



Spinoza & Stevin Prizes
Laureates 2020



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Nynke Dekker

Professor of Molecular Biophysics

Jan van Hest

Professor of Bio-Organic Chemistry

Pauline Kleingeld

Professor of Ethics and Its History

Sjaak Neefjes

Professor of Chemical Immunology

Ton Schumacher

Professor of Immunotechnology

Linda Steg

Professor of Environmental Psychology

The Hague, 30 September, 2020
Dutch Research Council (NWO)



Foreword

They're probably the most pleasant phone calls that I may make each year, and this year was certainly no exception. I had the privilege of telling six renowned researchers that they would receive the highest scientific award that we know in the Netherlands: the Spinoza and Stevin Prizes. Sometimes, I could literally feel the surprise, amazement and disbelief on the other end of the line. But also, of course, the immense joy once the message had actually sunk in. With the 2.5 million euros that comes with the prize, long-cherished research ambitions suddenly come within reach.

And that is exactly our intention with these awards. On the one hand, it is a considerable recognition of the groundbreaking work all of these researchers have carried out. But on top of that, we want to encourage and enable the laureates to do further research, train new talented researchers by involving them in this research and create societal impact.

Especially in this year, which to a large extent has been dominated by a worldwide pandemic, we can see how important the impact of scientific research is and how large an impact society expects research to have. I'm pleased to see that the Dutch government is turning to science and that genuine experts are playing an important advisory role in the process of developing policy to tackle the virus. Scientific knowledge is vital for an unequivocal and correct provision of information. The importance of the full breadth of science has also become apparent because the approach required to tackle pandemics like these requires far more than just the medical perspective. This pandemic is also exerting an impact on the economy, the environment, international political relations, people's behaviour, in brief, the very fabric of our society.

Research is not something you do alone, but in teams and across national borders. Each of these laureates demonstrates that in how they realise their research and disseminate their results. That is exactly why they deserve these prizes: they are not only outstanding researchers within their own discipline, but they also build bridges to other disciplines and to the world outside of science.

With this publication, we commemorate the prize ceremony for these six new laureates and explore both of these elements. In six diverse articles, the laureates not only give us a glimpse of their work, career and ambitions, but their peers, colleagues, collaborative partners, friends and family members contribute to these scientists' portraits. And in doing that, they reveal that science involves far more than just what happens in the lab or research setting. Together, they emphasise the high quality and considerable value of Dutch science and our impact on society.

Stan Gielen, President Executive Board NWO



'Within the field, we'd been hopping between subjects for some time. I missed the depth hand wanted to create more focus.'

NWO Spinoza laureate 2020

Nynke Dekker

Professor of Molecular Biophysics, Delft University of Technology

A life-long curiosity is driven by substantive questions

Her research takes place at the interface of physics, chemistry and biology. Professor of Molecular Biophysics Nynke Dekker is internationally renowned for her pioneering research into the interactions between individual proteins and DNA and RNA molecules, as well as the advanced techniques she developed to make these interactions visible. Colleagues call her ambitious, thorough, content-driven and insatiably curious.



‘When Nynke asked me in 2014 whether she could do a sabbatical in my lab, we had never met each other before’, says John Diffley, professor at the Francis Crick Institute in London. ‘Of course, I knew who she was – after all, she has made incredibly important contributions to biophysics. She was looking to take a different direction with her research and wanted to know more about the DNA copying systems we’d set up in our biochemistry lab. During such a sabbatical, visitors often hide away in their office to answer emails, and they mainly come to enjoy the nightlife. However, Nynke came to the lab each day to learn how to purify various proteins and how to perform copying reactions with these. She now uses the same type of reactions in her lab to study how DNA replication works at the single-molecule level.’

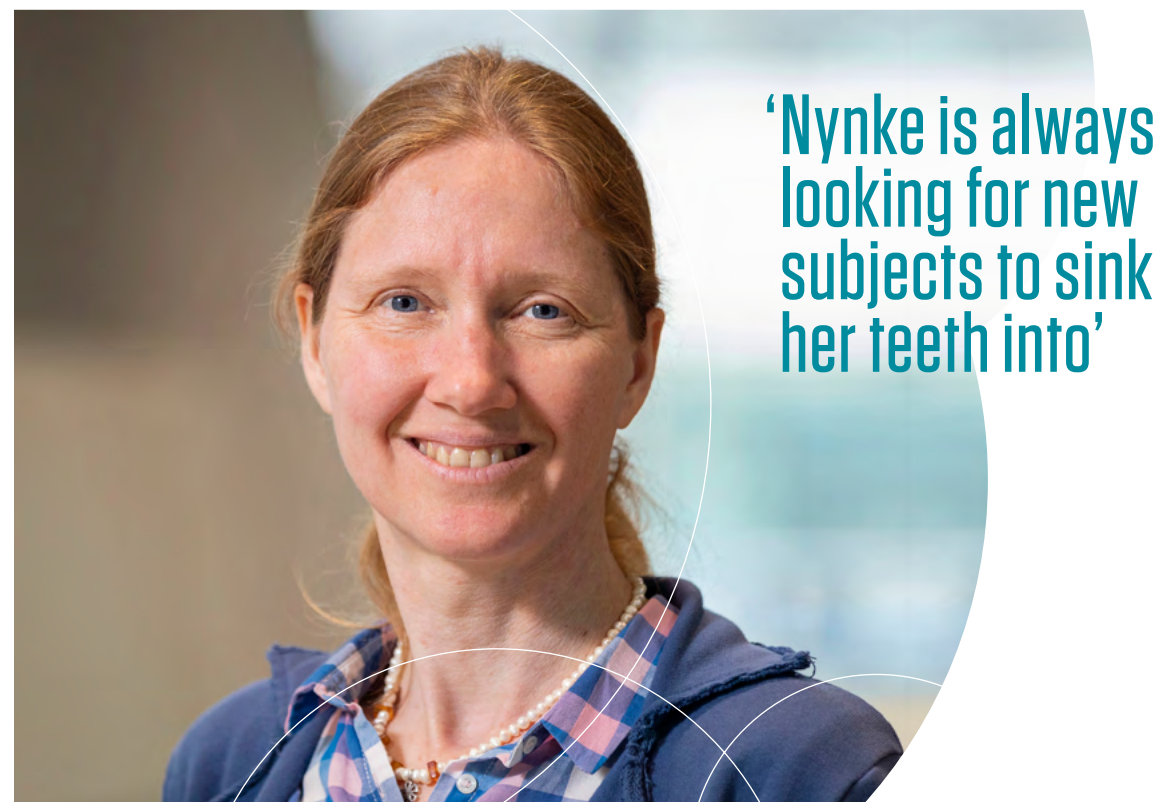
Diffley’s anecdote characterises the brand-new Spinoza laureate. ‘Nynke is driven by substantive questions’, says fellow Spinoza laureate Marileen Dogterom, chair of the Department of Bionanoscience at TU Delft. ‘She’s always looking for new subjects to sink her teeth into. Her sabbatical in the UK is a superb example of that. She used it to deliberately shift her research away from interactions between a single protein with a single DNA or RNA molecule towards experiments with more complex systems that can consist of up to twenty proteins. She reads up on the subject, takes a sabbatical, learns new things, and comes up with a decisive plan.’

Back to more biological research

‘For several years, I’d focused on developing new technologies, and I wanted to go back to biological research again’, says Dekker about that decision. The biophysicist wanted to focus on DNA replication in eukaryotic systems – systems in which the cells contain nuclei. John Diffley’s group provided her with the necessary knowledge for this. ‘I went there together with my analyst to learn how to purify the twenty different proteins needed for the replication’, says Dekker. ‘But to be honest, it was more like I was his assistant, and I mainly learned how much patience you need for all that purification.’

Nynke Dekker studied physics and applied mathematics at Yale University and gained a doctorate from Harvard University on the magnetic manipulation of caesium atoms on a chip. After that, she wanted to broaden her horizons. ‘Although I found atomic physics quite interesting, it was too predictable for me. You could very neatly calculate what should happen. Then you spent

years doing experiments, only to come up with an outcome that wasn’t in the slightest bit surprising. Back then, an awful lot was happening in biology. For example, the human genome project and DNA sequencing techniques were making considerable advances. From a practical point of view, biophysics is in some ways rather similar to atomic physics because you also use lasers, mirrors and magnetic fields. Only the system you’re studying is different.’



‘Nynke is always looking for new subjects to sink her teeth into’

Pulling and rotating DNA molecules

Before she delved into this new discipline, Dekker visited several highly promising groups in this young field. Ultimately, she was attracted to the group of David Bensimon at the École Normale Supérieure in Paris. ‘Nynke contacted us and asked whether a postdoc position was available. She had experience with the magnetic manipulation of objects and, back then, we had just developed magnetic tweezers with which we could pull and rotate DNA

Who is Nynke Dekker?



Born on 2 April
in Amsterdam

Gained her doctorate from Harvard
University for her research on steering
caesium atoms on a chip

Started at TU Delft where she first
was assistant professor and then
associate professor before she
became a full professor in 2008

Received European Young
Investigators Award for research
into how the functioning of
molecular motors on DNA in
the cell is disrupted

Presented a new type
of magnetic tweezer
that can be used to
measure the rotation
of individual molecules
such as DNA and RNA

1971

2000

2002

2007

2011

[Read more on nwo.nl/dekker](https://www.nwo.nl/dekker)

molecules. When she came to us, Nynke knew nothing about biophysics or magnetic tweezers, but she rapidly mastered both. Later she improved those magnetic tweezers in her group, for example by adding possibilities to measure the torque (rotational force). She has done fantastic work using these techniques, such as her work on topoisomerase, a protein controls the torsion in the DNA molecule. In that research, she has not only demonstrated how that enzyme uncoils DNA, but also how a certain type of chemotherapy blocks this protein and therefore kills cancer cells. I think showing how a drug works at the molecular level is her finest contribution.'

Helping the discipline advance

When Dekker is asked what she is most proud of, she refers to the new technologies she has developed. 'Our magnetic tweezers are now being used by others to make new biological observations that are genuinely increasing our knowledge.' And although she acquired international fame with her work on topoisomerases, she is personally perhaps even more satisfied with her studies into polymerases, the proteins that play a crucial role when a virus copies its RNA. 'It took us five years before we got that to work', she sighs. 'And it has always been difficult to acquire funding for that type of research, which is why it's never been a large part of my group. However, I'm really pleased that we persisted with this work because now we can rapidly characterise antiviral inhibitors. Moreover, that could prove very useful in a world that's been turned upside down by COVID-19.'



'I occasionally clear my head by taking physical exercise, as that helps improve my state of mind', says Nynke Dekker. 'And I can easily do that by commuting between Leiden and Delft on my racing bike.'

More focus

After several years focusing on the interactions between a single protein and a single RNA or DNA molecule, she found the work less satisfying. 'Within the field, we'd been hopping between subjects for some time. I missed the depth and wanted to create more focus.' This musing led to her sabbatical at John Diffley's lab, which in turn resulted in the plan that yielded her an ERC Advanced Grant of 2.5 million euros. Since 2018, this has allowed her to investigate the replication of DNA in a context that is as natural as possible. 'When a cell divides, several protein complexes are transferred from the original DNA molecule to the daughter molecules. At the molecular level, we want to figure out which of those so-called nucleosomes ends up on which daughter molecule, because the allocation between old versus new nucleosome complexes on the daughter DNAs has an impact on the signalling function of nucleosomes.'

'Now we can rapidly test antiviral inhibitors. And that could prove very useful in a world that's been turned upside down by COVID-19'

Dekker wants to use the Spinoza Prize to add an extra dimension to this research. 'Now we're mainly examining the interactions between molecules which ensure that the DNA is copied. However, in future research we could make the link to the repair of DNA damage, or examine how different components of the DNA replication machinery influence each other.' Bensimon and Diffley have high expectations of this research: 'We roughly know how DNA replication works in bulk reactions, but at the molecular level we still know little about the regulation and replication of our genetic material. That molecular understanding is a holy grail in our discipline, and Nynke can make important advances in this regard.' ←

Investing in Dutch biophysics

When Nynke Dekker exchanged Paris for Delft back in 2002, biophysics was still in its infancy in the Netherlands. 'However, there were people who wanted to put this subject on the map in the Netherlands', she says. One of them was Cees Dekker, who wanted to redirect his research into mesoscopic semiconductors towards biophysics. He did a tour of internationally renowned groups to learn more about this discipline. In Paris, he came to see how he could set up the best magnetic tweezers. 'That's where we met, and he asked me to come to Delft.' Dekker and Dekker – we're not related, they emphasise – established the discipline of biophysics at TU Delft. 'Initially, our group was made up of just physicists. After a few years, we realised that this group would only be viable if we sought more connection with biologists. So we went and talked with the executive board, and we were allowed to expand our activities with a strong biological section.'

At the interface of physics and biology

Back then, there was the first generation of group leaders throughout the country who were eager to explore the uncharted territory of biophysics.

Marileen Dogterom was one of them. 'In 1997, I was working as a young group leader at the research institute AMOLF, which wanted to invest in research at the interface between physics and biology. That was already happening here and there in the Netherlands, for example at VU Amsterdam. At about the same time, the FOM Foundation got on board by establishing the workgroup Physics of Life Processes and investing in incentive programmes for new groups. Several years later, TU Delft established the Department of Bionanoscience.'

Outstanding reputation

Dutch biophysics has an outstanding reputation abroad, says Dogterom. 'Biophysics has become a compelling, mature and fully-fledged discipline. Foreign job applicants come to the Netherlands because this is a compact country with a high concentration of outstanding biophysics.' David Bensimon from École Normale Supérieure in Paris and John Diffley from the Francis Crick Institute in London endorse that. 'The Netherlands is one of the best countries in the world when it comes to molecular biophysical research. You have several top groups in this field, and Nynke's group is definitely one of them.'




Jan van Hest

Professor of Bio-Organic Chemistry, Eindhoven University of Technology

Constantly striving for innovation

Focusing solely on interesting issues rather than disciplines and constantly developing yourself. That's essentially the formula for success that Jan van Hest, professor of Bio-Organic Chemistry, used to create a completely new field of research on the interface of biology and chemistry.



'I often feel like an explorer or professional athlete competing with the whole world.'

Looking back, it's not surprising that he has integrated biology and chemistry into his work, says Jan van Hest, sitting in his office at Eindhoven University of Technology. 'These were already my favourite subjects in secondary school. I eventually decided to study chemistry, because it seemed easier to move towards biology from there than the other way around.'

The student from Tilburg graduated in polymer chemistry at Eindhoven University of Technology in 1991. 'Around that time, Bert Meijer set up a new organic chemistry group there that focused on dendrimers – highly branched polymers. The idea of being part of such a new group appealed to me.'

Meijer has no trouble recalling those early years. 'Jan was the first PhD student that I was able to appoint myself. His doctorate was a huge success. We developed the first amphiphilic block copolymer – a gigantic molecule consisting of blocks of different polymers that assembles in water. That was complicated precision work. You start with a polymer onto which you keep attaching new pieces of a dendrimer. That means repeating the same reaction on the same polymer 32 times, always analysing precisely what you've created and how that molecule behaved. The article in *Science* in which we described this process was one of the highlights of my early career.'

Moving towards biology

With a doctorate in his pocket, Van Hest left for the United States to become a postdoc in

David Tirrell's group at the University of Massachusetts, where he learned the ropes of protein engineering. This was a new field that used polymer chemistry to modify existing proteins or to design new ones. 'At the time, we could only use a small set of building blocks from nature. Jan's background in organic chemistry meant he could help us decide which molecules could be suitable for expanding this set of useful amino acids', says Tirrell. Although the young Dutch postdoc only worked in his group for a year, he left an indelible impression on his American supervisor. 'Jan is a creative and lively person, who even then knew how to inspire my whole group. He combines biology and chemistry in such a way that the boundaries between the two disciplines become really blurred. He uses chemical structures when he can but switches to biological building blocks just as easily if it serves his purpose better.'



'My environment has a decisive influence on the direction my research takes.'

Personal development

'I had received an award for my PhD thesis from DSM, who immediately asked me to come and work for them. I had set my sights on the postdoc position first, however, because I thought it would be good for my personal development. When I returned to the Netherlands, I accepted their offer, because I wanted to know what it's like working in industry. A great deal of what I learned in those three years about cooperation and organisation is still useful today for managing my research group and institute.'

'Jan combines biology and chemistry in such a way that the boundaries between the two disciplines become really blurred'

Relaxed job interview

Van Hest continued to be drawn to science, however. 'I want to discover new things and educate young people. There's less opportunity to do that in a company.' Just when he was thinking about his future, he received a message from Radboud University in Nijmegen. 'Their professor of Synthetic Organic Chemistry, Binne Zwanenburg, was about to retire. They asked me to apply, even though that wasn't my specialisation at all.' The young chemist went to Nijmegen, without too many expectations. 'That was the most relaxed job interview ever. I mainly saw the interview as a great opportunity to outline my vision of the future of Bio-Organic Chemistry.'

Roeland Nolte, emeritus professor of Organic Chemistry at Radboud University and then director of the Nijmegen Institute for Molecules and Materials, also remembers the application procedure well. 'We had an excellent candidate to succeed Zwanenburg, Floris Rutjes. However, the list of applicants also included Jan van Hest. I already knew him, because I had been his second PhD supervisor. At the time, I wanted to push research in Nijmegen into a different direction by attracting young people with new ideas. The fact that Jan had experience working in industry was a plus. I immediately began making arrangements for the appointment of two professors, instead of one. That worked out very well.'

Who is Jan van Hest?



Born on 27 September in Tilburg

Received an NWO Talent Grant for a postdoc at University of Massachusetts in the field of polypeptide engineering materials sciences

Became a researcher at DSM Research, where he later became group leader

Appointed professor at Radboud University where he established a new group in bio-organic chemistry

Appointed scientific director at the Institute for Complex Molecular Systems at Eindhoven University of Technology

1968

1996

1997

2000

2018

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Seeking collaboration

It wasn't easy to be appointed professor at the age of 31, Van Hest says in hindsight. 'Those were really testing times, but I would have been crazy to miss out on such an opportunity. I swapped a permanent job for a temporary one and was expected to prove myself and develop a field of study within five years. You're bound to run into funding problems if you don't have a track record yet, though, especially if you're trying to launch a new field of study in the process.' Van Hest solved these problems by working together with his Nijmegen colleagues Roeland Nolte, Alan Rowan and Floris Rutjes. 'By collaborating, we were able to build critical mass, which enabled us to achieve excellent results within three years.'

One of the subjects that Van Hest and Rutjes collaborated on was research into microreactors. 'That was a completely new direction for Nijmegen at the time', says PhD student Pieter Nieuwland. 'My fellow PhD student Kaspar Koch and I investigated the possibility of using lab-on-a-chip applications in organic and bio-organic chemistry.' Eventually, this partnership led to the establishment of the company FutureChemistry, where Koch is managing director and Nieuwland director of technology. 'Jan is still involved in our company as a scientific adviser, although what we do now is no longer closely connected to his research. We still make grateful use of his enthusiasm, his knowledge and his extensive network to this day.'

Meanwhile, Van Hest had shifted his research to making artificial cells and cell organelles – structures that can fulfil a certain function in a cell. Among other

‘Jan uses the same kind of creative thinking as an artist’



things, he made nanoreactors and hollow spheres produced from polymers, which you can fill with medicines or with biological components such as proteins. ‘We’re using these to develop systems to tackle diseases, for example by locally releasing enzymes that can inhibit or cure metabolic diseases’, Van Hest explains.

A fresh stimulus

After seventeen fruitful years in Nijmegen, in which he not only published many breakthrough articles on a wide variety of subjects but also launched four start-ups and registered several patents, Van Hest thought it was time for a new challenge. In 2016, he returned to his alma mater in Eindhoven. ‘My environment has a decisive influence on the direction my research takes. A change of environment gives me a fresh stimulus and creates new contacts, and that ultimately leads to new insights.’

He’s currently working on artificial endosymbiosis – the implementation of artificial organelles in a living cell, or vice versa. ‘Only two groups in the world are working on this. We can really make significant progress in this area at

Eindhoven.’ That’s an important consideration for his selection of subjects, says the chemist. ‘What’s going to be important? And how can I contribute to that? For example, I worked on spider silk for a while. When that subject reached a certain maturity, the added value I could offer with my group was limited. That was a good time to switch to something else.’

Explorer as educator

After all those years in science, Van Hest still loves doing research. ‘I often feel like an explorer or professional athlete competing with the whole world. And I’m allowed to teach young enthusiastic people how to function in society. Ultimately, all the knowledge you gain automatically becomes obsolete and forgotten. It’s these people who are my real legacy.’

Van Hest advises his students to follow their dreams and not shy away from engaging in a new subject with a certain degree of naivety. ‘Start with something new because you think it will become important, and then learn as you go along. I try to instil sufficient confidence in my students to give them the courage to do that, just like my mentors instilled it in me.’ ←

Intuitive, original and creative

What typifies Jan van Hest as a scientist? According to his mentors, he always explores the possibilities, after which he carefully chooses what to focus on. ‘He has shown that his intuition is well developed and that he knows how to choose the right subjects’, **David Tirrell** says. ‘Jan uses the same kind of creative thinking as an artist’, says **Roeland Nolte**. ‘Jan has combined the knowledge and skills he acquired during

his postdoc period in a completely original way with his PhD work, and in doing so he has created a completely new field of study of which I have high expectations’, **Bert Meijer** explains. Meijer is pleased that Jan has succeeded him as scientific director of the Institute for Complex Molecular Systems. ‘And, of course, as his PhD supervisor, I’m proud that he has now received the Spinoza Prize.’



Pauline Kleingeld

Professor of Ethics and Its History, University of Groningen

‘My work is dedicated to Kant’s arguments and not to the man himself’

She is an eminent Kant scholar, the author of numerous publications and she has published a groundbreaking and prize-winning book: *Kant and Cosmopolitanism*. Pauline Kleingeld, Professor of Ethics and its History at the University of Groningen, puts the discussions between the eighteenth-century Enlightenment philosopher Immanuel Kant and his contemporaries in a new perspective.

‘The more I study his ethics and political philosophy, the more interesting I find it.’

For years, Kleingeld has studied themes such as the relationship between states, the compatibility of patriotism and cosmopolitanism, colonialism, slavery and racial hierarchy, and cultural diversity. She demonstrated that Kant made a U-turn in his thinking about racism and that his ethical principles regarding freedom and autonomy are still relevant for our modern world two hundred years later.

Your academic life has mainly focused on Kant. What makes him such an attractive philosopher?

'I had studied theology, had written my MA thesis about Kant, and for my doctoral research, I wanted to examine the work

of an important philosopher I could learn from. Kant wrote about many different issues in a well-considered and coherent manner. He clearly saw that the position you take about one issue has implications for what you can say about another. He's an interesting philosopher who lived in a fascinating period. And the more I study his ethics and political philosophy, the more interesting I find it.'

'I noticed that Kant has a very different understanding of freedom than people think'



Who is Pauline Kleingeld?



Born on 30 October in Rotterdam

1962

Gained her doctorate from Leiden University for her thesis on Kant's philosophy of history

1994

Appointed Professor of Philosophy (Ethics and its History) at the University of Groningen

2011

Won the Biennial Senior Scholar Book Prize of the North American Kant Society, for *Kant and Cosmopolitanism: The Philosophical Ideal of World Citizenship* (Cambridge University Press, 2012)

Read more on nwo.nl/kleingeld

Elected as a member of the Kant Committee of the Berlin-Brandenburg Academy of Sciences and Humanities

2013

2018

Kant judged female academics to be 'aberrations' who had missed their calling as women. As a female Kant scholar, what do you make of such a statement?

Smiling: 'My work is dedicated to his arguments and not to the man himself. People find that strange at times, but it is true. I'm interested in the philosophical aspects. When Kant talks about "human

beings", then who exactly is he talking about? Do women also fall under that description? I decided to investigate that, and my research resulted in an article about the problematic status of gender-neutral language use and the term "human being" in the history of philosophy.'

Some people think that we shouldn't make an issue of this. "Mensch" simply means "human being" and not "man" (Mann).

'Yes, that's correct. But Kant writes, sometimes in a single sentence, about human beings (*Menschen*) as men (*Männer*), about children (*Kinder*) who become

gentlemen or masters (*Herren*). You cannot simply ignore that. Back in 1883, when Aletta Jacobs sought the right to vote because she paid taxes as a Dutch subject ("Netherlander"), the Dutch Supreme Court determined that this term referred exclusively to men. Because, they reasoned, if the term had been meant to include women, then that would have been explicitly stated. Similarly, the word "human being" does not automatically imply that women are included too.'

What is the significance of your interpretation in the current debate about the racism and sexism of Kant?

‘Up until now, there were two positions: either you saw Kant as a consistent inequality thinker due to his racism and sexism, or you saw him as an inconsistent equality thinker and subsequently pushed his racism and sexism to one side. I adopt an intermediate position. I think there are tensions between the general wording of his principles and the tacitly assumed restrictions in their application. Kant uses a neutral word such as “human being”, but at the same time, he silently also uses a range of exclusion mechanisms that are not continuously at the surface, but are nevertheless present.’

‘I want to use my Spinoza Prize to try to develop a contemporary Kantian defence of moral universalism’

Despite this, you still want to continue studying Kant?

‘Yes, I want to use my Spinoza Prize to try to develop a contemporary Kantian defence of moral universalism. That issue has fascinated me since my high school days. What are human rights, are there generally applicable moral principles, and if so which, and how can you justify those? The eighteenth-century philosophical discussion about cosmopolitanism, which I have extensively written about in my book *Kant and Cosmopolitanism*, concerned various ways of thinking about universal principles, such as human dignity, freedom and equality. Since finishing that book, I have been focussing on Kant’s ethics. Kant is the philosophical founding father of one of the most important approaches to moral universalism. I have developed new interpretations of key elements of Kant’s writings on ethics. And now I want to investigate, together with a group, whether a more compelling contemporary Kantian ethics can be developed based on those results.’



Academically thorough with an eye for the wider public



Katharina Bauer,
Assistant Professor in
Practical Philosophy
at Erasmus
University Rotterdam,
did 18 months of
research under
Pauline Kleingeld’s

supervision. ‘I still view Pauline as a sort of mentor. She works very accurately and carefully, explains arguments very thoroughly and has an extensive knowledge of the literature. Many Kant experts believe that Kant tells “the truth”. There’s often an internal

discussion in which Kantian philosophers limit themselves to one perspective. However, Pauline has an open attitude and can genuinely pose relevant questions, such as those about cosmopolitanism, racism and sexism. She taught me to write very lucidly with a clear structure and build up. She wants to do fundamental research, and yet she also steps outside of the academic discussion to explain the subject to a wider public. I think this combination is really important, and that’s also how I want to do things myself.’

That's a huge project. And it doesn't necessarily fit in with the contemporary Zeitgeist with its emphasis on identity politics and the value of different cultural perspectives.

'So yes, I'm swimming against the current a bit with this project. However, identity politics is also often defended by appealing to moral notions, such as dignity and equality. And this project is only about fundamental moral principles. These can

be applied in different cultural contexts in various ways. Furthermore, general principles leave a lot of room for cultural variation.

It's often the case that once I develop a Kantian argument about one issue, then people come with objections about adjacent issues. Therefore, I must present the theory in its entirety because only then can it be genuinely convincing. And that's an awful lot of work because such a theory is an enormous constellation of ideas in which everything is connected with everything else. The Spinoza Prize has given me an exceptional opportunity to be able to do this, together with others, because I could never achieve this alone.' ←

Internationally respected role model



Lodi Nauta is Dean of the Faculty of Philosophy at the University of Groningen and Professor of History of Philosophy. Nauta was awarded the

Spinoza Prize in 2016. He says: 'Kant is one of the greatest philosophers of all time and is studied by philosophers, historians and ethicists. That's a large international field. Pauline has done excellent fundamental research into Kant, and she has shown the current

value of Kantian ethical insights. The combination of studying history and making it relevant to the contemporary situation is very interesting. Furthermore, she has acquired many new insights into Kant's ideas about politics in general. Pauline is a highly visible, internationally respected Kant scholar, who deals with our intellectual heritage in a subtle and nuanced manner. She does not want to form a school of thought but encourages people to examine texts critically. With this, she's a role model for young researchers who, as a result, like to come and work with her.'

How does one design a new Kantian theory?

Kleingeld is exceptionally pleased that she can use her Spinoza Prize to appoint people who can work with her on a Kantian defence of moral universalism. But how do you manage to reflect on things together? Kleingeld: 'You can work together on something like this if you have an open attitude and you hold certain questions and starting points in common. The people in my group receive the freedom to develop their own argumentation and do their own research. And then we will see whether it's actually possible to develop a genuinely convincing theory.'

Ideas about free will

She gives an example of her approach. 'In the current discussion about free will, I can see two ideas about what free will means. Most people see free will as the opposite of determinism: if free will exists, then determinism is false, and vice versa: if determinism exists, then there's no free will. Others say that free will is the opposite of coercion: you do something out of free will if you aren't forced to do it, and in that sense, free will is compatible with determinism.

These are two entirely different ways of thinking about free will.'

Independent of desires

'Kant's defence of free will has the reputation of being rather inconsistent. But what I noticed is that Kant uses a very different notion of freedom than people think and that he defined freedom in a third way, namely as the opposite of dependency and slavery. With free will, he means the freedom to act independently of one's desires. If you read Kant in that light, then his theory suddenly becomes consistent. In the coming period, I would also like to investigate what this way of thinking about freedom can add to contemporary discussions about free will. That perspective is also relevant for Kleingeld's research into moral universalism. 'If you can only act on the basis of your desires, then a Kantian ethics is pointless because that contains the idea that moral obligations unconditionally apply whether or not they match your desires. Free will is therefore a condition for moral responsibility.'

'I want to join forces with social scientists and set up an anti-smoking programme for pre-vocational secondary schools.'



NWO Spinoza laureate 2020

Sjaak Neefjes

Professor of Chemical Immunology, Leiden University
and Leiden University Medical Center

Boundless curiosity and unbridled enthusiasm

Eric in the Land of the Insects, Godfried Bomans' timeless bestseller, was the main reason for academic all-rounder Sjaak Neefjes to become a researcher. 'I was about ten years and thought that this miniature world was really cool.'



Just before midnight on 18 June, Sjaak Neefjes sent this email to his right-hand man Lennert Janssen amongst others, who had been managing Neefjes' Lab for over twenty years:

'Dear Friends, you may notice that I am honored to receive today a great and prestigious award. This I receive on behalf of the lab that has over the years performed (some of) the crazy experiments that I proposed and (thank God) many experiments that I did not propose. I am proud of the work of the Neefix lab and the great collaborators of the Ovaa lab that made all this possible.'

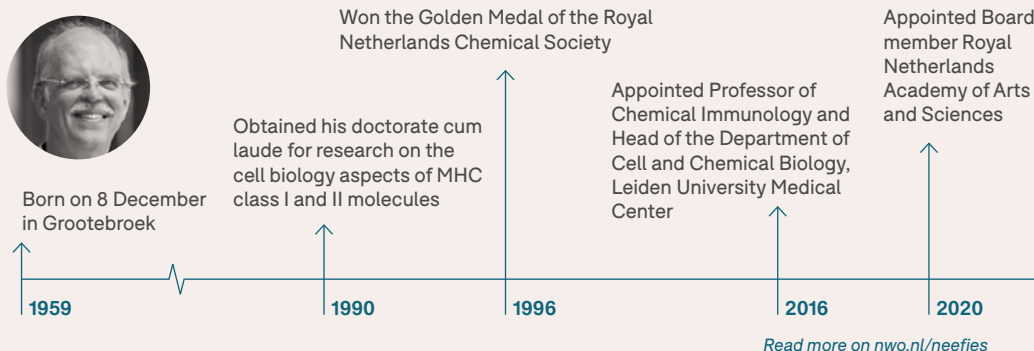
These have been eventful times for the professor of Chemical Immunology. He joined the board of the Royal Netherlands Academy of Arts and Sciences (KNAW) in May, lost his close colleague and friend Huib Ovaa that month to prostate cancer, and also won the Spinoza Prize. But initially he wasn't allowed to tell anyone about the latter. 'It was high time Sjaak won it', says colleague Hermen Overkleeft, with whom he works closely at the Institute for Chemical Immunology (ICI). 'There are many good Dutch scientists who are eligible for this prize, but Sjaak stands out head and shoulders above the rest.' Overkleeft has no shortage of superlatives and in particular praises Neefjes' creativity, curious nature and unbridled enthusiasm. 'He's averse to dogmas and combines his knowledge with a strong conviction and considerable tenacity when he's on to something.' 'And on top of that, he's a real sweetheart', adds lung specialist Wanda de Kanter. 'You should see how he interacts with students!' De Kanter visits pre-vocational schools with Neefjes for the Frisse longen ('Fresh lungs') project, to discourage students from smoking. About a quarter of all pre-vocational secondary education students between the ages of 12 and 16 smoke, and this percentage has not been declining in recent years. 'That worries Sjaak and explains why he wants to stay close to where it's happening.'

Not afraid of making mistakes

Neefjes' inspiration is Hidde Ploegh, biochemist and immunologist at the Children's Hospital at Harvard Medical School. 'Hidde and his credo "science is a way of life" have had a profound influence on me.' Ploegh still recalls the details of Neefjes' dissertation that he supervised in 1990, which earned Neefjes the distinction of cum laude. 'It was about the biosynthesis of the MHC complex. Sjaak introduced biochemical methods that were quite new at the time. But he's not afraid of getting his feet wet or making mistakes.' Ploegh also remembers something else distinctly: 'Sjaak's enthusiasm infected the other



Who is Sjaak Neefjes?



students. He has special interpersonal and social skills that have made him extraordinarily popular with his scientific colleagues. I'm a bit rougher around the edges and reserved when it comes to personal contact. But Sjaak will have no problem inviting a foreign senior researcher to stay at his home.'

Looking at research from a distance

In Hidde Ploegh's lab, Neefjes worked with the likes of Ton Schumacher, one of this year's Stevin laureates. Hermen Overkleeft, with whom he is now at the helm of ICI, was also a researcher at Ploegh's lab. 'I'm a chemist who turns to biology', Overkleeft says. 'Sjaak is a biochemist who turns to organic chemistry. We both like interdisciplinary research and want to excel in our fields. Sjaak thinks that an organic chemist can produce useful tools to enhance our understanding of cell biology. Whereas I believe it's important that organic chemistry can create molecules that we can do something with. This is the common ground we've found and what prompted us to set up NWO's ICI Gravitation programme.'

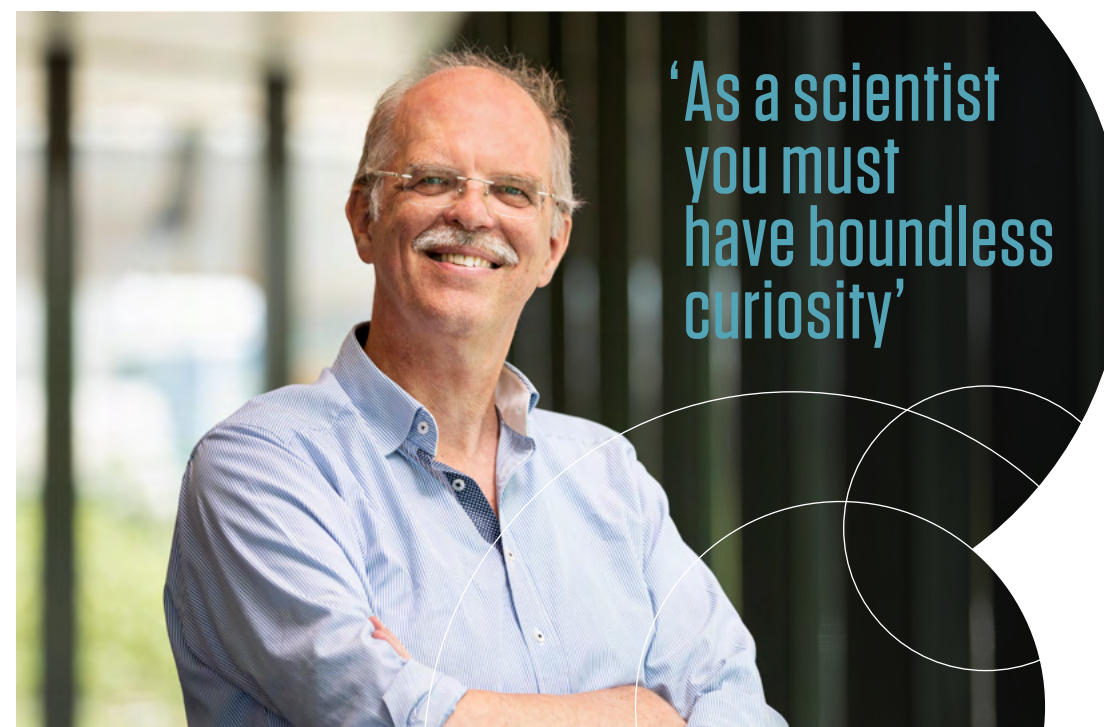
In this interdisciplinary programme, Neefjes was mentor of tenure tracker Annemarie van der Veen. 'He's good at looking at research from a distance and distinguishing the bigger picture: where's the gap in knowledge, what is there a need for?' she says about him. 'Sjaak thinks it's important that his research and his group are easy to find. He wants his research to be more transparent, more accessible and also make it more visible internationally. He walks around the workplace every day and sits down with people to ask how things are going. He's very approachable.'

The great thing about Neefjes is that he's a genuine fundamental researcher and always makes it clear that he's linked to the clinic, says Van der Veen. 'At LUMC, he's committed to bringing researchers and clinicians together. That's also reflected in his research into less toxic anti-cancer drugs.'

No mountain too high, no goal too far

Ploegh says of Neefjes: 'For him, there's no mountain too high, no goal too far.'

The development of a new type of anti-cancer medication is a good example of this, as Neefjes can attest to: 'Aclarubicin, previously used against acute myeloid leukaemia (AML), has been withdrawn from the market. It wasn't selling well enough and, moreover, it's very difficult to produce: it requires bacterial strains and the substance has to be made by means of fermentation, a process that we no longer possess the knowledge about in Europe. However, aclarubicin is much less toxic to the heart than the medication AML patients are now receiving. So even though they would stand to benefit from aclarubicin, I have received no support to develop it. I guess such an old medicine was considered unfashionable.'



Neefjes went ahead with his research nonetheless and brought in three partners. Aclarubicin is now being produced in India, funded with money from the legacy of Els Borst, former D66 minister as well as his mother-in-law. 'We're assuming that once doctors see that it's less toxic, they'll want to test it for other forms of blood cancer as well.'

A discovery met with scepticism

The research on doxorubicin, an anti-cancer medication used to

treat solid tumours, is a different story. Neefjes: 'Doxorubicin is an effective medicine that is widely used in clinics, but only given to patients for a short time because it causes heart damage. We discovered in our lab that doxorubicin not only causes DNA breaks that kill cancer cells, but it also damages the chromatin by removing the histones from the DNA.'

This discovery was initially met with a great deal of scepticism. Indeed, how could the scientific community, who had written more than 120,000 papers on doxorubicin, have overlooked this second mechanism of action? Yet it was true. 'By chemically separating the old from the new activity, we managed to synthesise away the cardiotoxic effects while maintaining the anti-cancer

effects', Neefjes says. 'I did that together with Hermen and it illustrates the power of combining biology with chemistry.' The implications are that the modified doxorubicin can be used for a longer treatment and for patients who have received the maximum dose. There is one major problem, however. This compound is not available for the clinic either, nor will it be made available due to a lack of patent protection. In principle, such compounds are never made available for the clinic. 'So there is only one option left to get this compound to the clinic: develop it ourselves! But this is very expensive, and I had been wondering how to finance this. And then I got a phone call from NWO...'

Neefjes intends to use a substantial portion of the Spinoza Prize to develop the new variant of doxorubicin for the clinic. 'I don't have to worry about funding that now. I had already raised money for aclarubicin with other people, but the Spinoza Prize is really crucial for the doxorubicin variant.'

Encouraging to always think things through

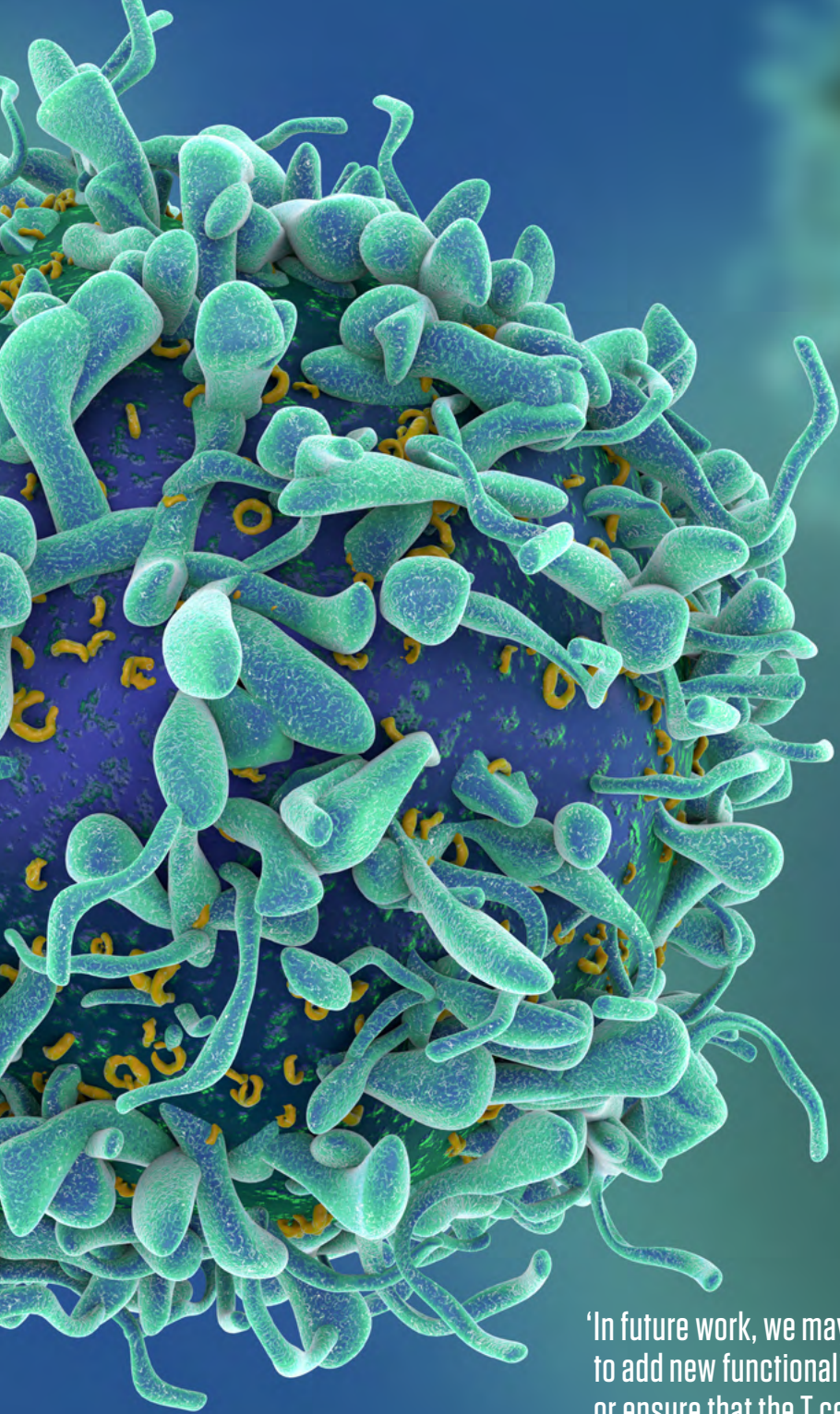
He has even more plans in the pipeline: 'Following on from my research into the link between salmonella infections and

intestinal cancer, I'm going to carry out cell biological and epidemiological research into the connection between food-related pathogens and cancer. To this end, I'm collaborating with the National Institute for Public Health and the Environment (RIVM), which has frozen clinical isolates relevant to our research on which we can see the bacteria of patients who later developed cancer. And I want to join forces with social scientists and set up an anti-smoking programme for pre-vocational secondary schools.'

He believes that as a scientist you must have boundless curiosity. He has the same attitude as a father, according to his daughter Anna. 'He always encourages you to think things through, to be extremely curious and always ask questions.' As a 16-year-old student Anna asked a question that even her father didn't know the answer to: how is it possible that proteins from outside a cell's nucleus don't end up in the nucleus after cell division? Neefjes asked PhD student Menno Spits to investigate this process. The answer was published last year. Anna is now studying biology. 'My father once asked jokingly whether I wanted to come and work in his lab, but I want to create my own career path.' As a father, Sjaak thinks that's extremely wise, but as a scientist, Neefjes thinks it's 'a pity for my lab'. ←

The Neefjes top 3

Hidde Ploegh doesn't have to think hard about Neefjes' top-three most important scientific accomplishments. 'To begin with, in the Netherlands he is one of the first people to recognise the importance of GFP, **Green Fluorescent Protein**, a fluorescent protein used to monitor processes in a living cell. In second place, Sjaak applied that principle to solve a specific aspect of antigen presentation: the **peptide transporters** that ensure that the antigen fragments produced in the cell are also presented correctly on the cell surface. That's a significant discovery. Number three is the discovery that he made as a PhD student: he demonstrated that a certain subset of MHC products travels along a path in the cell that provides a perfect explanation for the function of these proteins, and as a result he discovered the **MIIC compartment**.'



'In future work, we may well be able to add new functionalities to T cells or ensure that the T cells multiply themselves. I expect this area to make considerable advances in the next ten or twenty years.'

NWO Stevin laureate 2020

Ton Schumacher

Group leader Molecular Oncology & Immunology,
Netherlands Cancer Institute

The instructive path from idea to clinical application

Knowing purely for the sake of knowing, that's what drove immunologist Ton Schumacher at the start of his career. However, that changed when immunology was found to have the potential to combat cancer. 'Then, not just collecting knowledge, but also considering its use became my inspiration.'



The fact that your body is capable of recognising and controlling a wide range of intruders, even intruders that didn't yet exist when you were born, is what I find so incredibly fascinating.' Ask Ton Schumacher why immunology intrigues him and he answers without hesitation. How such a complex immune system works. The unanswered questions in cancer immunology. And what this discipline can still contribute to cancer treatment.

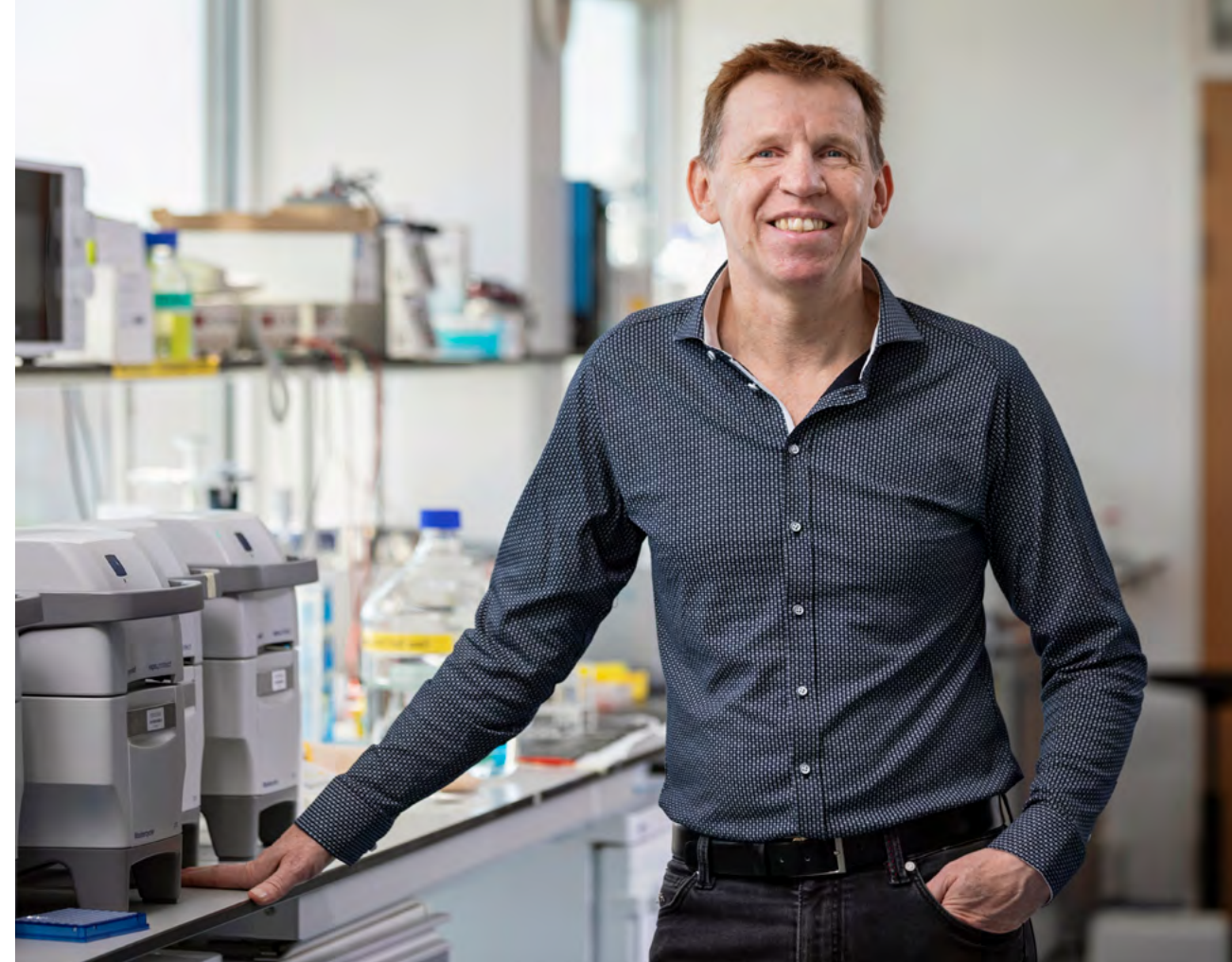
Schumacher is group leader Molecular Oncology and Immunology at The Netherlands Cancer Institute (NKI), member of the Onco Institute and Professor of Immunotechnology at Leiden University Medical Center. His research focuses on how T cells, white blood cells from the immune system, can recognise cancer cells and how we can stimulate such recognition. In addition to his research, the professor is active in the biotech industry. He has founded four companies, and a fifth is in the making.

'Sometimes, you need to step out of your comfort zone. Things need to stay a bit scary'

Role for cancer patients

Nevertheless, his work started on the fundamental side of science before most scientists appreciated that immunology could play a major role in cancer treatment. 'Immunology was viewed as conceptually interesting, but very few people expected that it would ever be useful in treating patients.' And that didn't attract his attention either, he says. 'When my group started at the NKI in 1996, I was purely driven by curiosity. It's the almost egoistic interest of young researchers who want to discover how things work without considering how that knowledge could be used. Simply knowing for the sake of knowing.'

However, that soon changed. The distance between the research institute and the hospital got smaller. At the end of the 1990s, medical oncologist John Haanen joined him in the office. Haanen can still remember the first meeting: 'I was originally in a different room. When space came up in Ton's room, somebody said to me: "Go and join him, he's an exceptional person."' It was the start of a successful collaboration. And the two of them still share an office.



Triumph for fundamental science

Thanks to conversations with Haanen, Schumacher started to gain a better understanding of the immune system's potential to treat cancer. The two of them established a research group to study immune reactions in cancer patients. One thing they discovered was that in many cancer patients, T cells could, contrary to what was generally assumed, recognise cancer cells because of the DNA damage that they had accumulated. That knowledge paved the way to the treatment of certain types of cancer with immunotherapy.

Although Schumacher characterises the discovery as 'a triumph for fundamental science', the applied side of science became increasingly important in his work. That was due to his workplace. 'At the NKI, you see patients walking through the door. And that makes you realise the potential impact of your work. In addition, our infrastructure for setting up patient-related research is magnificent.' Furthermore, he noticed something on the

Who is Ton Schumacher?



Born on 8 April
in Heemskerk

Gained his doctorate from VU Amsterdam/ The Netherlands Cancer Institute for his research into the interaction between molecules from the immune system and antigens

Started his own research group at The Netherlands Cancer Institute

Appointed Professor by Special Appointment of Immune Technology at Leiden University Medical Center

Won the Dutch Cancer Society's Queen Wilhelmina Prize, the most significant grant prize for cancer research in the Netherlands

1965

1992

1996

2005

2014

[Read more on nwo.nl/schumacher](https://nwo.nl/schumacher)

scientific side: 'In scientific articles, researchers often write in a final section that a newly developed technique could well be used for a certain application. But subsequently, little happens.'

And that's exactly where Schumacher finds his motivation. 'I could not help but think: Put your money where your mouth is. Don't just collect knowledge, but also consider its use, and that became my inspiration. I increasingly moved in the direction of translational research and biotech.'

Bridge between science and application

Biotech and science: they're two different worlds. However, Schumacher does see similarities: 'In both, there's the

dependence on external parties. In the academic world, you need to convince referees about your research proposal and in industry, the investors.' But the differences dominate. 'In science, you must be creative and able to switch to new things. In biotech, it's all about understanding who or what you need to bring a process to the next level.' Schumacher mainly has a substantive role in the early phase of the companies he's involved in. 'I contribute ideas in the concept phase in which we determine what we want to achieve and which people can make that happen. I'm not a great manager, and I frankly don't find that the most interesting part of biotech.'

Rather, his role is forming a bridge between science and application. But what makes him so successful in both? Schumacher, thinking deeply: 'I'm not a researcher with the deepest biological knowledge. But I guess I am pretty

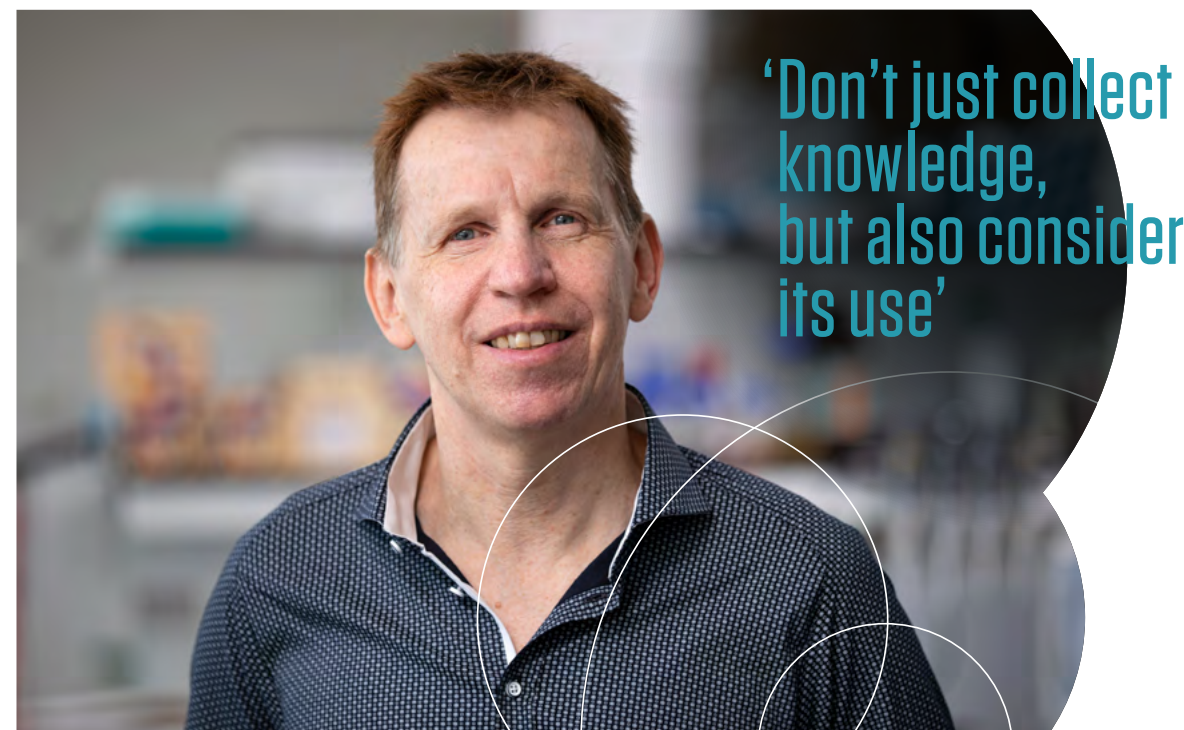
good at developing new strategies and technologies. And that means you can explore fields that other people could not yet explore. That's how I have run my lab, but this attribute is also useful within companies.'

Using technology to acquire knowledge

According to Christian Blank, oncologist at the NKI, Schumacher excels in taking

good innovative ideas and converting these into 'high-end' applications. 'He has the knowledge and knows how to put that to good use. It's a combination that yields success at companies.' Haanen states that Schumacher 'is technically very strong'. 'He really understands how you can deploy techniques to obtain knowledge about the immune system. He also knows how we can use the products from biotech companies to unravel mechanisms that play a role in combatting cancer.'

And also at an earlier stage, within the clinical studies in collaboration with Blank and Haanen, he knows how to bring the two worlds together. Blank: 'Ton is a scientist who clearly knows the possibilities of a clinical study but also



what's feasible.' Haanen: 'He's not a clinician, but he does understand what I need as a clinician so that I can do my work better. We speak the same language, and that's why the collaboration works so well. Ton oversees the entire field from the initial idea to clinical application.'

Too far ahead of the troops

Success has not always come easy. Schumacher learned the ropes in business in much the same way that he learned how to get ahead in his academic career. He remembers setting up the first company in 2001: 'We were somewhat naive about how things work in that world. The T cell therapy we focused on was scientifically interesting, but we were too far ahead of the troops. Companies were not yet ready for it then.' However, the idea would later be successful in another company, T Cell Factory, which was taken over by an American pharmaceutical company in 2015.

'The fact your body is capable of recognising and controlling a wide range of intruders, even intruders that didn't yet exist when you were born, is what I find so incredibly fascinating'

Yet, he is not one to talk about obstacles. He prefers the term educative experiences. He views his career as an adventure. 'I believe that if you feel too comfortable somewhere, then it's time to move on. Sometimes, you need to step outside of your comfort zone. Things need to stay a little bit scary.' Schumacher thinks he's benefited a lot from this approach. 'Looking back, I've experienced some remarkable things. We've gone from a period in which we didn't know how T cells work to quite a broad molecular understanding of this process, and in doing so, we've also discovered that we can use this knowledge to help patients. It's been a privilege to be part of this.'

Haanen testifies how Schumacher has grown with the field. Yet he also emphasises his 'constant focus' and even considers that to be crucial. 'Some scientists are constantly adjusting their course. Ton has always been committed to the subject and he's reaped the benefits of that. And it's why he always remained at the top in his research.'

Globally renowned treatment

The discovery that the human immune system can recognise and respond to cancer cells is what Schumacher refers to as 'the most important output from my lab'. It forms the basis of the checkpoint inhibitor therapy frequently used in hospitals. 'In many patients, we can see that a smouldering immune response is present, but that this immune response is ineffective because of inhibitory processes. By blocking these brakes on immune activity, the tumour-specific T cells can mount a more substantial attack.' Furthermore, with Blank he discovered that this therapy can be successful when applied before surgical intervention and used early in the disease process. 'It's one of the spearheads that has made this a globally renowned treatment', says Blank. For patients who lack such a smouldering immune response, there's another effective method. Via genetic modification, Schumacher and his group modify T cells taken from the body so that they can recognise tumour cells, and these are subsequently reinfused into the body. Back in 2006, this led to a first clinical trial for skin cancer patients. Now there are two approved treatments against blood cancer.

Schumacher can still see many possibilities to improve this treatment strategy. 'At present, we only modify the receptors, the part of the T cells that recognise tumours and other diseases. In future work, we may well be able to add new functionalities to T cells or ensure that the T cells multiply themselves. I expect this area to make considerable advances in the next ten to twenty years.'

Research still takes the lead

The successes have brought him acclaim. Schumacher has received prestigious research prizes in the Netherlands and abroad. He certainly sees this as a recognition: 'When you see the names of your predecessors you think: "Gosh, have I joined their ranks?"' But the research still takes the lead. 'Recognition is valuable, but you soon get back to business.' And that's what characterises him; obtaining fundamental knowledge, which can be used in the hospital. 'If I ever have grandchildren and they ask me what I'm proudest of, then I'll answer: "I helped us to understand how our immune system can recognise cancer cells." I still consider that a relatively fundamental contribution.' ←

'It's our task to present the facts from research, but that's not the same as saying somebody shouldn't eat meat or drive their car less frequently.'



NWO Stevin laureate 2020



Linda Steg

Professor of Environmental Psychology, University of Groningen

'I'm not the finger-wagging type'

Linda Steg's career coincides with the coming of age of her field: environmental psychology. Though it struggled considerably to gain a foothold in the early years, three decades later its scientific standing is undisputed. Not only that, behavioural science now has a clear voice in the international climate debate, partly thanks to Steg.

It's the late 1980s. Charles Vlek is teaching a group of students in a Groningen lecture theatre about the interaction between human behaviour and the environment. Three friends are sitting in one of the back rows, listening attentively. One of them, Linda Steg, came to Groningen a few years earlier because she wanted to work with children with behavioural problems. She studies andragogy, but has already discovered this is not where her future lies. Vlek's lectures on environmental psychology plants the seed from which a beautiful career will blossom. Steg does a research internship on the theme of sustainable mobility at the university's Traffic Research Centre. And when, a short time later, Vlek is appointed Professor of Psychological Decision Making and has an opening for a PhD student, Steg turns out to be 'an excellent candidate'. She obtains her doctorate in 1996 with a thesis on behavioural change to reduce car use.

It marked the beginning of many years of cooperation. The atmosphere in the group resembled that of a strike force taking on the world, they both recall. They had a good mutual understanding. As a mentor, Vlek praised his PhD student's energy, intelligence and constant cheerfulness. But there was no money for a permanent position. The university advised her to look elsewhere. When Vlek retired in 2003, Steg was told she had to leave as well. 'It was a struggle', Vlek says, looking back.

'Listening to people in other disciplines sharpens your view'



Who is Linda Steg?



Born on 21 February in Ravenswoud

1965

Gained her doctorate from the University Groningen for her thesis on behavioural change to reduce car use

1996

Appointed Professor of Environmental Psychology, Faculty of Behavioural and Social Sciences, University of Groningen

2009

Included in Thomson Reuters' list of 'The world's most influential scientific minds' (also in 2016 to 2019)

2014

Appointed Knight in the Order of the Netherlands Lion

2019

Became a member of the KNAW board and, as part of that position, chair of the Behavioural Sciences, Social Sciences and Law Domain

2020

[Read more on nwo.nl/steg](https://www.nwo.nl/steg)

'After receiving her doctorate in 1996, Linda managed to get by for ten years on temporary appointments, also elsewhere, until a permanent position as lecturer opened up in Groningen in 2005.'

Steg never made a roadmap for her academic career. Nor did she necessarily plan to become a professor. 'In my family it's never been a given that you're going to study.' After taking her doctorate, she had an instructive period at the Netherlands Institute for Social Research, where she became acquainted with the world of policymakers. But above all, she realised that she wanted to conduct theoretically sound research, preferably at the interface of fundamental and applied research. 'It's much more difficult to make an impact with applied research alone. It allows you to draw conclusions: if you do a, b will happen. But with a theoretical foundation you can also explain *why* this is the case.' As much as the field has matured since then, Vlek and Steg both believe that even in 2020 environmental psychology can still make considerable gains in that area. 'I hope that the Stevin Prize will enable us to work on the field's further theoretical and methodological foundation', Steg says, 'and above all inspire others to do the same.'

Priorities

Around the turn of the century, the field faced an entirely different kind of transition. 'For a long time, environmental psychology revolved around the question of how the environment affects us', Steg says. 'Sustainable behaviour and the role of human activity in general only became a central notion much

later. Today, that's what at least half of the papers in this field focus on.' The social urgency due to the climate crisis has only increased the field's academic relevance: 'We dovetail perfectly with university priorities such as sustainable societies and energy.'

Steg's research is therefore broadening its scope to include environmental behaviour in general: in addition to car use, it also includes energy consumption in homes, sustainable food and a reduction in household waste. The same questions are always asked: what moves people, how can you motivate them to act sustainably? When she worked on her inaugural lecture in 2009 on the occasion of her appointment as a professor, the pieces of the puzzle all fell into place. 'I wanted to mention the research of all my PhD students in my lecture. As a group, we were working on many different things. I once saw that as a weakness, but a colleague called it my strength. I placed all the research in an overarching framework that answered the question of how and under what conditions intrinsic motivation leads to environmentally friendly behaviour. For example, the impact on the environment proved to be one of the most prominent predictors of policy acceptance. People are willing to pay a higher price if they understand that this will ultimately solve environmental problems.'

'A leader that brings people together'

'Without Linda Steg's creativity and leadership, our scientific insight would not be as robust and the path to a sustainable society would be less clear.' The renowned American environmental sociologist **Thomas Dietz** (Michigan State University), whom Steg mentions as one of her inspirations, does not conceal his admiration. He calls her a delightful colleague who visibly enjoys bringing together the community of scientists, from senior scholars to new graduate students from across the globe. 'Her leadership in that respect has led to huge progress in the field of environmental psychology. Her own research is pathbreaking as she continually innovates. She incorporates all her new ideas into a holistic framework for understanding human decision-making.'



'I find it interesting to do things that are inconvenient, but extremely meaningful.'

The fact that Steg's chosen field was still in its infancy during her early career and that there was only a limited amount of literature available on the subject means that Steg has had a broad focus right from the start. How do other disciplines view certain challenges? Listening to people from other disciplines sharpens your view', she says now. 'Others ask questions about issues that are never discussed in your own discipline. Most ideas are generated by working together.' This attitude enables her to form alliances on all sorts of fronts, both in and beyond the world of science. Her predecessor Vlek admires the open-mindedness and 'social loyalty' with which she leads her group, while also seeking to connect with others. 'Without a trace of arrogance or self-importance. She has difficulty with people who abuse their position. That's something she would never do.'

'Trailblazer with no bee in her bonnet'

Something clicked immediately when they first met in the queue for customs in Brazil. Climate scientist **Heleen de Coninck** from Radboud University (now professor at Eindhoven University of Technology) was one of the lead authors of the report published by the Intergovernmental Panel on Climate Change (IPCC) in 2018. Linda Steg's participation marks the first time that a behavioural scientist was present as a full-fledged co-author. 'Initially, the climate world was led by natural scientists', De Coninck says. 'Then joined the engineers and economists. As a behavioural scientist, Linda is a genuine trailblazer.'

The atmosphere was sizzling, De Coninck recalls. 'We had to take drastic measures to keep global warming below 1.5 degrees. It will cause ideological clashes and



affect individual motivations and beliefs. Climate targets cannot be achieved without paying attention to the behavioural side, to how people make decisions.' She came to know Steg as someone who is driven by substance and not politics. 'The nice thing about her is that she rarely has a bee in her bonnet, she doesn't play games. You know exactly where you stand with her. And as soon as she sees the benefit of something, it becomes just as important to her as her own research.'

Presenting the facts

The climate debate is full of activism; the lines between fact and opinion often

are blurred. 'I don't want to take an outspoken position myself', Steg says resolutely, 'or in any case, I don't want to do research on subjects that I feel strongly about. That can result in bias, especially in the social sciences. Nor do I think it's the scientist's job to tell someone how to organise their life. I'm not the finger-wagging type.'

She views her role as follows: 'It's our task to present the facts from research. That should be the basis for starting a discussion. But that's not the same as saying somebody shouldn't eat meat or drive their car less frequently.' She takes the same position when advising policymakers. 'The boundary for me is when you say: this is where we're going. That's up to the politicians. I'm conducting research into acceptance, so I can indicate the conditions under which you can encourage people. Other people determine whether or not something is introduced.'

Sustainability has also become an important consideration for energy and network companies. What once began as window dressing is now a permanent part of many companies' policy. Steg works with energy companies, but also with organisations such as Urgenda, which sometimes have diametrically opposed views. 'They may not see eye to eye about how things should be done, but they're both interested in what drives people. These questions can bring together parties that represent conflicting interests.'

'It's not about money or technology; it's about public support'

'When energy projects fail, the cause is rarely technology or money, but nearly always social resistance.' This is becoming increasingly clear to **Gertjan Lankhorst**, who has been working in the energy sector for about thirty years. First as Director-General of Energy at the Ministry of Economic Affairs, and later as Director of the gas trading company Gastera. Until recently, he led the New Energy Coalition, in which the business community joins forces with science to work together on the transition to a sustainable energy supply. 'Your path inevitably crosses Linda's. She has and



continues to carry out groundbreaking work in this area. She was one of the first to give full support to this coalition.' Lankhorst knows that the necessary transition to clean energy sources is technologically feasible. 'The challenge is to win over society, especially when a new product isn't cheaper or easier to use. You don't buy support, you have to involve people as early as possible. Then you need to know what really moves them, how to galvanise them into action. That's where the expertise of Linda and her group lies.'

Thirty years after first being introduced to environmental psychology, Linda Steg is an established name. She has been on the Thomson Reuters list of the world's most influential scientists in recent years, and because of her exceptional scientific achievements she was knighted in the Order of the Netherlands Lion in 2019. And now she has won the Stevin Prize, which she and her peers also view as recognition for environmental psychology. Everyone you talk to about her praises her sharp intellect, her accessibility and her sincere interest in others. This prize will have a positive impact, not only on her work, but also on her field and the fight against climate change. ←

Colophon

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Spinoza & Stevin Prize

The NWO Spinoza and Stevin Prizes are the highest research awards in Dutch science. NWO awards the prizes each year to researchers, whose research is among the best in the world, according to international standards. NWO has awarded the Spinoza Prize since 1995 to a maximum of four scientists a year. The Stevin Prize, awarded annually to a maximum of two individuals or teams of researchers, was awarded for the first time in 2018. For both prizes, the quality of the researcher is of paramount importance. Whereas the Spinoza Prize focuses on the scientific work and fundamental problems, the Stevin Prize first and foremost honours the societal or economic impact. The laureates each receive 2.5 million euros to be spent on scientific research and activities with scientific impact. This is a recognition of, and stimulus for, their outstanding and groundbreaking work. The prizes are an accolade and an incentive for further research.