How Basel became a world class healthcare cluster and the pharma capital of Europe

Switzerland exports over 100 bn USD of pharmaceuticals per year and its pharmaceuticals, medical devices and related companies combined are worth over 500bn USD in market capitalization. This makes Switzerland a global heavyweight in the sector and Basel can justly claim that it is the pharma capital of Europe. The two largest companies, Novartis and Roche, are both headquartered in Basel and each of them has around 100'000 employees worldwide and each a market capitalisation of around USD 220bn. Among the other hundreds of lifescience companies in Basel, Lonza is one of the world leaders in manufacturing of pharmaceutical ingredients and Straumann in dental implants. Several global companies have their European headquarters in Basel, and the biotech start-up scene has developed considerably in the last decade.

From silk ribbons through chemicals to pharmaceuticals

Already in the 18th century, Basel started developing an industry of dyes to supply the makers of silk ribbons. As it progressed from extraction of natural products to synthetic production methods throughout the 19th century, Basel developed a significant chemical industry. Geigy was one of the chemicals pioneers (it merged with Ciba in 1969 and eventually became part of Novartis in 1996). At the end of the 19th century some of the chemicals companies starting manufacturing pharmaceuticals and converted/merged into companies such as CIBA ("**C**hemische **I**ndustrie **Ba**sel") in 1884 or Kern & Sandoz in 1885. Fritz Hoffmann founded a company focused on pharmaceuticals in 1896, which came to be known as F. Hoffmann-LaRoche or in short "Roche".

What were Basel's success factors?

Basel has a very central location within Europe. It is located in the Northwest of Switzerland, a country that borders with France, Germany, Italy, Austria and Liechtenstein. The river Rhine flows through Basel, where it changes direction and starts its flow from South to North along the border between France and Germany to end in the North Sea in Rotterdam, Netherlands. Basel benefited from the

migration of foreign know-how, in particular from French chemists who came to Switzerland to escape stringent patent laws which prevented them from manufacturing dyes freely.

Other factors were a strong capital market, good local demand, labour supply and politics tolerant to pollution (!).

Pharmaceuticals: Success is followed by the challenge to remain market leader and sustain growth

Already in the early 20th century, companies in Basel recognized the importance of working with the best scientists. Four Nobel prizes were either employed by or collaborated with the industry in the first half of the 20th century: Leopold Ruzicka (hormone synthesis, Ciba and Geigy), Albert Hofmann (synthesis of psychopharmaceuticals like LSD, Sandoz), Paul Müller (synthesis of DDT insecticide, Geigy), Tadeus Reichstein (synthesis of vitamin C, cortisone isolation, Roche). The work of scientist Leo Sternbach and his colleagues was pivotal to the growth of Roche with benzodiazepines (e.g. Valium) in the 1960's.

By the 1960's, Basel's pharma companies had become successful, global companies. But the horizon of success in pharma is defined by the rate of replacement of products whose "profitable lifecycle" is dictated by the patent expiry date. In the 1960's, these companies were facing a pipeline gap, with its big products facing patent expiry and generic competition.

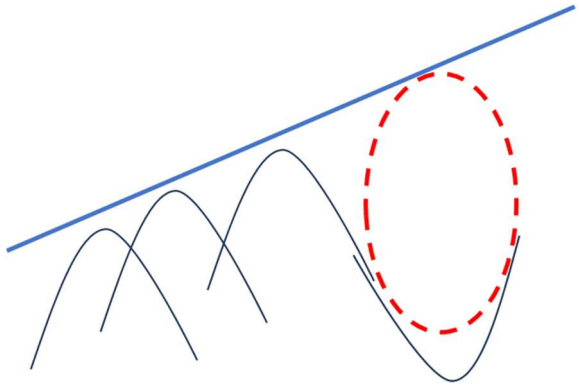

Figure 1: Pharma does M&A when it has a pipeline gap: 1) Product lifecycle defined by patent protection, 2) Growth needs sustained innovation (i.e. patent-protected products), 3) Innovation is dependent of internal R&D productivity and sufficient external partnerships, 4) Pharma R&D is expensive and risky, 5) When the pipeline is insufficient, there is a growth gap, 6) Gap can be filled with external acquisitions, pharma or non-pharma

Pipeline gap and ways to address them

There were two, almost contradictory "strategies" to address the gap: 1) diversify outside pharma, driven by the argument that "the age of big inventions in pharma is over", 2) invest more in fundamental research and establish closer links with universities, driven by the hope that research productivity would increase.

Diversification and re-focus

In order to diversify from pharmaceuticals, companies went on a buying spree in areas such as nutrition, agrochemicals, flavors and fragrances, etc. in the 1960's and 1970's. This cycle of diversification started to unwind again in the 1990's with divestments and spin-outs of non-core businesses, e.g. of agrochemicals into Syngenta or chemicals into Clariant and Ciba.

The two major events in the 1990's in Basel were the merger of Ciba and Sandoz to form Novartis and the acquisition of Genentech by Roche.

A shorter cycle of diversification followed by re-focus happened in the 2010's with Novartis acquiring Alcon in 2011 only to spin it out in 2019. In the case of Roche, you could argue that diversification and re-focus happened within pharma with investments in cardiology and metabolism in the 2000's, discontinuation a few years later, and investment again in recent years (e.g. the acquisition of Carmot in 2023).

Investment in fundamental research

The second approach of investing in closer links with academic research and establishing independent research institutes proved arguably more fruitful. Roche set up the Basel Institute of Immunology in 1969 which yielded Nobel prize winners Georges Köhler and Nils Jerne in 1984 and Susumu Tonegawa in 1987. Their research in monoclonal antibodies probably "opened up the minds" to biotechnology and motivated Roche to invest in Genentech in 1990, a decade or more earlier than most of its peers.

In 1970 Ciba and Geigy founded the Friedrich Miescher Institute and shortly thereafter, both companies merged to form Ciba-Geigy. The University of Basel, sponsored by the Basel pharmas, set up the Biozentrum with the vision of fostering an interdisciplinary research centre. The co-founder of the Biozentrum, Werner Arber, won the Nobel Prize of Medicine in 1978.

Whilst Roche discontinued the Institute of Immunology in 2000, it returned to investing more in fundamental research with its own Institute for Human Biology in 2023. Even the world-famous Federal Institute of Technology Zürich (ETHZ) decided to establish an interdisciplinary centre for collaboration between natural sciences and medicine in Basel, which was inaugurated in 2024.

Lessons learned: Focus and resilience better than diversification

What were the lessons learned from these cycles of diversification and re-focus? Non-core businesses do not contribute to the valuation of a pharmaceutical company in the stock market. They distract management away from the core business. Management's lack of expertise leads to overpaying for acquisitions and is a competitive disadvantage.

Building critical mass in pharma showed to be a more successful strategy: because development costs and the risk of failure are high, having a diversified portfolio and sufficient financial resources to "cushion the blows" is key. Resilience pays. Sticking to an area of strength even through a drought period of innovation ends up paying off, because when experts stay around breakthroughs are more likely to happen again.

What makes a successful healthcare cluster?

So, Basel has two large companies which grew over more than 100 years, but can it also claim that it is has a vibrant, innovative cluster? A critical review of the success factors highlighted in figure 2 suggests that.

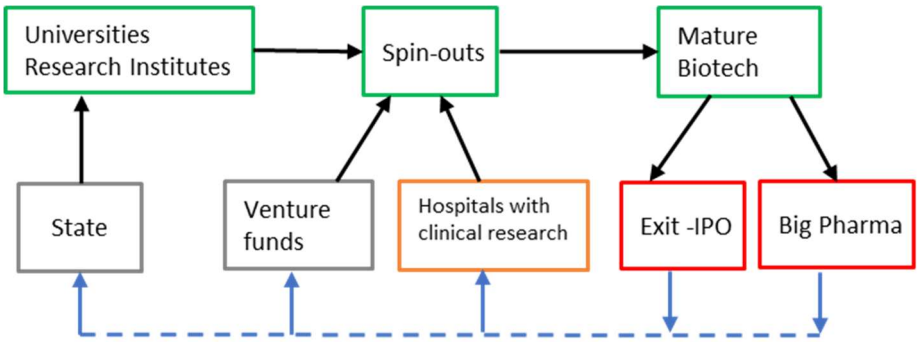

Figure 2: The virtuous cycle of a successful healthcare cluster

Basel has high quality universities and research institutes and hospitals with clinical research. Start-up companies are founded by academics or pharma executives who take assets deprioritized by big pharma and develop them further. Basel attracts talent from all over the world, which often moves between the big pharmas and/or ventures out into promising start-ups. The state provides non-dilutive seed money, the canton supports with physical infrastructure and venture funds finance the companies to progress further. The possibilities for an "exit" by investors are enabled by a well-functioning stock market and big pharmas close by in need of filling a pipeline. Investors then have new funds to re-invest in novel ventures and so the cycle starts again.

At the national level, Switzerland's stable/predictable political, legal and fiscal environment provides a supportive environment. The Basel cluster is well established, future growth will depend on keeping an entrepreneurial spirit and openness to innovation. The mission of Basel Biotech Consulting is to enable biotechs to turn an idea into a medicine.

Follow-up and feedback welcomed. A more detailed slide deck is available upon request.

Please contact luis@baselbiotechconsulting.com or

visit our website at www.baselbiotechconsulting.com

Further reading

1. König, Kreis et al, Chemie und Pharma in Basel, Christoph Merian Verlag, 2016
2. Breiding, Schwarz, Wirtschaftswunder Schweiz, Verlag Neue Zürcher Zeitung, 2011
3. The importance of the Pharmaceutical Industry for Switzerland, BAK Economics AG, 2024