



The Optimist

A journal to help you survive the valley of shit

March 2021 EDITION

EDITORIAL

Not long ago, we found ourselves at the pub the Optimist asking ourselves: why the hell did we ever decide to pursue a career in science? A few drinks in, we realized that we would not be doing relevant science if it was easy. Moreover, in any other job we would probably be bored. To be able to survive our PhD – in a healthy mental condition – we realized we had to change our mindset. We need to learn how to deal with failure, how to be patient and how to create a healthy work-life balance. In order to bring optimism back for ourselves and our fellow PhD students, we came up with the idea for this interactive journal by PhD students for PhD students. Our goal is to become healthy scientists that are hardworking but relaxed, ambitious but sharing, and confident but humble. We are convinced that the best way to achieve this is by sharing our struggles and by seeing the humor in it. But that is not enough. We believe the efficiency of science can be improved. The scientific method has proven very successful over the last decades. Nothing we write down here will change this. However, we would like to step away from the idea that the current way of doing science is the only way and encourage constructive discussions. Therefore, in every edition we will focus on a topic that merits some thought.

The optimist team,

Matthias, Donya, Hava & Simone

Cover: Donya Pakravan

Misinformation in science

Fake news and misinformation about scientific topics, such as vaccine safety or climate change, have existed since a long time. Some of these are harmless, but others might have life-threatening consequences. In an era where everyone can be a publisher on their social media platform, the issue of fake news has become more relevant than ever. Especially during this current pandemic, in which many people have unanswered questions and have been watching more news in search for answers.

We, as PhD students and scientists, should be able to clearly communicate and make science understandable to people outside our field or to a general public. Our scientific expertise should be used to help debunk myths and fight misinformation in science.

How does misinformation arise?

Being misinformed is believing in incorrect claims or holding inaccurate views, but also not knowing about scientific facts and processes (1).

The causes and consequences of misinformation can be **deliberate or unintentional**. Some gain money through advertising revenue by writing and sharing sensational pieces with misinformation to get clicks or produce viral content with fake news. A study from MIT has found that fake news travels six times faster than verified news (2). People are also more inclined to share information that has an emotional impact. Another way in which misinformation can be deliberate is through selling fake remedies or fake medicine.

Unintentional ways false information can spread quickly stems from a lack of understanding of basic science and from social media not allowing users to distinguish between accurate and questionable sources. Older people for example, are more vulnerable to fake news since they did not grow up reading news from the internet. We also tend to make generalizations based on our own experiences, which are not always representative of the full truth.

Belief in **conspiracy theories** or attributing false intents to members of the scientific community is another problem in combating misinformation. A US survey conducted in March 2020 found that 6% thought the SARS-CoV-19 virus was accidentally developed in a laboratory, while 23% believed that it was developed intentionally (3).

Fake news travels six times faster than verified news

Distrust in science and misinformation on how to maintain physical, nutritional and health security have led to avoidable harm or death (4). An example of this is the new measles outbreak due to the fabricated publication about the measles, mumps and rubella vaccine where wrongful claims were made that vaccines cause autism, which have caused anti-vaccination movements. The danger of misinformation is apparent when not one person, but movements and activists start spreading false information. These conspiracies also have long-lasting effects since they tend to come in cycles, where people forget about it for a while, but get picked up again after a few years.

Psychological factors can also contribute to belief in misinformation. *"Individuals are more likely to accept information that appears to follow a logical narrative, that comes from a source they perceive to be "credible," that is consistent with their preexisting values and beliefs, and that seems to be something other people believe."* (1). People also tend to selectively expose themselves to information that lines up with their beliefs, or interpret things by filtering information. As a way of keeping their family and friends informed and comforting them during the pandemic, people are quicker to share unverified news which appeals more to them rather than information grounded by facts.

As a scientist, we should use our knowledge to protect people from false information by using effective science communication.

Science communication done right is the best way to tackle misinformation

What to do about misinformation?

1. Seek out information from trustworthy sources and verify the source. Verify multiple reliable sources before sharing through social media, and use your brain (be critical). Fake news posts often make use of:

- vague, untraceable sources such as 'doctor friend of a friend' or 'scientists say'
- poor language, grammar, spelling or punctuation mistakes,
- messages that trigger strong emotions,
- misleading and fake social accounts, websites or images.

2. Make your friends and family, but also people outside of your personal bubble, aware and talk about difficult topics. Don't ignore difficult topics to avoid uncomfortable situations. A few tips on how to inform loved ones:

- Talk with empathy and try to understand them. Consider alternative perspectives to better understand where someone has received their information. Those who are anxious and feel powerless are often drawn to conspiracy theories. It's important to remember this when trying to talk to them.



- Create a space for discussion, rather than telling someone they're wrong.
- Give multiple, understandable examples or specific cases to inform them.
- Offer them tools (such as reliable websites or tips above in point 1) to fact-check what they see.
- If you see a false post on social media from someone you know, report the post. Recent changes in social media platforms make it possible to tag/remove false posts.
- If you are comfortable, you can take up a conversation privately with that person to talk about their motives, which is more likely to work than public shaming.
- Last but not least, make your research accessible/understandable to everyone and share it. Be a resource for others. Science communication done right is the best way to tackle misinformation and conspiracies in science.

Written by Hava Izci

Edited by Donya Pakravan, Simone Marcigaglia & Matthias Koch



DOING A PHD IN THE STONE AGE



Sebastian Haesler is group leader at NeuroElectronics Research Flanders (NERF). He did his PhD at the Max-Planck-Institute for Molecular Genetics in Berlin, Germany and postdoctoral work at the Center for Brain Science at Harvard University, with support from the Human Frontiers Science Program. In 2013 he started his position at NERF and as an Assistant Professor at the Department of Neuroscience of KU Leuven. Since 2015 he also serves as Director of NERF. His lab combines systems neuroscience research and collaborative neuroengineering to reveal mechanistic principles of brain function and to derive new technologies which will ultimately find their use in research and clinical applications.

How would you describe your experience as a PhD student?

Before starting my PhD I had completed a masters degree in agriculture, with a specific focus on quantitative plant genetics. During my masters studies, I realized that I got more excited about biomedical research than plant research. Hence for my PhD I moved to the Max-Planck-Institute for Molecular Genetics in Berlin with the ambition of working on human genetics.

After I arrived, I quickly realized that I wanted to go beyond creating lists of genes involved in mental disorders to work towards understanding why and how specific genes affect brain function. Hence, I turned to the study of one particular gene, which is involved in speech and language and studied it in the zebra finch songbird model. I was extremely lucky with my supervisor Prof. Constance Scharff who had just moved from Rockefeller University to Berlin.

90% of my scientific training happened during my PhD

She invested a lot of time in training me and provided me with a foundation in nearly all domains that are critical for a science career (critical thinking, writing, presenting, risk-taking, etc.). I would say that 90% of my scientific training happened during my PhD. My PhD was very productive, and I was really passionate about my research. Outside the lab, my PhD colleagues and I enjoyed the busy nightlife in Berlin – all in all I really had a fantastic time during my PhD, which is why I (somewhat naively) thought I can embark on a career in science.

Are there things you are specifically proud of, or things that you would approach differently in hindsight?

In my PhD research, I did the first-ever gene manipulation in the songbird model and demonstrated that the FoxP2 gene, which causes speech impairment when mutated in humans, causes song impairments, when knocked down in songbirds. I guess for some people in the field, that was too much novelty and my studies received quite some scepticism.

A particularly proud scientific moment came years later, when one of the leading scientists in the field published a study in a major journal, which directly built on my PhD findings. It is typically not until some time your publication that you come to appreciate the real impact of your discoveries. Often, scientists are focused too much on the short-term goal of publishing in a high-impact journal, but you will get the highest recognition if you do really foundational work. The other extremely proud scientific moment was when the first paper from my own team was published. Contrary to my PhD, my postdoc time was rather difficult. I had chosen a lab, with a young PI who shared my interests and also shared my scientific vision. However, what I could not have easily considered upfront but found out after moving to the US was that our ways of working were very incompatible. I am a little extroverted, I like to talk and discuss ideas and I have no problem changing my views, based on feedback.

You will get the highest recognition if you do really foundational work

My postdoc advisor was rather introverted, whenever he said something, he had thought about it a lot. It was also difficult to read his mind, his feedback was never explicit. Another difficulty I experienced was that the level of excellence among postdocs was at an entirely different level than during my PhD at a Max-Planck-Institute. Being surrounded by some of the best young researchers in the world really intimidated me at first and it took me a while to regain my self confidence. In hindsight, I am not sure if I could have done much differently, since the difficult experience simply uncovered some of my own weaknesses and eventually helped me overcome them and become a better scientist (and hopefully a better mentor).

Which advice(s) or tips would you give us PhDs?

My first and foremost advice to PhD students is: enjoy doing science! Train your creativity, question boundaries in your field! Is the standard way of thinking/doing the standard experiment plausible?

Big discoveries often come from people who experienced cross-fertilization from different areas of expertise

Does it really address the big questions? What are the big questions? What methodological innovation needs to happen to ultimately address the big questions? Spend time to look beyond your direct project. Big discoveries often come from people who experienced cross-fertilization from different areas of expertise. Take ownership of your PhD. It's your life, your time spent in the lab! Find out what you like and what you dislike about academic research. At the abstract level it sounds always great to be a professor, but it is also a job with pros and cons like any other job. If you are serious about a career in academic science prepare for a global career and check if that is compatible with other aspects of your life, e.g. a partner. Finally, be a nice person, there is no reason not to be, and it makes a huge difference if at least we all try.

Is there life after a PhD?

In this section, we interview former PhD students about the value of their PhD and which career moves they made later on.



Joachim Morrens completed his PhD at NERF (NeuroElectronics Research Flanders) after four years in the lab of Sebastian Haesler. He received an FWO scholarship to work on the contribution of dopamine neurons on learning in mice. Soon after graduation, he found a position as a data scientist at Janssen Belgium, where he has been working for the past two years.

What did you enjoy the most during your PhD?

First of all, the atmosphere: At NERF/IMEC where I was based, I built a lot of personal contacts with people across the institute and I made a lot of friends also outside of my lab. Hanging out and partying with friends who are going through the same is essential to keep your mental sanity when things get tough (and a PhD often does get very tough!). Secondly, the 'freedom' of doing what you want: waking up and having the opportunity to try to get an answer on the questions that enter your mind.

Why did you decide to leave academia and go for your current job?

To be honest, I already felt quite early in my PhD that the academic life - in the long run - was not for me. I guess I did not like the prospect of instability - always having to fight for new grants to survive, and potentially having to move from country to country to build a career. Also, I found academics to work really hard for a relatively modest salary (relative to their working hours). Lastly, there were too many parts of the daily job I did not really enjoy, so I had plenty of reasons why I decided to leave academia.

Which steps did you have to take to achieve this?

As a first step, I had to identify which direction I wanted to go. In my case, that implied working as a statistician or data scientist in the industry given that I really enjoyed the analytics part of my PhD project. However, I realized that the skills and knowledge I had at that time were not enough to really apply for such a job in the industry where I'd be competing with plenty of other people who did have the required background. In order to make up for that, I decided to follow a series of additional courses from the masters of statistics at the same time as my PhD. At times, it was very hard to combine the two, but I felt like I had no other choice. But I'm glad I did it, it really paid off!

What are your main tasks in your current job?

I am working as a statistician/data scientist in the market access department of Janssen EMEA. In our department we have to provide support to local (country-level) divisions who submit dossiers to local authorities (regulators, payers) with the aim of agreeing on a value-based price and reimbursement for our new innovative treatments that come to the market.

I found academics to work really hard for a modest salary

When these dossiers are compiled, several pieces of evidence are required and we do all the statistical analyses on real-world data as well as clinical studies to provide that evidence. Of course, authorities often challenge us and if it's the analyses they are challenging, or if they want to see more evidence or different analyses, it's also us doing extra work to try and provide the necessary evidence showing the value of our treatments. So our job as statisticians is really important - without data, no evidence, and without us, no data. :-)

Which skills that you gained during your PhD proved to be useful?

Contrary to the regulatory approval of drugs (think of the FDA in the US and EMA in Europe), the aspect of market access (which happens mostly at country level) is in a way much more subjective and a lot of it involves storytelling and building an argument. The latter is something I was well trained during my PhD.

In my field, in order to get published in a top journal, the storytelling and the argumentation had to be very refined, so my training was not lacking a lot in that aspect.

As statisticians, we do not simply execute the analyses which we are told to do, we also very much think along and try to come up with the most convincing analyses from a storytelling perspective. I am sure that the education and experience I had during my PhD helps me a lot in this aspect of my job.

In addition to that, I would say the writing skills acquired during my PhD are also a big plus. Relatively often, we do have to contribute to reports which are to be prepared under tight deadlines, and being comfortable at writing and compiling everything in a logically structured way is essential to succeed in this.

What would you give as advice to PhD students?

If you want to continue in academia, great, give it all and go for that - I am 100% convinced that life in academia can be amazing when you have the personality and passion for it.

However, if you feel you do not want to continue in academia, try to identify for yourself what you would like to do instead and try to be very specific here. If you do not find an immediate answer, go to some job fairs (there are plenty of those) to get some inspiration. Once you have identified the job you would like to do, browse through LinkedIn on a daily basis as if you are reading the newspaper and find the skills which are required for the job. If there's a couple of jobs you might want to do, try to find what they have in common in terms of skills you are missing.

 Go and talk to them, get some advice

Then, once you have gone through that process, make a plan of what you can do to acquire those skills which could for instance imply embarking on some extra courses. Also, it never hurts to find some people from the industry where you want to go to and talk to them, get some advice, and do some networking on the side.

Then finally, once you are a couple of months into the last year of your PhD, start applying for jobs (but be specific, and don't apply to too many of them because they are often time consuming and mentally consuming as well).

 The earlier you start, the more opportunities you will find

I know that this might sound like you should start to apply early - but this is really my recommendation: the earlier you start, the more opportunities you will find and the better of an offer you will end up with.

Also, if you end up finding an opportunity before you have actually finished your PhD, there is almost always a way to negotiate the start date and several places will allow you to start before you have formally obtained your PhD. And this last point brings me to a final piece of advice: always, always (I repeat: always) make sure that you obtain that PhD degree. I am sure that you can easily find a job without finally obtaining your PhD diploma, but if you are interested in making further career progression after your first position in industry, not having a PhD, MBA or MD degree is really a disadvantage.



PhD survival tips

Let's make networking work!

We all know that feeling (from back in the good old days when conferences were live): you are visiting a conference, this time without your favorite colleagues. You think about hiding in the toilets during breaks, or just focusing on the food... but then you get yourself together: this is the ideal moment for networking with potential collaborators! You feel slightly out of place while drinking your motivational coffee during the first coffee break, alone. After putting your name tag obviously visible around your neck and an approachable smile on your face, you scan the area for potential people to talk to. You rehearse your small talk topics, breath in and out and join another lost visitor at his private coffee table. Awkward silence and smiling. Small talk that ends too soon. Awkward silence again. You look for a way out (abort mission!), suddenly showing extreme interest for the snacks on the table. You subtly sneak away, until you are saved by the next-session-bell. That went well...

Luckily for all of us, such awkwardness can be avoided: just read these survival tips and tricks and become a collaborator-magnet!

1. Be prepared

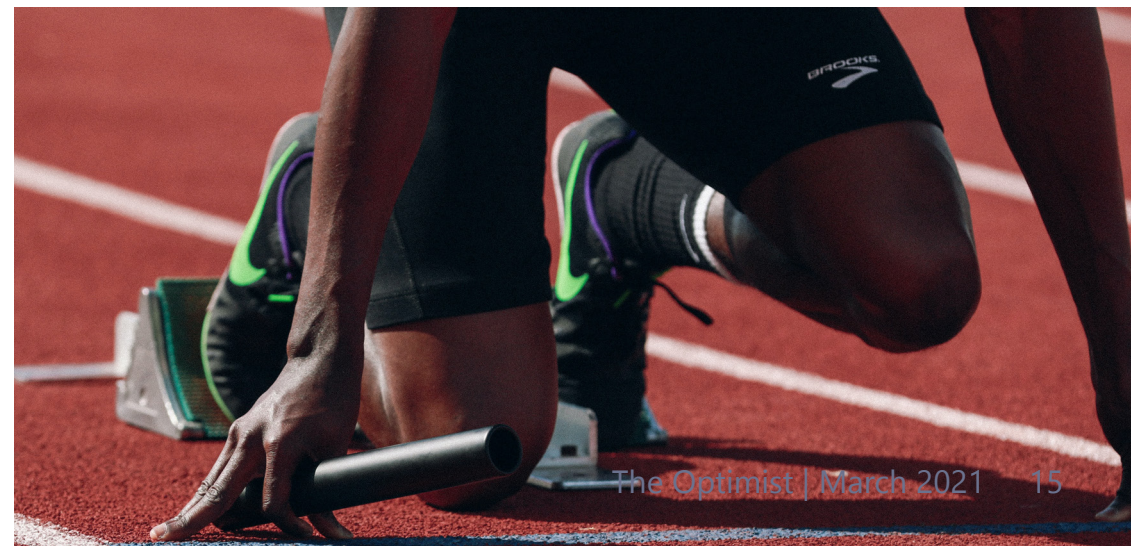
To make the conversation actually useful, you should have your goal in mind. Which topics would you like to talk about? Are there people you really want to meet? Maybe you vaguely know people that can be your buddy? Checking the list of attendees/abstracts can be very helpful in the search for potential collaborators.

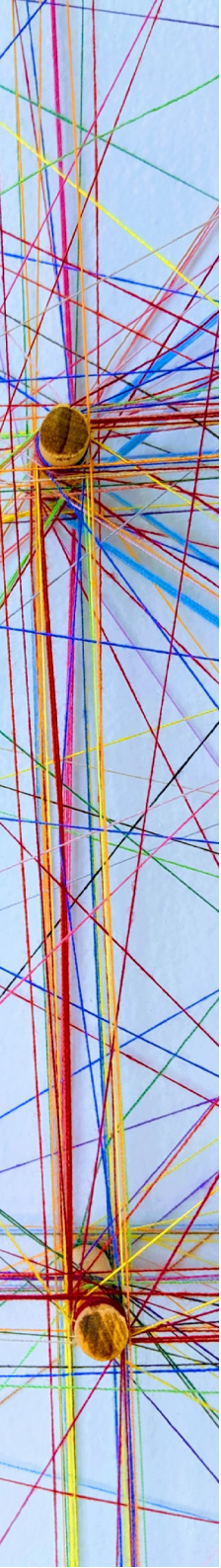
2. Find the easy way in

Step 1 is usually the hardest: how to approach people to start a conversation? Find the easy way in: join an ongoing group conversation, try to find a buddy, get introduced by another person, look for the people that show interest in connecting and use conversational ice breakers (like the lunch you are queuing for, a poster you are viewing, give a compliment).

3. Know your worth

Prepare your elevator pitch. Explain who you are, what you do and why it is important without getting lost in the details. Very annoying to be stuck with someone talking hours about fruit flies, or even worse, about all his/her publications. Don't be afraid to be self-confident, but avoid getting selfish.





4. Be open(-minded)

To keep a conversation interesting for both parties, speaking- and listening-time should be equally distributed. Ask questions or advice to give the other person the chance to speak, but make sure to tell your story too. Avoid judging or talking negatively, but be open-minded about various topics.

5. Body language

While hiding behind your coffee is an easy go-to, it's very important to look approachable. Don't cross your arms in front of your chest, but walk around and make eye contact. During a conversation, nodding your head shows you are actually listening. Finally, smile!

6. Follow-up

Starting the conversation is only half of the work, as you would like to sustain and solidify the connection (now or at a later time point). A business card is an easy way to be remembered after the conference, while an email confirming the connection is a direct step towards follow-up. Pro-tip: add a picture of yourself to your poster or business card. Visual memories work best.



7. Share your spark

After 3 days of conference, most people are overwhelmed by all the social input. To be remembered, you should thus stand out of this crowd. Adding a personal touch to the conversation will do the job, for example slipping in some information about yourself (e.g. hobbies), making a joke... Maybe add a tagline in your presentation or poster, or a quote on your business card.

Written by Laurien Van Dyck

News you may have missed

We all know how depressing reading the news can get, especially if you are already having a tough time at work. But do not despair! We've navigated through all that negativity to come up with a selection of articles that are guaranteed to lift your spirits!

Solar electricity is cheaper than ever

A recent report from Our World in Data (1) highlights the staggering decline in costs required to obtain electricity from renewable sources. The trend is shown to follow learning curves, where a doubling of the installed cumulative capacity corresponds to a reduction of the cost by the same fraction. This effect is particularly noticeable in solar energy, which got 89% cheaper over the past 10 years, but it applies equally well to wind (70% cheaper) and other renewable sources. Fossil fuel costs, on the other hand, have remained unchanged, which will hopefully result in a steady transition from coal to renewable power plants.



Slashing seabird deaths with colour

The recently passed regulation requiring longline fisheries in Namibia to implement bird-saving lines (BSLs) has prompted an in-depth study into their actual effect on wildlife (2). BSLs are nothing more than colourful streamers that act as visual deterrents for all marine species that are often caught and killed unintentionally (bycatch). Seabirds (albatrosses in particular) are one of the most threatened groups of birds in one of many

associations around the world that fights for their preservation. In this study, the Royal Society for the Protection of Birds has recorded a stunning 98.4% drop in bycatch in the year following the implementation of the new law, which shows that simple regulation can go a long way in the preservation of at-risk species.

On the way to the 10-minute charging electric car

A study by the Pennsylvania State University recently published in Nature Energy could be the stepping stone to a much wider adoption of electric cars[3]. The described battery features lithium iron phosphate cathodes and promises to be a safe, cobalt-free improvement on today's technology. In the study, the use of graphite in a blade battery design with a self-heating configuration, shows fast (10-minute) charging capabilities with high performance and long lifetime (2 million miles). Eventually, this achievement is expected to increase the widespread use of electric cars by eliminating the dreaded range anxiety.



Sources

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Hard shell tacos with chicken



Chef's corner

Preparation time: <20 mins | Serves 2

Ingredients

For the chicken:

- 2 chicken breasts
- Taco spice mix

For the pico de gallo:

- 15 cherry tomatoes or 2 tomatoes
- 1 (red) onion
- 1 garlic clove
- Handful of fresh coriander
- Lime juice
- Bit of ground cumin
- Pepper and salt to taste

For the guac:

- 2 avocados
- 1 (red) onion
- Bit of ground cumin
- Pepper and salt
- Lime juice

Toppings (essential)

- Sour cream
- Pickled jalapenos
- Hard shell tacos



Preparation

- 👉 Preheat the oven to 180 degrees for the taco shells
- 👉 Cook the chicken (in small pieces) topped with a bit of the taco spice mix in a bit of oil.
- 👉 For the pico de gallo: chop the cherry tomatoes, onion, coriander and add spices and lime.
- 👉 For the guacamole: chop the ingredients for the guacamole and mix with the spices and lime.
- 👉 Bake the hard shell tacos in the oven for 5 minutes
- 👉 Assemble the hard shell tacos fresh out of the oven: chicken, pico de gallo, guac, sour cream and pickled jalapenos.

Acrylic Pouring

COVID-19 sucks, right?! However, I got something fun to try for you: Acrylic Pouring. You might have seen it on social media and it literally is therapy for the soul. All you need is available at your local 'Action' supermarket. For starters I suggest to get 2-3 canvas (maybe start small like 20 x 20 cm), 3-4 acrylic colors you like, 1 x pouring medium, and optional silicone oil (literally, the silicone oil for your bike chain will do). Cover your workspace:

it will get messy!

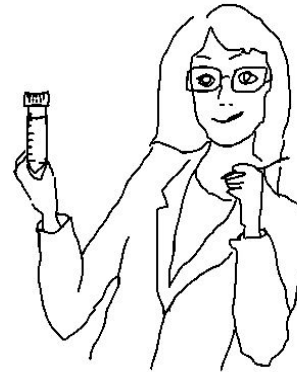
Let's get started

- Mix separately for each color 1:1 acrylic paint and pouring medium and stir until homogenous. Tip: 50 mL Falcon tubes are ideal :). Add a few drops silicone oil (magic number: 3) to create gorgeous cells and stir a bit. No need to add silicone to your base colors (e.g. white or black). The overall consistency of the paint-mix should be like molten ice cream.
- In a separate cup (Tip: empty, clean yoghurt cup) you layer the paint just as you wish. You can either let it flow slowly along the wall to create distinct layers or you literally just let each new layer drip over the other one. It might require a few tries to get the right estimation of how much paint to apply but the rule is: just do it! There are no mistakes, just happy little accidents!



HEY, IT'S OKAY TO...

Science is serious business,
but we may share similar frustrations



...suffer from covid cabin fever

...have moved to a new building 1 month ago but still find yourself taking an awkward turn towards your old building

...leave your camera on during a virtual meeting and have people across the Atlantic view your empty chair and office while you sleep

*...receive a message from a colleague reading "I F***** HATE SCIENCE" while screen sharing during your lab meeting*

...kick the vending machine because Kinder Buenos are out of stock and all there is left are healthy granola bars (we feel you!)

...hide under a table when lab coat checks are taking place (we do not encourage this!)

- Put your canvas in an elevated, even position (Tip: used tea light).
- You can pour the prepared mix either in any way you like over the canvas ('dirty pour'), or if you slowly layered it along the wall you can pour it now in small circles in the middle ('ring pour'). Or maybe a 'flip cup' might be perfect: put your canvas upside down on your cup, press together while you turn both around, wait a minute and then release the cup to let the paint flow.
- Tilt your canvas so that the color gets evenly distributed, also over the edges (in a circle, left-to-right, whatever you feel like) and voila!
- Leave it to dry (about 48 h) and optionally seal with a mat or glossy varnish.

If you want to find out more about other techniques, google 'Dutch pour' or 'swiping technique'. ENJOY!

By Yvonne E. Klingl

Instagram @ [ywenyvn.art](https://www.instagram.com/ywenyvn.art)

Thank you

Main topic

Hava Izci

PI interview

Sebastian Haesler

Is there life after a PhD

Joachim Morrens

PhD survival tips

Laurien Van Dyck

Chef's corner

Hava Izci

Fun/creativity

Yvonne Klingl

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Main topic

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