

How did you first find your way into the pharmaceutical industry?

I consider myself primarily a physician, but my objective has always been to try and touch the lives of patients. I'd practiced for many, many years as a rheumatologist and after my PhD I became a Professor of Medicine in Amsterdam at the Academic Medical Centre of the University of Amsterdam, and during this period I realised that if you want to make a medicine you need another entity to make this possible. During that time I also worked with many biotech firms and pharmaceutical companies as a consultant. Ultimately, I decided to join GlaxoSmithKline (GSK) with the idea that if I could make a medicine there, it could potentially affect the lives of billions of patients, rather than maybe hundreds or thousands that you can do as an academic professor.

What made you want to build your specialty in the fields of rheumatology and immunology?

When I graduated as a medical doctor, I wanted to become a specialist in internal medicine; in the Netherlands that's six years' training after your MD. I didn't consider rheumatology at all at that time. I had a permanent position as an Associate Professor of Internal Medicine at Leiden University Medical Centre, and then I started to collaborate in terms of research with the Department of Rheumatology at Leiden University, and this was the time when there was an emerging scientific revolution that ultimately led to much better treatments. Ultimately I got so much involved in collaborative research that I decided to also specialise in rheumatology after my internal medicine and ultimately I switched from the Department of Internal Medicine to the Department of Rheumatology. The 90s were really an era of very significant change in the area of rheumatology, probably similar to what you now see in the space of immune-oncology. Every time has its own little revolutions!

You were instrumental in setting up and leading GSK's Immunology Network; what was the drive behind the project and what did it mean to you?

While I was working at GSK, I saw the huge opportunity that immunology could provide as a scientific platform as a key to understanding many other disease areas, but also as a means of creating much more synergy and collaboration between different parts of the organisation that were working more or less in isolation in silos. I've come to the conclusion that while there are fantastic scientists in the pharmaceutical industry, the remit and the mindset and the scope are different; you need to bring in academics who work in a very different way, including the opportunity for blue sky thinking to go after pathways and molecules where it is not immediately clear how it could lead to a medicine or how it could be developed in clinical development. Of course, there are many ways to collaborate, including academics serving as a consultant or



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Dr Paul-Peter Tak, ex-Senior Vice President, Development Lead and Chief Immunology Officer at GSK, Venture Partner at Flagship Pioneering

collaborative projects, but our Immunology Network tried to create a radical new way of working with the external environment which was basically internalising the external academic environment.

The Immunology Network consisted of pillars, and the first pillar consisted of an external immunology board of world-class professors in immunology, all with slightly different perspectives. One would focus on immuno-oncology, another on autoimmunity, another on the emerging field of immuno-metabolics, another on neuro-immunology. We basically had a think tank where we had collective intelligence through which we could generate new ideas. The second was a very important pillar called Immunology Catalyst. It was physically based in Stevenage within the GSK facility; it was a very rigorous process to find the best external academic immunologists, and then we brought them into GSK for two or three years and basically gave them a state-of-the-art lab, supportive personnel and, most importantly, freedom. They could work on their own projects and continue to be part of the academic institution, and we reimbursed the university rather than paying the academics themselves. So they did not become GSK employees, they were free to do what they wanted to do, and if they discovered something, they would own the intellectual property, which is a rather radical idea. My idea was that by having these people inside, they would start to challenge GSK in terms of peer review and scientific debate, and they would not be part of the hierarchy; everybody would be free and able to speak up. But also, if these people work in an environment where everyone is thinking about drug discovery and drug development, they will start to come up with ideas that are relevant to making new medicines – and that's exactly what happened. It's really about a radical new way of working across the organisation in pharma R&D.

How do you look back at your time in pharma?

My whole time in pharma has been at GSK; I stayed there seven years. It has been an amazing experience. We built a whole early pipeline of medicines for autoimmunity as well as immuno-oncology. It has been an incredibly exciting adventure for me, and I have learned a lot about how these pharmaceutical companies work and what is needed to bring an academic idea into a medicine and ultimately bring it to the market where it is relevant for patients, physicians, prescribers, as well as regulators and payers.

What made you want to make the leap to Flagship Pioneering?

Regarding some of the ideas that were generated in the Immunology Catalyst, it would probably be very early areas of science and probably very high-risk. I thought it would make a lot of sense to create an organisational model that is fundamentally different for early discovery. The first example of this was the creation of a biotech company called Sytrix Therapeutics, which was started at the beginning of 2018. The company was founded by one of the professors that went into the Immunology Catalyst, Luke O'Neil, a professor from Trinity College Dublin and a world star in the field of immuno-metabolics. We decided to create this company where we had the best academics, where we brought in the rigour of decision-making of venture capital. I had a presence at the table along with the co-founders. The control and process that you need in late-stage development and getting a drug to market, they actually inhibit creativity and they interfere with the mindset that you need to be really successful in early discovery. So then I had this idea that ideally we would create an ecosystem of strategically aligned biotech companies that were initiated by GSK together with this academic network, but

supported by venture capital where you can work in a much more entrepreneurial way to get to the next stage, and then if these companies aren't successful they could be bought by pharmaceutical companies like GSK or they could work. I think GSK is now moving in a slightly different direction, but after being there for a period of seven years, I looked around and found Flagship Pioneering and basically this is exactly what they are doing: they create strategically aligned biotech companies and they support them in a very consistent way. They bring in the best people and let them do the job that they are really good at.

It's fascinating as we are focusing on what we call unreasonable research – things that are completely new in a highly investigative, creative and entrepreneurial environment. We can really work in a nimble and agile way; it's a really science-focused environment, it's fascinating. Of course, it's different to my role at GSK, where you press a button and the whole machinery starts to work. But here everybody will need to do stuff to get things done; it's a much smaller team. I don't really see that as a challenge, it's just a different mindset.

What continues to drive you in your day-to-day working life?

Three things: first, a very strong focus on the patient. It would be fantastic to look in the mirror at the end of my career and say: 'I have made my contribution with the things that I can do to really improve the lives of patients'.

Second, I'm fascinated by science. This is about scientific curiosity. I'm amazed by the explosion of knowledge that you can see at this moment with the new technology that you can use to address scientific questions.

And third, I have really enjoyed working with the team and building the team. I'm really enjoying leadership and I'm interested in people and culture and maintaining the culture to be successful. These are the things that drive me and make me happy to come to work each day.