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Linde Meyaard, 2023 Van Loghem Award laureate:
“Bridging fundamental and applied research”.

A lot has changed in immunology over time. Huge scientific progress and spectacular accomplishments such as immunotherapy went together with internationalization and a wider array of career opportunities for immunologists. But integration of academic research with industry could still be improved to stimulate more effective drug development, Meyaard argues.

“Initially, I wanted to study medicine. I didn't have a childhood dream of becoming a scientist”, Meyaard explains. “But I didn't draw, so I went for biomedical sciences instead. When I drew lots for Medicine the second time I was selected but decided to cancel it. By that time, I was already captured by the lure of immunology: to unravel how things work. This was also thanks to the passionate teaching of Marius Giphart at Leiden University. It was immunology for me from then on.”

Embracing coincidence

A captivating aspect of immunology is, that it affects everything in the body by either activation or inhibition, she says. “It is fascinating to observe how these complex systems works, and how these observations have now led to wonderful capabilities such as immunotherapy.” Meyaard is proud of the fact that a receptor she characterized in the nineties during her post-doc in the USA has now been picked up by three different companies. “For a while, I already wondered whether blocking this receptor could contribute to cancer treatment. Apparently, others had the same thought. It is an honor to witness how a molecule that I named is now the subject of clinical trials with blocking antibodies that target it. I have been lucky; not all fundamental discoveries can be applied.” Meyaard thinks it is great to dive deep into a topic – regardless of what that subject is. “There are so many interesting topics to explore. I think I just as easily could have become fascinated by Dutch language and literature.” Meyaard regularly meets students with a clearly defined research topic in mind. “I would say, embrace coincidence and chance. Sometimes, for some reason or another that specific topic doesn't work out. It has to be adapted and the students can be disappointed. They needn't be. Once you go for something, it will grow on you and becomes fun. In my experience, at least.”

Fundamental and translational

A topic close to Meyaard's heart is the relation between fundamental and applied research. “In science, it sometimes seems that fundamental and translational researchers each are stuck in their own trenches. This is exactly why I cherish a quote from some NWO gathering, where the speaker only distinguished between 'applied science' and 'science that has not yet been applied'.” Meyaard started out in curiosity driven research into the way immune cells are slowed down. “This is related to the questions: what happens if this process doesn't function as it should – and, on the other hand, could you manipulate it to cure diseases such as cancer? In a translational setting the process is regarded for its opportunities to mend particular diseases – a field that has exploded during the last decades. My lab presently spans the whole range from fundamental research to applied research in collaboration with industry. This is reflected by the way we are funded, with funds coming from NWO Science (ENW) for our collaboration with AMOLF alongside funds from biotech companies.”

Mismatched incentives

Industry! In academia, there is a lot of hesitation around collaboration with industry. Working towards end products in patients from an entirely academic setting is very difficult, in her experience. “If you wish to up your chances of patients benefiting from the results you find, the alternatives are either starting your own company or collaborating with industry. You don't have to become an entrepreneur yourself, if you are not cut out for it.”

There are several misconceptions about industry and working with industry, Meyaard knows. Will it limit your scientific freedom? Will your work be abused? Can you still publish research results? “These things do not need to change, provided you make the right agreements. You might even find that your counterparts are the same kind of scientists as your colleagues in academia. In our lab, we predominantly collaborate with biotech companies such as Argenx in Zwijnaarde, Belgium, but we also have done excellent projects with Big Pharma Boehringer Ingelheim. We figure out the mechanisms, our corporate counterparts optimize the drug that intervenes in that mechanism.” There's only one difference: academia's 'products' are papers, whereas industry works towards drugs in patients. “I appreciate curiosity driven research a lot – its continued funding should be carefully guaranteed. This is not a plea to invest everything in applied research; quite the opposite. But I think it is a pity when a publication is regarded as the nec plus ultra for fundamental research. We should look past the scientific incentive to score a publication in a high-ranking magazine, whereas there is less recognition for seeing to it that fundamental results are followed up into applications”, Meyaard says. “Application of knowledge to the benefit of mankind should be always on the table as a possibility.”

Innovation loop

Meyaard feels most comfortable with her choice to cover the chain from fundamental research up to collaboration with biotech. “Our collaboration with Kristina Ganzinger, group leader Physics of Cellular Interactions at AMOLF perfectly illustrates the ratio behind that. She studies how TCR and other signaling molecules organize into clusters that sustain signaling. Understanding of that mechanism will lead to more rational, targeted drug development and to better new drugs.”

It is an example of how fundamental and applied research should interact in a constant back and forth innovation loop. “To have it all under one roof might also be an answer to the infamous valley of death. Scientific explorers might regard optimization as not being their thing, but luckily others see attractive challenges in that specific activity.”

Coaching

Apart from the content of her work Meyaard enjoys coaching young people a lot. “You get the opportunity to hitchhike along during the formative stage of people's lives, mostly from their low twenties to their low thirties, when a lot of life's decisions must be made. The main question to be answered is: what do you really want from life? It is especially rewarding to play a modest role in that decision making.”

Choosing has both become easier and harder for young people over time. From a single career path, it went straight to the present embarrassment of choice. “What should one do after getting a Master's degree? The answer to that used to be: academic research. Nowadays you can deploy your immunology knowledge and experience in biotech, pharma, education and policy. I regard this as a very positive development for our field.”

Another thing that changed is internationalization. “I remember Dutch spoken NVVI annual meetings with only a few foreign speakers contributing in English. Those poor people couldn't understand a single word beyond their own talk. This is unthinkable now. Our lab, for example, is and has been for years a mix of nationalities, ethnicities, sexual orientations and introverted as well as extroverted personalities. This is a deliberate policy, as there is evidence that organizations thrive from that: the more mixed, the better the results. Apart from that, it is beneficial to individuals from countries where immunology education doesn't exist like this. Eventually, this also stimulates the

knowledge position of their country of origin. Everybody benefits.”

Leendert van der Ent



Foto: Laloës fotografie

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