



Canton Zurich
Department for Economic Affairs
Office for Economy and Labour

Cluster Study **Life Sciences Zurich** **2021/2022**

A study conducted by the Division of Business and Economic Development
Office for Economy and Labour of the Canton of Zurich



Life Sciences in the Canton of Zurich

We create opportunities for networking and dialogue among companies in the life sciences sector, as well as with research centres and other stakeholders within the sector's ecosystem. This is how we help pave the way to greater value creation, knowledge and innovation.

Our goals:

- Preserve existing jobs and create new ones
- Promote partnerships between representatives from business, science and politics, and with public administration
- Make visible and facilitate access to skills and expertise
- Provide and promote the best possible business and regulatory environment for companies to operate in



We carry out our activities in partnership with the Life Science Zurich Business Network.

Business and Economic Development
Canton of Zurich
Danielle Spichiger
+41 (0)43 259 49 86
danielle.spichiger@vd.zh.ch

**Business and Economic Development
Canton of Zurich**

zh.ch/business-location
www.lifescience-businessnetwork.ch

Executive Summary

Zurich established itself as a key location for the medtech industry as far back as the 1950s – and medtech is still today the centrepiece of Zurich's life sciences sector. The original industry cluster has, however, long since evolved into a multi-layered ecosystem within which a host of life sciences companies and institutions operating in research, development, production and distribution are interlinked in a stable cluster network.

Zurich's life sciences generated an economic output of 5.3 billion Swiss francs in 2019, reaching a share of 8.5 per cent of the total Swiss life sciences value added. One in seven life sciences jobs in Switzerland is located in the Canton of Zurich, which corresponds to roughly 18,900 jobs (FTE). This figure is exclusive of jobs at company head offices based in the Canton of Zurich: estimated to be in the four-digit range, these jobs cannot be unequivocally identified as pertaining to the life sciences sector from the relevant statistics.

The Zurich life sciences sector has increased its economic output by more than five per cent per year in the past ten years, displaying significantly higher dynamic growth rates than the rest of the economy. Life sciences, along with the ICT sector, are Zurich's fastest-growing industries and have steadily increased their share in its economy.

Although the sector's share of the cantonal GDP is still well below the five per cent mark, its contribution to economic growth is nonetheless substantial: since the last financial crisis, approximately one tenth of the canton's economic growth can be attributed to the dynamic nature of the life sciences industries. The fact that more than one in five Swiss high-growth life sciences companies are based in Zurich is further evidence of the extraordinary momentum within Zurich's life sciences cluster.

The cluster's strong economic momentum has also generated a substantial number of new jobs, with as many as 5,100 jobs created in the Zurich cluster in the past ten years.

As such, life sciences are something of a flagship of structural change for Zurich's industrial sector which has otherwise been marked by an overall decline of jobs.

Life Sciences Cluster Zurich in numbers

	Number of companies/ institutional units	Level in 2019		Growth 2009–2019	
		Jobs (FTE)	Value added (CHF million)	Jobs (FTE)	Value added (constant prices, in %)
Pharma	34	681	415	303	12.2
Biotech	42	793	423	262	5.6
Medtech	416	11,257	2,370	2,607	4.9
Med. R&D and labs	256	2,983	796	1,470	7.4
Wholesale	239	3,162	1,342	431	3.4
Life sciences*	989	18,876	5,345	5,075	5.3

Figure 1
Life Sciences Cluster Zurich
in numbers

Source: FSO, BAK Economics

* Does not include activities at company head offices

Cantonal ranking: Zurich accounts for the second most jobs in the Swiss life sciences sector

Life sciences in Switzerland are widely and closely associated with the pharmaceutical industry: measured in economic output, it is, indeed, the most important life sciences sub-sector. Accordingly, Northwestern Switzerland – which encompasses the cantons of Basel-Stadt, Basel-Landschaft and Aargau and is home to the largest pharmaceutical sites in the country – is considered Switzerland's number one life sciences location. Basel-Stadt thus accounts for the highest number of jobs in the sector.

In an inter-cantonal comparison of total number of jobs in life sciences, the Canton of Zurich ranks in second place behind Basel-Stadt. What is more, Zurich accounts for by far the most jobs in the field of biotech as well as in medical research & development and labs. As for life sciences wholesale, Zurich is the canton with the second most jobs after Zug.

The most important cantons for life sciences

	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Zurich's ranking
Pharma	 Basel Stadt 40%	 Aargau 15%	 Basel Land-schaft 8%	 Vaud 7%	 Ticino 5%	 Rank 13 (1%)
Medtech	 Zurich 26%	 Vaud 9%	 Bern 8%	 Solo-thurn 7%	 Basel Land-schaft 6%	 Rank 1 (26%)
Biotech	 Zurich 19%	 Basel Land-schaft 16%	 Basel Stadt 13%	 Neucha-tel 11%	 Vaud 9%	 Rank 1 (19%)
Med. R&D and labs	 Zurich 15%	 Vaud 12%	 Basel Stadt 11%	 Geneva 11%	 Basel Land-schaft 9%	 Rank 1 (15%)
Life sciences wholesale	 Zug 25%	 Zurich 15%	 Vaud 8%	 Bern 7%	 Basel Stadt 7%	 Rank 2 (15%)
Life sciences Total	 Basel Stadt 18%	 Zurich 14%	 Vaud 9%	 Aargau 8%	 Zug 7%	 Rank 2 (14%)

Figure 2
Cantonal ranking
Share of full-time equivalents (FTE)
2018
Source: BAK Economics

The medtech industry – heart and origin of the cluster

With more than 11,200 jobs (FTE) and a value added of some CHF 2.3 billion, the medtech industry constitutes the largest sub-sector of the Zurich life sciences cluster. Medtech value added (in constant prices) increased by an average of 4.9 per cent per year between 2009 and 2019 and was thus the main driver of growth in the regional life sciences cluster.

Currently, the medtech industry is suffering losses due to the coronavirus pandemic. Numerous surgical procedures have been postponed to ensure capacity to treat Covid-19 patients. As a result, fewer medtech products are being used (e.g. artificial joints and prostheses), causing value added and employment to decline. In addition, the introduction of a new medical device regulation (EU MDR), originally planned by the European Union for 2020 and subsequently postponed to 2021, is already casting a shadow on the Swiss medtech industry in the form of imminent restrictions on access to the EU internal market.

High potential: Zurich's biotech industry is on the rise

The pharmaceutical and biotech industries have been far less affected by the pandemic, not least because numerous companies are involved in research and development of Covid-19 therapeutics and diagnostics. Examples include Molecular Partners, Memo Therapeutics, InSphero, Biognosys and Neurimmune.

With a cluster share of currently well under ten per cent, the biotech industry is still comparatively small in terms of current jobs or value added. However, growth potential in biotech is high by virtue of its innovative capacity. One in three biotech companies in Zurich boasts a job growth rate of ten per cent per year. This pace of growth is significantly higher than the national average for the biotech industry.

Efficient technology transfer

Considered the flagship of the Zurich biotech industry, Bio-Technopark Schlieren-Zurich is a nationally and internationally acknowledged research location for companies and institutions in the life sciences sector. Today, Bio-Technopark Schlieren-Zurich houses fifty companies, including Roche Glycart AG, as well as several research and university institutions.

The Bio-Technopark research hub reflects a particular strength of the Zurich life sciences cluster: its success is closely linked to the quality of Zurich's universities and the efficient transfer of knowledge and technology. ETH Zurich (ETHZ) and the University of Zurich (UZH) are strongly committed to technology transfer and the promotion of spin-offs. As a rule, the first phase up to the "proof-of-concept" takes place in the academic environment, thus before young enterprises gain a foothold in the Bio-Technopark where they can then continue to develop and grow.

Zurich universities – excelling in research

Zurich offers a host of locational advantages, with university research as arguably one of its most decisive success factors. With ETHZ and UZH, the region is home to two first-class universities. International studies on research quality rank them as the top universities in Switzerland, both in the research domain of life sciences (ETHZ) and in biomedical and health sciences (UZH). An international comparison of life sciences locations also shows Zurich to be in the top tier in terms of university quality. The excellence of these two universities and the resulting research intensity and quality are important drivers of Zurich's innovative strength. Many spin-offs and start-ups are created in the vicinity of ETHZ and UZH, most notably in the domains of biotech and medical research & development and medical laboratories where the number of jobs has doubled to approximately 3,000 in the last decade. Their share in Zurich's life sciences value added amounted to approximately 15 per cent in 2019.

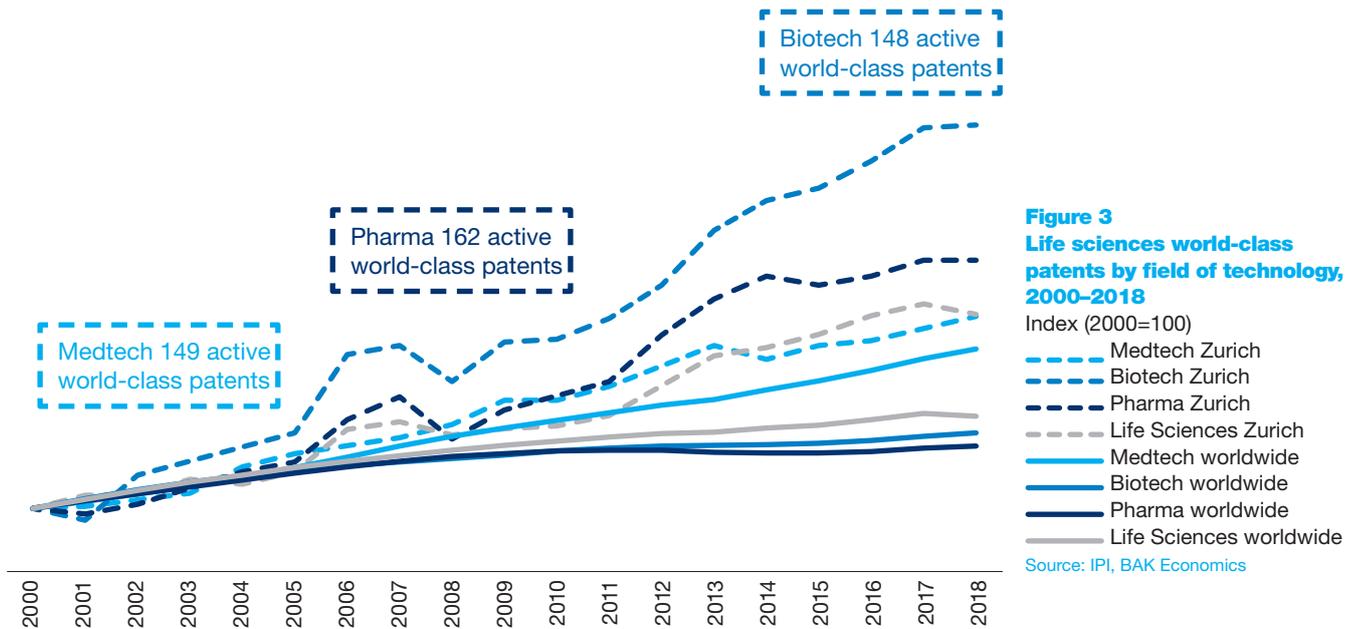
Technology transfer also plays an important role in medical research. One example of this is the Balgrist Campus where research and clinical practice are brought together and research groups from different disciplines collaborate under one roof with the aim of improving the health and quality of life of patients with musculoskeletal diseases. Companies from the medtech industry are also explicitly involved in the development of new products.

Zurich – an exceptionally dynamic location for life sciences research

The high innovation capacity of Zurich's life sciences cluster and the research success that this brings are also reflected in the technology analysis conducted for this study. Methodologically, an approach developed jointly with the Swiss Federal Institute of Intellectual Property (IPI) was applied, which selects from the overall universe of patents those that experts believe have the potential for future technology leadership and which are therefore associated with the expectation of substantial economic effects. In addition, patents considered "world class" can be filtered out within these future technologies. This refers to patents which, based on a specific evaluation system, belong to the top decile with the best patent quality in the respective technology.

Cutting-edge research in life sciences plays an important role in Zurich's technology portfolio. Approximately thirty per cent of all active patents in Zurich within future technologies come from life sciences. Within life sciences, the technology fields are divided into "medtech", "biotech" and "pharma". The number of active world-class patents in all three technologies has increased far more in Zurich than the worldwide average, which highlights Zurich's position as an exceptionally dynamic location for life sciences research. The increase in active patents has been particularly notable in the fields of biotech and pharma.

Life sciences world-class patents by field of technology



Zurich's focus within top life sciences research is on biotech and medtech. A look at the global competition in the technology domain shows Zurich to be particularly well positioned in the future and emerging technologies of red biotech, neuroprosthetics, cancer therapies, medical bionics, artificial joints, antibody therapies, radiation therapies and immunotherapies. In these technologies, the share of global world-class patents is between 1.5 per cent (red biotech) and 3.3 per cent (immunotherapies).

Positioning of the most dynamic technologies

A look at the world's most dynamic technologies shows the current position of Zurich's life sciences in the global competition in technology: taking into account the five fields of technology with the highest absolute increase in patents worldwide since 2000, Zurich is well positioned overall. The top technologies antibody therapies, cancer therapies and immunotherapies are all among Zurich's research priorities and show significantly higher growth than the global average. The share of the global portfolio of world-class patents in these fields of technology is above average (in some cases significantly so). Growth in the field of biosensors/lab-on-a-chip/bioprinting is also above average, albeit still at a comparatively low absolute level.

A strong increase can also be observed in Zurich's digital medtech industry. However, the global momentum in this area is, in turn, significantly higher. Zurich's below-average performance in digital medtech should therefore be seen as an opportunity, or as potential, rather than as a weakness. A successful example of digital medtech made in Zurich is dacadoo, a health and insurance tech company that uses mobile devices, social networks, artificial intelligence (AI) and big data to playfully improve the well-being of its users.

Zurich's position in the global competition in technology

Figure 4
Fields of technology with the highest absolute growth in world-class patents globally between 2000 and 2018

-- well below average
- below average
+ above average
++ well above average

Source: BAK Economics

	Share of Zurich life sciences	Share of patents worldwide	Zurich's momentum vs. global momentum
Digital medtech		-	-
Antibodies	++	++	++
Cancer therapies	++	+	++
Immunotherapies	++	++	++
Biosensor/Lab-on-a-chip/Bioprinting		-	+

Certain research fields are still young, which explains why there are comparatively few patents in those areas at this point. However, some of these fields of technology are developing at a fast pace and have correspondingly high percentage growth rates while still showing low absolute numbers. These include, inter alia, the research field of neuroprosthetics. Zurich cannot quite keep up with the global pace of growth in the most dynamic of these emerging fields of technology. However, two things are worthy of positive note: first, neuroprosthetics accounts for a higher share of the global portfolio of world-class patents than the average for all life sciences technologies and, second, Zurich's growth in the field of drug discovery is above the global average. By contrast, Zurich still has considerable catch-up potential to exploit in the areas of digital medtech, medical wearables and 3D printing.

Growth is proof of high innovative strength and competitiveness

Innovation and technological progress are the most important drivers of growth and prosperity. If innovation is understood to mean the commercial implementation of new products or new technologies, the effect of innovation for the national economy translates primarily into heightened productivity. In fact, it can be shown that life sciences value added per hour is higher in Zurich than the average in studied benchmark regions with a similar cluster structure. Productivity growth has also been above average over the past ten years.

A comparison of economic growth between 19 leading life sciences locations ranks Zurich in the top tier, accounting for the fifth highest growth in value added.

Biotech and pharma perform particularly well in Zurich. While growth in the benchmark regions is chiefly due to the momentum in the pharmaceutical industry, biotech is the main driver in Zurich. Thanks to its innovative capacity, biotech is where Zurich has a notable competitive edge compared with other international locations. Zurich's medtech industry has also shown significant growth, but is only mid-range in an international comparison of top medtech locations.

Outlook for life sciences in Zurich: the sector will continue to be an important driver of growth for the cantonal economy

Economic development in general is currently strongly influenced by the Covid-19 crisis. Overall, the life sciences sector is less affected than other industries, such as tourism. However, there are considerable differences within the life sciences industries as to the impact of the pandemic. As mentioned above, the medtech industry has been significantly more affected and suffered a decline in value added in 2020, which, in turn, also had an impact on the entire Zurich life sciences sector, given medtech's high share in the sector.

However, the medium- to long-term outlook is very promising. Hardly any other sector shows as much structural growth potential as life sciences' biotech, pharma and medtech industries. Increasing demographic ageing in developed economies, global population growth, a steadily growing affluent middle class in emerging markets, and progress in medicine and technology are leading to a much faster rise in global demand in the life sciences sector than in other sectors.

Thanks to their high innovative capacity and competitiveness, Zurich's life sciences are in a position to participate in this structural growth. This means growth in value added will continue to be significantly higher in the life sciences sector compared with the rest of the cantonal economy. Life sciences will continue to be an important driver of growth of the Zurich economy in the coming decade, and the significance of Zurich's life sciences cluster for the cantonal economy will continue to grow.

Business and Economic Development, Canton of Zurich

We are the point of contact for resident companies and companies interested in setting up a business in the Canton of Zurich.

Our core competencies and activities include:

- Relocation guidance for companies moving to Zurich
- Supporting resident companies
- Creating and fostering networking opportunities for companies with representatives from science and politics
- Work permits
- Administrative relief for companies

We support companies interested in moving to Zurich, from the evaluation process right up to the successful start of business, thus helping them gain a foothold in the Canton of Zurich. We do so in close collaboration with our internal and external partners.

With a view to strengthening visionary ecosystems (such as finance, life sciences, cleantech, creative industries, information and communications technology), we promote networking of companies operating in these sectors with representatives from science and politics in the Canton of Zurich.

Our Work Permit team issues permits for citizens from non-EU and non-EFTA states. Furthermore, we assist local and foreign companies with guidance through the cantonal administration and strive to facilitate administrative procedures.

In a nutshell: we inform, support, expedite and connect, serving as a link between business and public administration.

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Canton of Zurich
Tel +41 (0)43 259 49 92
standort@vd.zh.ch
zh.ch/location

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www.lifescience-businessnetwork.ch

