of expert meetings and networking events



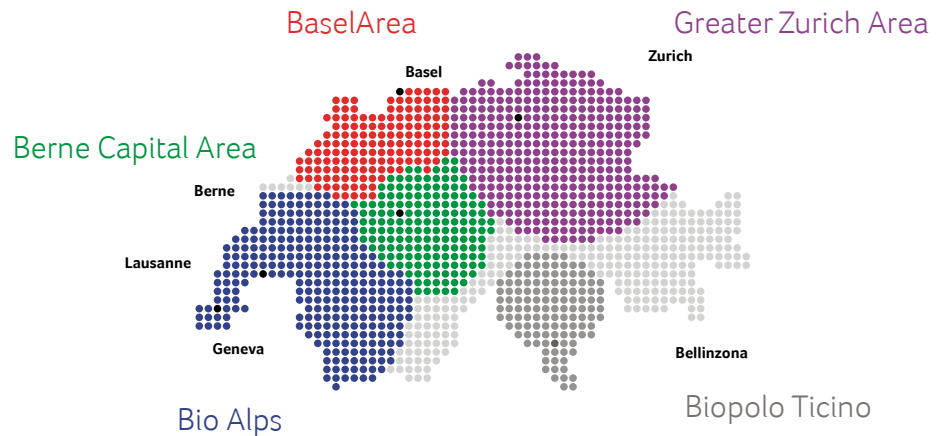
Peter Biedermann  
Director  
Medical Cluster

**medical cluster** 

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

# One Nation – One Medtech Cluster



Are you interested in developing and manufacturing products “Made in Switzerland”? With its favourable business environment and its excellent quality of life Switzerland offers very attractive conditions as a business location. The organisations listed below can provide you with useful information and support to establish your own business in Switzerland and support Swiss-based companies in their international business development with the Swiss Medtech Marketing Initiative.

**BaselArea Economic Promotion** welcomes companies to one of the world’s most successful life sciences clusters – with companies representing the full breadth of the industry – from medical technology and diagnostics to modern biotechnology and pharmaceuticals, and from multinationals to dynamic start-ups.

**Berne Capital Area** is the global centre of the precision industry. Medtech is one of the most important sectors and companies form networks such as the Medical Cluster. This special organisation establishes sciences industry partnerships fostering the realisation of innovations.

**Bio Alps** is one of the major European centres for biotech research. It is home to more than 200 bio- and medical technology companies, over 500 research laboratories and more than 10 research institutions. Research parks and technology transfer institutions support rapid development innovation.

**Biopolo Ticino** promotes life sciences in Ticino, the Italian-speaking sunny South of Switzerland. Aiming to create a fully integrated life sciences cluster, Biopolo Ticino seeks to align, network and integrate the life sciences value chain in the area and to attract foreign biotech companies and investors to the region.

**Greater Zurich Area** is a leading European centre of medical innovation. Its life sciences cluster comprises more than 400 biotech and medical companies, universities, technical colleges and technology transfer institutions – all facilitating the prosperous development of companies in the field of medical devices and biotechnology.

National information about the Swiss medtech industry is also available from the Medical Cluster, [www.medical-cluster.ch](http://www.medical-cluster.ch) and the Swiss Stock Exchange, [www.swx.com](http://www.swx.com) (page 30/31)

For further information please visit

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

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

[www.bioalps.org](http://www.bioalps.org)

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

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

[www.medical-cluster.ch](http://www.medical-cluster.ch)

[www.swiss-medtech.org](http://www.swiss-medtech.org)

[www.swx.com](http://www.swx.com)



The Centre of Excellence  
for the Swiss Foreign Economy

**Osec.** In addition to Osec's classic role as trade promoter, since 2008 we have taken on responsibility for location promotion as well as import and investment promotion for the benefit of developing and transition countries. These mandates have been given to Osec by Seco (The Swiss State Secretariat for Economic Affairs). Concerning export promotion Osec informs companies about foreign markets and offers detailed consulting services as well as accompanying customers in their ventures abroad. We also help foreign companies wishing to locate in Switzerland.

An important task of Osec is to work with customers in an efficient and effective manner in the development of their activities abroad. To foster this goal, Osec is working with public and private organisations worldwide and acts as the official Swiss trade promotion organisation as well as network manager of the "Business Network Switzerland". To fulfil this role, we work with a wide range of competent partners at home as well as abroad. In Switzerland and in Liechtenstein this network consists of chambers of commerce and industry as well as Cantonal (State) Economic Development Offices, in addition to trade and economic associations. On a project basis, Osec works in Switzerland and abroad with trade and professional associations as well as with private specialists (for example "Pool of Experts"). Abroad, the network consists of 16 "Swiss business hubs" and bilateral chambers of commerce.

## Helping Foreign Investors to Find the Best Business Location in Switzerland

Osec offers foreign investors many services comprising a wide approach entitled "Location Step-by-Step", which follows the same model as the "Export Step-by-Step" programme offered for trade promotion.

## Location Promotion – Initial Information

The goal of Initial Information is to provide the most important indications about Switzerland as a business location. Whether via the Web, info brochures, investor hotline, media tours or at an information event, Osec guides foreign investors. More detailed information about information events organised by Osec abroad are to be found via the link [www.osec.ch/location\\_events](http://www.osec.ch/location_events).

## Location Promotion – Basic Consulting

Under the Basic Consulting programme, Osec helps foreign investors in a personalised manner and addresses their specific questions. Osec carries out this task in close collaboration with partners from the private sector as well as with the network of Cantonal Economic Development Offices. The following services are offered by Osec in the framework of the Basic Consulting programme:

**First Consultation.** Osec supports the investor through his or her first evaluation. Osec supplies contacts to the Cantonal Economic Development Offices and works with the investor to develop a short list of potential locations as quickly as possible.

**Customer Requirement Profile.** Osec is pleased to work on and reply to specifications submitted to us by foreign investors. In such cases, most often asked questions include: What is the criteria for success? Distance to an international airport? What is the IT infrastructure available? What is the availability of specialised / highly trained workers?

**Offer.** During the final phases of location selection, Osec is still at the disposal of the foreign investor during the stage where personalised offers are submitted. Osec can open the right doors to a top decision maker in the cantons identified and is available to answer questions about the data contained in offers received for site selection.

**Fact-Finding Mission.** In cases where investors want to develop a first hand impression about Switzerland as a business location, Osec is pleased to assist to organise and accompany delegations on discovery

tours, taking into account all customer-specific needs. Switzerland has a lot more to offer than just mountains and chocolate!

## Location Promotion – Detailed Consulting

The detailed information, professional analyses and verified contacts of the "Location Step-by-Step" platform puts you on the path to a successful location in Switzerland. Detailed consulting services are executed by private experts at a fee.

**Strategy.** The strategy products from "Location Step-by-Step" are employed on the basis of the analyses and results of your personal Basic Consulting session. We will make the initial enquiries for you in Switzerland. The clear, modular structure of the three different strategy products and the options for combining them guarantee you a high degree of flexibility and individuality.

Strategy products are as follows:

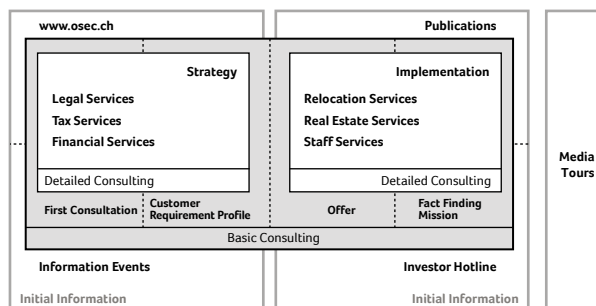
- Legal Services
- Tax Services
- Financial Services

**Implementation.** "Location Step-by-Step" implementation products are employed when you have clarified your location plans in detail using the strategy products, or if you are already located in Switzerland. Depending on your needs and questions, you can choose from our different products that offer professional assistance.

Implementation products are as follows:

- Relocation Services
- Real Estate Services
- Staff Services

### Location Step-by-Step



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

# From Healthy Ideas to Healing Products

**The Innovation Promotion Agency CTI.** “Science to market” is the idea behind CTI, the Swiss Innovation Promotion Agency. CTI is the Swiss Government’s prime tool for the promotion of knowledge and technology transfer between business and universities. In accordance with national economic policy, CTI aims to increase the level of innovation in the Swiss business sector by accelerating the process of turning new scientific knowledge into innovative products, processes and services. With a total annual budget of CHF 130 million, CTI promotes innovation in two principal ways, through funding of collaborative R&D projects and by strengthening enterprise in Switzerland.

Funding R&D projects is the main activity. It is a bottom-up process commanding 60% of the CTI annual budget. When a firm teams up with public research institutions for a joint R&D project, they can submit a proposal for funding to CTI. Project proposals are evaluated by a team of independent experts who make recommendations based on merit. The core criteria are innovative content and the anticipated economic impact. CTI funding covers the institution’s research staff costs up to around 50% of total project costs. In 2007, CTI contributed CHF 89 million to 277 projects generating a total R&D volume of CHF 128 million.

**Strengthening Enterprise in Switzerland Via Two Specific Programmes.** Through the “venturelab” education and training programme, CTI aims to motivate university students to become entrepreneurs. Since 2004, more than 24,000 students participated in a wide range of “venturelab” events and training courses.

Since 1996, CTI has also been helping individuals and teams to set up new companies through the CTI Start-up initiative. So far, more than 1,100 projects have been reviewed and the companies accepted by CTI Start-up received extensive coaching support from experienced entrepreneurs and consultants. 170 companies have been awarded the CTI Start-up label, which is now regarded as a prestigious quality label. The survival rate of firms bearing the CTI Start-up label is an excellent 85%.

CTI also supports researchers and businesses in joining international innovation programmes, e.g., Eureka, EU-FRP, Intelligent Manufacturing Systems IMS, as well as bilateral international R&D co-operations with emerging economies.

**CTI Medtech Initiative.** For over a decade, CTI has put special emphasis on applied research in medical technology. Medtech is one of Switzerland’s most dynamic and internationally respected markets. The figures are impressive: since the CTI Medtech initiative was launched in 1997, CTI has sponsored over 230 medtech projects with federal grants totalling over CHF 90 million. For every Swiss franc spent by the Swiss Confederation, business partners invest an additional CHF 1.50, which results in a total research volume of over CHF 225 million. Among the success stories highlighting the importance of the CTI Medtech initiative is the DACS project featured on page 13.

The CTI Medtech initiative has become a vibrant project platform and forum offering excellent networking opportunities. The annual high-profile “Medtech Event” attracts more than 350 attendees. The prestigious CTI Medtech Award was launched in 2005 to recognise excellent CTI-funded research projects in medical technology. These events also provide plenty of food for thought as prestigious panels discuss hot topics in Swiss and international medical technology. The CTI Medtech initiative is led by a panel of five prominent experts headed by Prof. Gilberto Bestetti. All active in universities and/or business, they are well positioned to acquire, evaluate and coach the projects very efficiently. Furthermore, they provide the CTI Medtech initiative with essential medical, technological and business know-how and experience.

## CTI Medtech Award Winner 2007

**Bern Implant Helps Where Hearing Aids Fail.** There are thought to be some 500 million people with hearing loss worldwide. The number in Europe alone is estimated at 70 million. Although many cases of hearing loss can now be treated effectively and relatively economically, only one in four of those affected uses a hearing aid.

Specialists differentiate between two causes of deafness – the lack of sound conduction and the lack of sound sensation. In the latter case, there is usually damage to the inner ear or cochlea, which can often be corrected by a conventional hearing aid. This relies on a small loudspeaker in an ear piece in the outer auditory canal that sends electrically amplified signals towards the inner ear. Implantable hearing aids pose an interesting alternative to this approach. They convert an electrical signal into mechanical vibrations, which are connected to functional structures in the ear. Implants have the advantages of being largely invisible and of allowing for an open auditory canal. Where you have lack of sound conduction, the problem is that the sound is not being conducted effectively through the outer and middle ear. Here a minimally invasive operation can improve the hearing ability. However, until recently there was no single solution available for patients with a combination of severely impaired sound conduction and sound sensation.

**Direct Acoustic Stimulation of the Middle Ear.** Motivated by the needs of his patients with this dual impairment, Prof. Rudolf Häusler, Director of the ENT clinic at the Inselspital Bern, put together a project team that included Helbling Technik Bern AG, Cochlear AG in Basel and Phonak in Stäfa as industry partners. The vision was to develop a new type of hearing implant. CTI offered support in the form of co-funding for the research salaries. Cooperation with microengineers, ear surgeons and audiologists over a period of several years gave rise to the DACS (Direct Acoustical Cochlear Stimulation) system. DACS consists of an implant and an external processor that includes a microphone, amplifier and battery. The sound signal picked up by the microphone is converted to an electrical signal, which is transmitted to the implant via a cutaneous plug. Fitting DACS is a surgical procedure. First, a miniature electromechanical drive system, hermetically sealed in a titanium casing, is positioned. It makes a small coupling rod vibrate. For the direct mechanical stimulation of the inner ear, a middle ear prosthesis called a stapedectomy piston is fixed to the thin coupling rod and immersed in the inner ear fluid.

**Surgical Combination Facilitates Hearing.** After the operation had been painstakingly practiced on anatomical head preparations, Prof. Häusler began the clinical study. The Ethics Commission gave the go-ahead for the first operation on volunteers. “The three selected patients at the Inselspital were all suffering from severe hearing loss due to otosclerosis – an ossification in the inner ear, which makes it impossible to pass sound waves on to the inner ear. They had already had negative experiences with hearing aids,” explains Dr Christof Stieger, electrical engineer ETHZ (Swiss Federal Institute of Technology) and audiologist in charge of the project. “With DACS, all of them attained an astonishingly significant, subjectively and objectively measurable hearing improvement.”

Since then, Rudolf Häusler’s research team has presented the DACS system to international conferences and has encountered keen interest among specialists. “The operation is a combination of conventional middle ear surgery and cochlear implant surgery,” says the senior consultant. “Given some initial training, any experienced ear surgeon can perform it.” In a CTI follow-up project, the team has now dispensed with the cutaneous plug. The aim is to develop DACS into a fully implantable system, in which even the microphone and energy source are under the skin. For people with severe combined deafness, DACS offers hope for a lasting improvement and the chance to reintegrate into family, cultural and work life.



Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs FDEA  
**Federal Office for Professional Education and Technology OPET**  
Innovation Promotion Agency CTI



Prof. Dr. Gilberto Bestetti  
Head of CTI Medtech  
Innovation Promotion  
Agency CTI

For further information please visit

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

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

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

# Why Switzerland?

Baxter Europe recently decided to move to a new office building in Zurich Opfikon, only three kilometres from its current location. Why stay in Switzerland?

We originally located our European headquarters here more than seven years ago and we are very pleased with our choice. Switzerland is geographically central to the European markets and serves as a convenient travel hub. Our second main criteria was tax management. One often takes political stability for granted, but even within the EU, not all countries offer the level of predictability that is so essential to doing business. And few countries match the high level of administrative transparency that we have in Switzerland. Even if things can sometimes be cumbersome, at least the processes are clear.

People describe you as a talent in developing businesses and people. Do you find enough talented people in Switzerland, or expats willing to move to Zurich, to employ and develop?

When recruiting, our first preference is definitely Swiss employees, as it is easier for everyone if they don't have to move families and find homes and schools for children. At the moment the Swiss market is very active, so there is a lot of competition to find the right people, both locals and expats.

What are the most important challenges for Switzerland in the global competition between the top business locations?

The cost of doing business here is high compared to other places that are equally well located. Secondly, when one recruits people from abroad there is currently a challenge in the Zurich area with regard to the relatively limited schooling and rather expensive housing options. The canton of Zurich is working very hard to attract more companies and to improve in these areas. This is important, as modern office buildings and competitive taxation won't be enough in the future. Thirdly, Switzerland's relationship with the EU is vital. We are here because Switzerland sits in the middle of this very large, single trading block. Therefore the stability of the EU-relationship is critical. It's safe to say that as far as the EU is concerned, the discussions on bank privacy and tax rates are not over. Companies will only locate their European headquarters here as long as the EU-relationship remains stable.

Baxter also runs production facilities in Switzerland, like Baxter BioScience in Neuchâtel. What Swiss advantages for the life sciences production do you see?

When we originally decided to base a manufacturing site in Switzerland, canton Neuchâtel was looking for the biotech industry to establish itself there and was very supportive. As it's a relatively small area, we quickly dried up the talent pool. I think there are actually more French than Swiss now working at our Neuchâtel site, because they are able to commute across the border. The talented people that are available have proven to be very well qualified and are central to the expertise and quality we maintain at this important part of Baxter's global supply chain network.



**Peter Nicklin**  
Corporate Vice President  
and President Baxter Europe,  
Middle East and Africa  
[www.baxter.com](http://www.baxter.com)

# Activities in Medtech

**IBM.** IBM is the world's largest information and communications technology (ICT) firm. Besides business and IT systems consulting and design, IBM also conducts basic research in eight labs around the world. One of the strategic accents of the Swiss lab in Rüschlikon is health care where Switzerland has an enormous potential to increase efficiency through ICT.

**Health Care Focus.** IBM offers a full palette of advanced and environmentally friendly information technologies that few other companies can match: besides hardware and software systems, there are various services like ICT and business consulting, training, custom software design and outsourcing of ICT infrastructure and whole business processes. The firm operates eight basic research centres scattered around the world. Each lab focuses on eight themes with one strategic priority. Close to Swiss the banks, IBM Rüschlikon was strong in privacy and security technology which made it an obvious candidate for a health care focus. After all, patient records are almost as sensitive as bank statements.

Unfortunately, the strength of the Swiss medtech industry and the Swiss healthcare system is not mirrored by the current state of the electronic network among the various stakeholders in the healthcare system. We asked Markus Nufer, Manager of Governmental Programs, IBM Switzerland, where the problems lie: "There are still some GPs that don't use electronic communication and therefore there can be substantial delays in the information flow," he says. Changing entrenched systems is always harder than starting from scratch so part of IBM's engagement in this field is pure CSR. "There is a substantial investment required that is not motivated by the business case," he explains. Many other countries are years ahead of Switzerland in the integration of patient data and the use of IT to increase health care efficiency. Denmark, for example, already offers patients access to their medical history via the Internet. Despite the lag, IBM still believes Switzerland can make a significant contribution given that all the technology complies with international standards and localisation is purely an add-on.

**Integrated Health Environment.** Currently work is underway on an Integrated Health Environment (IHE) that includes a universal patient index, a digital health dossier and better ways of processing, interpreting and transmitting digital images. Digital processing of ultrasound and x-ray images is one solution, another involves an avatar. Instead of a file with some handwritten notes, a doctor can view a depiction of the person with medical problems mapped to the respective body part. Another project involves advanced search engines that match medical terminology present in patient records to illness profiles. The health care savings that can result from faster and more accurate diagnosis are substantial.

Intensive work is also being done on custom health care ICT solutions such as workflow management and mobile IT solutions for doctors. Often produced in partnerships and based on Service-Oriented Architecture (SOA), these systems use powerful and flexible IBM middleware that allows new and existing IT systems to be easily integrated.

While traditional patient medical histories are shrouded in secrecy, the themes of open collaboration or social networking are also cropping up in IBM's medtech initiatives. For example, collaborative or consulting systems that allow specialists to exchange case history records or elderly people to remain independent longer. Hardly spectacular, this is still work that we will all appreciate sooner or later in life.



Markus Nufer  
Manager of Governmental  
Programs  
IBM Switzerland  
[www.ibm.com](http://www.ibm.com)



Swiss Made



Putting the Bite  
Back into Life



**Straumann AG.** Like so much of the Swiss medtech industry, the Straumann Group is strongly rooted in the skills and expertise of the Swiss watch industry. Founded in 1954, by Reinhard Straumann, the company began as a small, family-owned research institute specialising in materials testing and alloys for use in timepieces. One of their inventions was an alloy that is still used in watch springs today. In 1970, a breakthrough in the use of non-corroding alloys in fracture repairs inspired Dr Fritz Straumann to lead the company into the areas of orthopaedics and implantology. Following a management buy-out of the orthopaedics business in 1990, Thomas Straumann, the founder's grandson, began to focus the company's entire energies on dental implants where they are now a leading force.

Despite advances in oral hygiene and dental care, a surprisingly high proportion of adults still lose teeth. One in every two people aged 35–44 have lost at least one tooth, while a third of 65–74 year-olds are missing ten or more teeth. Conventional tooth replacement solutions using dentures or crowns and bridges have several disadvantages such as loss of bone from the jaw and the need to grind down healthy neighbouring teeth in order to anchor a bridge.

In the 1980's Straumann helped to pioneer the use of titanium dental implants to replace the natural tooth root and act as a reliable, lasting anchor for replacement teeth. Since then, implant dentistry has become the standard of care and millions of dental implants are placed every year. At the same time, Straumann has become the world's second largest manufacturer of implants with a market share of 17% and a global workforce of more than 2100 people. Its products and services are available in more than 60 countries through 21 distribution subsidiaries and a broad network of distribution partners.

In addition to refining its implant solutions, Straumann has made a number of important strategic acquisitions in the past five years, which now position it as the only leading company in implant and restorative dentistry and oral tissue regeneration. In 2003, the acquisition of the Swedish company Biora AB provided Straumann with regenerative products that help to rescue severely damaged teeth or to regenerate lost bone so that an implant can be placed. More recently, the acquisition of etkon AG in Germany in 2007 enabled Straumann to enter the highly attractive market for dental prosthetics made using CAD/CAM (computer-aided design/manufacture) technology.

The aging global population is one of several factors contributing to the rapid increase in the need for tooth replacement and preservation. Forecasts suggest that the global market could even double in five years, which is an attractive prospect for the industry. However, it is clear that the current capacity of dentists who are trained to place implants will not be sufficient to meet future demand. To address this problem, Straumann offers comprehensive training and services to the dental profession worldwide, including thousands of training and education courses each year, which are provided in collaboration with the Group's academic partner, the International Team for Implantology (ITI).

The company also collaborates with leading clinics, research institutes and universities, to research and develop improved and simpler solutions: for instance, Straumann recently introduced a revolutionary implant surface technology called SLActive, which cuts healing times by half and significantly reduces the risk of implant failure. The Group is also working on new high-strength materials to reduce the size of implants and a number of other projects to ensure perfect aesthetic outcomes in every clinical situation. Straumann's headquarters and research centre are located in Basel, Switzerland, a world centre for medicine, life sciences and clinical research. Its manufacturing sites are in the heartland of Swiss watch-making and precision engineering, as well as in the USA, Germany and Sweden.

Straumann became a publicly traded company in 1998. Since then, the price of its shares, which are traded on the SWX Swiss Exchange, has risen from CHF 18 to approximately CHF 280, putting the company's market capitalisation at around CHF 4.5 billion. Under its present CEO, Gilbert Achermann, net revenue has grown at a compound average rate of 20% over the past 5 years to CHF 714 million in 2007. At the same time, net income has risen at a compound average rate of 22%, with the net profit margin reaching 25% in 2007.

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

# Swiss Precision and Reliability

**Bien-Air Medical Technologies.** Despite having the company headquarters in Bienne and a high-flyer reputation, the “Bien-Air” name was never meant to refer to Biel/Bienne or to airline activities. Edgar Schönbächler, the Head of Research and Development, explains: “Our founder David Mosimann was a precision mechanic. When he created the company in 1959, he wanted to express, in his native French, his vision of making compressed air equipment that works and works well.” In 1965 he launched his first product and it was a world première: a turbine that reached more than 500,000 rpm with almost no heat and friction losses thanks to compressed air bearings.

Bien-Air Medical Technologies is still strong in air designs and produces air-driven instruments, but over the years it has extended the product range to include electrical micromotor systems and is now a leader in this field too. Schönbächler says the firm’s success is down to the simple combination of “innovation and reliability”. Innovation is vital because more and more practitioners are doing surgical-style procedures and work in the area of implants. This creates an increasing demand for versatile tools. Talking about reliability he characterises the firm’s position thus: “We don’t want to trump the competition with spectacular gadgets. Instead our products should be simply reliable and give some real advantages.” This has led Bien-Air to become a manufacturer driving forwards a trend in which the performance of each tool increases so the practitioner ultimately needs far fewer devices.

Bien-Air has a typically Swiss form of modesty. The company doesn’t aspire to be the biggest. They just want to be the best. Perhaps this is why the group is still family-owned. Schönbächler certainly sees the benefits: “It allows us to uphold traditional quality values. We can focus on creating really good solutions without the management having to constantly worry about the opinions of stock analysts who are squinting over quarterly results.” On the other hand he admits that a family firm can pose specific challenges: “We’ve got 400 employees and fairly direct decision-making. So with our ambitious organic growth goals, we are aware of the need to constantly improve our structure to better adapt to market needs.”

One such response was the creation of Bien-Air Medical Technologies in 2001 which includes the subsidiaries Bien-Air Dental and Bien-Air Surgery. The latter focuses on ear, nose and throat surgery where the instruments are similar to those used in dentistry. In 2007, the newly-created laboratory section was integrated into Bien-Air Dental with the goal of covering the full dental technology value chain from prophylaxis to prosthetic restoration.

Bien-Air is firmly rooted in the Swiss Jura region with production plants in Bienne, Saignelégier and Le Noirmont. The majority of their sub-suppliers are also located in that region. Schönbächler explains: “Although we develop much of the technology ourselves, we still rely on some outside expertise. Fortunately we can cover 80% of that need within a radius of 30 km. Most of the company’s engineers are also from the region.”

In the Jura there is an excellent network of colleges and you find experts in all fields of microtechnology. However, because the economy and especially the watch industry has grown so much recently, Bien-Air now looks to the engineering colleges in Yverdon, Lausanne and Geneva for recruits. These institutes are all very industrially minded and the ETH Lausanne is very strong in the life sciences.

When it comes to sharing know-how, Bien-Air is involved with networks like the Medical Cluster, which R&D manager Schönbächler views as a valuable initiative. “There are so many opportunities to interact and inspire each other. Having said that, Switzerland does have the tendency to think small when it comes to concrete joint ventures, which is perhaps why there is still so much unexploited potential in this country.”



Assembly of dental micrometres.

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

# Sensors and Sensitivity

**Sensirion AG.** On the beautiful sunny side of Lake Zurich, traditionally known as the Gold coast, is a little town called Stäfa – the unlikely home of a globally active high-tech manufacturer. Sensirion AG produces humidity and temperature sensors, as well as liquid and gas flow metres and controllers for international OEMs (original equipment manufacturers).

Sensirion works with its customers to refine sensors for use in custom or mass products with a wide range of applications. They are all based on CMOSens® Technology that allows the mass production of pre-calibrated devices such as liquid flow sensors. Applications are found in the automobile industry as well as in medical technology. Sensirion holds the ISO/TS 16949:2002 quality certificates and a portfolio of over 30 patents for their proprietary technology that unites sensors and CMOS electronics.

Ten years ago, Dr Felix Mayer und Dr Moritz Lechner left the Swiss Federal Institute of Technology Zurich (ETH) to found their own company which took off like a rocket: five years later they won the Swiss Economic Award 2004 for enterprise performance and significant future potential. The jury's intuitions were confirmed as the company grew rapidly and doubled the number of employees from 2006 to 2008. Sensirion now has over 120 employees. The Swiss location offers many benefits. Founding partner Dr Moritz Lechner says, "In order to grow, we depend on young, highly motivated employees and room to expand. In Stäfa industrial space is affordable and the residential options for young families are attractive. It's country living only 30 minutes from the centre of Zurich." The welcoming town authorities eased the decision to settle next door to the famous hearing aid manufacturer Phonak. On the other hand, some of the Canton-level regulations especially those relating to fire-safety required a little patience. Loosely phrased laws that depend on local official interpretations are a common feature in Switzerland with obvious pros and cons. Nonetheless, Sensirion looks back on the location choice with evident satisfaction.

Generating less than 3% of its revenue in Switzerland, Sensirion has established sales offices close to its main customers in the USA, South Korea and since 2008, in Japan. However, the production and head-office activities are still in Switzerland. The most important factor here is the availability of young talent. "In Switzerland there is without a doubt, a high density of people with the kind of qualifications that we are looking for. The ETH Zurich, for example, is an excellent talent pool. Recently one of our large American visiting customers commented that he never saw this kind of concentration of skills in any US company," says Mayer proudly. After all, it is not purely coincidence. Sensirion invited coach-loads of graduates from Germany to visit their facility in a proactive recruitment drive that resulted in many Germans moving to Stäfa's sunny slopes to take up new jobs with Sensirion.

Besides the Swiss standard of living, young Germans quickly notice another attractive advantage – flatter hierarchies that are not a common feature of Teutonic life. The typical Swiss aversion to rigid hierarchies is, according to Lechner, a vital factor favouring innovation and an integral

part of the Sensirion company culture. "We grow through innovation and that is something you cannot force. You have to employ talented people, accurately communicate the goals, position the crash barriers and then let them start thinking for themselves." This is exactly the approach that modern graduates respond to. In a survey of the most attractive employers for technology conducted among engineering students at Swiss universities in Spring 2008, Sensirion was ranked 18, ahead of Microsoft (Switzerland), Cisco Systems (Switzerland), Swatch Group and Nestlé.



The founders of Sensirion: Dr Felix Mayer and Dr Moritz Lechner.

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



# Interdisciplinary Network



# Trustful and Productive Exchanges in Switzerland

**swiTT.** The recent IMD and WEF global reports on competitiveness ranked Switzerland 1st for knowledge transfer between industry and academia. The top quality of academic researchers and clinicians, the access to patients in up-to-date clinics and flexible and lean collaborative processes are key ingredients driving technology transfer in the medtech field. The national association swiTT is facilitating transfer by organising educational events, developing best practice models and operating the unique national technology portal swiTTlist.

There are few fields where academic research is so frequently so close to practical application as in the area of medical technology. Clinicians at university hospitals often have their own research staff and facilities and are engaged in research and development with a potentially direct impact on patient treatments. Meanwhile, on behalf of industrial partners, Swiss academic institutions cover a broad range of research ranging from basic science, e.g., into new materials or electronics, to clinical testing of new products. Such collaborations are sometimes institutionalised as in the case of the Institute of Biomedical Engineering of ETH Zurich and University of Zurich.

As evidence of the attractiveness of Swiss academic institutions to industry, the already high number of collaborative projects has continued to increase in recent years. There are also a growing number of marketed products based on technology licensed from a Swiss university. And there is a continuous flow of new spin-out companies based on licensed university technologies that are founded or co-founded by researchers from Swiss universities. The most recent technology transfer survey conducted by swiTT, the Swiss Association of Technology Transfer Professionals, shows that Swiss universities and other public research institutions started more than 2,600 new collaborative research projects in 2006. In the same year, more than 200 patent applications were filed and almost 200 new license and option agreements were executed. About two thirds of the academic licenses went to small and medium-sized enterprises. Moreover, about 40 new spin-off companies were created in 2006. When properly handled, collaborations between industry and academia represent win-win opportunities. Industry gains access to top-notch researchers and clinicians, the network and broad knowledge of academia and well-educated young talents. Academia profits from industrial know-how, relevant research topics and additional research funding. Established processes for setting up collaborative research projects are in place at most universities and researchers are supported by experienced personnel at their local technology transfer offices. In order to minimise transaction costs for joint projects, administrative and contractual burdens need to be watched and optimised where possible. In this regard, swiTT plays an important role, e.g., through its educational events or through the elaboration of best practice models. Educational events are often open to people working in industry. To facilitate the screening of licensable academic technology opportunities for companies, swiTT runs "swiTTlist", a unique Web portal presenting new technologies discovered by Swiss universities\*. A technology alert ensures that people in industry who are interested in specific fields are informed immediately about new opportunities on swiTTlist.

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\*swiTT activities play a facilitating role in maintaining the excellent position of Switzerland in industry-academia collaborations. These co-operations between medtech companies and academia are major drivers of innovation. Finally, Swiss universities and university hospitals are attractive partners for industry due to the top-class academic research performed and the professional management of technology transfer.



Dr Herbert Reutimann  
Managing Director Unictetra AG  
President swiTT



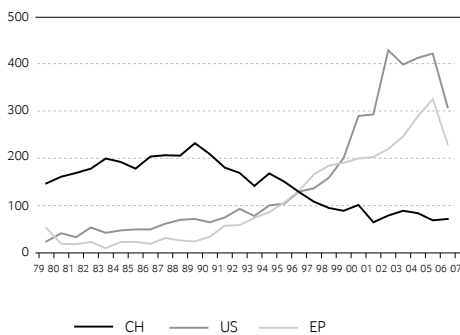
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For further information please visit  
[www.swiTT.ch](http://www.swiTT.ch)  
[www.unictetra.ch](http://www.unictetra.ch)

# Patenting Strategies of Medtech Companies in Switzerland

**Swiss Federal Institute of Intellectual Property.** Patenting an invention is the method of choice for protecting intellectual property rights in the domain of medical technology. Statistical analysis of patent data reveals that Swiss-based medtech companies use various patenting strategies. Between 1979 and 2005 they filed some 14,500 patent applications. From 2002 the activity rose to 1,000 filings per year. Overall, this represents approximately 2% of the worldwide activity in this domain.

**Medtech Patent Applications of Switzerland – Distribution of Priority Filings**



The priority application is the first patent application for a family of patents. Where this is filed does not necessarily reflect the importance of a certain market to the applicant. Instead, this decision will be influenced by any advantages or benefits for the applicant in the different patent office's filing procedures.

The diagram shows that until the mid-1990's, the medical technology industry in Switzerland preferred national priority filings. Thereafter, annual application numbers slowly decreased and US priorities came to dominate the field. The latest amendment to Swiss patent law now allows CH-applications to be filed in English. This may affect patenting strategies in the years to come. Furthermore, in recent years a trend emerged indicating that the European patenting procedure is becoming more attractive to the medtech industry: the number of EP-prioritised applications is increasing rapidly while the corresponding US numbers seem to have reached a plateau.

Besides the emerging attractiveness of EP patents we observed an above-average success rate of medical technology originating from Switzerland. Between 1990 and 2000, 57.5% of all priority applications filed at the European Patent Office (EPO) by Swiss-based companies were granted. In contrast, only 42.7% of medtech applications with a different origin were successful during this period.

It may be concluded that Swiss enterprises in the field of medical technology act as international players focusing on the North American and European markets. In addition, EPO records show that on average, applications by these companies are more likely to be granted. This success may be attributed to the high quality of research and development carried out in Switzerland.



Dr Frank Langlotz  
Patent Expert  
Swiss Federal Institute  
of Intellectual Property



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

# Hospital as a Research Institution



Photo: University Hospital Zurich

**University Hospital Zurich (USZ).** Networks, measures and transparency: clinical directors Prof. Dr Urs Martin Lütolf and Prof. Dr Gustav von Schulthess agree that these concepts are key terms in the USZ approach to quality management. “Made in Switzerland” may spell quality in some eyes, but Prof. von Schulthess is far from satisfied. “In far too many fields, Swiss quality is nothing but a good average,” he claims, and proceeds to explain: “Because all kinds of specialist operations are spread across hospitals around the country, it is hard for the level of excellence to be reached that only comes from completing a certain number of repetitions of the same operation.” Prof. Lütolf, however, sees the other side of the coin: “Our current system means that patient waiting lists are very short and the actual difference in quality between the various hospitals is much less than in many other countries. Perhaps this system is actually the result of our good average?” Despite their different perspectives, both my interview partners welcome the work being done on models where specialists could work in different hospitals in order to increase the frequency with which they conduct specific operations.

According to Prof. von Schulthess, further gains could be obtained by faster publication of quality data. “Before you say we’re not good at something, you have to prove that you are better. If you want true competition between hospitals then data has to be published regularly.” Prof. Lütolf gives an example: “We have collected the side-effects data for all our prostate carcinoma patients. With this evidence we can show that last year our rate of severe complications fell to less than three per cent. Our competitors don’t have that data yet, which immediately makes us the benchmark.” The hospital density and the high competition in the Swiss market will force everyone to support their arguments with data. And the data increase will make Swiss hospitals better industry partners. Prof. von Schulthess who works in Nuclear Medicine and Prof. Lütolf in Radiation Oncology perceive the collaboration with

the medtech industry as a good “give and take”. Prof. von Schulthess: “The trust is there, but a company doesn’t just throw millions at you without expecting some real return. You see we aren’t Harvard or Stanford; we haven’t got a Louis Vuitton bonus. We are a respectable university, but if we don’t deliver, then we’ll be out of fashion all too soon.”

**The Location to Compare Efficiency.** Prof. von Schulthess: “We are extremely reliant on technology. I could be the best in my field, but without the necessary technology, I’d be a nobody. Luckily, we are the perfect size for a partner looking to introduce new devices. If you want to study hundreds of cases of a specific rare tumour, so you can publish, you’d be better off in Beijing with 11 million residents. But if you are interested in the cutting edge, we are an excellent location.”

Prof. Lütolf supports this with an example: “Right now, we are working on a system called Rapid Arc. It irradiates the tumour much more precisely and faster – needing only a single rotation. This cuts treatment time to under 2 minutes making it very interesting for countries with limited budgets that need to speed patient throughput. This is not a priority for us in Switzerland, but industry is very interested in working with us to compare the efficiency of Rapid Arc with that of established approaches. We’ll soon be able to tell whether it is clinically as good as the standard methods. If so, it will be very interesting for Eastern Europe, Asia and India. This shows that introducing novel technology doesn’t need vast populations. And it is an area where we can really hold our own.”

Prof. von Schulthess, admitting his tendency to exaggerate declares, “In 20 years there will be ‘Have’ and ‘Have not’ universities. The ‘Have nots’ will be the teaching universities and the ‘Haves’ will be the ones with enough money to also conduct research. Firms who want to outsource their research or use the results of university research are vital sources of additional income.” Both my conversation partners now refer to Prof. Dr med Gregor Zünd, Head of the Clinical Trial Center of USZ. The Clinical Trial Center is a research station, with trained staff focused on volunteer and patient-oriented research. 11 specialists including doctors, statisticians and patent lawyers are involved in and monitor the studies. “Investigator-Initiated Studies – the transfer of research to the clinic is one of our strengths at the USZ,” says Prof. Zünd. “Our researchers are directly interested in positioning their ideas in the clinic and so we are much quicker when it comes to realising the ideas. We see this as part of our academic responsibility. We owe that to the public.”

**Rapid Innovations.** There are further factors that increase the tempo: the density of the network of partners in Switzerland allows one to find project partners close by. And follow-up is much easier, because the Swiss are much less mobile. People move around less, so it is easier to find patients to complete a ten-year follow-up. Prof. Zünd says, “This allows us to offer to industry rapid innovations that have already passed clinical trials saving them time and effort.” He is convinced: Top medicine can only be practiced in an environment of innovation and research – around a university. Zurich is thus predestined to be a top medicine location because of the close proximity of the USZ and ETH. “This type of bundled knowledge is rarely found anywhere in Europe. Projects from the ETH flow straight into clinical trials just like at MIT and Harvard.” But here the distances are shorter and there is less bureaucracy because we are a more manageable size. The researchers are involved in generating ideas and are particularly motivated because they know that the commercial success of a product can open up career opportunities in terms of spin-offs or working with a firm while remaining under the USZ umbrella.

“We have a strong trump in the ‘War for Talents’, because when it comes to clinical studies, we are much faster than Harvard or Houston, which are just two examples that I know well,” says Prof. Zünd with justified pride. He sees the university as an innovation motor that depends on the market expertise of the medtech industry. They are better at judging the market potential of an idea and so we encourage intensive and honest dialog. The telephone rings, interrupting our interview. Prof. Zünd returns to me animated: “That was the Head of Paediatric Surgery, Prof. Martin Meuli. He and his team have an idea that I think is excellent. So we are going ahead with some animal experiments. We should be ready to approach an industry partner with the product in about two years. Tomorrow, some of us are getting together to discuss the surgery and work out who could free up the necessary capacity. You see, this place is not only packed with ideas and innovative people, we are developing them constantly.”



Prof. Dr Urs Martin Lütolf  
Chair Division of Radiation Oncology  
University Hospital Zurich



Prof. Dr Gustav von Schulthess  
Chair Division of Nuclear Medicine  
University Hospital Zurich



Prof. Dr Gregor Zünd  
Chair Center of Clinical Research  
University Hospital Zurich

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



# Tradition in Financing Medtech



# Medtech Peer Group in Switzerland: High Calibre and High Growth

**SWX Swiss Exchange.** Switzerland has the highest per capita concentration of medtech companies in the world. This extension to medtech came naturally through Switzerland's long-standing traditions in watchmaking, precision engineering and microelectronics. With these roots, the medical technology industry has developed into an internationally recognised sector tracked by an active public and private investor base. Medtech companies listed on the SWX Swiss Exchange now form the largest peer group of its kind in Europe in terms of market capitalisation.

Among European countries, Switzerland has been able to position itself especially well as a hub for medtech companies by creating an advantageous business environment and an atmosphere in which private and public investors are very open to funding such companies. Underlying this remarkable development is Switzerland's long tradition of financing life sciences companies and the accumulation of expertise in valuing life sciences stocks. The result is a fertile ground for growth and prosperity for firms active in this field. Private as well as publicly listed companies benefit from the strong marketplace and the concentration of liquidity that the Swiss financial centre offers. When it comes to raising capital in the public markets, investment banks and consortia represent enormous financing and placing power.

## High Level of Recognition Among Analysts, Investors and Media Circles

Resounding names like Sonova (Phonak), Nobel Biocare, Straumann, Abbott, Baxter and Zimmer are listed on SWX. Despite the significance and size of the medtech market, the peer group is far from being overcrowded. This ensures high visibility for all participating companies. A further boost to the interaction with investors is the compact size of Switzerland with a high concentration of investors in only a few locations. Furthermore, there is close linkage and geographical proximity to other financial centres. Analyst coverage of life sciences companies in Switzerland is broadly provided by approximately 110 analysts at banks and brokerage houses who are highly specialised and usually have scientific/industry background. Meanwhile, investors active in the Swiss market are experienced and well funded. They too often have a life sciences background and focus. This coupled with their wide experience in evaluating complex business models lends eagerness to their medtech investments. The result is a vibrant yet comparatively stable market environment where companies can usually expect to be fairly valued.



## Attractive Environment for International Medtech Companies

Being internationally oriented, the SWX Swiss Exchange attracts many foreign companies. Of all listed companies 25% are of foreign origin. This figure rises to 40% in the life sciences field. It is therefore no surprise to find that the investment community is multicultural and multilingual as well.

Foreign companies considering an IPO on SWX should be aware of the advantages of a strong link with Switzerland for increasing visibility and investor's confidence be it through Swiss-based collaboration partners, private equity or venture capital investors, members of management, operations in Switzerland or a Swiss heritage (e.g., as a spin-off from a Swiss company). Ultimately, a substantial number of companies opt to relocate their headquarters to Switzerland pre-IPO and become a Swiss company. A prominent example is Nobel Biocare (SWX: NOBE). Nobel was originally only listed in Sweden. It established a holding company near Zurich in 2002 before listing its shares on SWX in addition to the Swedish listing. Today, Nobel is included in the SMI®, and as more than 90% of the trading in its shares had shifted to SWX, Nobel decided to delist from the OMX Nordic Exchange in May 2008.



Dr med Yvonne Gunsch-Wegmann, MBA  
Vice-President  
SWX Swiss Exchange AG

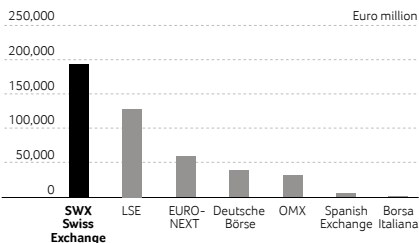


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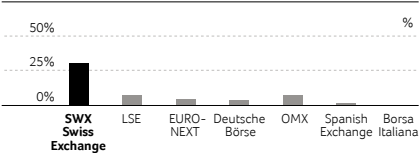
# Overview of the Swiss Financial Centre

## SWX is THE Life Sciences Stock Exchange in Europe

Market capitalisation of health care companies:  
Approximation based on DJ STOXX TMI Companies applying ICB classification

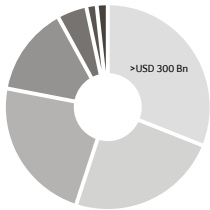


Share of health care versus total market capitalisation



42% of market cap. of European health care companies are listed on SWX  
SWX: ~40% foreign health care companies

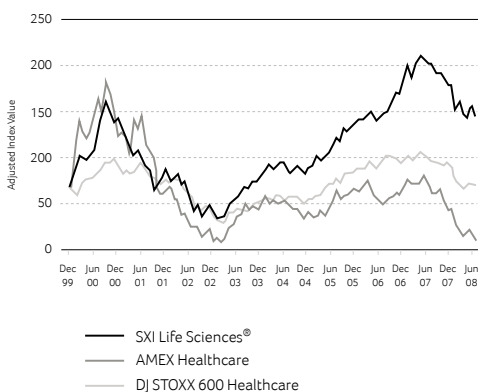
## SPI® (Swiss Performance Index) Industry Breakdown as of June 2008



Health Care	31%
Financials	24%
Consumer Goods	23%
Industrial	14%
Basic Materials	5%
Other	2%
Technology	1%

Source: SWX Swiss Exchange

## Performance of SXI Life Sciences®



Performance comparison of international life sciences indices (TR, CHF adjusted), chart based on monthly figures

**SWX Swiss Exchange.** The tremendous interest in the Swiss bio- and medtech sector is best illustrated by examining the performance of the Swiss sector indices SXI LIFE SCIENCES® and SXI Bio+Medtech®. They have outperformed their US and European counterparts in most instances (see graph). As of 1 May 2008, companies domiciled outside Switzerland whose equity securities have a primary listing on the SWX Swiss Exchange may also be included in another highly relevant index family: the SPI® Family (Swiss Performance Index). By being a component of the SPI®, companies gain visibility and heightened recognition. Moreover, the liquidity of their shares will be enhanced because the index serves as a benchmark for many pension funds and small- and mid-cap investment funds.

## A Self-Regulatory Framework

Unlike other countries, the practical administration of securities trading is largely entrusted to SWX. While SWX is legally obligated to align its rules and regulations with international standards, it still has considerable leeway in specific matters. Today, SWX offers a regulatory environment that is in close touch with the market and takes into account the needs of both domestic and international issuers and investors. For instance, Swiss GAAP FER, US GAAP, IFRS and other internationally recognised accounting standards are still accepted at SWX. In addition, companies only have to report on a semi-annual basis. Furthermore, as a self-regulated exchange with the authority to administer the entire listing process on its own, SWX offers a very straightforward listing procedure. Once a listing application is submitted, the decision of the Admission Board can be expected within a mere four weeks.

## SWX and the Swiss Financial Centre

- **Tremendous placing power:** The Swiss financial marketplace is very international. The total volume of all client deposits stands at roughly CHF 5,333 billion, of which more than 75% is invested in shares and equity funds. As only around 10 companies are entering the market in good years, every IPO benefits from this high concentration of liquidity and an excellent visibility among investors, analysts and the media.
- **Leading position in cross-border private banking:** Switzerland, with its market share of 32%, is the global leader in cross-border private banking.
- **Leading stock exchange for life sciences in Europe:** 42% of Europe's life sciences market capitalisation is attributable to the SWX. On SWX, approximately one third of the total market capitalisation (~ CHF 225 billion) is stemming from the life sciences sector.
- **Largest capitalisation in medtech in Europe:** The SWX has the largest peer group in medtech in Europe in terms of market capitalisation (CHF 22 billion market capitalisation of primary listed companies and CHF 192 billion of primary and secondary listings added).
- **Excellent track record in life sciences:** The SWX Swiss Exchange has a proven track record in IPO transactions and after-market and peer group performance for life sciences companies.
- **Industry indices:** The SXI Life Sciences® index and the more specific SXI Bio+Medtech® sub-index have a positive impact on companies' visibility and liquidity, as they are used as benchmarks by investors. Furthermore, several derivative products use them as their underlying index.
- **Broad analyst coverage:** Approximately 110 sector-focused analysts at brokerage firms and banks cover the life sciences stocks listed on SWX. For some companies, coverage starts well below a free float of CHF 100 million and it can usually be expected above CHF 100 million.
- **International investor base with industry expertise:** Thanks to the dominance of the life sciences sector in Switzerland, investors active in the Swiss market are extremely knowledgeable about the industry and have wide experience in assessing complex business models and in valuing companies. Accordingly, they have created a comparatively stable yet vibrant market environment and a growing demand for life sciences stocks.

For further information please visit

[www.swx.com](http://www.swx.com)

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

# The Swiss Medtech Industry – a Truly Global Player

The Medtech industry is one of the most diversified and globalised industries in Switzerland. More than 700 companies are active in diverse fields; dental technology, biomaterials, diabetes and hearing aids, surgical instruments and orthopaedics are the most famous areas but large, medium and small Swiss companies are engaged in many other lesser known niches. The market segments differ significantly in terms of maturity, regulatory environments, reimbursement policies, intensity of R&D and most of all, in terms of distribution structures. Common to all of them, however, is the assurance of global growth driven by a rising world population, medical technology advances and the spread of affluent diseases such as obesity, diabetes and high blood pressure. Swiss medtech firms are well positioned to benefit disproportionately from these opportunities.

## Globalisation

The growth trend in the emerging economies of Asia and Latin America has accelerated especially in recent years. The developing middle classes with their rising disposable income are increasingly able to afford modern medical therapies and devices. The Swiss medtech players are reacting by developing their international distribution networks and setting up their own companies or by taking over existing local distributors. This type of market proximity allows them to respond to the growing needs for local advice and training. Companies who get this right gain a significant competitive advantage as the safety and effectiveness of modern medical devices still depend on appropriate training of sales and medical staff.

In addition to distribution, many medtech producers are developing their own production, research and development activities in these emerging markets. So, for example, Nobel Biocare now has research and production facilities in Pakistan, China, South Korea, South Africa and Brazil. Sonova, one of the world's leading hearing aid manufacturers, has been successfully producing in China for many years. We are also aware of many mid-sized Swiss companies that are intensively occupied with the evaluation or development of production facilities in these regions.



Heinrich Christen  
Partner  
Ernst & Young, Zurich  
Industry Leader Medical Devices

## Innovation

To participate in the growth of the world market also requires a strategy of permanent innovation. The global Swiss medtech players are amongst the most innovative in the sector. Individual companies are often the undisputed leaders in their fields. But innovation is not limited to the large firms or universities. It also happens in start-ups that often team up with hospitals for clinical trials. In Switzerland, there are six top hospitals in a 300 km radius. In the last ten years, the Swiss medtech start-up scene has made massive advances. Each year we see a series of new highly interesting companies springing up. The following list is a far from comprehensive look at some of the most interesting players, that you will surely hear more of in future.

- **Medartis** is a company that has developed comprehensive expertise in the fields of metallurgy, osteosynthesis and oral implantology in recent years. This knowledge is crucial to successful osteosynthesis in the area of the facial skull, forearm and handbones.
- **PearlTec** is still a young start-up that came out of the ETH scene. It has an interesting technology that increases the efficiency of CTI and MRI investigations.
- **Primequal** is a multi-award-winning start-up with an innovative technology that allows the exact dosing of liquid medication in a range of applications.
- **Solianis** has developed non-invasive technology for measuring blood-sugar levels and Straub Medical has successfully launched new technology to mechanically remove blood clots in a low-cost procedure from peripheral arteries (arms, hips and legs).

These are just a few examples of the Swiss medtech sector's impressive products of innovation "Made in Switzerland". It is certainly a field worth exploring. You won't be disappointed with your discoveries.



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

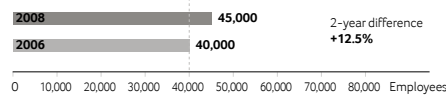
# Milestones

- 1983 Introduction of the first implantable and programmable neurological stimulation device for the treatment of chronic pain
- 1983 Roche launches Reflolux, also known as “Accu-Chek”, the first device that allows patients to monitor their own blood glucose levels themselves
- 1984 First development of engine-driven prosthesis allowing patients to move their fingers
- 1984 The first patients are treated with a proton therapy at the Paul Scherrer Institut (PSI)
- 1986 First successful insertion of a stent, a small, lattice-shaped metal tube, in a human coronary artery
- 1991 Richard Ernst (ETH Zurich) receives the Nobel Prize for Chemistry for his contributions to the development of the methodology of high-resolution nuclear magnetic resonance (NMR) spectroscopy
- 1993 First freely accessible nuclear magnetic resonance tomograph supplying cross-sectional images without exposing the patient to radiation (x-rays)
- 1996 First market approval of a tissue-engineered product (cartilage) in the United States
- 1997 Launching of CTI Medtech, a federal initiative to promote the collaboration between public institutes and private companies
- 1997 In Bern, the association “Medizinal-Cluster Bern (MCB)” is set up
- 1999 Launching of the platform “Zurich MedNet” which includes 400 companies, research institutes and hospitals
- 1999 The Swiss Network on Health Technology Assessment, SNHTA, is established
- 1999 In London, a team of surgeons performs the first minimally invasive, robotic-assisted beating-heart coronary bypass graft
- 2000 The Federation of Swiss medical devices’ trade and industry associations (FASMED) is founded
- 2001 Market launch of first pill cameras (capsule endoscopy) to diagnose diseases of the small intestine
- 2002 Swissmedic, the Swiss supervisory authority for therapeutic products, is founded
- 2002 Kurt Wüthrich (ETH Zurich) receives the Nobel Prize for Chemistry for his development of nuclear magnetic resonance spectroscopy for determining the three-dimensional structure of biological macromolecules in solution
- 2002 First approval for drug-coated stents which greatly decrease the rates of restenosis
- 2003 Market launch of first digital cardiac pacemakers
- 2003 After many years of testing, the FDA approves the first bone cement containing antibiotics
- 2003 Opening of the Life Science Incubator biotop in Schlieren near Zurich
- 2004 First FDA approval for an artificial disc (Charité) for treatments of patients with degenerative disc diseases
- 2004 The Swiss Stock Exchange introduces the first two sector-specific indices: the SXI Life Sciences® and a focused SXI Bio+Medtech®
- 2004 First approval for Merci Retriever, a medical device for the removal of brain thrombosis
- 2004 Launching of the national Medtech Internet portal: [swiss-medtech.org](http://swiss-medtech.org)
- 2004 A pilot project with electronic health cards involving 2,500 insureds 40 pharmacies, 33 doctors and 7 hospitals starts in Lugano
- 2005 Introduction of the e-invoice. Hospitals can receive medtech bills over the platform PayNet
- 2006 Launch of specific Swiss academic medtech education programmes:
  - master programme at ETH Zurich and University Bern (biomedical engineering)
  - master programme at Bern University of Applied Sciences Engineering and Information Technology (postgraduate programme)
- 2008 The Medical Cluster is about to become a nationwide partner for the Swiss medtech industry
- 2008 Introduction of the National Implant Register (SIRIS – Schweizerisches Implantatregister)

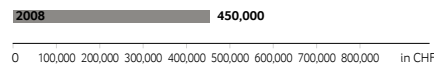


# Facts & Figures

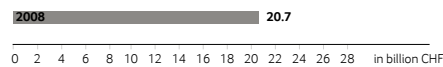
## Number Employees in Swiss Medical Technology



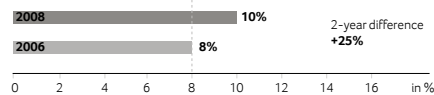
## Gross Revenue per Swiss Medtech Employee



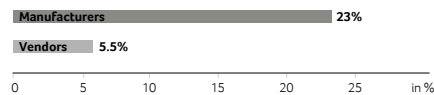
## Gross Revenue of the Swiss Medtech Sector



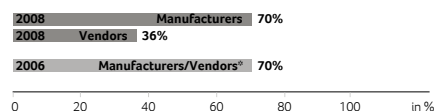
## Swiss Medtech Yearly Growth Forecast for the Next 2 Years



## Annual Growth in Swiss Medtech Employees the Past 2 Years

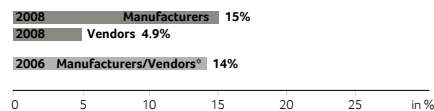


## Export Share of Earnings of Swiss Medtech Manufacturers and Vendors



\* Manufacturers and vendors data were not separated in 2006

## Swiss Medtech R&D Investment as Share of Revenue



\* Manufacturers and vendors data were not separated in 2006

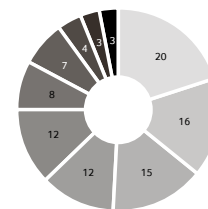
Source: Swiss Medical Technology Industry – The 2008 Survey, Bern

## Large International Medtech Firms Producing in Switzerland

Company	Sub-market	Employees in CH
B. Braun	Orthopaedics, Hospital aids	750
DePuy, J&J	Orthopaedics	2,000
Haag-Streit	Ophthalmology	280
Mathys	Orthopaedics	230
Medtronic	Active and passive implants, vascular diseases and diabetes	1,000
Roche	In-vitro diagnostics	1,750
Smith & Nephew	Orthopaedics	350
Sonova/Phonak	Hearing aids	920
Straumann	Dental implants	740
Stryker	Orthopaedics	600
Synthes	Orthopaedics	2,660
Ypsomed	Injection systems	1,000
Zimmer	Orthopaedics	1,000

Source: Medical Cluster

## Market Segments of the Swiss Medtech Industry



Market Segment	Percentage
Electromedical instruments	20%
Aids for disabled	16%
Dental products	15%
Hospital hardware	12%
Implants	12%
Disposables	8%
Surgical instruments	7%
Diagnostic devices	4%
Diagnostic and therapeutic radiation devices	3%
Ophthalmology	3%

Source: Medical Cluster

## Number of Medtech Employees in Europe


Country	Employees	% of European Total
Germany	110,000	25.0
United Kingdom	60,000	13.6
Switzerland	45,000	10.2
France	40,000	9.1
Italy	29,800	6.8
Ireland	26,000	5.9
Spain	25,400	5.8
Romania	15,000	3.4
Sweden	15,000	3.4
Denmark	14,000	3.2
Czech Republic	12,760	2.9
Netherlands	9,500	2.2
Poland	8,700	2.0
Austria	6,000	1.4
Belgium <sup>a</sup>	5,500	1.3
Hungary	4,250	1.0
Finland	3,000	0.7
Portugal	3,200	0.7
Greece	2,500	0.6
Slovakia	2,200	0.5
Slovenia <sup>a</sup>	1,240	0.3
Norway	500	0.1
<b>Total Europe</b>	<b>439,550</b>	<b>100.0</b>

<sup>a</sup> Covering only those employed by Eucomed member companies of the relevant national association

Source: Eucomed / Medical Cluster

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