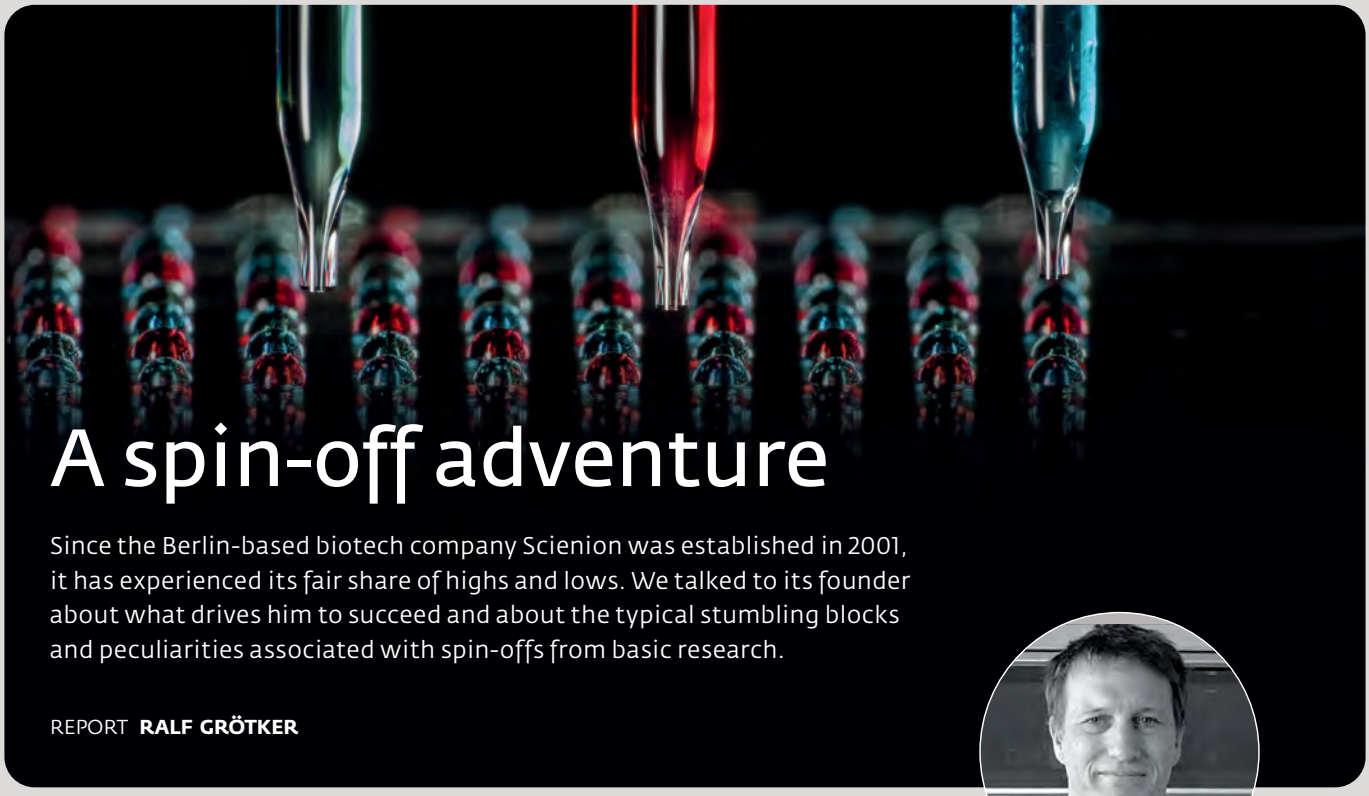

A spin-off adventure

Since the Berlin-based biotech company Scienion was established in 2001, it has experienced its fair share of highs and lows. We talked to its founder about what drives him to succeed and about the typical stumbling blocks and peculiarities associated with spin-offs from basic research.

REPORT **RALF GRÖTKER**

The company

Scienion deposits DNA, peptides, antibodies, enzymes, and proteins to substrates in such a way that the biological activity of the molecules is preserved. In principle, the devices are ink-jet printers for biological molecules and living individual cells.
For example, corporate customers use them to manufacture pregnancy tests, allergy tests, tools for cancer diagnostics, or biosensors for glucose measurement.

scienion
ENABLING LIFE SCIENCE

The founder

Holger Eickhoff actually spends his entire time at the company from Monday morning to Friday evening. Weekends are family time.
"When our children were still young, we lived in Berlin, in the district of Zehlendorf, close to the Max Planck Institute for Molecular Genetics, where I was doing my postdoc research. After that we moved to Syke, near Bremen, where we had more family around. With parents and parents-in-law on hand, my wife was able to return to work, and I've been commuting by train since then." The children have since left home.

"I LIKE IT WHEN SUCCESS IS CLEARLY DEFINED."

Whenever he can, Eickhoff goes swimming three times a week, racking up at least three kilometers each time. He was a competitive swimmer until his mid-20s: "My best time for the 200-meter butterfly used to be two minutes two seconds. Now it takes me 2:30." He never regretted not staying in academia. "I like it when success is clearly defined. In a company, this means generating growth and earning money. But when you publish something as a scientist, the response is always: 'Interesting! But ….'" Does he want to take early retirement in his late 50s? "No chance," he says. Scienion is still not nearly well-enough known – and that's something he wants to change. "For our customers, the devices we sell them are a huge source of income. We'd like a bigger share of that part of the success story."

Note: at that time, the world record was 1:56, but now it is 1:51.

Photos: Scienion AG

The idea

In the mid-1990s, Holger Eickhoff was a postdoc in Hans Lehrach's group at the Max Planck Institute for Molecular Genetics. Lehrach had started building up DNA libraries back in the 1980s, and the technique of dispensing biomolecules onto a membrane via a dot-matrix printer was his invention. "We improved on this idea and commercialized it," says Eickhoff. "When we worked with Hans, we had already begun printing not only on membranes but also on glass, because it's a better substrate for fluorescent detection." Of course, they weren't the only ones. Indeed, they were up against competitors with the same plan. One such competitor was Oxford Gene Technology. "They later took aggressive action in the marketplace because of potential patent infringements and even paid us a visit – but they had nothing on us." And how did he come up with the idea of founding a company in the first place? "We were inspired to act by a business plan competition in Berlin. A colleague came to me and suggested that we should take part.

"WE NEEDED SIX MILLION TO LAUNCH."

I thought: this is quite different from an application for research funding. We entered the competition with a plan for a biochip company, which we called Biomatrix. When we lost, it only increased my desire to succeed." During his doctorate, Eickhoff had already founded a trading company that imported optical tables, microscopes, and cameras from the U.S. "So I already knew how to set up a company." While in Berlin, he heard about Max Planck Innovation: "We were doing basic research but using an industrial approach, enabling high throughput. Uli Mahr and Jörn Erselius from Max Planck Innovation were very helpful when it came to overhauling our original plan." Finally, they were ready to go: Biomatrix was dead; long live Scienion! "We submitted a concept to the Berlin Brandenburg Innovation Award scheme – and we won. We needed EUR 6 million to launch – that would allow us to pay the salaries of 30 employees for the first three years as well as the rent on the premises, and to buy equipment such as centrifuges and automated pipetting systems. By March 9, 2001, we'd obtained all the signatures from our investors and shareholders." And so the rollercoaster ride began.

Plan A

Just half a year after the company was founded, the world was shaken by the news of 9/11. After that, nothing was quite the same. A sense of disillusionment set in. "One of our main investors pulled out of all investments in the life sciences sector," says Eickhoff. "And suddenly, there was no money." It wasn't easy to instigate changes in the company strategy with a partner who was still there but wasn't available for joint decision-making. Ultimately, the shares were bought up by the remaining shareholders, and new ones came on board in 2006. The Max Planck Society also participated in subsequent rounds of financing – sending an important signal to the other investors. Of course, there were also other factors at play: "We believed market studies that said the biochip market was experiencing astronomical growth! We set our sights on a market share of 2%." That may sound modest, but arithmetically, you get gigantic numbers. The biochips from Scienion were technically outstanding and were being offered at an attractive price. However, they were not a diagnostic tool but rather a product that, in those days, was primarily being bought by researchers – and there were other and above all bigger suppliers on the market, who had greater marketing capacities and could also offer more customer service. "We invested vast resources in order to generate biological content of our own – DNA, proteins, antibodies. And then we discovered that our customers already had biological content themselves. Sometimes they asked us: what about the technology you have for producing biochips? Our answer was: that's not for sale – it's our proprietary competitive advantage! As we hit rock bottom, I halved the size of the company. I had to let a quarter of the employees go, and another quarter subsequently quit because the whole situation had become too uncertain for them."

"WE BELIEVED MARKET STUDIES THAT SAID THE BIOCHIP MARKET WAS EXPERIENCING ASTRONOMICAL GROWTH!"

Plan B

The balance sheet for 2005 told a sobering story: it wasn't possible to achieve any revenue growth by selling biochips. It was time for plan B. "We designed, built, certified, and marketed the first device on a very tight budget," says Eickhoff. Not long afterward, Scienion found itself at the center of a review by the U.S. Food and Drug Administration (FDA). "A customer who we'd supplied with a device was audited by the FDA, and we and our technology were caught up in the middle of it. It was very exciting, and the necessary documentation almost stretched us to our limits." News of the procedure's positive outcome attracted new investors. "Whereas before, we had two people producing print heads for our own requirements, there are now 30 people working on this task." In 2010, Scienion sold a proper production system for the first time, allowing biochips to be produced on a conveyor belt. This gives the company a key advantage for many applications. "Take antibiotics in milk, for example," says Eickhoff: "In a cheese factory, antibiotics kill the cheese cultures, so you already have to check the milk trucks for antibiotics – for every single delivery. In turn, that means you need thousands of assays in the broad application. That's where our technology gets stuck in!" Could anyone have predicted that sales of biochips wouldn't be successful in the early 2000s? "Certainly not us," Eickhoff admits. "We were very well versed in the technology and very enthusiastic about it. We suffered from tunnel vision and developed products that failed to reflect the needs of the market. We were excited by chips with 3,000 proteins on them, but no one wanted them – or at least they didn't want to pay for them." At some point, they began listening to their existing and potential customers. "That was a key step forward, as was the moment when we stopped defining ourselves solely by our technology. Instead, we started to look at the demand that existed on the market and where we could be of use."

"WE WERE VERY WELL VERSED IN THE TECHNOLOGY AND VERY ENTHUSIASTIC ABOUT IT. WE SUFFERED FROM TUNNEL VISION AND DEVELOPED PRODUCTS THAT FAILED TO REFLECT THE NEEDS OF THE MARKET."

Tailwind

Since 2005, a lot of the changes in the market for diagnostic tools have benefitted Scienion as a supplier. "We first discussed the HPV test for detecting papillomaviruses in 2004/2005." The test can be used to determine whether a patient is infected with viruses from that family. "But you actually want to know the exact type of virus, as not all of them are carcinogenic," Eickhoff explains. "And companies that have offered tests for typing viruses have worked with our technology." The entire field has grown steadily since then – with the occasional new virus strain being added, as well as vaccines that are only active against a few types of virus. "When it comes to diagnosis, physicians therefore want to know exactly which viral populations are present in a patient. We then developed a panel that allows you to search for sexually transmitted diseases in swabs taken for the HPV test."

Takeover attempt

Over the last few years, Scienion has been subject to a series of takeover bids by other companies. "From the outside, we may look like a bargain," says Eickhoff, "because investors from the early years are still on board, and an outside observer suspects they may want to sell up at a low price." The first offer came from a company based in Canada that wanted to finance the purchase price with a capital increase on the stock exchange. The company was listed on the Toronto Stock Exchange and wanted to move to Wall Street. "This meant we had to audit our business figures extensively, first according to German law and then according to Canadian and finally American law," says Eickhoff. "Several auditing firms made a small fortune in the process. But in the end, the Canadian company was unable to finance the acquisition, and we carried on alone."

Photo: Scienion AG

New markets

Scienion has since begun to address other segments of the market: "Veterinary diagnostics are hugely important for us nowadays. It's an attractive market because it always involves large numbers of units and payment is always immediate. For example, one of our customers produces thousands of diagnostic tests every day for dogs, allowing dog owners to check whether ticks can be detected in the animals' bloodstreams," says Eickhoff. If necessary, they can then buy a spray to control the ticks. "This application in companion diagnostics is something none of us had in mind. It's completely different from the clinical sector, where research into new active substances or the individual adaptation of medications is carried out on a relatively small number of patients." In retrospect, the company's initial approach was not entirely incorrect. "We were just too far ahead of the curve," says Eickhoff. "Back then we were developing surfaces that were 100% repellent for all sorts of things, and we now use these surfaces in a process known as single-molecule handling. But no one saw a market for them in those days." In fact, Scienion is now also selling biochips as a successful side business – in other words, resurrecting its original business model. "Especially when larger customers want to see how our technology works, they buy our chips before deciding on a device," says Eickhoff.

Advertising/ customer acquisition

Every year, Scienion appears at about 30 trade fairs, conferences, or events, as well as in publications. "Not in publications where we're named as authors, but rather where we are featured in the 'Materials and methods' section," explains Eickhoff. "When we do business with a new customer, we usually begin by investing two or three days' work that we don't charge for. This has benefits for both parties: the customer gets to see how we work, and we see what the customer already has and what they need, allowing us to make a good assessment of own efforts and revenues that await us. In the case of biochips, this can range from a few thousand euros to EUR 100,000 or 200,000. The devices start at EUR 50,000 or EUR 150,000-200,000 for larger models, with production devices costing between EUR 500,000 and several million euros."

Looking to the future

"For many years, we were driven by concerns about how we would survive the next quarter," says Eickhoff. Thankfully, that's no longer the case, he says. "Now that we have more wind in our sails, we can plan strategically." Scienion founded a U.S. subsidiary in 2011, followed by a French subsidiary called Cellenion in 2016/17. "Unlike the otherwise 'dead' molecules that we've dispensed over the course of the company's history here, we dispense live material. Single or multiple cells, such as three-dimensional cell groups, can therefore be dispensed alive and in a fully functional state for use in analysis. With this technique, we've really hit a home run in terms of demand!," Eickhoff explains. Analysis at the individual cell level – in the field of oncology, for example – is currently a major area of interest. "Our technology can be used to analyze tumors to determine which cells that they contain are responsible for what. This is another area in which we're further expanding our range of biochips. That's where our future lies." Other sectors include the personalized dosing of drugs for patients on special edible paper, as well as artificial noses – silicon components that are able to detect tuberculosis in the patient's breath. And the company is also interested in exploring new sales regions. "Right now, we're looking at China," says Holger Eickhoff.

"NOW THAT WE HAVE MORE WIND IN OUR SAILS, WE CAN PLAN STRATEGICALLY."