



JON VAN ROOD A BRILLIANT PIONEER WITH AN INSATIABLE CURIOSITY

If you could single out one recurrent element in Jon van Rood's career as an immunologist, it would be his instinct for cooperation. He was instrumental in setting up the blood bank in Leiden and later founded Eurotransplant, two initiatives that would have been inconceivable without teamwork. His research into the human immune system, culminating in his pioneering work on tissue antigens, was one of the factors behind the sharp increase in transplant survival rates. He continued to work tirelessly right up to his recent death at the age of 91. He was a pioneer whose curiosity remained insatiable throughout his life

■ **JON VAN ROOD'S PROSPECTS** of a brilliant academic career could easily have been nipped in the bud. During the German occupation of the Netherlands in the Second World War, he was forced to go into hiding but decided one evening to leave his safe house to go and see his girlfriend on her birthday. When he got back, he found that a V2 rocket had fallen close to the safe house. The window in his room had been shattered and a piece of broken glass the size of a sword was sticking through the back of his chair. It's a good example of how fortune seemed to smile on him throughout his life.

Blood bank beginnings Fortune also played a big part in his working life. In 1950, a twist of fate saw him land a job as a clinical clerk in New York's Presbyterian Hospital, where he worked under Robert Loeb, the famous professor of medicine. This proved to be a fertile feeding ground for his natural sense of curiosity. "It was there that I really became interested in research." Upon his return to Leiden University, he did stints as a houseman under Jaap Mulder, a professor of internal medicine whom he described as "the best teacher on the course", and who also gave his youngest assistant a part-time job at the blood bank. Within a year, he was running the department.

The sky was the limit Under his leadership, the blood bank in Leiden built up an international reputation for itself. "I was incredibly fortunate in having such outstanding professors in my vicinity. Not just Jaap Mulder, but also people like Andries Querido, Willem Goslings and Johan Goslings. The whole place was abuzz with new ideas. It was a time when the sky really was the limit. We genuinely felt that we were rebuilding the country. We had loads of support from the Americans, who were fantastic, and we were

never short of money. If you put in a request for a lab technician, you'd be asked whether you wouldn't like to have two instead."

"You'll spring a leak if you give blood" It was hard work, though, and staff would sometimes spend the entire weekend at work. "There was a tremendous shortage of blood donors. So I would go to all the local factories in Leiden and try and recruit donors during the breaks. That was also when we first started collecting blood in plastic bags and not just in bottles – as was the standard procedure in 1952. There were teething problems with the bags: a newspaper claimed that they tended to tear. I can remember, on one particular occasion, when I had just told my bright and cheery story about becoming a blood donor to a group of factory workers, the foreman stepped up and said, 'Lads, don't do it. You'll spring a leak if you give blood!'"

The discovery of HLA It was at the blood bank that Jon van Rood got to know Aad van Leeuwen, the lab technician he worked with for over 50 years. Together, they produced a vast number of important publications. The first, in 1958, instantly broke fresh ground. It was a three-man effort, the third person being a colleague called George Eernisse. The article was prompted by the unusually vehement reaction of a mother of seven to her first blood transfusion. This caused Van Rood to wonder whether a pregnant woman might produce antibodies against the cells that the child in her womb had acquired from the father. It signalled the start of a research project that culminated in the award of a doctorate with distinction and which also played a key role in the discovery of HLA. The large quantity of blood sera available at the blood bank proved of tremendous help to his research.

A guinea pig in his own experiments HLA stands for human leukocyte antigen. Although first discovered on white blood cells (known as leukocytes, hence the name), HLA is a gene complex that has been found to occur on all cells in the human body apart from red blood cells. It is thanks to HLA that white blood cells can detect not just the waste products of viruses and bacteria, but also foreign cells and tissue. A series of workshops on HLAs, in which leading experts exchanged ideas and performed on-the-spot experiments, resulted in rapid growth in the pool of knowledge on these tissue types. The success of these workshops was due in no small part to Jon van Rood's unceasing dedication and energy. For example, he used the workshops to present the results of a study into skin transplants, a study in which he had used a number of people – including himself! – as test subjects. This medical experiment showed that both blood transfusions and skin transplants are more likely to be successful if the donor and the recipient have the same tissue type.

Amazing biology This discovery also explained why rejection was such a big problem in the transplantation of organs. Nonetheless, the main object of the large number of HLA groups is not to complicate organ transplants. The fact is that the HLA groups play an important role in defending the body against bacteria and viruses: a person's HLA type determines how efficiently his or her immune system can respond to an infection with a particular virus. "The biology of the HLA system is quite simply amazing. The number of possible permutations is larger than the entire human population. In other words, there will always be survivors if an epidemic breaks out. It's a survival mechanism for the human species. It raises the question of why certain extremely rare HLA groups do not

die out." Jon van Rood ponders for a moment, before adding, with a smile on his face: "Perhaps it's a case of opposites attracting. As they say in French, *la femme choisit l'homme qui la choisira*. My own wife's a good example: she's got a nose for it and soon realised that I was from the right HLA group."

International cooperation Valuable though HLAs are, they present transplant specialists with immense challenges. Aware that a big network of organ donors and recipients would increase the chances of finding good matches, Jon van Rood decided it would be a good idea to set up a European network of transplant hospitals. He presented his plan at a workshop in Turin. "Although the people attending the workshop reluctantly admitted that it was a good idea, the mood was quite different when I got back to Leiden. The vast majority of my colleagues dismissed the idea out of hand, saying that I was mad to suggest it. The only enthusiastic response came from a nephrologist called Ab Struyvenberg. And there were a couple of transplant hospitals in Belgium that were prepared to go along with it. That's how we started. I can still remember the helicopter landing on the sports fields with the first donor kidney sent to us by Guy Alexandre in Leuven. Once it became clear that the system worked, though, everyone was soon convinced."

How Eurotransplant got its name And so it was that Eurotransplant was born. The new baby quickly put on weight. In 1970, just one year after Jon van Rood's appointment as a professor of internal medicine, the network already consisted of 68 transplant centers in Belgium, West Germany, Luxembourg, Austria, Switzerland and the Netherlands. Hungary, Croatia and Slovenia joined later on. Finding the name was a matter of sheer serendipity. "I was in my car. The

whole plan was ready, but I didn't have a name yet. I was racking my brains as I sat waiting behind a lorry at a set of traffic lights. The name on the lorry was Eurotransport. It was my eureka moment."

Breaking ground with good people "Eurotransplant has grown thanks to all the people I have been privileged to work with," Jon van Rood is keen to stress. "People like Aad van Leeuwen and George Eernisse, and Hans Bruning, our first biochemist, and many others. We had no support staff when Eurotransplant was launched, which meant that we were left with piles of paperwork to deal with between operations. A lot of this was handled by my secretaries, Marjan Roodzant and Carla McKenzie, but the rest of the staff also did their share. The first director, Henk Schippers, did a brilliant job in building up the organisation and also laid the foundations for our close ties with the insurance companies – whom Henk persuaded that a successful transplant is much cheaper than dialysis. We also had a sort of parliament, consisting of heads of department, active transplant surgeons plus a number of internists and HLA specialists, who would come together for meetings. Among them were Bernard Cohen, who succeeded Henk Schippers, and Guido Persijn, the medical director. We're fortunate to have had lots of good people."

Team-building under sail There was a tremendous team spirit, not least because the pioneers of transplant medicine were a good team of people who got on well with each other. "My passion for sailing played a key role in all this," Jon van Rood explains. "Once we had successfully completed the first transplants with the aid of Eurotransplant's network, we organised a meeting in Leiden. After the meeting, I invited anyone who fancied the idea to come along with me for a trip on my Frisian sailing barge. This first outing turned into something of a tradition that was highly instrumental in fostering a team spirit."

Jon van Rood remained closely involved with Eurotransplant until he retired in 1991, and he made a point of attending all the annual conferences thereafter. He was also one of the founders of Eurodonor in 1970 (now known as Matchis) and Bone Marrow Donors Worldwide in 1988. Right up to his death in July 2017, he used to go in to Matchis' offices every day. He helped countless young academics, not only with their research but also in finding sources of finance. Although he was awarded a range of prestigious prizes, he just missed out on a Nobel Prize.

He died literally on the job. As the scion of a creative family, with two sisters who became artists, he was brimming with new ideas right up to the very end of his life. His creative gene enabled him to forge lateral and associative links with other disciplines and fields. Just about every day saw him making the journey to Leiden University Medical Centre. "My wife would say: 'Go and play with the kids!' She's good at getting plants to bloom and grow. As you can see from the garden, which is full of flowers and plants growing in impossible places. It's a principle she's always applied to the children and now she's applying it to me."

A new era in medical science Right up to his death, Jon van Rood was still working on the immunological aspects of the interaction between mothers and their unborn children. He believed that HLAs, which we now know play a role in autoimmune and infectious diseases and which can even help to destroy tumours, would usher in a new era in medical science. "In 10 or 20 years' time, we'll have a completely different idea about diseases caused by viruses and bacteria. This is my personal belief, and I have sometimes been proved right in the past." 🌱

Professor Emeritus Jon van Rood practised science on a daily basis right up to his death in July 2017. He also contributed to this book to mark the 50th anniversary of 'his' Eurotransplant. This interview was one of his last.



Laboratory technician **Aad van Leeuwen** and **Jon van Rood** worked together for over 50 years