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bcn SCHOOL FOR BEHAVIOURAL AND COGNITIVE NEUROSCIENCES

# magazine 137

MAY 2026

## Influencing The Brain

university of groningen

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FROM THE BOARD ROOM

# The profile of BCN

BCN exists by the grace of her members, their research and teaching. Having been a member of BCN for a very many years, I have often experienced the director and the board to act at some distance from its members, as board members can only directly represent part of the basis of the school. For that reason, the current board and director have initiated a series of actions to improve the inclusion of and communication with our members. One of these was the organisation of a bi-annual discussion session with the BCN members at each faculty. In some of these meetings some members questioned whether the profile of BCN covers their work adequately or rather whether their research takes place actually only at the periphery of our school. This profile was therefore one of the issues discussed at the last retreat of the board and director of our school. There we discussed the intended scope of BCN, its history and its name, as well the involvement of researchers. I will elaborate on these three topics below.

Let's start very briefly with some history. Having been a member since the establishment of the school, my memory and experience of the past may be of some use (one of the few advantages of getting older), before the roots of BCN get lost in time. BCN was originally created to answer the request of the central government to establish and fund research schools in order to organize broader research networks each with their own unique interdisciplinary focus. Initially, the research school Behaviour, Cognition, and Neuroscience was established within the University of Groningen, based on the idea that all these three topics have strong connections to each other and the brain. In the selection process, as there was funding for just a limited number of such schools, the name was changed into the current one, Behavioural and Cognitive Neurosciences, answering a request for a clearer focus and as a strategic choice to have the united spirit of BCN reflected in the name. This change did not have any repercussions for its focus in daily life. For example, in my own faculty, FSE, strong support for BCN came among others from Behavioural Biology and Behavioural Ecologists, and from the UMCG from Biological Psychiatry, of which most of their work at that time did not directly involve the study of the brain itself.

In due time, with new governments, the idea of research schools was abandoned. And with it, its funding. Next, graduate schools were implemented. Although BCN had already a unique and very strong interdisciplinary PhD educational program in place, the Deans of the faculties wanted to each have their own graduate school. Nevertheless, BCN survived well for two reasons: First, it was the only research school that was organized within the same university, and not between universities, which greatly facilitated connections between researchers of different disciplines, unhindered by geographical distances. And although administrative rules would not facilitate its continuation, the school was (and is!) strongly supported from bottom up by researchers themselves that felt inspired by interdisciplinary approaches. It is almost impossible to know what kind of research is conducted by the many UG researchers outside your institute or faculty, and it was (and is) much appreciated that BCN very much facilitated interfaculty contacts. Second, the well-functioning PhD programme was highly appreciated by both participating staff and students, so that the faculties that participated in BCN were willing to outsource part of their education to BCN and pay for its costs.

However, these developments led to two changes within BCN: first, the school became predominantly focused on education. Second, the UMCG became a major funding source for the school. This was and is gratefully acknowledged, but led to the impression that neuroscience and its clinical applications became a major focus of BCN. Also because the director was and is appointed by the UMCG, many meetings are taking place in the UMCG being provided with relatively low costs, UMCG provides the largest proportion of PhD students, and the current name of the school seems to suggest a focus on the N of BCN (further reflected in bold type in our logo).

This perception led the board and director to take a step back and discuss what actually the function of BCN should be, and thereby its profile, name, logo, mission and vision. What we primarily want is to foster an active and lively interdisciplinary community of researchers and teachers on neuroscience, using the label neuroscience in its broad sense. As behaviour (often controlled by cognitive processes) and cognition (often studied by behavioral expressions) are both the result of processes in the brain, studying the B or C is equally relevant for neuroscience as studying the N itself. Knowledge of one of them can guide research on the other. In addition, we support approaches from both a mechanistic, functional and evolutionary point of view. Evolution has shaped the (limitations and adaptive value of the) current mechanisms underlying B,C and N, while the mechanisms may provide constraints on evolutionary plasticity and therefore the adaptive capacity of animals, including ourselves. As a consequence our research is relevant for both brain health (in humans but also other zoological organisms including welfare related issues in animal husbandry) and planetary health.

The above led to several action points by the board and director. 1. The adjustment of our mission and vision, which can be found on our website. 2. The improvement of two-way communication with our members about policy matters and our mutual perspectives on the field. 3. A strengthening of the research leg of BCN, especially the interdisciplinary collaboration between all combinations of the three fields. This would also create a better balance between research and education, since currently we are mostly known for our excellent education program. For the last two points we have initiated bi-annual meetings per faculty between the director and the board of BCN with the BCN researchers, the establishment of a research advisory committee with a representative of each institute participating in BCN, as well as a postdoc committee, and we are exploring possibilities for increasing funding for our interdisciplinary research.

Finally, a word on the place of BCN in the organization of the University, as this may be confusing to members new to BCN or who are part of faculties who underwent major reorganization. BCN is an organization independent from the board of the university and as such differs from the 4 more recently established schools that also have a somewhat different profile: these function as an interface between the university and societal organisations, with focus on direct social relevance of research, whereas BCN also covers fundamental research. Further, it is an additional independent unifying layer of organization that connects research institutes, and therefore membership of BCN does not at all compete with membership of other organizational units such as research institutes or research groups. BCN membership does not bring financial costs with it for individual members, but provides access to its events and members can be asked to contribute in kind to research or educational activities. PhD candidates can choose among different graduate schools, including BCN.

With this, I hope to have given some insight on how the director and board strive to clarify and stimulate the role of BCN in fueling a lively academic and interdisciplinary research community. We all have much too little time these days to explore with colleagues the different angles of approaches to our research, with our feet up on the table; BCN can play an important facilitating role in this.

- **BY TON GROOTHUIS, CHAIR BCN**
- **PHOTO BY ZHENYU ZHANG**

# WHAT NOW? LIFE AFTER THE DEFENCE

**ADITHYA SARMA**
*"My one true friend, sleep – The impact of social interactions on sleep, and consequences of sleep loss for memory"*

**On June 24th, 2025, Adithya (Adi) Sarma defended his PhD thesis titled "My one true friend, sleep – The impact of social interactions on sleep, and consequences of sleep loss for memory". In this interview, Adi talks about his research, his journey through the PhD, and how his choices have shaped his career path.**

## Looking Back & Reflecting

***First, I would like to congratulate you on not only finishing your PhD but doing so with the Cum Laude distinction! I am sure this journey holds many memories and challenges that we are excited to explore. But before we dive into the "fun" part of the interview, I would like to start by asking you for a general overview of your PhD project.***

Thank you!! It still feels slightly surreal to hear it phrased like that. Broadly speaking, my PhD explored the relationship between sleep, memory, and social context. I was interested in two connected questions. First, how does sleep deprivation affect social memory? And second, how do social interactions influence sleep itself?

In mice, I studied how sleep deprivation impacts hippocampal dependent memories, especially object location memory and long-term social recognition memory. One of the key insights was that not all sleep deprivation is equal. The method used to keep animals awake matters and different waking experiences produce different neural consequences. I also showed that a relatively short period of sleep deprivation after a social experience was enough to impair long term social memory, and that these memories could be restored through targeted interventions. That part of the work focused on understanding how vulnerable memory engrams are to disrupted sleep.

In parallel, I worked with fruit flies to examine the other side of the equation. Instead of asking what sleep loss does to memory, I asked how social context shapes sleep.

There, we discovered that flies housed in groups actively wake each other up through specific interactions, which led to reduced sleep. That finding for me challenges the idea that sleep is purely an internally regulated state and maybe suggests that social environment can be embedded within sleep regulation itself.

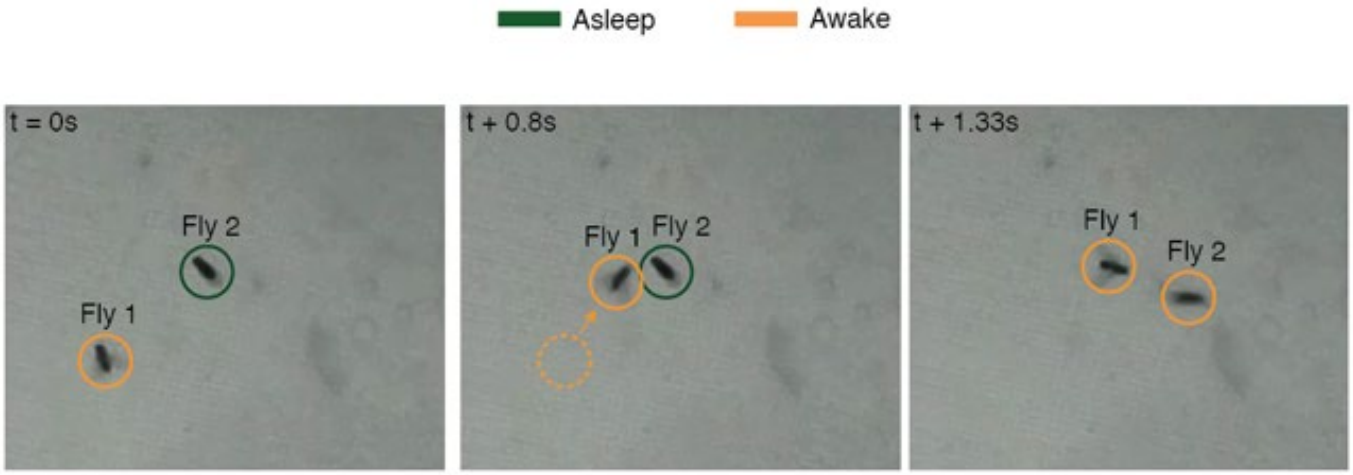
So overall, my thesis tried to connect sleep and social context across species with memory embedded in between the two. The common thread was that sleep is not passive, and neither is social experience. Both actively shape how memories are formed, stabilized, and expressed.

***Reflecting on your project, were there any surprising findings? Any that may have led to shifting the initial project towards a different direction?***

Omg so many! But my favorite one came from the fruit fly work. We originally set out to examine how living in a group influences sleep in fruit flies. A reasonable assumption based on the consequences of isolation in other species, is that being alone would be disruptive and perhaps reduce sleep. Instead, we observed quite the opposite. Flies housed in groups consistently slept less than flies kept in isolation. Importantly, this was not simply because there were more individuals moving around in the arena. Using a custom tracking pipeline (see picture) that we developed, we could look closely at individual interactions between these flies and found that certain encounters between flies were followed almost immediately by awakenings. These were specific behavioural events that reliably disrupted sleep, which we termed wake-inducing interactions. In other words, flies were actively waking each other up!!

This finding forced us to think more carefully about what sleep looks like in a social environment. Sleep is often studied in isolation under tightly controlled laboratory conditions. But in natural settings, animals rarely exist alone. For a species that lives in groups, social presence is not just background noise. It is part of the environment that shapes behavioural decisions, including when to sleep and wake up. More broadly, this shifted the conceptual framing of the project. Rather than viewing sleep as a purely internally regulated process occasionally disturbed by social factors, it became clear that social context might be embedded in sleep regulation itself. That realization changed how I approached the rest of the analysis and the way I think about what the term “adequate sleep” means to different organisms.

This picture depicts the social interaction between two flies using the pipeline mentioned. Over the course of just a few seconds, two flies are seen to interact with one another. At time point zero of measurements (t=0) Fly 2 was sleeping (wings tucked in) - the fly is considered to be sleeping if it stays inactive for more than 5min (prior to measurements). In the second panel, Fly 1 flew over to Fly 2 to wake it up (wings of Fly 1 are wide and moving); Fly 2 is then captured mid movement at t=1.33s. This phenomenon is termed as wake-inducing social interactions.




Wake-inducing interaction

***For as long as we've been alive, we sleep (almost) every day. You would think by now we would have mastered the art of good and healthy sleeping habits! What do you think is a common misconception about sleep in today's society? And what would be your number one tip/advice that everyone should be implementing in their lives?***

A common misconception is that a single night of poor sleep is harmless as long as you recover it later. Many people believe that an all-nighter can simply be compensated for the next day. Biologically, that is not how it works. Or at least that is not how it works in mice. Sleep is not just about total duration. Timing matters. In our work with mice, we showed that even a relatively short period of sleep deprivation immediately after a social experience was enough to impair long term social recognition memory. The memory was formed, but it became inaccessible. That tells us that sleep right after learning is critical for proper consolidation and later access. More broadly, sleep is not just passive rest but an active biological process. If you interrupt it at the wrong time, the consequences can be long-lasting. So maybe my one piece of serious advice would be: make sure you go to sleep right after you meet someone? Or don't if you don't want to remember the person.

***What aspects of your personal life and also work life kept you motivated, especially during the last year of your PhD?***

On the work front, my final year was the moment when many of the major experiments finally started to reveal their results. As my PI would say, this was the cream of the cake. It felt like I was closing loops that had opened in the very first year of my PhD. Many of the experiments were designed with that long arc in mind. So, when the data began to come together, it was incredibly motivating. At the same time, there was always uncertainty. You invest years into an idea, and you hope it holds. We unapologetically engaged in the very unscientific tradition in the lab of knocking on wood before every important result came in (it worked 50% of the time). Everyone participated haha. I guess it was our small way of acknowledging that science is rigorous but also humbling.

On a personal level, I genuinely do not think I could have managed that year without my partner's support. She understood how much was happening at once. Writing the thesis, finishing experiments, responding to reviewers. It was a lot. She made sure that home felt calm and warm, even when work felt intense. And yes, that often included carrot cake waiting at the table! Those small things mattered more than I can probably explain.

*"Many people believe that an all-nighter can simply be compensated for the next day. Biologically, that is not how it works."*

***If you could go back in time, would you change your project or trajectory in any way?***

I am not really sure if it sounds cliché, but I would never change anything! The messy chaos that a PhD usually is was thoroughly rewarding in every single way. I was very lucky to be in the most supportive environment I could have possibly imagined, both with my colleagues and with my PIs. Every decision made and every experiment done, no matter where it led, was equally rewarding and frustrating. I honestly think I would be happy to go through the whole shenanigans all over again. They were part of the journey, and without them it would not have been the same experience!

## Life After PhD

***Now focusing on what you have been up to since last June, how did you feel the moment you finished your PhD?***

I am pretty sure I did not process it for at least a month, and maybe I still have not fully processed it yet. What I did feel though, was a sense of completion. Not just of the PhD, but of my journey in Groningen. I came here as a young master's student. Somewhere along the way, life turned into a massive roller coaster, especially with my health. To then come back and finish what I had once set out to do meant more to me than I can properly put into words. For me, the PhD and the thesis that came with it felt like a thank you to the city. To all its wonderful people. To the friends, mentors, and family who stood by me and made it possible to reach that milestone. On

the day of the defense, it genuinely did not feel like an individual achievement. It felt like a win for all of us.

***And looking at the present, what have you been working on?***

I decided to pursue a post doc and headed way down to Nijmegen to start a new chapter. At the moment, I am working in Dr. Lisa Genzel's lab here in Nijmegen. My focus still remains memory, but now primarily semantic-like memories. Specifically, I am interested in how repeated experiences become structured knowledge over time rather than remaining isolated events. The idea is to examine how information is abstracted across experiences and stabilized in the brain. At the same time, we label and manipulate memory encoding neuronal ensembles using chemogenetic approaches to track how these ensembles evolve across brain regions during learning. In many ways, this feels like a natural continuation of my PhD. I am still asking questions about memory, but from a systems level perspective. Instead of asking how memories function as single episodic events, I am asking how the brain builds stable knowledge in the first place and how those traces evolve across networks.

***How did you go about finding this position? Was this something you already had in mind during the PhD? And were there any challenges with moving to a new city and starting "all over again"?***

I did plan to stay in the broader field of memory, especially social memories, and ideally continue working with both mice and fruit flies. I still have ideas that I would like to explore using two model systems in tandem. I think there is real value in dissecting conserved circuit principles across species. But I also realized that some of those ideas need more time to mature. At the same time, I felt the need to step outside my PhD environment and see how other labs function. I wanted to expand my technical repertoire, especially in the field of memory engrams and systems consolidation. During my PhD I focused heavily on hippocampal dependent memories. Now I wanted to understand how memory traces evolve at a systems level. So, I actively searched for positions across the field. I used the academic network I had already built and reached out to people directly. I also regularly checked platforms like the FENS job market and the Dutch Neurofederatie listings to narrow down roles that aligned with my interests. That combination made the process more focused and manageable, and in the end, I actually found this position through the FENS listing. In the current political climate, especially as an international researcher, it felt important to think carefully about where opportunities were realistically available. I wanted something new enough to challenge me, but familiar enough to provide stability. This position felt like the right balance.

> *"For me, the PhD and the thesis that came with it felt like a thank you to the city. To all its wonderful people. To the friends, mentors, and family who stood by me and made it possible to reach that milestone."*

Moving to a new city always comes with challenges. You rebuild routines. You rebuild networks. You establish yourself again in a new lab culture. Starting over forces you out of your comfort zone. It reminds you what it feels like to be new somewhere. That can be uncomfortable, but it is also important for growth. After spending close to nine years in Groningen, it genuinely felt like home. Leaving that comfort was not easy. You leave behind familiar streets, favourite cafes, the people who know your story. You have to build small things again from scratch. New colleagues and new coffee places. And yes, the biggest challenge might actually be finding your favourite supermarket all over again. But those small rebuilding steps are also what slowly turn a new place into home!

***We very often hear about people leaving academia after their PhD experience, but it is refreshing to learn that so far all of our interviewees have gone to pursue a post-doc. Nevertheless, I can imagine this decision crosses everyone's minds at some point, so I always ask this question: Before making the decision to start the post-doc, did you think about leaving academia to pursue a different path? And if so, what made you change your mind and stay?***

I did not, actually. I think I always wanted to stay in academia, with all its faults and positives. I enjoy the full process from writing grants to supervision to writing papers. Coming up with ideas and then testing them and even the slow parts of reading and refining arguments. There is something deeply satisfying about building a question from scratch and following it through. That does not mean I am unaware of the challenges. Academia

can be unstable, and it can be competitive. But for me, the intellectual freedom outweighs those uncertainties. I like that my job revolves around curiosity so the decision to stay did not feel dramatic. It felt consistent with how I like to think.

> *"There is something deeply satisfying about building a question from scratch and following it through (...) Academia can be unstable, and it can be competitive. But for me, the intellectual freedom outweighs those uncertainties."*

***How does the day-to-day life in your current position compare to that in your PhD?***

In some ways, it is more freeing. You no longer have a thesis hanging over your head and there is no single document that defines the end point. That removes a very specific kind of pressure that follows you throughout the PhD. At the same time, there is also something slightly existential about it. There is no clear finish line, and it becomes less about completing a degree and more about sustaining a career. You think about grants, funding cycles, and how to build something that lasts. A lot of it depends on timing, strategy, and yes, a lot of luck!! What I do appreciate is that I can enjoy science more for what it is. I am not constantly thinking about thesis chapters, but I can shape ideas more freely and take intellectual risks without the immediate shadow of a deadline. It also feels like a transition phase. During the PhD you are training and refining your skills, but as a post doc you are expected to define direction. You supervise more, think more strategically, and start asking yourself what kind of scientist you actually want to become. That shift feels both exciting and grounding at the same time. Overall, the role feels broader and less contained and there is more responsibility, but also more intellectual space to grow into it.

***It seems you are enjoying every bit of this chapter that quickly followed the graduation. As it is often said, do what you love and love what you do, and I have no doubt you truly are positively engaged with the scientific side of your life! However, I am always curious to ask: if you could pause your current position for 6 months, what would you focus on or what personal interests would you like to give more attention to?***

In hindsight, I probably should have taken a bit more rest between my PhD and my post doc. So, if I had six months now, I think I would slow down and give space to things that are not tied to deadlines or funding. I have always wanted to host small pop-up lunches. Cooking is something my partner and I genuinely enjoy. I love making food from my home in India, and I have always wanted to invite friends and meet new people simply to share food and conversation. I would also love to learn how to plate food properly. Not just tasty, but beautiful and intentional. I do not think I have really allowed myself the time to do that properly. I tend to get lost in my work, and weekends easily turn into extensions of the week. So maybe those six months would be about creating something joyful that has nothing to do with experiments. Just food, people, and a full table!

***And now looking ahead, where do you see yourself in the next 5 years?***

I think I honestly do still see myself in academia. I would like to be leading my own research group and hopefully moving toward a professorship, but only if I feel that I can contribute to changing how academia currently functions. I genuinely enjoy research, I enjoy thinking about questions for long stretches of time, and I enjoy building ideas with other people. That part I want to keep. What I do not want to inherit uncritically is the culture of constant hustle and pressure that pushes people to their limits. I see friends and colleagues leaving academia at a rapid rate, and the reasons are rarely about lack of passion for science. The problem is right in front of us. Yet change feels slow. We still normalize environments where people are constantly stretched thin and I think it is high time that we move away from that model and start embracing kindness and collaboration as core values rather than afterthoughts.

If we slowed down slightly and created healthier environments, we would probably generate more diverse and creative hypotheses. When people feel safe, seen, and supported, they think more freely. We also need to become better supervisors and better researchers in how we treat the next generation. It should not feel like survival training. It should feel like being invited into a community of thinkers.

> *"What I do not want to inherit uncritically is the culture of constant hustle and pressure that pushes people to their limits (...) The next generation of academics will inherit the environment we help create."*

I was fortunate to have the kindest supervisors, supportive staff, and a genuinely collaborative environment during my PhD. That shaped how I now supervise students. I try to lead with openness and respect, and to make sure people feel acknowledged. I hope to continue evolving in that direction. Research has never been an individual achievement, and it should never be treated as one. Change cannot just be symbolic. It is not about using more "we" than "I" in presentations. It is about meaningful structural choices. Who gets authorship? Who is acknowledged? Who is invited into discussions? Who feels safe speaking up? These are daily decisions that shape culture far more than slogans do. So, in five years, I hope I am still doing science that excites me, but also helping shape an academic environment that is kinder, more inclusive, and more sustainable. If I can contribute to that in a real way, not just in words but in practice, then it would feel meaningful.

***Having lived in Groningen and now Nijmegen, would you move again elsewhere in the Netherlands or even abroad?***

My partner has set her eyes on Utrecht or London, primarily because she wants access to all the vegan goodies. So, if Utrecht would like to offer me a tenure track position, they should let me know immediately. London is also welcome, preferably with accommodation included - but in all seriousness, I really do love many things about the Netherlands! The academic culture, the openness, the balance. I would be very happy to stay here if the right opportunity comes along. If not, the UK would probably be my next preference.

***Finally, do you have any words of advice for other PhD candidates?***

I think one of the most important things we can do in academia is to shift the culture toward kindness and teamwork. If you get the chance, supervise students. I always found that to be one of the most rewarding parts of my PhD. It is genuinely wonderful to see students grow through a project. You see how your guidance, whether in presentations, reports, or simply being patient, shapes their confidence. Sometimes kindness is what makes them fall in love with science. Treat students with respect. Set a tone that values collaboration over competition. The next generation of academics will inherit the environment we help create.

At the same time, do not lose yourself in your work. I genuinely love what I do, and that makes it easy to blur boundaries. Experiments spill into evenings. Writing spills into weekends. You convince yourself that just one more analysis will make the difference. And sometimes it does. But it should not come at the cost of everything else. Have people around you who remind you that there is a life outside the lab. Friends. Family. That balance is not a luxury, but it is a necessity.

***It has been a great pleasure to speak with Adithya Sarma and hear about his honest thoughts on academia and life beyond work! It is always refreshing to interview a previous PhD that has had such wonderful experiences and can pass on some wisdom and advice. We wish Adi a successful journey—be it in the Netherlands or the UK—the world is never too small for open-minded and motivated researchers alike!***

- **BY MARIA JOÃO CAIADO**
- **PHOTOS BY JUNFEI CAO & REIJER BOXEM**

IN FOCUS

# Where Is My Tail?

The sun is shining and spring is coming! On such days you may feel so exuberant that you would gladly wag everyone off the pavement with your metaphoric tail. On a different day, when your star paper has been rejected perhaps, you may feel so thoroughly defeated that you would prefer to retreat with your tail tucked firmly between your legs. At such moments, one cannot help but miss the presence of a robust, flexible, and expressive tail. The horse uses it to swat away flies, the cat relies on it for balance, the lizard can regenerate it, the howler monkey swings from it, and—provided we refrain from docking them—piglets possess charmingly curled ones. Yet... where is ours?

The vast majority of the animal kingdom appears to be blessed with this versatile appendage. Only the chimpanzee, the gorilla, the bonobo, the orangutan, and their close relatives, the so-called great apes, are tailless. We, of course, also belong to that group. What happened to our tail? Did we trap it in a door? Leave it behind under a passing train? Snag it on an inconvenient branch? An extra limb for grip and balance would surely be useful. Elegant, even. But alas, we must navigate life decidedly tail-free.

The loss of our tail likely occurred some 25 million years ago, when our lineage diverged from that of Old World monkeys, and the five tailless ape species shared a common ancestor. Even now, humans still briefly develop a tail: during the fifth week of embryonic development, a small tail containing approximately 10-12 vertebrae emerges, only to disappear again by the eighth week. On rare occasions, a child is born with a vestigial tail—a remnant of this embryonic structure—occurring in roughly 1 in 50,000 births. Typically, this anatomical curiosity is swiftly and discreetly addressed by a surgeon.

A group of geneticists at the Broad Institute of MIT and Harvard investigated what fifteen tailed monkey species possess that the six tailless ape species lack. Remarkably, they traced the difference to a single gene. This is noteworthy, as traits such as height, weight, and intelligence are generally influenced by dozens, if not hundreds, of genes. But here, the entire matter of the tail appears to hinge on just one: the TBXT gene.

Humans still carry the TBXT gene, although for some time it was assumed to be functionally irrelevant, dismissed as "junk DNA," a label frequently applied to genetic sequences whose purpose we do not yet fully understand. In our case, the TBXT gene no longer functions as it once did. In the common ancestor of the great apes, a so-called "jumping gene"—a mobile genetic element capable of relocating within the genome—inserted itself into the regulatory start region of TBXT. With that single insertion, the developmental programme for a tail was effectively disrupted. So to say: one leap, and gone was our tail. Ordinarily, such loss-of-function mutations are dealt with mercilessly by natural selection. No tail? Fewer offspring. Exit lineage.

Yet this time, matters unfolded differently. The TBXT gene is not solely concerned with tails; it also plays a role in the formation of the neural tube. At this point, I hope the neuroscientists in you perk up. The neural tube is the embryonic precursor of the central nervous system. Its lower portion develops into the spinal cord, while its

upper portion undergoes an intricate folding process to form the brain. The TBXT gene is involved in this critical developmental choreography. It is conceivable that the altered gene conferred some advantage, perhaps facilitating more efficient bipedal locomotion, perhaps influencing brain development. In other words, we may have surrendered our tail in exchange for something arguably more valuable: enhanced cognitive capacity. An evolutionary trade-off.

Should you feel that the bargain was not entirely fair, I regret to inform you that returning to the tail-bearing status is no longer an option. But let us indulge in speculation: if, in some distant future, ten additional IQ points could be gained by relinquishing another body part, which would you be prepared to sacrifice?

## Sources

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● BY IRIS SOMMER
● PHOTO BY MARJORY HARINGA

# SCIENCE ON WEDNESDAY

**If BCN neuroscience was captured in art, what would it look like? For Science on Wednesday, students of Art Academy Minerva created artwork about neuroscientific findings from BCN researchers. This project was made possible by Marie-José van Tol, Robert Schoevers, Iris Sommer, Franciska de Beer, Sander Martens, Dagmar den Boer, Misia Prycka, Marjolein Viersen, Jort Noorman, Mae Tol, and Mary-Ann van der Linden. Here we display two facts and accompanying artworks.**

**Are you interested in seeing more artwork?**
Every Wednesday, you will find a brain fact with artwork on the Science on Wednesday social media pages.

● BY SCIENCE ON WEDNESDAY TEAM


**Alcohol destroys more than you love. But not your English pronunciation.**
A study at Lowlands showed that 80 festivalgoers started to speak poorer Dutch after drinking some glasses of alcohol. Interestingly, the alcohol did not affect their English pronunciation.

Artist: **Maarten Poelhorst**
Researcher: **Martijn Wieling**
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**People who wake up frequently at night, hallucinate more often.**
People who wake up frequently at night are at greater risk of experiencing hallucinations. These hallucinations are not limited to the night, but can also occur during the day. These results were found through an online study conducted in a large group of Dutch participants.

Artist: **Margarita Spasova**
Researcher: **Sanne Brederoo**
Reference:

Brederoo, S. G., de Boer, J. N., de Vries, J., Linszen, M. M. J., & Sommer, I. E. C. (2021). Fragmented sleep relates to hallucinations across perceptual modalities in the general population. Scientific reports, 11(1), 7735. https://doi.org/10.1038/s41598-021-87318-4

MARVELOUS MIND

# The importance (and fun) of science communication

**A crucial part of a scientist's career is communicating their findings to the general public. For Iris Sommer and Marie-José van Tol, science communication is more than just a part of their job; it's a deep passion. They are both fascinated with the brain and want others to experience this too, but not in a lecture hall. Instead, they organise projects in cinemas, museums, and on social media to bring science to the general public in an approachable way. The Marvelous Mind project was the result of their passion for science communication. In this interview, they talk about the project and the importance (and fun!) of science communication.**

## From Amsterdam to Groningen

Marvelous Mind was inspired by the project Brein in Beeld, a project in Amsterdam founded by Jeroen Geurts. In this project, neuroscience was brought to a larger local audience and one of the things that Iris particularly liked about the project was the films. "When I came from Utrecht to Groningen, Brein in Beeld was a bit too far away for me. So then I thought, why not make our own branch in the north?" Iris explains. She then formed a group together with Marie-José, Robert Schoevers, and Sander Martens, to discuss how to shape this idea. The name Marvelous Mind was born and the small group of four quickly grew out into a larger group full of new enthusiastic young members that tackled a number of projects to bring neuroscience to the people of Groningen. "It was so much fun," Marie-José recalls. "You're suddenly talking about a whole other aspect of your life; what movies you like. It was very fun to think of those links between movies and neuroscience."

## Marvelous Mind Movies

The Marvelous Mind Movie series has become one of the most visible successes of the group. This project is a collaboration with the Groningen Forum where movies

are shown and instead of commercials, the audience is presented with a short talk about a neuroscience topic related to the movie and is given the opportunity to discuss the movie afterwards. These movies can be documentaries about novel therapies, but also movies like Bladerunner, making it a very popular project. Iris confirms: “The movies are always sold out!”

Choosing a movie is not always straightforward. “Sometimes movies are not available with Dutch subtitles, so it’s also finding out which movies work,” Marie-José explains. Their associate at the Forum regularly contributes ideas as well, making it a shared creative effort.

While some people come specifically for the Marvelous Mind movie, some people just buy a ticket for a movie and discover that instead of commercials, they are treated to science. “That’s wonderful for us,” Marie-José explains. “It’s great to share research with people who otherwise would not necessarily seek out the science.”

The talks after the movies are also fantastic. Many people feel comfortable to ask questions from their own experiences and ideas related to the movie. “We’ve had people share very personal things,” Marie-José recalls, “one time there was an evening about psychosis and someone shared that they had experienced it themselves.” The aftertalks can be a bit challenging, though. Questions often extend beyond the researcher’s expertise. “You have to reason why you think certain things,” Marie-José says. “It’s a rewarding challenge to get out of your own comfort zone.”

This project started out as UMCG focused topics and speakers and has since evolved to more BCN-related topics with speakers from different faculties, broadening the range of topics discussed. The Marvelous Mind movies aren’t just for the general public to be introduced to new topics, though. BCN researchers can also learn about new research. “The movie about addiction with a talk from Anton Scheurink, for example. I really liked listening to it from the perspective of my research and to know what he’s doing. The people are also very approachable, which makes it very fun,” Marie-José says.


## Beyond the big screen

While films are an important part, the Marvelous Mind group organised more than just movies. The group has also produced a museum exhibition (BRAINSTORM at the University Museum), a podcast called Bovenverdieping, and participates in annual events such as Noorderzon, European Researcher’s Night, and Zpannend Zernike. The Marvelous Mind project was also acknowledged with the KNAW Gewaardeerd! award, which was used to finance the Science on Wednesday project. Science on Wednesday is a collaboration with the art students of Minerva where brain facts are turned into artworks and shared on social media.

The importance and joy of science communication

If it was up to Iris Sommer, she would work on Marvelous

Mind fulltime. “I think that’s the most fun part of our job and I’m very grateful,” Iris explains. “It’s the part of our job where we can be more creative than the standard format of a scientific paper.” But in the academic reality, grant deadlines, PhD supervision, manuscripts, and administrative tasks compete for attention. “The deadline of the grant is not going to wait for you until you’ve done that fun outreach event,” Iris notes. “Outreach sometimes gets less priority, even though it’s incredibly valuable.”

For Marie-José, science communication is both rewarding and professionally relevant. “If you can tell about your research in an accessible way, then you can also more easily deepen the complexity for the expert audience,” she explains. “It’s hard to make a difficult story easy to comprehend. This is really a skill that’s trained by contributing to Marvelous Mind.”

Another important aspect of science communication is that it will foster trust in science. “When you can’t explain something in easy words, that may create a sort of distrust,” Iris explains. “You can easily hide behind difficult words.” Rather than reacting defensively against scepticism, she believes it’s better to proactively seek contact with the local communities.

## The impact of Marvelous Mind

While there is no objective measurement tool to indicate the impact of the Marvelous Mind project, they show movies where a young audience flocks to, for example The Big Lebowski. “Some people come for the movie and don’t necessarily have the intention to listen to the scientific introduction, but the talks still fascinate them, and they learn something about neuroscience,” Marie-José explains. She argues that scientists should devote at least an hour a week to science communication, whether that’s by explaining research to a school class, sharing their research on LinkedIn, or engaging in discourse online, for example.

Iris’ regular appearances on national television help to reach a broader audience when she talks about her research. Besides highlighting research in Groningen, her appearances also help to fight stereotypes about professors. “It’s very good to show a female professor on television,” Marie-José says. “That makes academia more visible and approachable.” Visibility on national television can also have some practical benefits. Around the time of one TV appearance, Iris was recruiting participants for the No Guts No Glory study and mentioned it during a TV appearance. This generated awareness for the study and people thought about joining the study because of this TV appearance. “Sometimes outreach simply helps,” Iris says.

## Tips for science communication

How can scientists actually improve their science communication skills? Marie-José’s advice is to practice your pitch. “It’s important to be able to briefly explain what you’re doing, why it fascinates you, and what we can achieve with it,” she explains. “Try to practice this when you’re at a birthday party with people with a different background.” Mastering your pitch is not only helpful to outreach, but also for job interviews, for example. She believes these skills are so crucial that the Master research programme should devote more time to teaching how to pitch yourself.

Iris emphasises knowing your audience. Different groups require different approaches. Patients or families of patients are more interested in concrete tips to relieve symptoms for example. Children require age-appropriate language and explanations of basic concepts. “Many children haven’t even thought that there might be something like grey cells in between their ears.” Inside her team, Iris pays close attention to who can communicate to which group the best. “One person can’t communicate with all those groups. Some people communicate better to patients, others better on social media. It’s best to divide roles within a team.”

## Future of Marvelous Mind

Marvelous Mind continues to evolve. New ideas are constantly being discussed, from knowledge dinners to design competitions to new ways to continue the Science on Wednesday project. “We should probably sit down to brainstorm sometime,” they laugh.

**Did this interview make you excited to join Marvelous Mind and get involved in more science communication? The team is always looking for people to organise more projects or to introduce Marvelous Mind Movies related to their research, so don’t hesitate to reach out to Marie-José van Tol or Iris Sommer!**

● BY MARY-ANN VAN DER LINDEN

# NEW STAFF WRITER

## JAN BETHE

Hello there! My name is Jan Bethe and I am a BCN Research Master student in the first year. I follow the C-track of the programme, focussing on cognitive neuroscience. Currently my peers and I are involved in the first of two research projects that we get to do as part of the master, and I am very lucky to do a project on phase coding in working memory using non-invasive brain stimulation methodology.

I have been living in Groningen for three and a half years now and had an amazing time so far. After being involved with the study association of psychology for three years, I was looking for a new extracurricular activity inside BCN. Because I always had a lingering interest in writing that I never explored, I was rapidly convinced that I wanted to join the BCN Magazine staff when our Editor in Chief, Tassos, advertised for it during one of the lectures last year. I think this is a great opportunity to connect with other BCN members and to exchange ideas with more people than my immediate peers and I am very much looking forward to my time at the magazine, especially to learning from others and contributing with my work and ideas!

- **BY JAN BETHE**
- **PHOTO BY MERLIJN BROUWER**

# REMA COLUMN

Almost exactly one year ago, in April 2025, I applied for the BCN Research Master. After having graduated from my degree in psychology around the same time, I was certain that I wanted to pursue a master's degree in cognitive neuroscience or a related field, but the research part of the master was something that I could not really get a grip on at the time. I did not really know what it meant or what to expect from such a degree programme other than, well, that it's focussed on research. There was this distant vision of wanting to pursue a PhD and with that a potential career in academia, yet the main motivation behind choosing the BCN master over other options was my interest in the field and only secondly to have the option to work in science.

Only now that I have completed the first semester of the master's programme and my minor thesis research project has picked up pace am I beginning to understand and experience what working in research is like—or rather, what it can be like. From conversations with peers, supervisors, and other people involved in academia, it quickly became evident that there is no blueprint for what working in research looks like and that it will vary greatly depending on many factors, such as how well you get along with supervisors and colleagues, the lab and research culture of a place, and the expectations and perspectives of all parties involved. Or, in other words: the environment and the people involved will shape experiences in science as much as the research and work itself. While I cannot judge how some of these factors are experienced by others or how their evaluation changes over time and the course of a career, I do want to share the viewpoint and expectations of a master's student that is now standing in front of the gates of this ominous estate that is science. To stay within that metaphor, from the outside, academia can sometimes seem like an elitist, rigid place, an old place full of history, knowledge and expertise that is skeptical of newcomers and difficult to navigate.

While this analogy works for what science can seem from the outside, it starts lacking when looking at it from within. My experience so far suggests it to be more welcoming than I had earlier thought. Generally, my expectations of what research is were in stark contrast with the reality of starting my research project, something I am only realizing now that I have started to reflect on the past and coming months for writing this very column. Up to this point, I rarely stopped to think about whether an experience did or did not fit in with what I had expected. I was busy doing new and exciting things that I had only read about in books or papers before and was and still am invested in the process. If I had felt disappointed or bothered by how things are going and how I am feeling about it, I definitely would have found myself ruminating about it, probably for the same reasons that psychologists recommend gratitude journals or mindfulness exercises: we tend to focus on the negative and fail to be appreciative of the things that are going great. Ultimately, my expectations did clash with reality, but in a good way.

One of the things I was most positively surprised about was how active a part I have in my current project. I expected to face sharp hierarchies and to have a limited role as an assistant or a bystander because I am 'just a student'. Instead, I am given full responsibility for a lot of the tasks while also being provided with assistance when I need it, making it a rich learning experience. It feels like I am finally moving from theory to practice, which is fantastic. That being said, I know that not all experiences in my career, or even in this project, will be as rosy as they have been so far and I am curious how my perspective will change over the course of this project and beyond.

All things considered, the research master and my current project have so far made me look forward to what is to come. Should there ever be a time in which worry and concern seem to get the upper hand, I will remind myself of a quote from Danish philosopher Søren Kierkegaard that helps me to be accepting of the present and is probably as true for a career in science as it is for most things: Life can only be understood backwards; but it must be lived forwards.

- BY JAN BETHE
- PHOTO BY MERLIJN BROUWER

# BCN LECTURE SUMMARIES

**Whether you'd like to reminisce about your favourite BCN lecture or you're curious about a topic and did not manage to attend the session - we got you covered! In this magazine edition we include summaries from two BCN lectures: one on the evolution of circadian rhythms, and another on human brains from an omics perspective.**

## "The flexible circadian clock: adaptive in nature, maladaptive in modern society"

**Prof. dr. Roelof Hut**

On November 6th, we were joined by Prof. Dr. Roelof Hut who delivered an immersive talk on how circadian rhythms drive many aspects of our behaviour from an evolutionary point of view, that may be traced back to the very first life forms! Interestingly, many of these evolutionary patterns suggest that daily rhythms may have evolved as a form of adaptation to the environment and further resulted in diversification.

Humans have a 24-hour internal biological clock that synchronises with external inputs, such as light. But how did this come to be? Did mammals become nocturnal because dinosaurs—the predator species—were diurnal and forced an evolutionary predation/nocturnal bottleneck?

Mammals have a primary retinal photic input to regulate their circadian rhythm while other non-mammal animals have several (extra-retinal) photic input pathways. Moreover, other evolutionary evidence, such as the adaptation of endothermy, may have contributed to the way in which mammals regulate their circadian rhythms today. With this major adaptation, animals can generate and maintain high body temperatures through internal (homeostatic) metabolic processes; in humans, this temperature is kept at 37°C. Predation and competition amongst species are thought to have driven, to an extent, this endothermal adaptation thereby explaining why mammals could become nocturnal and still survive without sunlight and natural heat sources. This may have also affected the way in which photoreceptors work and why mammals evolved to have a primary input region for light in the retina.

As mentioned, mammalian circadian rhythms are ~24h long in an environmental light-dark cycle. The circadian system in mammals is regulated by an internal clock called the suprachiasmatic nucleus (SCN) of the hypothalamus. The SCN receives photic inputs from the retina and regulates the following rhythms: melatonin release (via the pineal gland), glucocorticoid release (via the adrenal glands), and body temperature regulation. These signals help align peripheral clocks in other tissues with the environmental light-dark cycle.

Interestingly, Hut showed that bright light input reduces intrinsic heat production even when the environment cools down. This means that, in bright light, the body naturally expects heat, so it does not work to heat up core body temperature as much, thereby linking pre-optic light input to thermal regulation. Moreover, it was observed that, while mice are nocturnal animals, when food intake is reduced and mice need to "fend" for more, they adapt their rhythm and shift their activity into daytime, without changing overall daily activity (in a ~24h period). However, this pattern was quickly restored when mice had access to unlimited food in constant darkness. This shows that working for food can shift activity timing without changing the central circadian clock, highlighting

the flexibility of the circadian rhythm. Importantly, while this daytime shift occurs first, if food was increasingly scarce, animals entered torpor—a state of reduced physical activity—to conserve energy. Overall, there seems to be a strong link between energy metabolism and adaptation of the circadian behaviour given that reduced energy intake seems to override the nocturnal activity pattern.

Transcriptomic analyses revealed that in the SCN, core circadian genes do not seem to change their expression extensively as a result of rhythm shifts. However, the habenula—a highly evolutionary conserved brain area—shows the highest changes in transcriptome and has been deemed important in integrating metabolic signals and circadian behaviours.

From a societal and clinical point of view, these links between energy metabolism and circadian adaptations seem to largely impact humans. For example, night-shift workers tend to show a shifted circadian rhythm, consequently causing a shift in their eating schedules which may interfere with the body's production of insulin, for example. Unsurprisingly, after what we learned in this talk, circadian syndromes can deeply impact metabolic dysfunction, as well as sleep deprivation and chronic stress.

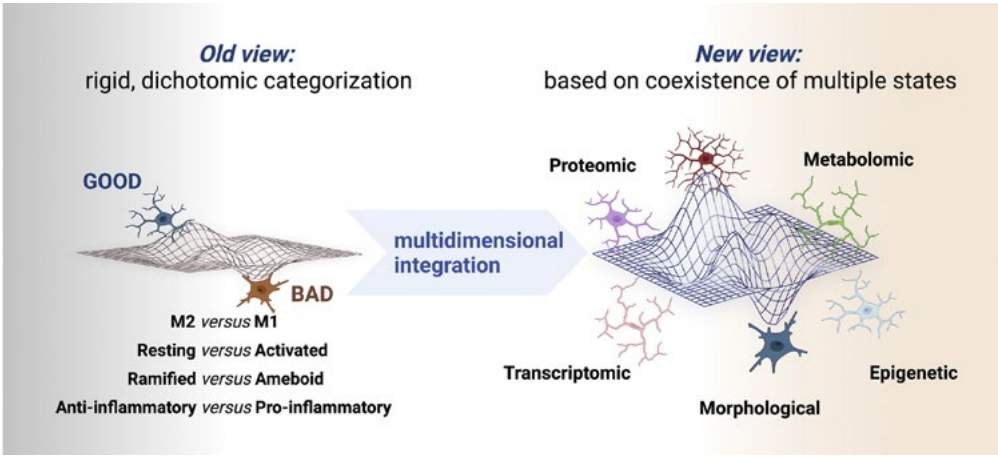
During the Q&A we also discussed the impact that daylight savings can have in humans and how changing the time can shift our circadian rhythms. This measure can lead to social jet lag, accompanied by sleep deprivation, decreased cognitive performance, as well as shifts in hormonal responses (e.g. glucose metabolism), all of which can impact one's health. We also discussed how morning light exposure is crucial in development and how starting school early may deprive young children of this. Overall, not only did Hut cover a plethora of research and its evolutionary origin tracing back to early life forms, but also, amidst his research into circadian clocks and energy metabolism, he also left us with some "food for thought" on how certain social norms and "laws" may be (negatively) shaping our health. Indeed, our "flexible circadian clock [although] adaptive in nature, [may have become] maladaptive in modern society".

## "The Healthy and Diseased Human CNS: An Omics Perspective"

**Prof. Dr. Bart Eggen**

Microglia, often regarded as the guardians of the brain, may hold the key to advancing neuroscience. On December 4th, 2025, Prof. Dr. Bart Eggen, who specialises in microglia, gave us an immersive talk that encapsulated the beauty of these cells. So, what are microglia? These are specialised immune cells of the central nervous system that act as the brain's primary defence. Microglia are constantly scanning the brain and sensing its environment to maintain brain health. In fact, as Bart showed, when we create a lesion with laser ablation, for example, we can see microglia immediately migrate to the lesion site within minutes and contain the damage.

Microglia are highly heterogenous in function and morphology. For example, their complexity differs between grey and white matter – composed of neuronal cell bodies and myelinated axons, respectively. Interestingly, if single microglia spans both white and grey matter areas, its heterogeneity becomes apparent too. In disease, microglia may also take on different forms. This is seen in Alzheimer's disease (AD), a neurodegenerative disease characterised by the aggregation of a toxic misfolded protein called amyloid-beta (Aβ) and its accumulation into larger structures called Aβ plaques. In this scenario, microglia actually surround the plaques and change their morphology to try to digest it – though it is also hypothesised that continued activation of microglia




From: Paolicelli et al., 2022, Neuron (https://www.cell.com/neuron/fulltext/S0896-6273(22)00953-9)

in disease environments may also lead to the increased secretion of toxic factors which directly injure neurons.

Within the field, microglia research has evolved from original views. That is, previous ideas that microglia are either in a "resting vs activated" or "M1 (pro-) vs M2 (anti-inflammatory)" phase are now considered outdated. Instead, the world of transcriptomics and proteomics has challenged this dualistic, and simplistic, way of looking at microglia and has helped us better quantify and classify a wide repertoire of microglial states.

In genetics, DNA gets transcribed into RNA, which is then translated into corresponding proteins. From RNA we can perform transcriptomics, and from protein, proteomics. During his talk, Bart focused on transcriptomics analyses of microglial (states). Using single cell sequencing, it is possible to sequence microglia and look at gene clustering. This was done with microglia at distinct developing stages from foetal tissues. It was observed that gene expression clusters followed a gestational week gradient indicating microglial development. In early developmental foetal stages microglia are immature and phagocytic, while in late gestation they acquire a surveillance function. Interestingly, in mice this microglial development happens post-birth while in humans, it occurs during the first trimester already!

Microglia have gained particular attention in research related to multiple sclerosis (MS). MS is a debilitating demyelinating disease which affects mainly movement in patients. Neuronal axons are surrounded by a protective, fatty-protein layer that wraps around them to facilitate fast electrical transmission called saltatory conduction of action potentials – this is crucial for the rapid firing of neurons. MS is an autoimmune disease whereby immune cells attack the myelin sheath that protects neurons, therefore disrupting signal transmission. MS is quite heterogenous in the way it presents phenotypically by patients but also at the brain level. There are three types of characterised MS lesions: active, inactive and mixed. So, then why do some lesions repair themselves? And why do some become inactive?

Going back to the world of transcriptomics, in recent years spatial transcriptomics was developed. Using this technique, you can now trace back in your tissue sample, where exactly each gene is expressed. Now, take several MS lesions from post-mortem brain tissues of donors and sequence using this technology – now you have access to gene expression profiles of each lesion type, be it outside the lesion, at its core, on even the rim of the lesion itself. Looking at the rim of lesions specifically is interesting as this is the site where they would expand or retract. Remarkably, PLP1 – a gene that encodes for myelin – in MS is expressed around lesions but not in their core. If we find out which genes are active in the rim and in different lesion types and if we target them, does this pose a promising therapy in MS?
Research in pinpointing microglial states and tissue-region specificity is certainly making progress and we can only hope that developments in this regard continue to be furthered in scientific research. We thank once again Bart Eggen for the insightful talk on the wonderful world of the "omics" and what information they can provide us, but also how it can be applied in an ever-evolving field of neurodegeneration that so desperately seeks novel treatments.

# NEW STAFF WRITER

## EMILY MICHAIL

Hi everyone! My name is Emily Iliana Michail and I'm a half Cypriot half Finn, living in and loving Groningen for the past four-something years. I completed a Bachelor's in Psychology in Cyprus, followed by the BCN ReMa in the Clinical and Molecular Neuroscience track. Presently, I'm working on my PhD in the Internal Medicine department at the UMCG in collaboration with Trinity College Dublin, investigating the pathophysiology of medical delirium in association to sepsis, through a highly translational approach. My ultimate goal is to work towards therapeutic approaches that make geriatric and palliative care fruitful, anthropocentric, and comfortable; an area that has recently drawn my attention is the use of psychedelics for end-of-life anxiety and potentially, terminal delirium.

As a self-proclaimed BCN veteran I happily shove my nose in any fun initiative within the community, including organizing events through the BCN PhD Council, running the social media accounts for the Summer School for Psychedelic Research, and now, writing for the BCN magazine (alongside reading every edition meticulously). In my free time, I love listening to music and learning the harp, reading and writing (obviously), and in general staying creative whether that's through theatre, improv comedy, or drawing comics inspired by iconic quotes my flatmates say and plastering them all over our house.

● BY EMILY ILIANA MICHAIL

# Retreat, Recharge, Research

## Two Days of Brains, Banter, and a Bit of Bingo

**What happens when you gather a group of PhD students, take them out of their usual routines, and drop them into a scenic setting for two days? A surprisingly perfect mix of intellectual curiosity, unexpected competition, and just the right amount of chaos.**

### Day 1: From Neurons to Nature

At the Fletcher hotel in Paterswolde, we kicked things off with a series of PhD presentations that showcased just how diverse (and impressive) our research community really is. Topics ranged from the intersection of speech and music in therapy, to multiple sclerosis, treatment-resistant depression, CBT, ketamine, and cognitive aging. In true academic fashion, questions were sharp and discussions were lively.

The competition for the Best Presentation Award was fierce, and ended in a tie, sparking both celebration and mild controversy (the good kind). Two winners went home with their award; congratulations to Jiahao Li and Özlem Yeter!

But the real icebreaker? Bingo, with a twist. Instead of numbers, we had to uncover quirky facts about each other to complete our cards. Think: “has lived in three countries,” “plays a musical instrument,” or “hates coffee” (yes, they exist). It was networking, but actually fun.

The enthusiasm got us a little overheated, so in the afternoon, we traded lecture slides for fresh air during a two-hour walk into nature. Along the way, we were greeted by horses, a deer, and—because subtlety is overrated—a full rainbow.

The day wrapped up with a three-course dinner that gave us a chance to unwind, followed by a lively game in the hotel pub organized by the PhD Council. Then it

was time to get some well-deserved rest and we each retreated to our hotel rooms.
(Fun fact: did you know that the founder of the hotel named it after his dog, Fletcher? We learned more than just about science during this trip.)

## Day 2: Back to Business (Mostly)

Refreshed (more or less), we dove into another round of presentations. Topics included memory, depressive relapse, insomnia, Parkinson's and driving, and delirium. After a whole morning of sitting and listening, it was time for another walk to stretch our legs and clear our minds. After lunch, there was one more session of presentations and another voting round for the best presentation of the day.
This time, there was a clear winner for the Best Presentation Award, earning well-deserved recognition. Congratulations Caterina Stacchiola!

## More Than Just a Retreat

Beyond the presentations and prizes, the retreat delivered something equally valuable: connection.
We sharpened our skills, not just in presenting, but in asking questions, leading sessions, and thinking across disciplines. More importantly, we got to know each other as people, not just researchers.
All of this unfolded in a beautiful setting that reminded us, every now and then, to look up from our data and enjoy the view.

- BY MAE TOL
- PHOTOS MARIE-CHRISTINE VAN DE GLIND, SUSANNA GIRINO, AND NINGNING ZENG

# NEW STAFF WRITER

## JAVIER GARRIDO JIMÉNEZ

Hoi! Javi here. I grew up in the hills near Barcelona, and after a few years of venturing to work as a scuba diving instructor in Iceland, I decided to move to Groningen to study Psychology. I am currently combining a Research Master's in Clinical Psychology, and the BCN C-Track, hoping to bridge my interests in both fundamental research and clinical/neurotech applications.

I am currently writing from Sydney, Australia, where I am completing my thesis project, which combines direct clinical work with research in multiple trials in the context of anxiety disorders in children, as well as assessing an AI tool for diagnostics. I am extremely interested in leveraging technology to improve our field, but also in the more philosophical, crazy and chaotic aspects of science and human cognition.
In my free time, you will find me drinking coffee, petting dogs, pretending to read while watching dog memes, or running away from Groningen, seeking warmer climates.  I hope to get to meet and exchange ideas with all of you! And I hope we newcomers can bring some value to the magazine.

● BY JAVIER GARRIDO JIMÉNEZ

# NEW STAFF WRITER

## LENE DE JONG

Recently some BCN Research Master students and I have joined the writing staff of the BCN magazine, our first task: write a short introduction about ourselves. My name is Lene de Jong and I hail from the north of the Netherlands, Fryslân, to be specific. I obtained my Bachelor's in psychology at Utrecht University and studied Cognitive Neuroscience for a year in Nijmegen. But now I am back in Groningen to complete the BCN Research Master, where I am following the Molecular and Clinical Neurosciences (N-track). As I write this, I have just started my minor research project where I will be researching the influence of gut-microbiota on protein aggregation in Parkinson's Disease.

Outside of my studies I participate in powerlifting competitions, so I can often be found in the gym. When I am not in the lab or the gym however, you'll probably find me partaking in some relaxing activities. I am an avid reader and movie-goer, so the Forum library and cinema are some of my favourite places to pass my free time. I am excited to be a part of the BCN magazine team and look forward to contributing to and learning from the BCN community!

● BY LENE DE JONG

# ANNUAL BCN MEMBERS DAY

## Influencing the brain: How thoughts and feelings are shaped by actions and experiences

**At this year's ANNUAL BCN MEMBERS' DAY, speakers considered the ways in which our inner landscape is influenced by a multitude of external and internal factors. From biological sex differences in anxiety to the cultural shaping of music perception, the broad range of topics underlined the wide scope of research conducted within the BCN Research School. On February 6th, the UMCG was filled with members of the BCN community eager to present their work, hear about others' research, and connect with professors, ReMa students, and PhD candidates.**

Welcomed by coffee and tea, attendees gathered at the Anda Kerkhoven centre for a full day of research ahead. The morning started with a welcome from the BCN board, delivered by BCN director Marie-José van Tol. Marie-José highlighted the growing attractiveness of the BCN programme and shared the news that the BCN Research Master has once again been voted the best neuroscience programme in the Netherlands. Several announcements were also communicated regarding the impactful role of BCN outreach through several initiatives, such as Science on Wednesday, Marvelous Mind, as well as the success of the Brainstorm exhibition—with over 27,000 visitors so far! Indeed, this set the positive tone for the rest of the talks which showcased the standard of BCN's research quality and capacity.

This short introduction was quickly followed by a series of short presentations. Suzanne van der Veldt opened by presenting her work on the use of mouse models to better understand differences in the experience of anxiety between sexes. Her talk highlighted how carefully designed studies can use animal models to help better understand biological mechanisms underlying emotional behaviour. Interestingly, in a behavioural paradigm, she

observed that female mice are more prone to anxiety and this is thought to be mediated by serotonergic neuron activation in the hippocampus. Decoding neural circuitry associated with the sex-specific vulnerability towards anxiety is pivotal in developing targeted interventions for anxiety disorders. Next, Ellie Harding, from the Faculty of Arts, spoke about how exposure to different music during development may influence one's perception/preferences. As fundamentally postulated by Hebb in 1949, "neurons that fire together, wire together"—and the way in which we respond to music is no exception. Ellie then had everyone in the audience tap along to various rhythms to illustrate exactly that: our cultural experience with music shapes our rhythmic perception throughout life.
After these talks, it was time for the poster presentations. In total, 48 PhD candidates and 43 ReMa students presented their work.


## Lene de Jong with a ReMa Perspective...

With a rolled-up poster in my bag, I arrived at the UMCG early Friday morning. After attentively listening to the morning talks, I made my way to the poster session. Wandering through the hall lined with posters, I was amazed by the diversity and quality of research from my peers. In groups, we gathered around each other's posters to hear short pitches on topics ranging from the influence of pupil size on visual and auditory detection, to the use of calcium imaging to dissect neural responses to song memory in zebra finches. I was inspired to see the breadth of research within BCN, which you do not always get exposed to when studying primarily within your own track. I selected posters that piqued my interest, while also making sure to visit my fellow ReMa students. The session offered a glimpse of what the coming months would hold for many of us, as we inevitably see a bit less of one another during our internship.

## Maria João Caiado with a PhD Perspective...

This year I had the great pleasure of attending my fourth BCN Members' Day. Having experienced this day both as a Master's student during COVID in a virtual setting, but also as PhD for several years in a row, I always look forward to what this day has to offer. It is great fun to see what other BCN members are up to and what other research is being conducted right under our noses—your next collaborator could be just around the corner of your department! I also enjoy catching up with friends, getting to know the new ReMa and PhD cohorts, and talking with other PIs, especially those who taught me at the Master's level that I don't see as often. I also appreciated everyone that came to my poster and spared a few minutes to chat about science; I had the opportunity to engage in many insightful conversations with other researchers that are just as much into ferroptosis and mitochondria as I am! I also got the chance to watch other PhD candidates present their posters and learn about other topics!

After the poster sessions, the organized lunch provided a welcome break and a chance to continue our conversations in a more informal setting. Refreshed and replenished, we returned to the lecture hall where the program continued with a talk by Manon Werst, who presented on behalf of Marieke Pijnenborg. Manon explained that the effects of social media on your mental health depend on many factors, such as personal characteristics, which is a particularly relevant topic in this day and age, with increasing use of social media and its associated risk. With no hesitation, Manon playfully called out the audience on how much we "indulge" in social media and screen time at an all-time high frequency. This was nicely paralleled to a talk by Daphne Brandenburg from a philosophical perspective, where she discussed liberalism for "brains that can't help themselves".

Later in the afternoon, neurosurgeon Marc van Dijk presented an up-and-coming novel and non-invasive way of deep brain stimulation. While probe lesions and electrode based deep brain stimulation are leading ways of managing motor dysfunction in Parkinsonism and tremor disease, he discussed the promising future of non-invasive brain stimulation techniques using focused ultrasound. The UMCG aims to bring this technique to Groningen. It is indeed fascinating how direct modulation of the brain can offer hope for patients with severe neurological and psychiatric conditions.

After the presentations, Mark Hipp was called to unveil the BCN Seed Grant winners, followed by short presentations from previous recipients. Amongst the winners of 2025 were Maria João Caiado and Sönke Steffen, Luisa Epifani and Thomas Wilschut, as well as Minke de Boer, Gera de Haan and Anne Vrijling. Presentations by former Seed Grant recipients highlighted how the grant can stimulate new interdisciplinary collaborations and further novel research ideas.
The BCN dissertation award was then presented to Alejandro Marmolejo-Garza for his work on interrogating mitochondrial and metabolic involvement in Alzheimer's disease. Alejandro delivered a talk where he explored several chapters of his dissertation working with post-mortem brain tissues, brain organoids, as well as cell cultures, offering great insight into the research models that we currently have available to study Alzheimer's disease and diseases alike.

Towards the end of the day there were presentations about scientific writing for the general public. In these sessions, we got to hear from the perspective of Iris Sommer, Christien Boomsma, and Sebastiaan Mathôt. Each with their own writing style and niche, the speakers captivated the audience with their views on writing and its process from a creative to practical point of view. The key takeaways from the writing series were the emphasis in good science communication and its importance when it comes to prioritizing clear explanations, and to make information accessible. Ironically, it seems that it is sometimes easier to write something for the general public about a topic outside your own expertise as you are forced to revert back to simpler language - this is a skill we can all reflect on and practice for the next time we have to present our research in a room full of eager listeners (or at your next family dinner!). In addition, there was time to meet the BCN Board which made for a good

opportunity to see the people behind the organization of the BCN Research School. It was great to see how they listened to members' experiences and feedback about BCN and created an open space for discussion.

To end the day, after careful consideration based on poster presentation and pitches, the jury awarded the best poster prizes. From the PhD programme, we congratulate Floor Gelmers, Lina Albakri, and Maria João Caiado, as well as Amber Kal from the ReMa programme.

All in all, the members' day provided a great opportunity to connect with other people and become more involved in the academic community!

First-year ReMa student **Kim Barbara** reflects: "It was great to be able to present my research to my peers while also staying informed on the research of the BCN Master's and PhD cohort."

Another BCN ReMA student puts it quite succinctly: "The Members' Day showed me that science brings together like-minded individuals who share curiosity, passion for critical thinking, and are motivated by discovery." - Tellos Fatta.

**Teresa Mitchell Garcia**, in her third year of the PhD programme, also shared with us: "It's very insightful to listen to the talks on such diverse topics but all related by the brain. During the poster sessions, I look for research related to mine to find new methods and connect to other groups."

Second-year PhD **Emily Michail** fondly recalls: "Events like this one always make me appreciate how effortlessly all levels of BCN discuss with each other, whether you are a student, staff or PI, you can approach anyone and start a conversation. It's just a great environment to be part of".


- BY LENE DE JONG AND MARIA JOÃO CAIADO
- PHOTOS BY ZHENYU ZHANG

# GRAND STUFF

## Pascalle Mossel wins Woldring Prize 2025

On Friday, November 21, the Woldring Prize 2025 was awarded to Pascalle Mossel for her exceptional dissertation:
*"[18F]MC225 and PET: in vivo measurements of the P-glycoprotein function at the human blood-brain barrier."*

Pascalle Mossel worked as a physician-researcher at the Department of Nuclear Medicine & Molecular Imaging. She defended her dissertation on October 14, 2024, at the University of Groningen.
Her doctoral research has made an impressive contribution to the field of nuclear medicine and molecular imaging. The jury praised her combination of technical expertise, scientific curiosity, and social relevance.
Her work is exemplary of the spirit of the Woldring Prize: innovative, interdisciplinary, and of great clinical importance.
The prize winner gave an excellent presentation about her research via Teams, while the award ceremony took place in person during the NVNG Science Day in Bunnik.

## Four consortia are working on participation in education and work for people with brain and/or mental disorders

Four projects have been awarded funding within the NWA Call "Participation of people with brain and/or mental disorders in education and work". The projects focus on promoting social participation for people with brain and/or mental disorders, with a specific focus on their participation in education and (un)paid work. Lisette van der Meer from BSS is participating in a project that has received a grant.
https://www.nwo.nl/nieuws/vier-consortia-werken-aan-participatie-in-educatie-en-werk-voor-mensen-met-hersen-en/of-psychische-aandoeningen

## NWO ENW-M grant for Wicktor Szymanski

Prof. dr. Wiktor Szymanski, together with prof. Schelto Kruijff of the UMCG receive EUR 825,000 for developing a new, light-controlled treatment technique that simultaneously visualises the activated medicine and its effect.
The ENW M grant offers researchers the opportunity to develop creative, high-risk ideas and bring about scientific innovations in all disciplines of the Exact and Natural Sciences.
https://www.rug.nl/fse/news/awards-and-grants/nwo-enw-m-subsidies-voor-drie-fse-onderzoekers

## 110th Anniversary Neurology department

On January 18, 1916, Professor Wiersma opened the new psychiatric-neurological clinic of the Provincial, City, and Academic Hospital Groningen. This marked the beginning of the Neurology department at the UMCG. Over the years, the field has developed significantly; from the first diagnostic techniques and treatments to the outstanding patient care and groundbreaking research of today. This year, the Department of Neurology celebrates its 110th anniversary.

## Rubicon Grant for Thomas Tienkamp

As a promising graduate form the University of Groningen Thomas Tienkamp will be able to conduct research at a top institute abroad for two years thanks to the Rubicon programme organized by the Dutch Research Council (NWO). The NWO Rubicon programme enables talented, young researchers to acquire international research experience to help kick-start their academic careers.
https://www.rug.nl/about-ug/latest-news/news/archief2026/nieuwsberichten/two-promising-ug-researchers-to-top-institutes-abroad-on-rubicon-grants

## Merel Keijzer, Marie-José van Tol and Martien Kas have been appointed members of the Royal Holland Society of Sciences and Humanities

Membership is a recognition of scientific quality and social engagement, and offers the opportunity to actively contribute to the activities of the KHMW.
https://www.rug.nl/about-ug/latest-news/news/archief2026/nieuwsberichten/0210-khmw-extern

## Vici Grant for Marieke Wermer

The Dutch Research Council (NWO) has awarded a Vici grant, worth up to €1.5 million, to Marieke Wermer, Professor of Neurology at the UMCG. This will enable her to develop an innovative line of research and set up her own research group for five years.
https://www.rug.nl/about-ug/latest-news/news/archief2026/nieuwsberichten/0226-wermer-vici

# BCN PHD COUNCIL NEWS

## First bcn introductory activity

On Tuesday 18th of November, the BCN PhD council warmly invited all first-year BCN PhD students to the first edition of the BCN PhD introductory activity. The goal of the activity was to bring together the new cohort of PhD students and to get them acquainted with one another, as well as with the BCN Research School. The afternoon kicked off with an icebreaker activity, where participants mingled and searched for peers who matched certain criteria. This led to the discovery of people with interesting hobbies and habits, such as students who don't drink coffee or those who love bouldering. After the icebreaker activity, Marie-José van Tol warmly welcomed the PhDs to the BCN research school. The main part of the activity was a presentation by the PhD council covering the organizational structure as well as the ins and outs of the PhD program. The afternoon ended at BOEL where everyone could show their jeu-de-boules skills while enjoying a well-deserved drink. The competition was fierce! We are very happy to welcome these fresh PhDs to our research school and wish them an exciting and inspiring PhD trajectory ahead!

- BY JANINE ROOK
- PHOTOS BY JANINE ROOK AND MARIA JOÃO CAIADO

## Another successful edition of the "your dissertation" workshop

After the successful and much sought-after workshop hosted by Lisa Kiltz before summer, we decided to organize another session to accommodate more PhDs! During this workshop, Lisa sets PhD candidates up with the necessary tools for them to design and write their theses using Adobe InDesign. This programme is free of use for RUG/UMCG employees so it is crucial that candidates in their final year get the chance to learn from Lisa so they can take advantage of the resources that are available to them.

As time flies by, PhDs often find themselves struggling to edit a large (book) document for their thesis, and in many cases, end up having to spend hundreds of euros for an editor to put the book together. With this workshop, we hope to give our BCN PhDs the right tools to be able to create a book without breaking the bank, and that is reflective of them and their hard work.

We hope to continue to host these workshops at least twice a year so BCN PhDs feel supported in this matter!

- BY MARIA JOÃO CAIADO

# Winterstad ice skating

As chilly days became constant and with the Christmas holidays just around the corner, the council treated fellow BCN PhD students to an ice-skating outing. Every December, Grote Markt is transformed into the magical Winterstad, equipped with rides, food stalls, a mulled wine bar, and of course an ice-skating rink! Amidst this wonderful setting, the attendees gathered and laced up their skates, embarking on an icy, twirling adventure!

In true holiday spirit there was joy, laughter (and, naturally, the occasional tumble), with some trying out their luck on the ice for the first time, whilst others showcased their skills like true winter sport experts! After an hour of slipping and gliding, it was time to warm up with some delicious, steaming glühwein, happily sipped on over lively conversation and mingling.

Of course, this outing would not be complete without a sweet treat, and there could be no other option than the iconic, traditional oliebol! Everyone got to pick their poison, raisin-filled or dusted with powdered sugar, and indulge in the fried, sugary goodness.

We could not think of a better way to bid 2025 farewell, than with a cosy hangout like this one. With hearts full of wintry glee and stomachs full of oliebollen, we prepare to bring you even more fun events in 2026!

- BY EMILY MICHAIL
- PHOTOS BY DANIQUE ZANTINGE

# Bcn welcomes 2026 with a pubquiz & more

In keeping with BCN tradition, the arrival of 2026 was celebrated with a community gathering over drinks and the highly anticipated PubQuiz. On the afternoon of January 23rd, members from across the BCN community met at the rooftop bar of The Happy Traveler, where they enjoyed beautiful views over the city while welcoming the new year together.

Participants were asked to form teams while fueling up on drinks and snacks, just in time for Sönke to begin hosting the PubQuiz of the evening. In his fashion, the evening was filled with nonsensical questions in all kinds of themes, ranging from politics to music and the arts. Through perhaps some frustration and many laughs, the BCNachos team managed to tune their brain frequency to Sönke's thinking process and win against all odds!

We were once again very happy to see the great turnout of the event and we look forward to seeing everyone together again soon.

- BY MARIA JOÃO CAIADO
- PHOTOS BY MARIA JOÃO CAIADO

# Science jam – fiction writing

On the 10th February, the Science Jam returned for a brand-new edition! Science Jams are an initiative whereby BCN professors and staff share with us their hobbies outside academia in a short presentation, combined with a practical workshop. This edition was all about fiction writing with our guest Sebastiaan Mathôt; Sebastiaan is a cognitive neuroscientist with an interest in visual perception, attention, and artificial intelligence. He writes short stories and novellas in which he explores the boundaries between reality and fiction and distributes these stories through handmade paperbacks.

The event took place in the cozy basement of the Dog's Bollocks Pub, where we set up a traditional book binding workstation complete with an industrial paper cutter, a book press, decorative paper, and all the required bits and bobs to complete our workshop.

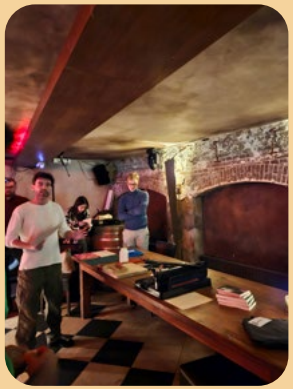
The evening commenced with everyone gathering around the workstation and contributing to the different steps of the book binding procedure. Under the careful guidance of Sebastiaan, participants took turns measuring the margins appropriately, cracking the spine, cutting the book's pages, selecting decorative paper, mounting the book in the press, and gluing the spine; all done with utmost surgical precision (well, almost). Whilst the glue dried, Sebastiaan gave a presentation on the process of writing a fictional story and all the components one must consider, including the plot, the characters, the prose, incorporating visual art alongside text, how to take inspiration from everything and anything that calls to you, and how to nestle fantasy within the boundaries of reality!

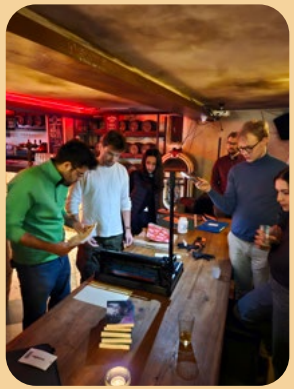
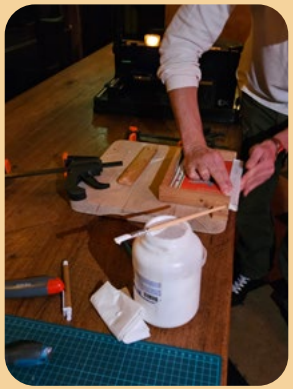
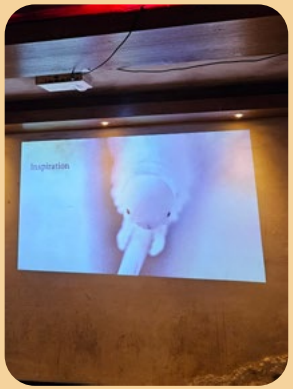
A lively and inspiring discussion accompanied the presentation in true Dead Poets Society fashion. Drinks had been drunk and borrel platters demolished, and soon our book was dry enough to pass around for observation. We had successfully produced a slightly wonky edition of Sebastiaan's Griffinfly short-story collection, which, alongside a second copy he had previously bound himself, were gifted to two lucky winners as a result of a raffle.

If you're interested in Sebastiaan's latest book Een wereld vol denkers (A world of thinkers), a Dutch-language popular-science book, you can read more about it in the previous edition of the BCN magazine or learn more about his fiction writing at suchwasnot.com.

Previous editions of the Science Jam included topics such as urban sketching, culinary science, improv comedy, and speed skating! Interested in participating in the next one? Then keep an eye out for our email invitations or join the BCN PhD Socials Whatsapp group to be the first one to know!

- **BY EMILY MICHAIL**
- **PHOTOS BY EMILY MICHAIL**

# PHD AND OTHER NEWS

## Update: New Course Registration System

I have recently approved all courses organized by BCN in the new course system. You should now be able to see this in Hora Finita. Please let me know if any BCN course is still missing or appears incorrectly in your portfolio. I would also appreciate it if you report any other inaccuracies in the system or in Hora Finita regarding BCN courses.

Once you have applied for a course, you will receive a confirmation at your UG email address. Please forward this email to your regular email account, if you don't use that email address. I have noticed that some of you are not receiving these confirmation emails or mails with course information, so please check that your email address in the course system is correct. Inform me if it is not.

## BCN lectures

Have you noticed that our lectures are no longer exclusively online? We were thrilled to see the lecture hall packed at the last lectures! Don't miss out: come join us in person at the lecture hall for the next lecture! Mark your calendar for the following dates: June 4, September 3, October 1, November 5 and December 5. Most of them will be held in person at the end of the day.

## New Courses

We were able to add two courses from the master's programs that are exclusively accessible to BCN students, namely Speech Science and Cognitive Neural Networks. If you missed these courses this time, keep an eye on my invitation emails during the year!

## BCN 40th Anniversary in 2027

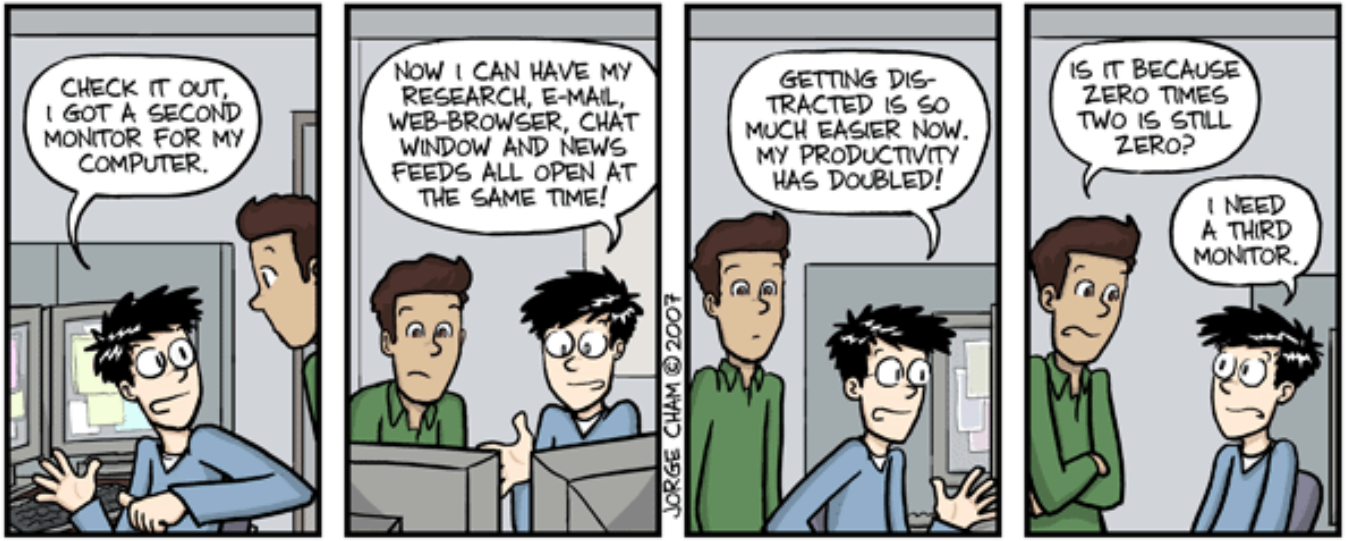
BCN will celebrate its 40th anniversary in 2027. We will update you soon on the plans for this milestone. We have already begun organising the festivities, and we can promise that they will be memorable!

## Agenda BCN Activities:

June 4, 2026: **BCN Lecture organized by FSSE**
September 3, 2026: **BCN Lecture organized by the Arts Faculty**
October 1, 2026: **BCN Lecture organized by BSS**
November 5, 2026: **BCN Lecture organized by UMCG**
December 5, 2026: **BCN Lecture organized by the UMCG**
2027: **BCN will celebrate its 40th anniversary**.

## Good to know

If you would like discuss work-related or personal issues, please feel free to contact the confidential counselor of your Graduate School:
GSMS: Stella Noach e.j.k.noach@umcg.nl 050 361 9976, confidential counselor
GSSE: Yvonne Folkers y.folkers@rug.nl 06 28257733, confidential counselor
GBSS: Marieke Timmerman, m.e.timmerman@rug.nl 050 363 6255, director GS
GSH: Merel Lobo, m.s.lobo@rug.nl 050 3635858 , coordinator CLCG or Rachael Fletcher, r.l.fletcher@rug.nl 06 31982400, coordinator GS
GSPh: Janine Weeting, j.c.weeting@rug.nl 0505 363 6157, coordinator GSPh



# Between theory and practice: doing a PhD at a University of Applied Sciences

**Since starting my PhD, people often ask me the question: where are you actually doing your PhD? At the University of Groningen, or at Hanze University of Applied Sciences?**

**The honest answer? Both.**

My contract is with Hanze University of Applied Sciences, but I am also officially registered as an external PhD candidate at the University of Groningen. In practice, this means that my daily work mainly takes place at Hanze: an environment where education, professional healthcare practice, and research are closely connected. At the University of Groningen, I am part of my supervisor's research group at the Faculty of Arts and closely involved with the linguists there, which makes me feel more connected to the academic side of research.

My PhD focuses on the early detection of Alzheimer's disease (AD), the most common subtype of dementia. AD develops gradually and the disease progression can be divided into two main stages: the predementia stage and the dementia stage. In the predementia stages (preclinical AD and mild cognitive impairment (MCI)), individuals may already show underlying pathological changes in the brain, but without functional impairment in daily activities. By the time someone receives a diagnosis of dementia due to AD, the disease has often already progressed substantially. Although there is currently no cure, earlier detection is important, because it may create more opportunities for treatment in the future or for prevention[1,2,3,4,5].

My research is based on the hypothesis that declines in cognitive and motor function, particularly the

connection between language and motor functioning, occur together and could therefore potentially be used in the early detection of AD. One of the first signals of AD is usually memory loss, but there are also other signals in language and motor function[1]. Previous research suggests that even before the dementia stage, subtle differences in language and motor functioning can already appear. In the MCI and dementia stage, language and speech changes have been observed in (semi-) spontaneous speech tasks, including lexical changes (e.g., increased use of pronouns and high-frequency words), word-finding and word retrieval difficulties, reduced speech rate, frequent hesitations, and changes in utterance length or semantic content[6,7,8,9]. In addition, motor changes such as alterations in gait, balance and reduced handgrip strength have been observed in preclinical AD, MCI, and AD[10,11,12,13,14,15,16,17,18]. Furthermore, several studies suggest that combining characteristics from multiple observable domains, such as language, speech, and motor functioning across these stages, may improve the classification of individuals with dementia due to AD, MCI, and without cognitive impairment[19,20].

Like many researchers, during my bachelor's and master's programmes I was trained in a more traditional academic way of doing research with a focus on theory more than application. My PhD also has an empirical component through examining language and motor function in three disease stages of AD (MCI, mild AD, and moderate AD). At the same time, however, the main goal of my PhD is to contribute to improvements in professional healthcare practice. This contribution to healthcare practice involves focusing on measurement tools that can be used in a valid and reliable way in clinical practice. Both language and motor functioning can be measured objectively, which makes them potentially useful for earlier screening or assessment. For example, motor functioning can be assessed using measures such as grip strength or walking tests. Language can be evaluated through analyses of spontaneous speech or structured language tasks. In clinical practice, these types of assessments may be carried out by different healthcare professionals, depending on the care setting, including physiotherapists, speech therapists, clinical linguists, or neuropsychologists.

Another aspect of working at a university of applied sciences is the connection with education of future healthcare professionals, such as physiotherapists, speech therapists, nurses, or applied psychologists. Within the speech therapy program, I teach several courses related to research, including thesis supervision, a module on qualitative research, and evidence-based practice. Whenever possible, I also try to involve students in my research, for example with recruiting participants or collecting data. For many of these future professionals, engaging with research is an essential part of their practice. By involving them early on, they learn not only how research informs their work, but also how research is conducted. Ultimately, research aims to improve professional healthcare practice. Involving students in the research process helps bridge the gap between knowledge and application, enabling them to improve their own professional practice in the future.
Doing a PhD from a university of applied sciences has shown me that research does not take place only within (research) universities. Being close to professional practice often raises new and relevant questions. Sometimes, the most interesting research questions emerge precisely at the point where theory and practice meet.

● TEXT AND PHOTO BY MARLIES OEGEMA

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# INAUGURAL LECTURES

## Kleur bekennen (Showing one's true colours)

INAUGURATION
**Prof. M.J.H (Marieke) Wermer**
TITLE
Kleur bekennen (Showing one's true colours)
CHAIR
Neurology
FACULTY
Medical Sciences
DATE
January 16. 2026

This oration reflects on 110 years of Neurology in Groningen, highlighting the transformation of the field from early neuropsychiatric care to a highly specialized, technology-driven separate discipline. Major advances such as neuroimaging (CT, MRI), neurointervention, and subspecialization have reshaped both clinical practice and research in Neurology, positioning Groningen as a center of excellence with strong programs in neurotraumatology, movement disorders, and vascular neurology.

A central theme is the need for greater visibility and impact of Groningen, both in science and clinical care. Despite high-quality research and care, a traditionally modest culture may limit recognition, recruitment, and dissemination. Professor Wermer argues that visibility is essential to attract talent, guide patients, and demonstrate societal relevance.

The lecture further addresses inequities in healthcare, particularly sex-based differences in stroke recognition, treatment, and outcomes. Women are more likely to present with atypical symptoms, leading to underdiagnosis and undertreatment. These disparities extend beyond biology to structural issues such as wage gaps and regional differences in access to care, emphasizing the need for systemic change and targeted research and treatment

A major scientific focus is cerebral amyloid angiopathy (CAA), a major cause of stroke and dementia, and traditionally viewed as an age-related disease. New observations of young patients with prior neurosurgical exposure suggest a potential iatrogenic, prion-like transmission mechanism of amyloid-β. This paradigm shift raises the hypothesis that CAA might also be transmissible via blood, supported by epidemiological signals. These insights form the basis for  a new translational research line integrating epidemiology, imaging, and experimental models for which professor Wermer recently received a Vici grant.

Finally, the professor Wermer calls for a shift toward mechanistic, intervention-driven research in small vessel disease, including early-phase clinical trials targeting inflammation and amyloid clearance. Collaboration, critical reflection, and societal engagement are emphasized as essential to advancing both science and equitable healthcare.

● PHOTO BY GERHARD_TAATGEN

● EVELYN KUIPER-DRENTH, ON BASIS OF PRESS REPORTS OF THE UNIVERSITY OF GRONINGEN

# BCN THESIS DEFENCES

## Modifying TDP-43 toxicity: The role of ion channels and neuronal networks

PHD STUDENT
**L. (Lale) Güngördü**
THESIS
Modifying TDP-43 toxicity: The role of ion channels and neuronal networks
PROMOTORS
Prof. dr. ir. E.A.A. Nollen
Prof. dr. V. Guryev
FACULTY
Medical Sciences

Neurodegenerative diseases are complex and involve several biological processes. Protein toxicity plays a central role in age-related disorders such as Amyotrophic Lateral Sclerosis (ALS) and Frontotemporal Dementia (FTD).

Currently, there is no cure or effective treatment for these conditions. In ALS, the gradual loss of motor neurons leads to muscle weakness, paralysis, and ultimately death, often within a few years of diagnosis. As life expectancy increases, the number of people affected is expected to rise, making it urgent to better understand these diseases and develop new treatment strategies.

In this thesis of Lale Güngördü the microscopic worm Caenorhabditis elegans was used to study the biological mechanisms of TDP-43 toxicity, a protein strongly linked to ALS and FTD. We have characterized a worm model that overexpresses the human TDP-43 protein. This model mimics the key features of TDP-43 proteinopathies, including abnormal protein localization and movement impairments. Through detailed behavioral analysis, TDP-43 was shown to disrupt neuronal circuits by altering the balance between excitatory and inhibitory signals. Restoring this balance improved movement, suggesting that targeting the nervous system as a whole may be more effective than focusing on single neuronal types. Furthermore, several ion channels were identified as modifiers of TDP-43 toxicity, and their rescue mechanisms were further investigated.

These findings highlight ion channels as potential therapeutic targets and broaden understanding of how protein toxicity affects the nervous system. Overall, this thesis demonstrates how simple model organisms can provide valuable insights into complex human diseases and help pave the way toward new treatment approaches.

Dissertation

Lale defended her thesis on October 27, 2025.

## Psychophysiological underpinnings of cognitive reserve in older adults with mild traumatic brain injury

PHD STUDENT
**S.A. (Sebastián) Balart Sanchez**
THESIS
Psychophysiological underpinnings of cognitive reserve in older adults with mild traumatic brain injury
PROMOTORS
Prof. dr. J. van der Naalt
Prof. dr. ir. N.M. Maurits
FACULTY
Medical Sciences

The studies in this dissertation of Sebastian Balart Sanchez explored how cognitive reserve (CR) influences cognitive processes and their neural underpinnings reflected in the electroencephalography (EEG) of older adults with mild traumatic brain injury (mTBI). A systematic review showed that the relationship between CR and electrophysiological measures varies across populations, tasks, and analysis methods. Following this, the data of three EEG experiments were analysed that were performed with older adults with mTBI and without mTBI: registration was done in participants executing a working memory task (N-back) or a selective attention task, or during a resting-state condition. Results from the working memory task showed that mTBI negatively affected performance, with CR playing a role in mitigating these effects particularly at higher task difficulties. However, CR did not consistently influence the P2 and P3 ERP components during execution of different cognitive tasks. During the selective attention task, CR was associated with changes in P2 characteristics but not with task performance. Additionally, our analysis of resting-state EEG did not reveal a link between alpha asymmetry and posttraumatic complaints or CR.

In summary, the findings presented in this thesis have expanded our understanding of how CR influences the effects of mTBI in older adults through the analysis of cognitive, behavioral, and EEG data during resting state and selective visual attention and working memory task performance. Future research could capitalize on more challenging cognitive or emotional-task related paradigms,

incorporating a longitudinal study design and exploring alternative EEG analyses such as frequency decomposition, and AI techniques to bridge the gap between research and clinical practice for older adults with mTBI.

Dissertation

Sebastián defended his thesis on October 29, 2025.

## Advancing the diagnosis of major depressive disorder by adding a biological perspective: key considerations for developing a biomarker panel for MDD

PHD STUDENT
**M.C. (Michael) Jentsch**
THESIS
Advancing the diagnosis of major depressive disorder by adding a biological perspective: key considerations for developing a biomarker panel for MDD
PROMOTORS
Prof. dr. R.A. Schoevers
Prof. dr. H. Burger
COPROMOTOR
Dr. M. Meddens
FACULTY
Medical Sciences

Major depressive disorder (MDD) is a psychiatric disorder with a high disease burden impacting not only patients but also healthcare. Current diagnostic methods primarily rely on professional standards and guidelines, with limited incorporation of biological factors. Introducing a biological perspective to the diagnosis of MDD might enhance diagnostic accuracy, facilitate treatment initiation and effectiveness thereby improving quality of life and reducing healthcare costs. Over the years accumulated research into the biological background of MDD resulted in the postulation of several hypothesis believed to play a role in MDD pathophysiology. With the elucidation of MDD pathophysiology biomarkers were also found with the potential to be utilized in a diagnostic environment.

This thesis of Michael Jentsch is split in two parts. Part one focuses on some key considerations for developing a biomarker panel for MDD by looking at the fundamentals of biomarker discovery and biomarker methodology within a clinical environment. Part two focusses on the essentials of biomarker panel model development and validation towards clinical applications.

Based on the various studies described in this manuscript, it can be concluded that three aspects are important for the development of a biomarker panel in depression diagnostics, namely biological indicators, analytical indicators, and methodological indicators. Without good biological and analytical indicators, a reliable predictive model can never be developed.

PHOTO BY MARIANNE ENSTROM

Although this manuscript provides a good indication that implementing a biological perspective within current depression diagnostics can be of added value, a biological test will never become the gold standard. However, it does have the potential to supplement and improve current diagnostic practices.

Dissertation

Michael defended his thesis on November 5, 2025.

## Feeling art: A Multi-Method Exploration of Emotions, Embodiment, and Sense-Making in Art Experiences

PHD STUDENT
**G. (Gemma) Schino**
THESIS
Feeling art: A Multi-Method Exploration of Emotions, Embodiment, and Sense-Making in Art Experiences
PROMOTORS
Prof. dr. R.F.A. Cox
Prof. dr. B.P. van Heusden
FACULTY
Behavioural and Social Sciences

This dissertation explores how emotions are not simply side effects of art, but central to how we make sense of artistic experiences. Emotions arise through the interaction between people, artworks, and the spaces in which they are encountered. Across empirical studies, this research shows how bodily sensations, movements, and conversations together shape the meaning of art.

In the first (online) study, participants mapped where they felt emotions in their bodies while looking at artworks with the use of Bodily Sensation Maps, revealing that art emotions are embodied and often complex, such as bittersweetness. The second study examined children and adolescents with self-chosen meaningful artworks, showing that younger children rely more on bodily movement, while adolescents reflect more abstractly—yet in all cases, social interactions (i.e.: conversation) played a central role. The third study focused on adults discussing self-chosen meaningful artworks in pairs, demonstrating how strategies such as imagination and conceptualization intertwine with emotions like awe, nostalgia, and interest. The final study moved into the museum and used a multi-method approach to measure visitor experiences with physical and virtual installations. This approach helps to answer interdisciplinary questions, for instance about desired impact, relevant for psychologists, philosophers and curators alike.

PHOTO BY RUG

Together, these studies highlight that art experiences are embodied, emotional, and inherently social processes of sense-making. This work encourages museums, education, and science to recognize the importance of bodily and emotional dimensions of art experiences, moving away from narrow views of art as mere objects of beauty or triggers for disembodied contemplation.

Dissertation

Gemma defended her thesis on November 6, 2025.

## Tagalog agrammatism and how it shapes associated verb morphological deficits

PHD STUDENT
**J.M. (Jonathan) Gerona**
THESIS
Tagalog agrammatism and how it shapes associated verb morphological deficits
PROMOTOR
Prof. dr. R. Jonkers
COPROMOTORS
Dr. D.A. de Cock
Dr. C. Salis
Dr. J. Webster
FACULTY
Arts

Errors in using verbs are common in people with acquired language disorder called agrammatism, where grammar is used incorrectly during conversations. The way these individuals use verbs, correctly or not, seems to depend on how complex their language's verb system is. In languages with more complicated verb systems, people with agrammatism tend to use verbs correctly more often, while the opposite is true for languages with simpler verb systems. This study looks at people with agrammatism who speak Tagalog, a language that combines both complex verb patterns and allows the use of simple forms that hasn't been studied much before. The results will help us better understand agrammatism and how it may manifest in different languages, which ultimately offer new insights into analyzing language problems in people with aphasia across the globe.

Dissertation

Jonathan defended his thesis on November 13, 2025.

## Identifying a need for additional care: Development and evaluation of two screening instruments for people with visual problems

PHD STUDENT
**V.L. (Vera Linde) Dol**
THESIS
Identifying a need for additional care: Development and evaluation of two screening instruments for people with visual problems
PROMOTORS
Prof. dr. N.M. Jansonium
Prof. dr. J.H.C. Heutink
COPROMOTORS
Dr. A.A.J. Roelofs
Dr. A.J. van Sorge
FACULTY
Behavioural and Social Sciences

People with visual problems do not always receive the additional care they need, because their complaints are not recognized in time. Additional care, such as (neuro)visual rehabilitation, helps people with visual problems to maintain their independence and quality of life. However, many people access this care at a late stage or not at all. This applies to individuals with eye diseases as well as those with acquired brain injury (ABI). In her PhD research, Vera Linde Dol developed two screening questionnaires to improve earlier detection.

The VQL-6 (6-item Vision-related Quality of Life and Limitations questionnaire) comprises of six questions that provide insight into the patient's quality of life and perceived visual limitations in ophthalmic practice. The outcome of the questionnaire is visible in the electronic medical records and helps ophthalmologists to identify who may benefit from additional care. A pilot study at the UMCG showed the VQL-6 could facilitate timely referrals and was positively received by both patients and ophthalmologists.

For neurorehabilitation, the SVCq-ABI (Screening Visual Complaints questionnaire – Acquired Brain Injury) was developed. This 23-item questionnaire identifies visual complaints in people with ABI, such as blurry vision, light sensitivity, and reading difficulties. The results showed that 78% of individuals with ABI reported one or more visual complaints, highlighting the importance of systematic screening.

PHOTO BY JENNE HOEKSTRA

Both questionnaires are practical in use, easily integrated into digital patient systems, and align with the trend towards patient-centered care. They support healthcare professionals in recognizing a potential need for additional care at an earlier stage, thereby supporting the deployment of timely, appropriate care for people with visual problems.

Dissertation

Vera Linde defended her thesis on November 20, 2025.

## Protein disaggregation by the metazoan Hsp70-system: The role of J-domain proteins

PHD STUDENT
**N. (Niels) Alberts-Visscher**
THESIS
Protein disaggregation by the metazoan Hsp70-system: The role of J-domain proteins
PROMOTOR
Prof. dr. H.H. Kampinga
COPROMOTOR
Dr. N.B. Nillegoda
FACULTY
Medical Sciences

The human cell is filled with proteins. These proteins enable almost all important functions and processes that are important to the cell. To be able to fulfill these functions, proteins need to fold into a complex three-dimensional structure. While proteins are able to spontaneously fold into these structures in a test tube, in the crowded environment of a cell they need assistance to fold properly. When, for whatever reason, a protein does not fold properly fold or unfold it loses its function. However, unfolded proteins can also clump together and aggregate.

These protein aggregates can stick to other proteins and structures in the cell which can ultimately lead to the death of these cells. Protein aggregation is the cause of several brain disorders, such as Parkinson's Disease or ALS. To prevent protein aggregation from happening the cell contains a vast quality control system that helps fold or refolds proteins, or clears proteins that are incapable of folding. In this thesis of Niels Albert-Visscher we demonstrate that, when protein aggregates do form, this quality control system is capable of disassembling these proteins aggregates. To do so, the cell contains various so-called "protein disaggregation systems" that are capable of targeting various types of aggregates

PHOTO BY LEONI VAN RISTOK

to ensure that cells can handle multiples types of protein aggregates that can form during someone's life.

Dissertation

Niels defended his thesis on November 26, 2025.

## Bipolar and schizophrenia spectrum disorders as seen through the second brain: gut microbiota as a new field of treatment

PHD STUDENT
**J. (Jenny) Borkent**
THESIS
Bipolar and schizophrenia spectrum disorders as seen through the second brain: gut microbiota as a new field of treatment
PROMOTOR
Prof. dr. I.E.C. Sommer
COPROMOTOR
Dr. B.C.M. Haarman
FACULTY
Medical Sciences

This dissertation of Jenny Borkent, called "Bipolar and schizophrenia spectrum disorders as seen through the second brain: Gut microbiota as a new field of treatment", explores the relationship between the gut microbiome, bacterial translocation (or intestinal permeability), and psychiatric disorders such as bipolar disorder and schizophrenia spectrum disorders.

We examined differences in the composition of the gut microbiome,

PHOTO BY CHASE WANG

inflammatory processes, and intestinal permeability between individuals with and without these conditions. Additionally, we investigated whether associations exist within these patient groups between gut biomarkers and clinical characteristics of the disorders.

Finally, a large-scale clinical trial was conducted to evaluate whether probiotics have a beneficial effect on psychiatric symptoms, gastrointestinal complaints, and markers of intestinal permeability.

The findings presented in this dissertation contribute to a deeper understanding of the role of the gut-brain axis in severe psychiatric disorders and open up new perspectives for potential treatment strategies.

Dissertation

Jenny defended her thesis on November 26, 2025.

## The Pahenu2 phenylketonuria mouse model: Novel insights from behavioral and neurophysiological findings

PHD STUDENT
**J. (Junfei) Cao**
THESIS
The Pahenu2 phenylketonuria mouse model: Novel insights from behavioral and neurophysiological findings
PROMOTORS
Prof. dr. R. Havekes
Prof. dr. E.A. van der Zee
FACULTY
Science and Engineering

Phenylketonuria (PKU) is an inborn disorder where the body cannot properly break down an amino acid called phenylalanine (Phe), causing it to build up in the blood and brain, damaging brain function and changing behavior. While we already understand many effects of PKU, there's still much to discover about how it works and what symptoms it causes.

This study used a special type of laboratory mouse (Pahenu2) that has PKU to better understand how high Phe levels harm the brain and body. The research focused on three main areas. First, it reviewed what scientists have already found about how PKU changes behavior in mice. Second, it explored how inflammation in the brain might lead to problems in a particular brain region called the striatum, which may explain some of the behavior changes.

Finally, the study investigated how PKU affects brain activity and sleep patterns. The findings give new insights into how PKU impacts the brain and behavior, paving the way for further research into better ways to manage this condition, including alternative dietary interventions and other therapies.

Dissertation

Junfei defended her thesis on December 2, 2025.

## Frozen rhythms: Timing and thermoregulation of hibernation in the garden dormouse

PHD STUDENT
**M.R. (Maarten) Hamberg**
THESIS
Frozen rhythms: Timing and thermoregulation of hibernation in the garden dormouse

PROMOTORS
Prof. dr. R.A. Hut
Prof. dr. R.H. Henning
Prof. dr. R. Havekes
FACULTY
Science and Engineering

Hibernation is used by many mammals, and for the larger part consists of torpor, where the metabolism and body temperature drop dramatically. Periodically torpor is interrupted by arousals, where body temperature is restored to ~37°C for several hours.

In my first experimental chapter, I characterized how torpor and arousals differ across a variety of ambient temperatures, between -10°C and 20°C. I found that torpor phases lasts the longest around 5 to 10°C. In addition, garden dormice need to prevent freezing during torpor when the ambient temperature drops below 0°C, for which they require a strong increase in metabolic rate.

In the subsequent experimental chapter, I investigated where and how circadian rhythms are present during garden dormouse hibernation. Although body temperature does not display over rhythms, the interval between arousal initiations is performed with a strong circadian gating, suggesting a persistent clock in torpor. Using phospho-proteomic analyses, I found that during torpor the liver displays circadian rhythms in both protein abundancy and protein phosphorylation, demonstrating for the first time molecular circadian rhythms in torpor.

In the next chapter, I recorded brain activity of hibernating dormice to test the hypothesis that arousals occur in order to sleep. Combined with experimental sleep deprivation I demonstrated sleep homeostasis during hibernation. In the fourth chapter, I artificially elongated phases of torpor but allowing garden dormice to warm to ~30°C, which effectively prevented endogenous arousals from occurring. Collectively, this thesis sheds light on which processes dictate garden dormouse hibernation.
Dissertation

Maarten defended her thesis on December 2, 2025.

## Functional shades of grey: Nuances in diagnosis and management of functional neurological disorders

PHD STUDENT
**T.J. (Tjerk) Lagrand**
THESIS
Functional shades of grey: Nuances in diagnosis and management of functional neurological disorders
PROMOTOR
Prof. dr. M.A.J. de Koning-Tijssen
COPROMOTOR
Dr. J.M. Gelauff
FACULTY
Medical Sciences

Functional neurological disorders (FND) are conditions in which people experience symptoms such as weakness, tremors, or seizures, that result from changes in how brain networks function, rather than from structural abnormalities.
This thesis of Tjerk Lagrand aimed to improve the diagnosis, management and understanding of FND. Traditionally seen as a psychiatric problem, FND is now recognized as a neurological condition that benefits from a biopsychosocial approach, acknowledging the interaction between biological, psychological, and social factors.

Research described in this thesis showed that, besides physical examination findings ('positive signs'), clinical features from the patient's history - such as sudden onset, fluctuating symptoms, fatigue, and psychiatric history - help distinguish FND from other disorders. Combining these features in predictive models improved diagnostic accuracy to nearly 90%.The studies also explored driving ability and healthcare use among FND patients. Findings showed that while their hazard perception is intact or even enhanced, physical symptoms can still affect driving performance. Importantly, when patients receive a clear and satisfactory of their diagnosis, healthcare use drops dramatically.
Effective care requires multidisciplinairy, stepped-care approaches, tailored to the individual. Collaboration between neurologists, psychologists, physiotherapists, and other professionals ensures that patients receive the right care at the right time.

Overall, this thesis emphasizes that FND care should balance scientific structure with individual flexibility. Understanding the 'grey areas' between neurology and psychology is essential to improve diagnosis, treatment, and patient well-being.

Dissertation

Tjerk defended his thesis on December 3, 2025.

## Machine learning for video-based assessment of movement disorders: application to early onset ataxia and developmental coordination disorder

PHD STUDENT
**W.T. (Wei) Tang**
THESIS
Machine learning for video-based assessment of movement disorders: application to early onset ataxia and developmental coordination disorder
PROMOTORS
Prof. dr. Ir. N.M. Maurits
Prof. dr. P.M.A. van Ooijen
COPROMOTOR
Dr. D.A. Sival
FACULTY
Medical Sciences

Children with movement disorders often struggle with balance, coordination, and everyday motor tasks. Two common conditions Early Onset Ataxia (EOA) and Developmental Coordination Disorder (DCD) can look very similar in the clinic, making it hard for doctors to tell them apart. A precise diagnosis is crucial, since early treatment can improve a child's long-term development.

Traditionally, doctors rely on visual observation and rating scales to assess these disorders, but such methods can be subjective and vary between clinicians. This thesis of Wei Tang explores how artificial intelligence (AI) and video analysis can help make these assessments more objective and consistent. Using short videos of children performing simple tasks such as walking or touching their finger to their nose, the research develops AI systems that automatically recognize patterns of movement linked to EOA, DCD, or healthy motor function.

The thesis combines traditional machine learning and modern deep learning models to analyze movement from regular clinical videos, without the need for special sensors or equipment. These models achieved promising accuracy and were able to highlight which parts of a child's movement were most important for their decisions, making the results more interpretable for clinicians.
By focusing on four key qualities, reproducibility, accuracy, explainability, and robustness, this work moves a step closer to trustworthy, AI-based tools that can support doctors in diagnosing pediatric movement disorders. In the future, such systems could make neurological assessments faster, more objective, and more accessible for children and families worldwide.

Dissertation

Wei defended his thesis on December 10, 2025.

## Intraoperative motor response monitoring: Trials involving techniques and titration of anesthetic depth

PHD STUDENT
**M.C. (Maria) Gadella**
THESIS
Intraoperative motor response monitoring: Trials involving techniques and titration of anesthetic depth
PROMOTORS
Prof. dr. A.R. Absalom
Prof. dr. R.J.M. Groen
Dr. G. Drost
COPROMOTOR
Dr. M.M. Sahinovic
FACULTY
Medical Sciences

Surgical procedures near the spinal cord carry a risk of neurological damage. To reduce this risk, intraoperative neurophysiological monitoring (IONM) is used to assess nerve function in real time. A commonly used technique is transcranial electrical stimulation to measure muscle motor evoked potentials (Tc-mMEPs). However, these signals are highly variable, which can lead to false warnings and unnecessary surgical interruptions.

This thesis of Maria Gadella aims to improve the reliability of Tc-mMEP monitoring and reduce false positive alerts. Part I investigates optimal stimulation parameters and electrode types. Surface electrodes were found to be a safe and effective alternative to needle electrodes. Part II focuses on the influence of anesthesia. Depth of anesthesia significantly affects Tc-mMEP signals, especially in leg muscles, suggesting that current reference practices may need revision. Part III explores additional motor responses, such as H-reflexes and F-waves, which appear more stable under anesthesia and may provide complementary information.

The findings contribute to improved guidelines for neurophysiological

monitoring during spinal surgeries. Future research should focus on standardizing stimulation protocols, refining anesthetic management, and integrating late motor responses into IONM.

Dissertation

Maria defended her thesis on December 17, 2025.

## Mapping the cellular heterogeneity of multiple sclerosis lesions Towards understanding lesion progression

PHD STUDENT
**M. (Mirjam) Koster**
THESIS
Mapping the cellular heterogeneity of multiple sclerosis lesions: Towards understanding lesion progression
PROMOTORS
Prof. dr. B.J.L. Eggen
Dr. W. Baron
Dr. S.M. Kooistra
FACULTY
Medical Sciences

Multiple sclerosis (MS) is a progressive disease of the central nervous system (CNS) characterised by demyelination and inflammation. Affected areas – termed lesions – are differentiated in lesion types based on inflammatory activity, degree of demyelination, and anatomical location. The prevalence of certain lesion types and a larger overall lesion load correlate with disease progression. The cellular and molecular processes behind the formation, progression and potential resolution of MS lesions are not completely understood. Affected and involved cells derive both from the CNS and the immune system, and their relative contributions differ between lesion types. This thesis of Mirjam Koster aimed to address this cellular heterogeneity to better understand lesions and thereby MS progression.

PHOTO BY JENNE HOEKSTRA

To address the aim, we compared the gene activity profiles of lesions at the cellular and spatial level. We detected a novel rim around active lesions, which was predicted to precede the lesion core during the progression of lesions. These rims were characterised by the presence of 'responsive' microglia, a microglial state involved with phagocytosis and lipid metabolism, which we propose takes part in lesion expansion. Moreover, astrocytes in white matter lesions adopted gene activity profiles typically detected in grey matter astrocytes. We also studied interactions between microglia and the immune cells in the leptomeninges – a CNS barrier which tends to become inflamed during MS – and found perturbed cellular communications. Overall, the findings presented in this thesis highlight cellular, molecular and spatial processes in MS lesions and might pave the way towards new strategies for interfering in MS.

Dissertation

Mirjam defended her thesis on January 14, 2026.

## A timely dementia diagnosis – from recognition to decision-making across care settings

PHD STUDENT
**F.C.W. (Fleur) Visser**
THESIS
A timely dementia diagnosis – from recognition to decision-making across care settings
PROMOTOR
Prof. dr. B.C. van Munster
COPROMOTORS
Dr. M.E.A. van Eersel
Dr. N.A. Verwey
Dr. L. Hempenius
FACULTY
Medical Sciences

Many people are only diagnosed with dementia when the disease has already progressed. Patients and family members do not always seek help, and when they do, healthcare professionals do not always address concerns. In this thesis, Fleur Visser examines why it can take long before dementia is recognized and what healthcare professionals need to diagnose it timely. "Timely" here means appropriate to the situation and aligned with the preferences of the patient and their family. The findings show that a timely diagnosis requires more than medical knowledge.

PHOTO BY STEPHAN KEEREWEER

General practitioners (GPs) often find it difficult to raise the possibility of dementia and discuss the choices that follow. Together with patients and family, they need to decide between options such as wait-and-see, conducting tests in primary care, or a memory clinic referral. This conversation becomes even more challenging when a patient does not acknowledge symptoms and declines further testing. Some GPs feel unsure about their ability to diagnose dementia or question the value of a diagnosis. Clear guidance on roles and responsibilities, and collaboration with other professionals, such as practice nurses, can help.

In hospitals, memory problems are often missed, with the risk of suboptimal care. Physicians and nurses want to consider memory problems when treating other conditions, but report needing more knowledge and time.
Visser concludes that a timely dementia diagnosis begins with open discussion of concerns, close collaboration between professionals, and an approach that recognizes the person behind the patient.

Dissertation

Fleur defended her thesis on January 14, 2026.

## Speech motor control following surgical treatment for oral cancer: acoustic and kinematic insights

PHD STUDENT
**T.B. (Thomas) Tienkamp**
THESIS
Speech motor control following surgical treatment for oral cancer: acoustic and kinematic insights
PROMOTORS
Prof. dr. M.B. Wieling
Prof. dr. M.J.H. Witjes
COPROMOTORS
Dr. D. Abur
Dr. S.A.H.J. de Visscher
FACULTY
Arts

Surgical treatment for tumours in the oral cavity often lead to problems with speech articulation. In this dissertation, we investigated the speech outcomes of speakers who received surgical treatment for oral cancer using a novel method, namely electromagnetic articulography (EMA). EMA is a method whereby small sensors are attached to the tongue, lips, and jaw to measure their movement during speech. The results described in this dissertation show that while tongue mobility decreases after surgery, speakers are able to use the lips and jaw in a compensatory manner. The identification of these compensatory articulatory strategies may be used to design evidence-based speech rehabilitation.

Dissertation

Thomas defended his thesis on January 15, 2026.

## The eye's mind: Cognitively driven pupil-size changes

PHD STUDENT
**A. (Ana) Vilotijevic**
THESIS
The eye's mind: Cognitively driven pupil-size changes
PROMOTOR
Prof. dr. E.G. Akyürek
COPROMOTOR
Dr. S. Mathôt
FACULTY
Behavioural and Social Sciences

We often think of the eyes as cameras that faithfully capture the world, but this is a misleading metaphor: the eyes do not simply receive the external world—like the brain of which they are an extension, they anticipate it, shaped by what we

PHOTO BY VINCENT SIMÉON

expect and value. How far does this influence reach? Can what we think, want, or aim actually shape the earliest stages of what we see? In this dissertation, I argue for sensory tuning: the idea that cognition reaches down into the very earliest stages of sensation, optimizing sensory intake based on the demands of the current situation and the immediate future.I first show that attention not only determines what we select in the visual world, but also shapes how visual information is taken in, by dynamically modulating pupil size. I then demonstrate that these attentional effects on pupil size arise specifically from image-forming visual pathways, rather than from non-image-forming visual pathways. Next, I show that attention continues to influence pupil size even when visual stimuli are no longer perceived, indicating that sensory tuning operates both with and without subjective perception. Pushing this idea further, I provide evidence that attention-related influences may extend as far as the retina itself, as reflected in changes in retinal signals, although the precise mechanisms underlying these effects remain unresolved. Finally, I argue that cognitively driven changes in pupil size serve a functional role, helping the visual system balance competing demands such as sensitivity, resolution, and readiness for action, and I integrate these findings into a broader framework that situates sensory tuning as a unifying principle linking cognition and sensation

Dissertation

Ana defended her thesis on February 5, 2026.

## Neuroplasticity in psychiatric disorders: biological mechanisms underlying pathology and treatment

PHD STUDENT
**J.E. (Jesca) de Jager**
THESIS
Neuroplasticity in psychiatric disorders: biological mechanisms underlying pathology and treatment
PROMOTORS
Prof. dr. I.E.C. Sommer
Prof. dr. E.F.J. de Vries
COPROMOTORS
Dr. J. Nuninga
Dr. E. van Dellen
FACULTY
Medical Sciences

One of the most fascinating properties of the brain is its ability to adapt. This

so-called neuroplasticity refers to the brain's capacity to change its structure and function in response to experiences, learning, or brain injury. Neuroplasticity is important for the development of cognition, emotion, and behavior throughout both childhood and adulthood.

This thesis of Jesca Jager focuses on how this ability of the brain to change plays a role in psychiatric disorders. In the first part, we investigate neuroplasticity in people with schizophrenia spectrum disorder and healthy siblings. We show that individuals with this condition have fewer synapses—the connection points between brain cells. In siblings, there are indications that the brain may adapt to partially compensate for this, which might prevent them from developing the disorder.

PHOTO BY JAAP@JAPE.PHOTOGRAPHY

The second part focuses on depression and treatments such as conventional antidepressant, electroconvulsive therapy, and ketamine. We show that these treatments partly work through similar changes in the brain, but each also have its own distinct effects. Some of these changes are associated with improvement of symptoms, while others may explain side effects.

Together, the findings demonstrate that the adult brain is constantly changing and adapting. Although significant changes in brain wiring can cause temporary memory loss, they also create the potential to form new neural connections that benefit mental well-being.

Dissertation

Jesca defended her thesis on February 11, 2026.

## The uniquery of knowance: morphological processing of nonwords in reading

PHD STUDENT
**A. (Alessia) Rossetto**
THESIS
The uniquery of knowance: morphological processing of nonwords in reading
PROMOTORS
Prof. dr. R. Jonkers
Prof. dr. L. Beyersmann
COPROMOTORS
Dr. S. Popov
Dr. S. Fischer-Baum
FACULTY
Arts

Words are often made up of small meaningful parts, such as sweet+ness or kind+ness. These small parts are called morphemes, and many studies have shown that they help people read new words (also called nonwords). Indeed, readers tend to read nonwords containing morphemes more quickly and accurately compared to nonwords without morphemes. However, most studies have examined nonwords presented one at a time, although in everyday life readers normally read words in sentences. This thesis examines how morphemes influence the reading of nonwords both

PHOTO BY SIGRÚN LEA HALLDÓRUDÓTTIR

in isolation and in sentences. It also explores two other linguistic factors: how easy it is to interpret the meaning of the nonword (semantic interpretability) and whether the morphemes in the nonword follow the regular combinatorial rules (syntactic legality).

To answer these questions, the experiments in the thesis use several techniques. Healthy readers are asked to decide whether the nonwords they see are real English words or not, to read them aloud, and also to read them silently while brain activity is recorded. In addition, people with acquired reading difficulties caused by brain lesions read aloud the nonwords. Their performance provides insights into the strategies they use to overcome their difficulties. The findings offer new evidence on how readers use morphemes, meaning, and combinatorial rules when processing nonwords. Based on these results and previous studies, the thesis proposes a flowchart that summarises the main steps involved in reading. This model aims to give a clear picture of how different linguistic factors support the reading process.

Dissertation

Alessia defended her thesis on February 12, 2026.

## North Sea-Progressive Myoclonus Epilepsy

PHD STUDENT
**S.S. (Sjoukje) Polet**
THESIS
North Sea-Progressive Myoclonus Epilepsy
PROMOTORS
Prof. dr. M.A.J. de Koning-Tijssen
Dr. T.J. de Koning
Prof. dr. O.C.M. Sibon
FACULTY
Medical Sciences

North Sea-Progressive Myoclonus Epilepsy (NS-PME) is a rare, inherited disorder caused by a mutation in the GOSR2 gene. Patients develop symptoms at an early age, including balance problems (ataxia), disabling involuntary muscle jerks (myoclonus), and epilepsy. All known patients have ancestry tracing back to countries around the North Sea, likely originating from Friesland. The disease was only identified in 2011, and due to its rarity, limited information was available.

In her dissertation, Sjoukje Polet investigated the disease course, quality of life and underlying disease mechanisms of NS-PME. Retrospective chart reviews and questionnaires revealed a typical clinical sequence: ataxia around the age of 2, myoclonus around age 5, and epilepsy typically before the age of 10. Despite this typical sequence, symptom severity and progression varied among patients. Notably, heat was identified as a significant factor exacerbating symptoms.

The second part of the dissertation focused on quality of life. Interviews with patients and families revealed that QoL is primarily determined by independence, autonomy, social interactions, and personal fulfillment. These factors are not adequately captured by standard quality-of-life questionnaires.

Finally, Polet explored the disease mechanism using a Drosophila Melanogaster (fruit fly) model. This model showed that glial cells, the supportive cells of the nervous system, play a crucial role in the pathogenesis. Furthermore, GABA-A

receptor-stimulating anti-epileptic drugs significantly reduced seizure activity in the model.

In summary, this dissertation provides valuable insights into the disease course, key factors influencing quality of life, and potential starting points for future therapeutic research in NS-PME.
Dissertation

Sjoukje defended her thesis on February 18, 2026.

## Dystonia – neurophysiological and neurotransmitter insights

PHD STUDENT
**S.A.J.E.A. (Saar) Lagerweij**
THESIS
Dystonia – neurophysiological and neurotransmitter insights
PROMOTORS
Prof. dr. M.A.J. de Koning-Tijssen
Prof. dr. J.M.C. van Dijk
FACULTY
Medical Sciences

This thesis of Saar Lagerweij focuses on dystonia, a movement disorder characterized by involuntary muscle contractions that result in abnormal movements and/or postures. In addition to motor symptoms, patients often experience non-motor symptoms, including cognitive impairment, depression, and anxiety. Dystonia is considered a network disorder involving dysfunction across multiple interconnected brain regions. A major part of this thesis concentrates on cervical dystonia (CD), the most common subtype, affecting the neck muscles.

The primary treatment for dystonia consists of botulinum toxin injections, which reduce muscle overactivity. However, in a subset of patients this treatment is insufficient, and deep brain stimulation (DBS) can be considered. DBS involves implantation of electrodes in the Globus Pallidus interna (GPi), a structure within the basal ganglia. After implantation, stimulation parameters such as voltage and frequency are adjusted based on clinical response. Objective assessment of treatment effects remains challenging due to the lack of reliable biomarkers.

The main aim of this thesis was to identify objective biomarkers for dystonia. The first part investigates whether electromyography (EMG) can objectively quantify dystonic muscle activity. Abnormalities in the EMG power spectrum and increased intermuscular coherence within the 4–12 Hz frequency band were observed in patients with dystonia. These findings support the hypothesis of an underlying pathological neural "drive," likely originating in the basal ganglia and measurable across brain regions and muscles.

The second part of the thesis examines the role of the cholinergic neurotransmitter system using PET imaging in patients with cervical dystonia. Increased expression of the vesicular acetylcholine transporter (VAChT) was found in the right cerebellum, along with potential associations with non-motor symptoms such as anxiety, depression, and cognitive complaints. Together, these results highlight the importance of further research into EMG-based measures and the cholinergic system as potential biomarkers to improve diagnosis, monitoring, and treatment optimization in dystonia.

Dissertation

Saar defended her thesis on February 18, 2026.

## Advancing tools to assess visual crowding in healthy vision and glaucoma

PHD STUDENT
**D. (Dilce) Tanriverdi**
THESIS
Advancing tools to assess visual crowding in healthy vision and glaucoma
PROMOTORS
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FACULTY
Medical Sciences

Seeing the world clearly is not only about sharp eyesight. Much of what we do every day, reading street signs, finding a friend in a crowd, or safely navigating busy environments, depends on how well we can recognize objects in our peripheral vision. In many people, including those with eye diseases such as glaucoma, this ability is limited by a phenomenon called visual crowding: when objects are close together, they become difficult to identify, even if they are not blurred. Although crowding has major consequences for daily life, it is rarely measured in clinical practice, largely because existing tests are slow or cumbersome.

PHOTO BY REYER BOXEM

This thesis of Dilce Tanriverdi set out to improve how we measure crowding and to understand when and why it changes. I developed several new, rapid and more engaging methods that use eye tracking and continuous measurements to assess peripheral vision. These tools make it possible to measure crowding rapidly instead of lengthy test sessions. I then investigated whether crowding is affected by factors such as light level, showing that crowding remains remarkably stable across bright and dim environments. Finally, I explored how crowding behaves in glaucoma, a disease that damages the optic nerve and leads to blindness if untreated. My findings suggest that the increased crowding seen in early glaucoma may provide insights into functional difficulties that are not captured by standard clinical tests.

Overall, this work advances our ability to measure and understand peripheral vision, offering new possibilities for earlier and more meaningful assessment of visual disorders like glaucoma.

Dissertation

Dilce defended her thesis on February 18, 2026.

## Scanning for sight: Compensatory scanning in hemianopia during mobility tasks in virtual reality

PHD STUDENT
**E.M.J.L. (Eva) Postuma**
THESIS
Advancing tools to assess visual crowding in healthy vision and glaucoma
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In homonymous hemianopia (HH), half of the visual field is missing. This makes everyday activities, such as walking, cycling, and crossing the street, more challenging. Our research examined how people with HH use their eyes and head to move around safely. A literature review was performed combined with experiments in Virtual Reality (VR). In VR, people without HH were temporarily given a simulated visual field loss to study spontaneous adaptations.The results show that in these test environments people with HH often adapt better than expected. In VR, they were able to cross streets and cycle just as safely as people without visual impairments. This suggests that hemianopia does not always have to be a permanent, major limitation.However, not every adaptation is effective. Some people, for example, spontaneously look more often toward their blind side while cycling or make shorter eye movements while driving, without actually detecting more traffic. Effective scanning is situation specific: strategies that help when crossing the street do not always help when cycling. Slowing down your speed can also play a role.Compensation training could focus on scanning more broadly, using strategies suited to the situation, and unlearning ineffective habits. The current VR has limitations, such as misperception of distances and speed, and a smaller field of view compared to the real-world. Therefore, VR should be used for practicing specific components of mobility activities.With the right strategies and training, many

people with hemianopia can continue to participate in traffic safely and independently.

Dissertation

Eva defended her thesis on February 19, 2026.

## Ketamine for depression: Moving from research to clinical practice

PHD STUDENT
**J.K.E. (Jorien) Veraart**
THESIS
Ketamine for depression: Moving from research to clinical practice
PROMOTORS
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FACULTY
Medical Sciences

This thesis explores the use of ketamine in people with treatment-resistant depression. It starts by examining the concept of treatment-resistant depression, a term that is widely used but poorly defined. Importantly, this label may negatively influence patients' expectations and sense of hope. As an alternative, more neutral framing is suggested.


PHOTO BY JENNE HOEKSTRA

Survey data from individuals seeking ketamine treatment show that many have been suffering from depressive symptoms for years and are dissatisfied with standard treatments. At the same time, there is strong interest in innovative approaches. The thesis therefore focuses on the clinical potential of oral esketamine, studied both in a randomized controlled trial and in real-world clinical practice. Fixed low doses were not effective, but higher, individualized dosing led to meaningful improvement in a subgroup of patients.

The thesis further examines ketamine treatment in patients with complex and comorbid forms of depression, including those with psychotic symptoms, post-traumatic stress disorder (PTSD), and patients receiving maintenance electroconvulsive therapy (ECT). In these populations, ketamine was often effective and well tolerated, particularly when provided in a supportive and carefully monitored setting. Combining ketamine with psychotherapy appears promising, although more controlled research is needed.

Finally, the thesis addresses important pharmacological issues such as drug–drug interactions, the safety of combining ketamine with MAO inhibitors, and variability in blood levels. A key finding is the possible occurrence of auto-induction, meaning that repeated oral use may speed up ketamine's own metabolism, potentially reducing its long-term effectiveness. Overall, this work offers practical guidance for the safe and thoughtful use of ketamine in clinical practice.

Dissertation

Jolien defended her thesis on March 2, 2026.

## A new chapter: Lifestyle change to promote recovery in outpatient mental healthcare

PHD STUDENT
**C. (Charlie) Schillemans**
THESIS
A new chapter: Lifestyle change to promote recovery in outpatient mental healthcare
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Behavioural and Social Sciences

People with mental illness often have an unhealthier lifestyle and poorer physical health, contributing to a life expectancy about 15 years shorter. Mental healthcare usually focusses on symptom reduction, while clients indicate that personal and societal functioning are also important for their overall recovery. Such as having work or experiencing meaning in life. People can lead a good life, even when they have mental health symptoms.

To support all these areas of recovery, this dissertation examined what a lifestyle intervention can contribute for people with mental health illness. The combined lifestyle intervention for mental

PHOTO BY SITI AISYAG

healthcare (CLI-MHC) developed at Lentis, called CHAPTER, supports participants in making healthy lifestyle changes in the areas of physical activity, nutrition, sleep, relaxation, spirituality, substance use, and social participation. The intervention uses small, achievable personal goals and can widely be implemented within specialist mental healthcare.

Two randomised pilot studies in clinical practice showed that the intervention is feasible. Participants were enthusiastic and noticed positive changes. They particularly valued elements that often receive less attention in other lifestyle programmes, such as relaxation and spirituality. Notably, changes were not limited to mental or physical health, but were especially visible in other aspects of recovery: participants became less self-critical and better able to set boundaries. The programme also appears to be a worthwhile investment in terms of costs and benefits. Larger-scale follow-up research is needed to confirm its (cost-) effectiveness, explore how CHAPTER can be sustainably embedded in mental healthcare.

Dissertation

Charlie defended her thesis on March 9, 2026.

## Reflections of the self: Exploring the Role of Self-Image in Psychotic Disorders and Virtual Reality as a Therapeutic Tool

PHD STUDENT
**M. (Marit) Hidding**
THESIS
Reflections of the self: Exploring the Role of Self-Image in Psychotic Disorders and Virtual Reality as a Therapeutic Tool
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Self-esteem is a key factor in mental health, especially for individuals with psychotic disorders, who often experience a distorted sense of self and low self-esteem. Furthermore, adolescents are vulnerable due to high self-criticism, increasing the risk of mental health problems. Virtual Reality (VR) can be a helpful tool to improve current therapies for self-esteem.

In the first part of this thesis, we investigated how self-esteem and changes in self-esteem are associated with other factors in psychotic disorders through a systematic review and using a large dataset of people in remission from a first episode of psychosis. Low self-esteem was found to be associated most frequently with more severe psychotic symptoms, higher self-stigma, and more severe depressive symptoms. Social support emerges as an important contributor to healthy self-esteem. Over time, improvements in self-esteem are associated with reductions in psychotic

PHOTO BY R. DE VRIES

symptoms, fewer negative side-effects from medication, lower self-stigma, and greater social support. These findings highlight the importance of addressing self-esteem in treatment, as it is closely tied to better outcomes.

In the second part of this thesis, we investigated two single-session VR interventions designed to reduce self-criticism and increase self-compassion in students and explores their value for suicidal ideation. Both interventions proved effective, regardless of the participants' level of suicidal ideation. The results suggest that VR can be a valuable addition to current therapies targeting self-esteem and self-criticism, offering new possibilities for improving general mental well-being.

Dissertation

Marit defended her thesis on March 18, 2026.

## Mild traumatic brain injury at the emergency department: From one-size-fits-all to a patient-centered approach

PHD STUDENT
**S.M. (Sophie) Coffeng**
THESIS
Mild traumatic brain injury at the emergency department: From one-size-fits-all to a patient-centered approach
PROMOTORS
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FACULTY
Medical Sciences

Mild traumatic brain injury (mTBI) is one of the most common injuries seen at the emergency department (ED). Although most patients recover fully, a considerable proportion develop persistent symptoms such as headache, concentration problems, and fatigue, which impact daily functioning and societal participation. Nevertheless, limited evidence exists regarding early interventions aimed at preventing these symptoms.

This thesis describes the consequences of mTBI across different patient groups. Older adults are more vulnerable: they more often experience complications such as intracranial hemorrhages and deteriorate more frequently during hospital admission, while their symptoms at the ED are less evident. Therefore, we recommend that, for the time being, older patients with mTBI routinely undergo a head CT scan in the ED.

Furthermore, not all patients with mTBI experience the same symptoms or outcomes. Patients presenting with acute neck pain represent a distinct subgroup with more frequent and persistent complaints like dizziness, headache, and neck pain. In addition, patients with a head injury discharged home directly after their ED visit also often report long-term complaints. Risk factors include higher age, acute headache, and physical or mood-related symptoms two weeks after the injury.

Interestingly, despite persistent symptoms, both older adults and children often report good long-term quality of life after (m)TBI, a phenomenon known as the 'disability paradox'.

The main conclusion of this thesis is that mTBI is not a uniform condition. Different subgroups have specific risk factors and treatment needs. Future research should therefore focus on subgroup-specific, symptom-oriented interventions rather than a one-size-fits-all approach.

Dissertation

Sophie defended her thesis on March 18, 2026.

EVELYN KUIPER-DRENTH, ON BASIS OF PRESS REPORTS OF THE UNIVERSITY OF GRONINGEN

# CHEEKY PROPOSITIONS

*Als je onmiddellijk zou weten dat kaarslicht vuur is, dan was de maaltijd al lang geleden gekookt. (If you immediately knew that candlelight is fire, then the meal would have been cooked a long time ago.)*

**MICHEAL JENTSCH**

*Doing a self-funded PhD means solving problems with persistence, relentless creativity, and trust in the value of your work.*

**GEMMA SCHINO**

*Sometimes, a (research or art) work does not need to be perfect, it needs to be shared and seen.*

**GEMMA SCHINO**

*Seeing goes beyond sight itself, and should therefore be screened within a broader context.*

**VERA LINDE DOL**

*The lack of effective pharmacological treatments for neurodegenerative diseases is more a matter of a lack of proper diagnosis than a lack of putative therapeutics (Gribkoff & Kaczmarek, 2017).*

**NIELS ALBERTS-VISSCHER**

*"Negatieve resultaten zijn ook resultaten" (Negative results are also results)*

**JENNY BORKENT**

*There's no losing, only learning. No failure, only opportunities. And no problems, only solutions." – Pitbull.*

**MIRJAM KOSTER**

*Promoveren is als een berg op fietsen, zolang je maar blijft trappen kom je er uiteindelijk. (Doing a PhD is like cycling up a mountain: as long as you keep pedaling, you'll get there in the end.*

**FLEUR VISSER**

*Like many first-year psychology students, I set out to discover the human soul. Ten years—and a bachelor's, master's, and PhD—later, I suspect it's in what we call the error term of our statistical models.*

**ANA VILOTEIJEVIC**

*"Je neemt altijd jezelf mee" meaning wherever you go, you'll always bring yourself!*

**JESCA DE JAGER**

*An interesting fact I found out in my research is that we know much more about our language than we realise. For example, most people would not be able to say what the affix -ance means, but when we read a word like knowance, we are able to infer its meaning because our brain knows how this suffix works and the meaning it conveys.*

**ALESSIA ROSSETTO**

*Peripheral crowding is elevated in individuals with preperimetric glaucoma, suggesting early functional impairments in this group. – Chapter 4*

**DILCE TANRIVERDI**

*The first step in creating knowledge is learning how to learn. – inspired by Frank Herbert, Dune*

**DILCE TANRIVERDI**

*'No one can whistle a symphony. It takes a whole orchestra to play it'; addressing treatment-resistant depression calls for (inter)national collaboration to make meaningful progress.*

**JOLIEN VERAART**

*Een promotietraject lijkt op het opvoeden van een kind: voortdurend bijsturen, improviseren, onzekerheden onderweg, persoonlijke groei, en pas achteraf besef je hoe snel de jaren voorbij zijn gevlogen. (PhD trajectory is like raising a child: constantly adjusting course, improvising, facing uncertainties along the way, experiencing personal growth, and only afterwards do you realize how quickly the years have flown by.)*

**CHARLIE SCHILLEMANS**

*Virtual reality interventions deserve a permanent place in the contemporary psychologist's toolkit, as long as they are grounded in sound, evidence-based therapeutic principles.*

**MARIT HIDDING**

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# COLOPHON

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