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Under the influence of light

New chromatographic tools for elucidating photodegradation mechanisms

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CHAPTER 9

Epilogue

If you can't communicate your science, is it even science?

The scientific community uses rather traditional ways of communicating, such as presentations and posters, and still do not use the full potential of the tools unleashed by the digital revolution. While to-the-point, application-based videos have become the norm rather than the exception in our digital society, most communication performed within academia is lengthy and theory-based. This shows the somewhat rigid character of academia. For academia to stay connected to science performed in industry, for example, new ways of science communication should be explored. Examples are pitches, videos, or even podcasts about scientific subjects. Luckily, conferences create more and more room for these kinds of communication, through video contests, pitch competitions, or even an open assignment where the candidate is completely free to share their science story in their own way.

While these competitions are very stimulating, there are only few students that commit to these assignments compared to, for example, poster presentations. You might argue that the new generation of scientists is, apparently, not ready for this revolution, but I think this is untrue for four reasons, *i.e.* *i)* early-career scientists are stimulated by their supervisors to present their work as poster or as presentation, *ii)* they have limited knowledge about the possibilities concerning new competitions, *iii)* it will take a lot of time to prepare both a poster and a pitch or video, and *iv)* the present generation of students was barely stimulated during their studies to use new media. In my 10 years at the University of Amsterdam I was never challenged during my courses to think outside the box when it comes to communicating science within the field. Implementing new ways of communication in bachelor or master courses could stimulate creativity, which can then lead to scientific innovation.

For an enthusiastic student there are possibilities to develop and challenge themselves. Pitch competitions, such as FameLab and the 3-minute thesis competition (3MT) are contests for students around the world to tell the story of their PhD in only three minutes and. Such competitions are often accompanied with pitch training. On a national level, similar pitch competitions exist, such as the Spotlight prize of the Royal Dutch Chemical Society (KNCV) in The Netherlands. An enthusiastic student could also apply for actual science-communication summer schools, such as the one organized at Leiden University, or even choose to pursue a science-communication major in an MSc program. If you are interested in communicating your scientific research, reach out to the press office of the university, who may help you with presenting your science to a new audience.

In March 2020 we all experienced a seismic shift in science communication due to the Covid-19 pandemic. With the science communication migrating to completely online, new methods suddenly became more accepted and used more than before. Such methods are here to stay, although they will not fully replace the commonly used methods of communication. Also, online platforms, such as LinkedIn, started to play a bigger role in connecting scientists with colleagues in the field. Fast forward to 2022, we can still see the remains of this sudden shift, which has made many scientists realize that new ways of science communication need a place in the scientific world

While the previous part of this section concerned communication within academia or between academia and industry, I also want to touch upon science communication to another audience: the general public. Better communication about science and about the scientific field could help in various areas, such as *i)* the distrust of the public towards science, *ii)* the stereotypes about scientists, and *iii)* the number of students choosing a natural-science degree. I will discuss these areas separately, but as you will see, they are interconnected.

During the covid-19 pandemic we saw an increasing distrust of the public towards science, which could be attributed to, among other things, the communication from academia to the public. Without any interaction, scientists are often seen as privileged people in their 'ivory' tower, without any human characteristics. Giving scientist a seat at the table during talk shows or creating more in-depth items on the news may reduce this distrust. An alternative way to reach the public would be through social media, such as Instagram, TikTok, or YouTube. The age group using those channels does not watch television as much (if at all), which means that they are normally not reached at all.

Then the stereotypes about scientists. The idea that scientists generally are old, white, and male is toxic for the work environment at the university. It reduces diversity in all layers (future students, students, PhD candidates, middle-career staff, and professors) since the 'perfect' scientist is always portrayed in this way. The feeling of not belonging can be a reason to overlook the field or a reason to decide that it is just not for you. The problem is that once we let people outside science create communication about science, for example a tv show or a movie, the stereotypes will appear. Think about children shows where the evil scientist has crazy grey hair, or the Big Bang Theory, where the scientists all seem to have social difficulties and are dressed in a hysterical way. Because we let this happen, new generations are exposed to the same stereotypes, which makes those stereotypes very persistent.

Lastly, the next generation of students often think that studies such as chemistry have poor career perspectives. I remember very well when I was a high-school student that we used to say that with a bachelor's in law or economics we could 'still become anything'. In retrospect, I could not agree less. Where is the logic in that? And why could you not still be anything if you were to go for chemistry or physics. I personally think you can do much more with these natural sciences. By communicating about science and showing the extent of the influence that science has on our economy, future students will see that you can become more than only a science teacher.

Because the world is not equally exposed to role models from all fields, we as scientists have the duty to spread the story of science to the general audience. With new developments in The Netherlands concerning science-communication centres, I believe that the government is starting to realize this as well. Science communication should be a crucial part of being a scientist and in my opinion, we should enhance the skills of communicating about science on the bachelor, master, and PhD levels. If science communication receives greater recognition, it can also play an important part in the selection process of candidates at the tenure-track or professor level. In this way we will slowly start to step down from the idea that a professor is only good with 'male qualities', such as leadership and dominance, instead of 'female qualities', such as communication and teamwork.

During my PhD, I was looking for (new) ways to communicate my science. It started with some videos and pitches, but it *really* started around October 2020. I was discussing many of the problems described in this chapter with my dear colleagues Noor Abdhussain and Lotte Schreuders. Before then, Noor and I had already tried to film our daily life at university, but this unfortunately came with an incredible workload. Together with Lotte we decided to create an Instagram channel about our life at university and we named it *Sisters in Science NL*. On this channel we created many posts about our science, our life at university, and about the stereotypes. Our slogan eventually became: *if you can see it, you can be it*.

One thing led to another. Since then, we appeared on national television twice, starred on the radio a couple of times, did many presentations, performed in a theatre show, and shared our story in different interviews and podcasts. We found a new way of communicating science in a fun, exciting and fast way, which fitted our creative style. I think my research benefitted from the creative endeavours we engaged in with *Sisters in Science*, since it made me use a completely different way of thinking that I could also implement in my scientific work.

With *Sisters in Science*, we hope to make an impact on three different levels. Firstly, by making ourselves visible to the public, we hope to battle stereotypes and to break the vicious cycle of scientist stereotyping. Secondly, we aim to show the current generation of students that they can become a scientist, even if they think that they do not belong in the scientific world because of the stereotypes. We hope to make the university a more diverse place on all levels. Lastly, we hope to show the future generation of scientists that they, too, can be a scientist. We need to be aware that academia is a privileged place that many people have no connection to. With our initiative we hope to remove these barriers.

When starting this new type of science communication, we were unsure whether the scientific community would appreciate it. We do not shy away for difficult subjects, such as the enormous number of burnouts in the field. However, in December 2021 we were granted the Diversity Initiative Award (50 k€) of the Dutch Research Council, which confirmed that what we are doing is benefitting the science community in general.

Still not convinced? Think about this.

A brilliant scientist may perform fantastic research, publish very important papers, and maybe even win a Nobel prize. A brilliant science communicator, however, may inspire thousands of children, motivate many early-career scientists, and create an army of change.

In the end, you can do so much more together than alone.