

## Positivity bias



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# FROM THE BOARD ROOM

On behalf of the entire BCN Board, welcome to the first BCN Magazine of 2022! At the time of writing, the BCN Winter meeting 2022 has just taken place. Although necessarily – just like last year – it was organized online in GatherTown, the Winter meeting is always a meeting place par excellence for BCN researchers, from the Research Master students to professorial ranks. Top-class BCN research is presented in the poster sessions, the BCN thesis award winner (or even winners this year – a testament of the high quality of BCN theses) is announced and both the Board and the BCN PhD Council present their lowdown of the past year. And lowdown is a strange word to use in this context because 2021 has been full of highs instead:

Once again the BCN Neurosciences Research Master program was crowned the best of its kind in the Netherlands; despite the pandemic, a great many of BCN's talented PhD candidates successfully defended their work; 2021 saw the Nothing but the Truth Symposium taking place, with plenary talks, discussions and workshops exploring truth and trust in science and academia; and 2021 was also the year where BCN's PhD training program became more structurally recognized and embedded within BCN's participating faculties. In making the rounds to talk to the different Faculty Boards, board members clearly felt the appreciation and – often unawareness – of the interdisciplinarity work that BCN researchers have done since 1987. With the University of Groningen's investment in and focus on the four newly instantiated interdisciplinary schools, BCN has been the institutional home for T-shaped researchers for over 30 years; T-shaped in a strong monodisciplinary basis but branching out with keen interests in adjacent or, indeed, less adjacent academic fields.

The meetings with the Faculty Boards coincided with the current re-accreditation process of BCN: we got to explain BCN's vision, mission and future directions to the Faculty Boards as we were writing them down in a self-report. It is hard to do justice to the BCN community in a paper exercise: we can go into our Rema and PhD training programs, summarize the many lunch meetings, note down stimulating BCN lectures, show our BCN newsletter which has now been rebranded for the glossy Magazine that it has been for years, relate the BCN PhD Council's initiatives and outings, talk about BCN members' prolific public engagement efforts such as the Groningen Brain Olympiad or Marvelous Mind Movie events. But the vibrant BCN community is perhaps best felt in small encounters and ideas: during the Winter Meeting, common interests and wonderments were shared, plans for our PhD community and Research Master student community to get together were made on the spot. BCN as an institute can turn sparks into flames. A prime example of the latter has materialized for the first time in the BCN Seed grants, the winners of which were also announced at the Winter Meeting.

We invite you to join the BCN Board in looking forward to the Spring in many ways: to new beginning in the re-accreditation process, to in-person BCN meeting and events and budding research collaborations, with sparks kindled to flames.

On behalf of the entire BCN Board,  
Merel Keijzer

# LIFE AFTER COVID

## My experience with the COVID-19 pandemic

**During this pandemic I have witnessed solidarity, fraternity, and empathy; conversely, I have also witnessed greed, indifference, and envy. The best human and societal traits, but also characteristics that we ought to be ashamed of, have been on display. In the following paragraphs, I will share my experience and reflections derived from the COVID-19 pandemic. Let me first provide some context, I have a small clinic in a city of 1.05 million (INEGI, 2020), Santiago de Queretaro, Mexico, where I have lived since 2012. My entire clinical career as a physician has been in this city, which interestingly takes the name after the pre-Columbian ball game as two mountain ridges that form a ravine named “La Cañada”, which resembles a Mesoamerican ballgame court called òllamalìztli (Figure 1 and 2).**

My original plan was to return to Mexico for a couple of months to write up my Ph.D. thesis. Instead, I stayed for 9 months (January to September 2021), and my life changed. I have tested positive for SARS-CoV-2 on five occasions and negative on four; three positive tests

before being vaccinated. I have never developed symptoms and the only ailment I had during these two years was an intermittent burn-out syndrome. I have treated or supervised the treatment of 3417 patients with PCR or antigen test-confirmed cases to this day



Figure 1: Photograph of a Mesoamerican ballgame court in Monte Alban Archeological site in Oaxaca, Mexico. Image taken from <http://historiaorigenjuegodepelota.blogspot.com/>. Retrieved February 11, 2022.

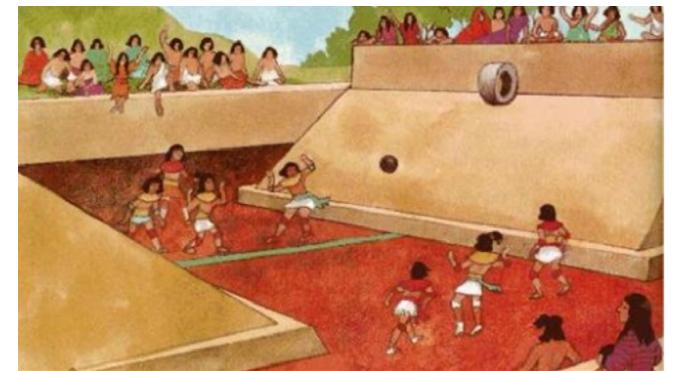


Figure 2: Illustration of a Mesoamerican ballgame. <http://historiaorigenjuegodepelota.blogspot.com/>

(February 11, 2022). Of these patients, 338 patients had a moderate, severe, or critical clinical presentation. Out of those 135 patients who had a severe, or critical clinical presentation, thus their oxygen saturation levels were below 70% (i.e., severe) or below 50% (i.e., critical) without supplementary oxygen. I have treated, people from all walks of life, from a catholic bishop to a police chief, to three drug lords, to a couple of college professors, and a score of physicians. All these patients decided to initially receive care at their homes. Unfortunately, 15 people passed away, fathers, mothers, and sons, all members of a thriving community. Many lives have dramatically changed as this global pandemic has changed how we interact with each other. I will share some of my reflections stemming from the COVID-19 pandemic.

### ***What have I learned from this pandemic?***

This pandemic has shown me the material or fabric that Mexican society and individuals are made of. I have witnessed how valuable the elderly are in Mexican society. It was and still is amazing, to witness how the daughters and sons organized to take care of the elderly. Without a second thought, entire families mobilized to rent oxygen tanks and oxygen concentrators. I have witnessed the strength of humankind to battle a punishing and debilitating disease. It became evident to me that Mexico extends beyond its geographical borders, as families organized and coordinated efforts both in Mexico and the United States to provide the best care to their sick family members.

In Mexico, no one can hide from COVID-19. This pandemic has exposed our weaknesses as a society and as



individuals. People who thought were healthy found out whether they were. Many people in my native country are sick, especially of type 2 diabetes mellitus (DM2). Mexico is among the top five countries in prevalence and mortality secondary to DM2.

The five highest [type 2 diabetes] prevalence [was] observed in China (89.5 million), India (67.8 million), United States (30.7 million), Indonesia (21.0 million), and Mexico (13.1 million). The top five countries of deaths were India (254,555), China (153,185), Indonesia (97,005), United States (68,558), and Mexico (64,067)." (Lin et al., 2020)

This pandemic sadly exposed how sick people in my country are. There was no hiding from this disease. We learned that many of our family members were sick from DM2, dyslipidemias, hypertension, and pulmonary diseases. We also learned that many people who we considered malnourished, due to their low body weight, were healthier than people who seemed a bit overweight but healthy.

I also learned that the SARS-CoV-2 virus affects the central nervous system in various ways. Very often patients suffer from sleep disorders during the infection.

In some cases, anxiety and depressive symptoms are observed if the patient suffers a severe or critical form of the disease. Several patients pleaded to their family members or me to stop the medical treatment. Tinnitus and vertigo are also sequelae found in a small group of patients. While patients with a history of different types of headaches most often suffered from different forms

of headaches (e.g., hemicrania continua, migraine, cluster headache). COVID-19 is a systemic disease that affects, the lungs, kidneys, heart, and brain.

### *How did I experience the pandemic?*

At the beginning of the pandemic, my students and former internal medicine students shared relevant literature, reviewed management strategies, discussed their personal experiences with at-home patient care. I felt prepared to do my part, I thought that I was ready to contribute to the patient management of COVID-19 patients. Once I arrived in Mexico, I felt ready to contribute to the COVID-19 patient care effort. However, what I thought would be a part-time endeavor, became an 18-hour a day job. I arrived in Mexico just before the apex of the second epidemiologic wave. The months of January and February 2021 were exhausting. Although for the first time in my medical career I felt that I was saving lives, that my work really made a difference, I felt incomplete. Frustration and disgust were the predominant feelings I had towards the medical community in my native country. I felt frustrated because not enough physicians wanted to visit and treat COVID-19 patients. I felt disgusted and disappointed towards the medical community, especially with pulmonary medicine specialists who charged their full consultation fees but only provided management via videocalls, without a physical examination. I was disappointed that economic gains were the primary incentives behind this therapeutic model.

After a couple of months and over 1500 patients, my sense of frustration and disgust changed to a sentiment

of impotence and fear. I felt powerless and baffled at the clinical evolution of some of my patients during the summer months. My impression was that the delta variant was a whole other story. I no longer felt that I was making a difference. It was a sobering and humbling feeling. I felt vulnerable and powerless. This feeling of uncertainty began to dissipate when several general physicians joined the effort to treat COVID-19 patients at home. As the third wave ended and my Ph.D. thesis defense approached, I grew hopeful as I saw how families who had previously suffered through the struggles of battling this disease helped and assisted other families. At one point in time, 36 oxygen tanks were at our disposal and our care network extended to 7 states in Mexico, as well as California and Texas in the USA.

After my return to Mexico in December 2021, the fourth wave changed my perspective on the pandemic yet again. This last wave has been less labor-intensive thanks to the vaccination effort. However, due to many factors, including misinformation and fear of the unknown, many people in Queretaro chose not to get vaccinated. This was initially a source of frustration but as I talked and treated unvaccinated patients, I learned two major things: 1) health should not be a political bargain chip; 2) fear of the unknown is a very powerful driving force. I grew more tolerant and patient as a result of my interaction with unvaccinated patients. I learned that convincing an unvaccinated patient to get the COVID-19 shot was an uphill battle. I learned to listen carefully to their worries, address their concerns and educate them on their knowledge gaps. I also learned to back down out of respect for their decision-making freedom.

### **How has this pandemic changed my life?**

Before the pandemic, I knew that as a physician I could impact the quality of life of my patients and in some cases make life-altering decisions in favor, but also in detriment, of my patient's health. However, throughout this pandemic, I have learned that as physicians we might not always cure, but we can always comfort and console our patients. This pandemic has humanized my approach to patient care. This pandemic has changed my life and my view of what society should look like.

On a personal level, I separated from my partner after being together for eight years due to our diverging perspectives and philosophy about life. I learned that materialism and greed lead to an ephemeral sense of happiness, while solidarity and empathy are eternal sources of joy. Since the age of 11, I have professed to be an atheist; however, I have witnessed improbable events that some might refer to these events as miracles. After my experience with this pandemic, I firmly believe that science and religious thought are complementary, as we need both faith and technology to overcome this momentous challenge.

...scientific research can flourish only in alliance with some religion or ideology. The ideology justifies the costs of the research. In exchange, the ideology influences the scientific agenda and determines what to do with the discoveries. Hence in order to comprehend how humankind has reached Alamogordo and the Moon – rather than any number of alternative destinations – it is not enough to survey the achievements of physicists, biologists,

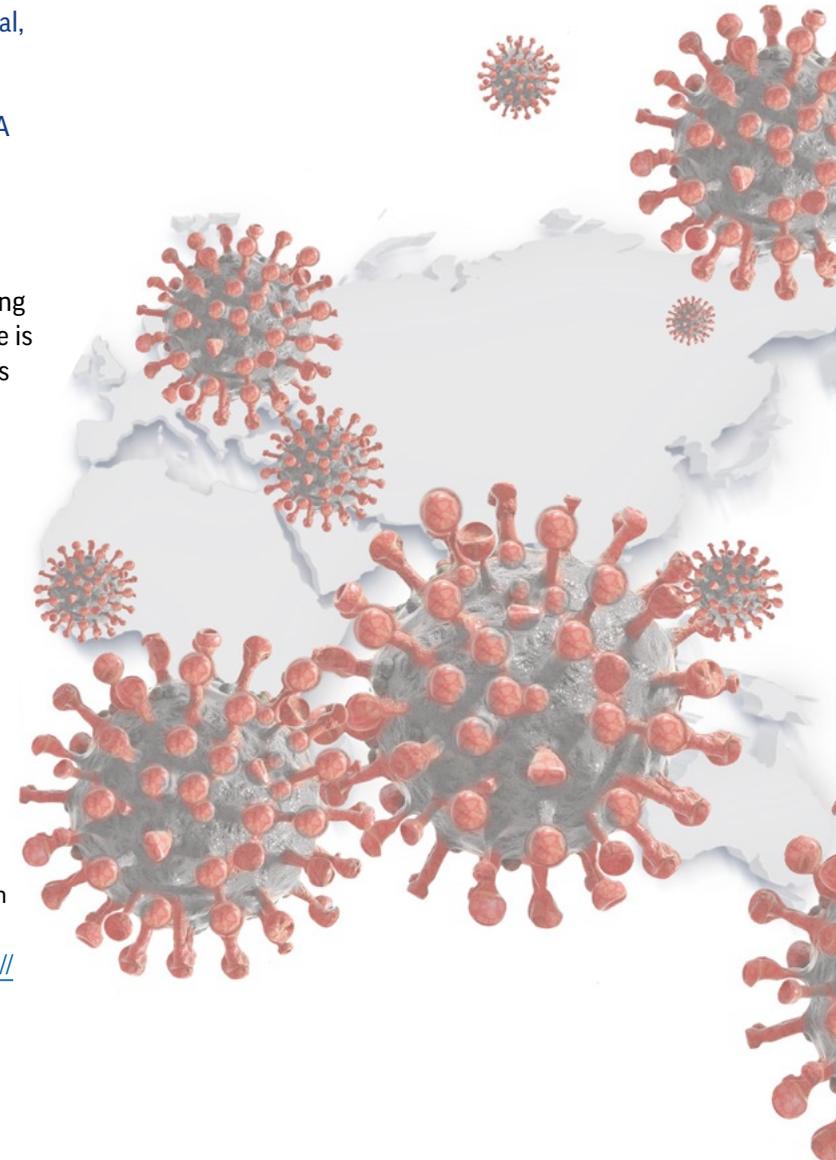
and sociologists. We have to consider the ideological, political and economic forces that shaped physics, biology, and sociology, pushing them in certain directions while neglecting others. (From *Sapiens: A Brief History of Humankind*, by Yuval Noah Harari, chapter 14, page 274)

Much more work is needed in this pandemic. Vaccine inequity is still a challenge. A balance between rewarding innovation and abiding by the principles of open science is still needed. This pandemic has unmasked many players in the pharmaceutical industry and political leaders around the world. Our society is not perfect but a work in progress. I have hope that solidarity, fraternity, and empathy will thrive over greed, indifference, and envy. Maybe I am a dreamer, but this pandemic has given me hope for our future.

● BY JAIME MONDRAGON

#### REFERENCES

- INEGI. Censo de Población y Vivienda 2020 – SCITEL (in Spanish). <https://www.inegi.org.mx/app/scitel/Default?ev=9>. Retrieved February 11, 2022.
- Lin, X., Xu, Y., Pan, X. et al. Global, regional, and national burden and trend of diabetes in 195 countries and territories: an analysis from 1990 to 2025. *Sci Rep* 10, 14790 (2020). <https://doi.org/10.1038/s41598-020-71908-9>



# NEW STAFF WRITER

## ALEJANDRO MARMOLEJO-GARZA



Hello readers, I am Alejandro, new member of the staff team for the magazine. I am currently a PhD student in the departments of Biomedical Science of Cells and Systems (BSCS) and molecular pharmacology (MF). My PhD research focuses on the relationship of mitochondrial dysfunction and Alzheimer's Disease. I am originally from Mexico, I obtained my medical degree in 2017 and then pursued the medical and pharmaceutical drug innovation master (now MMIT). I like to play the piano, I have studied piano since I was 7. I am fascinated by the effects of language learning on the brain although I may not be the best subject to test this (learning dutch is work in progress).

I joined the BCN Magazine staff because I like writing about science/academic life and I was already contributing to the science communication blog Sci-fact ([scifact.home.blog](http://scifact.home.blog)), together with some colleagues. I am active in the BCN research school too, as I am part of the BCN PhD council.

I am looking forward to contributing to the BCN magazine in upcoming issues.

- BY ALEJANDRO MARMOLEJO-GARZA
- PHOTO BY SANDER MARTENS

## BITS AND PIECES COLUMN

# No time for ambitions

**Monday:** OK. New week. New plans. What will I finish? Well, this week I really want to get further with writing this important paper I desperately want to get out soon. Then of course my weekly meetings with my PhD- and MSc-students, teaching, commenting on paper drafts. Oh, and of course trying to shorten my to-do list with long overdue tasks. This week, I will REALLY get it done.

**Pling.** New e-mail. From school. "Dear full time-working mum, the coming ten days, the class of daughter #2 has to go into quarantine". Sigh. OK. That's fine. I'll manage. She's cute. Just wants to do something else every ten minutes, but thank goodness for iPads and Playmobile. We'll be fine. It's what it is. Let's first go to bed, tomorrow we'll start fresh.

**Tuesday:** Good morning girls! What do you want, daughter #1? A throat-pastille? Does it hurt swallowing? Well, let's do a self-test. Look at that, two nice red lines. You will have to stay home for the coming eight days. Luckily the government just changed the rules, so your sister can go to school. Yes, honey #2, I know you looked forward to isolation and no school so much, but I can't change the rules. Could you please stop screaming and get up from the floor?

**Five days later:** Blegh, I'm not feeling too well. Sigh. Positive. OK. I was waiting for it. Let's get it over with and get super-immunity! Go!

Another eight days later. Whoohoo, everyone's healthy! Let's continue our lives and get something done!

**Pling.** New e-mail. "Dear exhausted and socially deprived mum, today we have a shortage of staff, so after-school care will be closed the coming two days for both your daughters.

**Pling #2.** Another new e-mail. "Dear hardly sane hint of a person, tomorrow there will be no school for daughter #2 because the teacher has to take care of her daughter, who's home with covid".

OK. That's two weeks down the drain, with ten new items to my to-do list. And no letter written. Clearly, this is not the time for ambitions. Not even for a decent column. Maybe next week.

**Pling.** NOOOOOOO!

● BY MARIE-JOSÉ VAN TOL

● ILLUSTRATION BY SANDER MARTENS



## NOW WHAT?...

# Life after defence: A conversation with Azzurra Invernizzi and Anna Neustaeter

**The journey of a PhD scholar is often depicted as the transformation of a dependent student into an independent, strong-willed and confident achiever. Azzurra Invernizzi (Post-Doctoral research fellow at Icahn School of Medicine at Mount Sinai, New York, USA) and Anna Neustaeter (Post-Doctoral research fellow at Mount Sinai Health System, New York, USA) talk about their journey in academia after obtaining their PhD.**

**AZZURRA:** Hi Anna it is nice to see you again after a long time. How was the year 2020 for you in terms of finishing your PhD and looking for a Post-Doc position?

**ANNA:** It is nice to see you too, Azzurra. During the final year of my PhD, I actively started looking for Post-Doctoral positions as I was moving back to Canada. I began this process in the beginning of March. I was invited for a Nature communication conference where I met with a few Post-doc researchers. I heard of a job opening through this conference, which led to my current position. How was last year for you and how did you manage to find your current post-doc position?

**AZZURRA:** I actually started looking for positions in my final year of PhD as well. I have a technical background, I wanted to move to New York for personal reasons and to pursue a career in Industry. However, I could not get a visa as they were rejecting non-research visas during the pandemic. Thus, I started applying for post-doc positions that were inclined towards a more technical approach. Currently I am working with big data, applying techniques and methods that I had learnt during my PhD. I found an advertisement for a position in machine learning and fMRI

research on ResearchGate and applied. Having a good network on platforms such as ResearchGate and LinkedIn is very essential.

**ANNA:** You need to keep your scientific presence online and up to date. Surprisingly, we are actually working for the same company. I was thinking similarly as you did in terms of shifting to industry. However, then I noticed this the position which really fit my skillset, and managed to obtain it. Additionally, it was close to home.

### **How do you know each other?**

**AZZURRA:** We were both part of a Marie Curie early-stage researcher grant including 25 PhD positions, focused on investigating glaucoma using various techniques. My main focus was to investigate the function of the visual cortex in glaucoma patients using functional MRI. Let's talk about the present, Anna what topic are you currently working on?

**ANNA:** My background was biology and genetics oriented. I looked at adult onset in complex diseases and glaucoma is indeed a complex disease with several genetic variants. I looked at it from a genetic epidemiological view point

where I investigated genetic risk. Genes that were implicated with glaucoma were taken as risk factors and applied to a population based cohort. Those with lowest and highest risk for glaucoma were invited to be examined. In my current post-doc I am now looking at Crohn's disease, which affects the gastro-intestine track. I am looking at a population-based cohort of affected patients and their first degree relatives that are unaffected. This cohort is followed over time and I am looking at the nutritional component. Basically, it consists of a wholistic approach of looking at the disease to understand who may be at a higher risk in north America. My own skill set is on big data, using R. I work mainly with statistical data. What skillset would you recommend as being essential?

**AZZURRA:** I complete agree with you. R is a very essential tool and is open source as well. I personally use MATLAB and code most of my scripts myself. In my field in neuroimaging, Python and MATLAB are extensively used.

**ANNA:** If you sort of have a coding background or develop coding skills it is valuable beyond academia.

**AZZURRA:** Yes, coding but also being able to communicate your results in an appealing graph are important skills. R and Python are very nice tools for doing that.

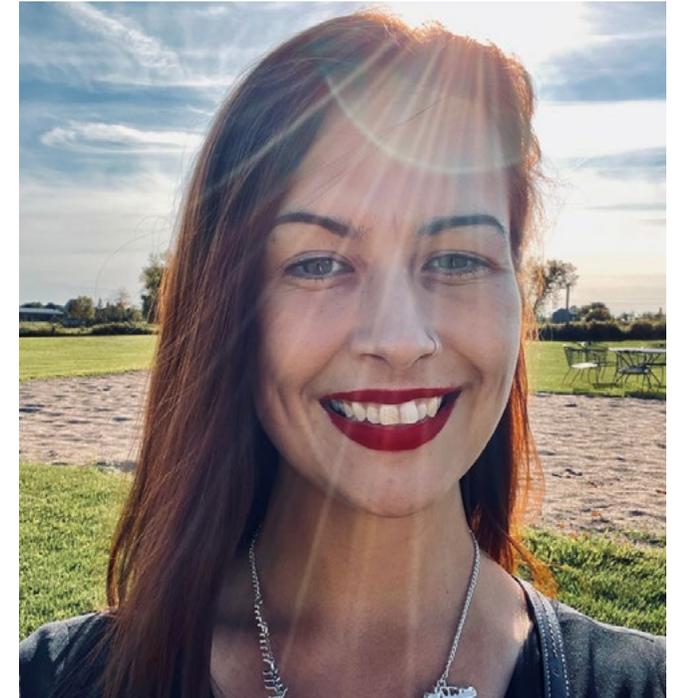
**ANNA:** There is a move to graphical abstracts. Nobody wants to read a giant table these days. Don't be ashamed to understand statistics at an undergraduate level. Statistics form a really fundamental foundation for science.



### **How does the near future look for you?**

**ANNA:** My Intention is to eventually work within the Canadian government looking at an overview of epidemiology as it stands in Canada. I would want to give guidance at a population based level. And what about you?

**AZZURRA:** I am planning to have one foot in academia and another foot in the industry. Although it would be quite challenging, there are plenty of opportunities for various types of jobs after your PhD that are not only post-doctoral positions.



**ANNA:** It was great discussing and talking to you once again after such a long time! I wish you the best for your current position in America.

**AZZURRA:** It was indeed great talking to you and I also wish you the same for your future career!

● **BY KAVYA PRASAD**

● **PHOTOS AZZURRA IVERNIZZI BY KIM WESTRA**



A Better  
Door  
Opened

So I had defended my PhD in March 2021, and there laid before me all the choices I had to make for my future career. In fact, I had started job hunting some months prior to my defense, but the urge to decide on which career path to take became more pressing immediately after my PhD defense.

The thought of finding something in an industry was quite seductive: during my PhD I had been entertaining the thought of just having an 9-5 kind of job. After all, I wouldn't have to be constantly thinking about my work after office hours. This is in no way to hint that I had a difficult time during my PhD, and thus, I wanted an easy escape. I probably belong to the minority who had a very pleasant time during their PhD. I had a very good personal and professional relationship with my supervisor, and that made an awful lot of a difference. There were several occasions where even I felt it was probably unfair to have such a good and supportive supervisor, given the horror stories I had heard about from other PhDs. On top of that I also enjoyed working on my topic. Nevertheless, I knew deep within me that taking on a scientific career was something I did not want to pursue. What I really wanted was to teach. I find teaching exhilarating, and I cannot envision ever getting bored with only teaching. However, the reality of finding a teaching position became quite disconcerting as only a few teaching positions are advertised. I had been told by many people it would be easy to be hired as a teacher because most people would rather go into research than to teach. But this was not the case for me.

*"I probably belong to the minority who had a very pleasant time during their PhD. I had a very good personal and professional relationship with my supervisor, and that made an awful lot of a difference"*

*"Just one choice, and my future would have looked completely different."*

So I was faced with the choice of sticking to what I really wanted and to keep searching, but after being unemployed for some months, my patience was running out. Consequently, the other possibility, which was to look for a non-academic job, became even more appealing. Or perhaps, to consider a post-doc? After all I would still get some opportunities to teach. Eventually, I was sending out job applications for all of these options, but mostly for non-academic jobs. Oh and how stressful that was. I got so used to rejection emails to the extent that anytime I got a reply from any of my applications, I would quickly skim through to look for the word 'unfortunately' (unfortunately there were others with better profiles...), and if I didn't see this word, then I would go back and read the whole email from the beginning. I managed to have about 4 interviews for non-academic positions, but I still could not land any of those jobs in the end. Fortunately, I finally found a job, a teaching position in Computational Linguistics at the University of Groningen. Yes, what I really wanted!

Looking back now, I was very close to making a choice which could have defined my career path for the rest of my life. Just one choice, and my future would have looked completely different. I was trying out several options, because I just wanted to get a job, but unbeknownst to me was that my dream job was waiting for me. Maybe I was lucky! But it can also hold true that when a door closes, a better one opens.

- BY FRANK TSIWAH
- PHOTO BY DANA ILIUCIUC



# THE 2022 BCN WINTER MEETING

## Testimonials and visual impressions



On February 3rd, the traditional BCN winter meeting was held, again in a non-traditional way due to COVID restrictions: online in the virtual playground of Gather Town. As always, PhD students and BCN master students got the chance to present their research, discuss their ideas and learn from other researchers within BCN. The key-note lecture was given by Amir Amedi from the School of Psychology in the Interdisciplinary Center (IDC), Herzliya, Israel.

- BY ALEJANDRO MARMOLEJO GARZA
- SCREENSHOTS BY SANDER MARTENS

The screenshot shows a virtual meeting interface. On the left is a participant list with names like Sander Martens, Alexandros Christop..., Ana Vilotijevic, Anika Poppe, Annemieke, Ashkan Najad, Becca, Catherine Sibert, Celeste Vervoort, Cheryl, Clara, Diana, Diana Koopmans, Diederik Smit, Dilce Yanivverdi, Dora, Elina, and Eline. The main area displays a welcome message: "Welcome to the ... February 3, 2022 BCN Winter Meeting". The BCN logo and "School of Behavioral and Cognitive Neurosciences" are visible. Below the title, it lists: "Organized by: Diana Koopmans and Evelyn Kuiper-Drenth (BCN Office)", "Hosted by: Heymans Research Institute, Faculty of Behavioural & Social Sciences", and "Chaired by: Mark Nieuwenstein". A notification at the bottom says "gather.town is sharing your screen. Stop sharing Hide". On the right, a vertical strip of video thumbnails shows other participants.



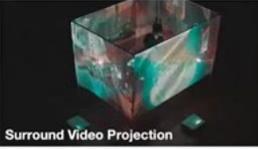
**Martinica Garofalo,**  
MD-PhD student

*In my opinion, the BCN Winter Meeting was a success! I experienced it as a safe learning environment, where PhD and master students could present their posters and ask each other interesting questions. It gave me the opportunity to meet other PhD students, to network and to learn more about the current research projects within the BCN. Also, the key-note lecture by Professor Amedi was really engaging! Although there were some logistical issues (mainly related to the use of Gather Town), everyone showed a lot of understanding and flexibility, making the meeting very dynamic and fun to attend.*

### The Baruch Ivcher Institute for Brain, Cognition and Technology



Ambisonic Audio Room (97 speakers)



Surround Video Projection



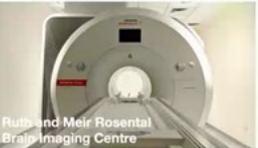
Virtual Reality



Wearable Technologies



Touch and Vibration

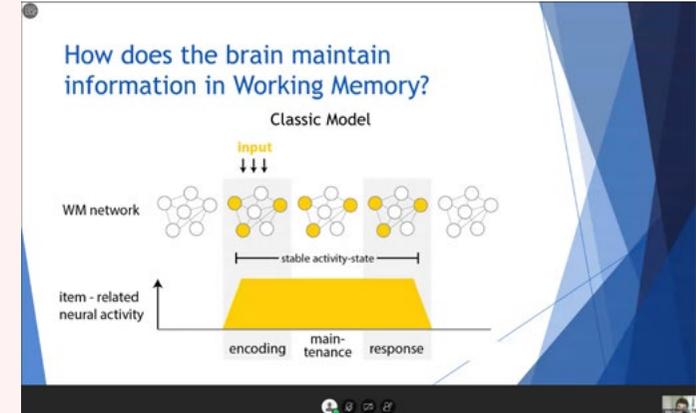
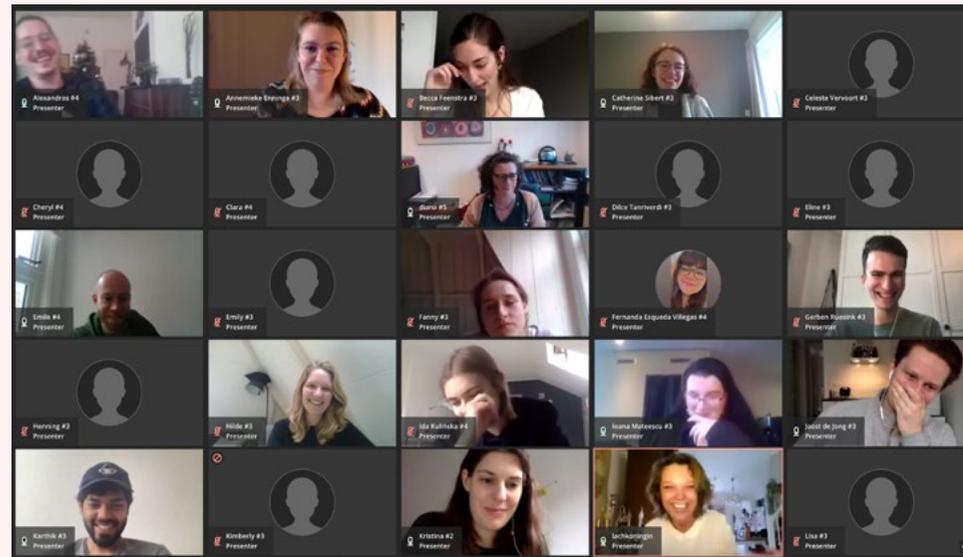


Ruth and Meir Rosental Brain-Imaging Centre

The Baruch Ivcher Institute for Brain, Cognition and Technology

Reichman University Baruch Ivcher School of Psychology

### Laughter Workshop



**The Response of Human Auditory Cortex to Amplitude-Modulated Tones**  
 Shahin Safazadeh<sup>1,2,3</sup>, Marc Thioux<sup>1</sup>, Gijs Hoskam<sup>1,2</sup>, Remco Renken<sup>1,2</sup>, Pim van Dijk<sup>1,2</sup>

**Introduction**  
 Neurons in the auditory cortex are organized following tonotopic gradients. Beyond frequency, a critical component of natural sound is time or amplitude modulation. AM. Mapping the auditory neural organization as the result of temporal modulation, known as "tempotopy", showed that tonotopic gradients are roughly perpendicular to the gradient of the tonotopic map; in the current study we utilized functional MRI to map the neural organization of the human auditory cortex (AC) as a function of sound frequency, and sound amplitude modulation using pure tones carriers for amplitude modulation.

**Material and methods**  
**Subjects**  
 Nineteen healthy subjects were recruited at the University Medical Center Groningen (UMCG) according to the approved ethical protocol.

Number of participants	Age range (years old)	Gender	Hearing threshold (250-4000 Hz)	Hearing disorders
19	20-35	10 M / 9 F	< 20 dB HL	None



**Tingting Chen,**  
 PhD Student

It was my first time participating in the BCN winter meeting. I think it was a meaningful activity in which you could enjoy a lot of interesting presentations and discuss with people from different fields. It gave us glimpses of the breadth of brain science and opportunities to have interdisciplinary communication. Hope we can see more exciting research next time!

**BCN Poster awards**



Poster 2 by Wei Tang

**Scaling of 2D gait skeleton data for quantitative assessment of movement disorders from freestyle single camera video recordings**

**Introduction**  
 Gait analysis is a key tool for diagnosing and monitoring movement disorders. However, traditional gait analysis methods require specialized equipment and are often expensive and time-consuming. Recent advances in computer vision and machine learning have enabled the development of gait analysis methods that can be applied to single-camera video recordings.

**Methods**  
 We developed a novel method for scaling 2D gait skeleton data. The method involves extracting key gait parameters from 2D gait skeleton data and scaling them based on a set of reference values. The scaled data can then be used for quantitative assessment of movement disorders.

**Results**  
 The results show that the scaled data can be used for quantitative assessment of movement disorders. The method is simple and easy to use, and can be applied to single-camera video recordings.

**Conclusion**  
 The method provides a simple and effective way to scale 2D gait skeleton data for quantitative assessment of movement disorders. It is a promising tool for clinical research and diagnosis.

Poster 10 by Tingting Chen

**Neuroprotective effects of extracellular mitochondria against ferroptosis**

**Introduction**  
 Ferroptosis is a form of regulated cell death characterized by the accumulation of lipid peroxides. It has been implicated in various neurodegenerative diseases, including Alzheimer's disease and Parkinson's disease. Extracellular mitochondria (EMs) have been shown to have neuroprotective effects against ferroptosis.

**Methods**  
 We investigated the neuroprotective effects of EMs against ferroptosis in neuronal cells. We used various methods, including cell viability assays, flow cytometry, and electron microscopy, to study the effects of EMs on ferroptosis.

**Results**  
 The results show that EMs have neuroprotective effects against ferroptosis. EMs can reduce the accumulation of lipid peroxides and increase cell viability in neuronal cells.

**Conclusion**  
 EMs have neuroprotective effects against ferroptosis. This finding may provide a new therapeutic target for neurodegenerative diseases.

Poster 19 by Elina van den Brandhof

**The Combination of Machine Learning and Neurophysiological Knowledge: A Classification System for Hyperkinetic Movement Disorders**

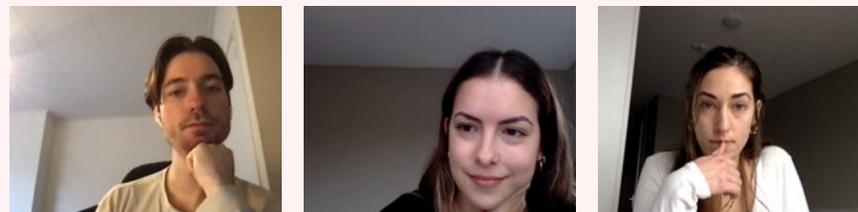
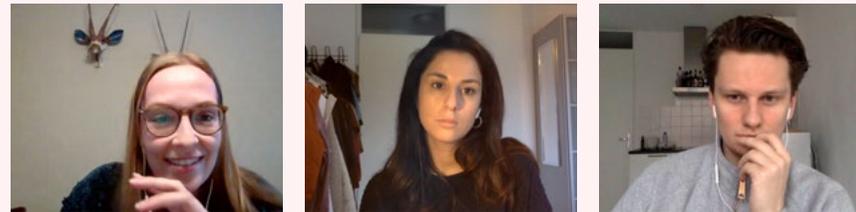
**Introduction**  
 Hyperkinetic movement disorders (HMDs) are a group of neurodevelopmental disorders characterized by excessive and involuntary movements. The diagnosis of HMDs is often challenging due to the overlap of symptoms with other conditions. Machine learning (ML) and neurophysiological knowledge can be combined to develop a classification system for HMDs.

**Methods**  
 We developed a classification system for HMDs based on ML and neurophysiological knowledge. The system uses ML algorithms to analyze neurophysiological data and classify HMDs.

**Results**  
 The results show that the classification system can accurately classify HMDs. The system is easy to use and can be applied to clinical research and diagnosis.

**Conclusion**  
 The combination of ML and neurophysiological knowledge can be used to develop a classification system for HMDs. This system may improve the diagnosis and treatment of HMDs.





**Prajit Dhar,**  
PhD Student

The winter meeting was a great way to meet all the BCN researchers and stay up to date with their latest research. Though there were some hiccups during the online meeting, Diana was ever present and quickly provided a resolution. Already looking forward to the next meeting!

### Pubquiz



February 3, 2022  
BCN Winter Meeting

Round 1 - Question 1 (answer)

How many PhD students are currently enrolled in the BCN graduate training program?

c) 231



# BUDDY PROGRAM FOR PERSONS WITH A SEVERE MENTAL ILLNESS

Lisette van der Meer is an assistant professor at the department of clinical and developmental neuropsychology and a senior researcher at the department of psychiatric rehabilitation at Lentis Psychiatric Institute. She developed a buddy program to increase connectedness between people with a serious mental illness (like schizophrenia or bipolar disorder) and society. By coupling psychology students to patients or service users (a less stigmatising term for people who “use the psychiatric services provided by the psychiatric care facility”), they hope to stimulate a reconnection with society for service users while at the same time creating a learning opportunity beyond the textbooks for students. Mindwise interviewed Lisette van der Meer and Justin L. Abu Hoof, a psychology student who supports Lisette in setting up the buddy program and volunteers as a buddy for Nick, who has been a service user of Lentis for over 5 years now.

## *What is the buddy program about?*

**LISETTE:** In the program, buddies meet approximately once a week and spend time together. How they spend this time is up to the buddies, but this can vary from taking a walk, to watching a movie, playing a game or cooking a meal. The idea is that when the buddies undertake activities together, they learn about themselves as well as their buddy. In that sense, becoming a buddy gives valuable insights for both the student and the service user. We ask students to be available for at least a few hours per week for at least a year, to create some continuity for the service users. We organize intervision meetings for students to share their experiences and support them when they encounter difficulties. In the end, we hope that the experience for both students and service users results in a positive and ‘normal’ contact based upon mutuality between people receiving psychiatric care and students.

## *Why did you join the buddy program?*

**JUSTIN:** Dr. van der Meer and I first met within the context of doing a research internship as part of a course in the Excellence Programme. During our interview, we had an open discussion about what I missed during my



years of studying Psychology: attention for individual differences in people with psychiatric problems. More specifically, I felt that we learned about various psychological topics from a very scientific, statistical and general perspective (i.e. learning about mental disorders and their symptoms in terms of “averages”). I expressed the need to look beyond our textbooks and learn more about the individual behind the disorder. This is how I became introduced to the buddy program.

### **Why are you so enthusiastic about the project?**

**LISETTE:** I really like to introduce students to the field of psychiatry, and particularly to the group of service users who need intensive long term psychiatric treatment. I enjoy the stories and enthusiasm of both students and service users. Students do not seem to be discouraged by the difficulties in activating service users, but are mostly dealing with this very well. Buddies tend to be genuinely interested in their partner and often enjoy each other's company. I think the key here is that the project emphasizes 'normality', mutuality and open dialogue between buddies, which may stimulate self-reflection and rediscovery of talents, characteristics and enjoyable activities that may have been long lost for the service users.

### **Can you say something about your first meeting with your buddy?**

**JUSTIN:** I met my Buddy, let's call him Nick, shortly after my interview with dr. van der Meer. Before I met Nick, I had a one-to-one introduction meeting with a psychiatrist who explained his issues. I was very excited to meet Nick. At the same time, I was also anxious to do or say

anything that could hurt Nick's feelings. This feeling almost entirely vanished when I was introduced to him. Even if I was introduced to his mental illness at first, and knew (theoretically) many things about it, I tried to leave my psychological knowledge at the doorstep. We took a long walk along the grounds of Lentis, and both of us were very keen on getting to know more about each other on a mutual basis. My focus and intention were not getting to know more about his illness, but what his interests are; what he is passionate about – ordinary things I would also ask other people or friends that do not suffer from a mental illness. And then, naturally, he opened up about his life story: for example, how he became a service user at Lentis, and about how he thinks and feels about his mental illness.

### **Can you describe a funny moment? and a difficult moment?**

**Justin:** A really heart-warming moment was when I spent time with Nick in the common room where we met other service users. We were hungry and ordered food. Unlike his case description that was shared with me, he is indeed shy but very sociable and caring for others' needs. He immediately shared our food with others that were hungry. The positive responses to his generosity (by other service users and me) made him intrinsically happy, and he became instantly more confident in participating in group conversations. During our buddyship, one difficult moment was when Nick asked me for drugs. Knowing that he has a history of drug abuse, I declined his request and gave him an honest reason: that this could be a trigger for his condition and that I, as his Buddy, cannot reinforce drug abuse.

However, I not merely declined his request but also tried to find out more about why and when he feels the need to take drugs. So I turned a “difficult” moment into a deeper understanding of his feelings and issues which resulted in a much stronger bond than we had before.

### **Which aspects are bottlenecks? And why?**

**LISETTE:** An important bottleneck is finding buddies for non-Dutch speaking students. Though there are service users who can and want to speak English, it is not the majority. So it does sometimes take time before we can couple international students to a buddy. Nevertheless, we have also been able to couple some international students who speak languages like Farsi and Mandarin to service users, which is really fantastic for service users who are not able to speak in their native language all that often.

### **What does science say about buddy or activities programs for the severely mentally ill?**

**LISETTE:** In fact, there is not a lot of research in this field. In the literature, this is called 'befriending'. There is some evidence that for people who have regular contact with volunteers the amount of social contacts increases (Priebe et al., 2020). We developed an intervention or game that can support the buddies in coming up with activities and stimulate rediscovery of identity. Preliminary results indicate that this game may indeed result in increased reflection, mutuality and stimulate recovery of identity (van der Meer et al., 2021), but we are currently working on improving that tool and increasing our understanding of its necessary ingredients.

### ***Do you have advice for buddies-to-be? What kind of mindset do buddies need?***

**JUSTIN:** The most important advice I can give future buddies is to be open about yourself and to have the mindset of mutuality. I never tried to “help” Nick by applying my psychological knowledge – I was always well aware that I am not trained for this, and that there are enough health care workers who care for his mental condition. My primary goal was to not see my Buddy as a person with a mental disorder. I wanted to gain a new friend – and I am happy to have reached that goal. Nick is my friend and we do a lot of things together; from taking walks in nature to going shopping in Groningen and texting frequently. If you have the mindset of mutuality, you will very quickly realise that this is the way to foster each other’s interests and passions. Ultimately, you will strongly contribute to the resocialisation process of your Buddy.

### ***The final question is from Lisette: “Justin, what has participating in the project brought you?”***

**JUSTIN:** Participating in this project and further developing this project for other Psychology students with dr. van der Meer has brought me not only valuable learning experiences. The project changed my whole perspective on Psychology as a discipline. What struck me the most is that Nick is really not a typical case of his diagnosed mental illness. He does suffer various symptoms but his core personality strongly deviates from what we have learned during our Psychology programme. Unlike what is written in the DSM-V and stereotypical case descriptions, I realised that Nick is a person like you and me – a person with passions, dreams, interests, and issues. Although

patients are usually categorised according to the DSM-V, I strongly desire to focus more on individual differences – to not only see a “patient that has a mental disorder”, but first and foremost to see a “person with his or her own identity, character, passions, dreams and interests”.

### **Interested?**

We are currently looking for new buddies, particularly Dutch speaking buddies. If you would like to join the program or would like to receive more information, please contact Lisette (l.van.der.meer@rug.nl) or Justin (j.abu.hoof@student.rug.nl)

● **BY YVONNE GROEN**

Originally published by Mindwise [link: <http://mindwise-groningen.nl/>]



**Yvonne Groen** is a bio/neuropsychologist with a clinical interest. She focuses on cognitive and emotional impairments in people with the developmental disorders Attention Deficit Hyperactivity Disorder (ADHD) and Autism Spectrum Disorder (ASD). Specific areas of her studies are: social cognition and social skills, school neuropsychology, reward sensitivity and motivation.

# NEW STAFF WRITERS WANTED!

## Do you enjoy reading the BCN magazine?

If so, why not join our enthusiastic editorial team and make it even better? Regardless of whether you're a master student or PhD student, it's a great way to expand your network, improve your English writing skills, and be actively involved in BCN. Interested?

Send an e-mail to Sander Martens, [a.d.j.martens@rug.nl](mailto:a.d.j.martens@rug.nl)!



SANDER MARTENS



EVELYN KUIPER-DRENTH



PALLAVI KAUSHIK



MARLIJN BESTEN



ALEKSANDRA CYWINSKA



KARINA KÖPKE



ABIGAIL TÓTH



KAVVA PRASAD



JAIME MONDRAGON



ALEJANDRO MARMOLEJO-GARZA



MICHEL HOOIVELD



SOPHIE VAN ZONNEVELD



SOPHIA WILHELM



LAUREN HANSEN-MANGUIKIAN

# COOL LINKS

1.] Brain from top to bottom:

<https://thebrain.mcgill.ca/index.php>

This website provides a guided tour in various topics of neuroscience such as simple to complex anatomy of organisation of the brain to understanding various brain disorders and their underlying pathology.

2.] Comparative mammalian brain collections:

<http://neuroscielibrary.org/>

This web site provides browsers with images and information from one of the world's largest collection of well-preserved, sectioned and stained brains of mammals.

3.] <https://www.brainfacts.org/about>

provides a collection of advancing brain research stories. Here, you can find answers to intriguing questions such as "What can animals teach us about ourselves?"

4.] Article from MIT: Artificial networks learn to smell like the brain

<https://news.mit.edu/2021/artificial-networks-learn-smell-like-the-brain-1018>

5.] What's new in neurology?

<https://www.uptodate.com/contents/whats-new-in-neurology>

To help medical professionals make appropriate care decisions and drive better outcomes, UpToDate delivers evidence-based clinical decision support that is clear, actionable, and rich with real-world insights.

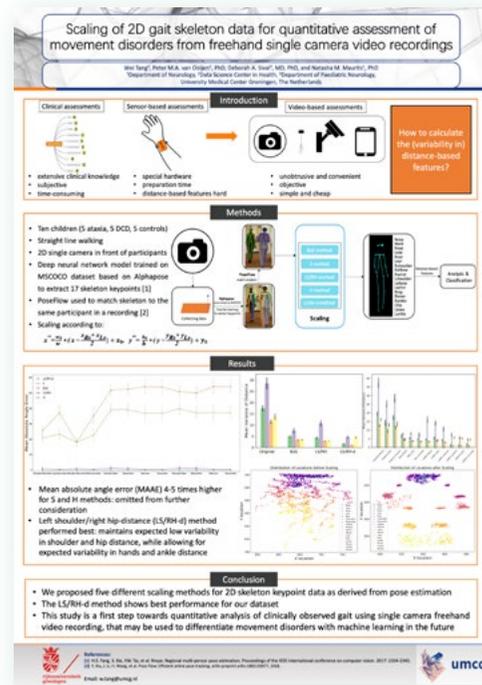
● BY KAVYA PRASAD

# GRAND STUFF

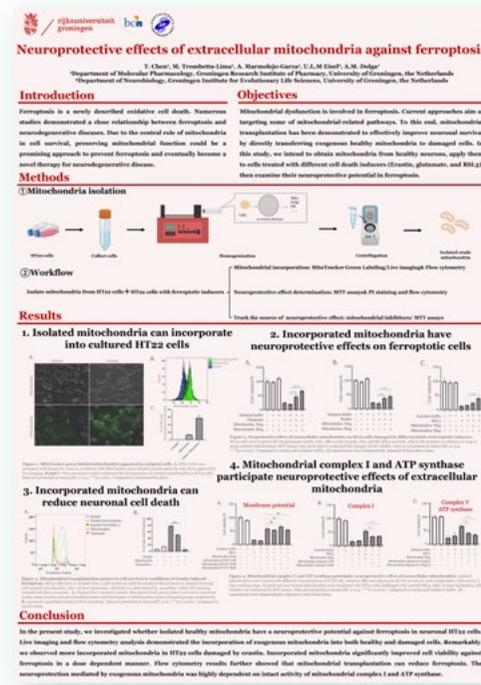
## BCN poster prizes

On February 3rd, the 2022 BCN winter meeting took place (see page 14). The BCN poster prize was awarded to three PhD students: Wei Tang, Tingting Chen, and Elina van den Brandhof! Fanny Sophia Bunn won the BCN research master student poster award!

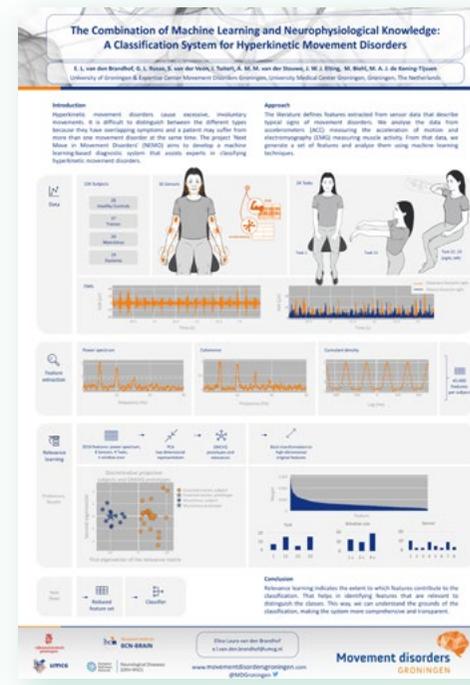
## BCN poster prize



Wei Tang

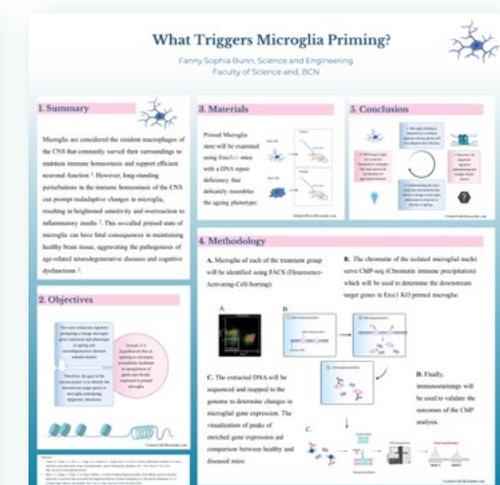


Tingting Chen



Elina van den Brandhof

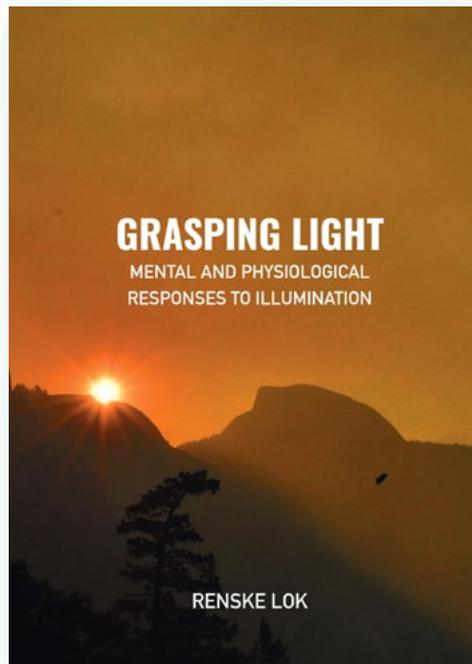
## BCN research master poster award



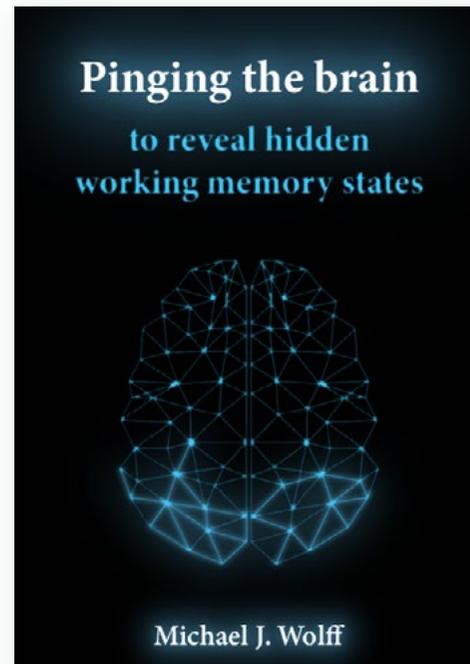
Fanny Bunn

## BCN dissertation prize

The jury's chair, Hanneke Loerts, revealed during the winter meeting that for the first time ever, there were two winners: Renske Lok and Michael Wolff!



Renske Lok



Michael Wolff

## BCN Seed grant winners

Four teams have won a BCN seed grant for their interdisciplinary research plans:

**Romy Buwalda - Smit (FSE); Mick Elliot (FSE); Jelmer Prins (UMCG); Susanne Kooistra (UMCG)**

Project Title: Unravelling the cellular identity of fetal cells in the maternal murine brain by means of single-cell RNA sequencing

**Alejandro Marmolejo Garza- (UMCG/FSE); Tiago Medeiros Furquim (UMCG/FSE); Prajit-Dhar (Arts); Amalia Dolga (FSE); Erik Boddeke (UMCG); Bart Eggen (UMCG)**

Project Title: Deciphering the grammar and morphology of the protein language in Alzheimer's Disease

**Joelle Jagersma (UMCG); Usula Koch (Frei Universität Berlin); Jocelien Olivier (FSE); Sonja Pyott (UMCG)**

Nothing compares 2 U: using the naked mole-rat as a comparative model in auditory neuroscience.

**Jens van Dalfsen (UMCG); Sanne Brederoo (UMCG); Peter Meerlo (FSE); Jeanine Kamphuis (UMCG)**

Insomnia treatment to normalize the pathophysiology of psychiatric disorders: a pilot study evaluating the influence of cognitive behavioral therapy for insomnia (CBT-i) on biomarkers of major depressive disorder

## Berry Kremer new METC-chair

Berry Kremer is per 1 januari 2022 benoemd tot voorzitter van de Medisch Ethische Toetsingscommissie (METC). Hij vervult deze functie naast zijn functie als afdelingshoofd Neurologie. Hij volgt Willem Kamps op die vanaf 2010 voorzitter METC is geweest.

*Translation: Berry Kremer has been appointed chairman of the Medical Ethics Review Board (METC) as of January 1, 2022. He fulfills this position in addition to his position as head of Neurology. He succeeds Willem Kamps, who has been METC chairman since 2010.*

## Marie-José van Tol new chair of De Jonge Akademie

Brain researcher Dr Marie-José van Tol, assistant professor of Neuroscience at the UG/UMCG, joined The Young Academy of the Royal Netherlands Academy of Arts and Sciences (KNAW) in 2019. She has now been appointed as the new chair of the national board of The Young Academy. Her chairmanship will begin in April 2022. <https://www.rug.nl/news/2021/12/dr-marie-jose-van-tol-new-chair-of-de-jonge-akademie>



Marie-José van Tol

## Iris Sommer elected Distinguished Lorentz Fellow

Iris Sommer, psychiatrist, author, and Professor of Psychiatry at the University Medical Center Groningen, has been appointed Distinguished Lorentz Fellow at the [Netherlands Institute for Advanced Study \(NIAS\)](https://www.rug.nl/news/2021/12/iris-sommer-geselecteerd-als-distinguished-lorentz-fellow). This appointment allows Sommer to dedicate five months to her research on a nearly full-time basis in 2022, together with a multidisciplinary team. Her research focuses on the online monitoring of the mental health of psychiatric patients by means of automatic speech analysis.

<https://www.rug.nl/news/2021/12/iris-sommer-geselecteerd-als-distinguished-lorentz-fellow>



Iris Sommer

## UMCG receives more than 2 million Euros for research into psychiatric and functional disorders

Psychiatric and functional disorders are among the most common disorders worldwide, and have a major personal and societal impact. These disorders often occur together, but it is not yet sufficiently clear what the causes are. The American National Institute of Mental Health recently awarded a grant of more than two million Euros to the UMCG for research into the causes of these disorders.

Over the next five years, principal investigators Hanna van Loo, Robert Schoevers and Kenneth Kendler will work with a multidisciplinary team of researchers from the UMCG and Virginia Commonwealth University.

<https://www.rug.nl/news/2021/12/umcg-ontvangt-ruim-2-miljoen-euro-voor-onderzoek-naar-psychiatrische-en-functionele-stoornissen>

## Mandemastipendium for Wieke Eggink: Dystonia in children

Wieke Eggink conducts research into dystonia in children: a neurological movement disorder in which abnormal postures and movements occur. This is often difficult to recognize and it is often associated with other symptoms in children. Eggink wants to talk to doctors to improve recognition of dystonia and strives to make dystonia in children more measurable.

<https://www.umcg.nl/w/nieuws/mandemastipendia-innovatieprijzen-2022>

## Educational innovation prize for Catheleine van Driel: resilient healthcare professionals

Catheleine van Driel developed a training course for A(N)IOS to learn how to apply stress reduction techniques during increasingly stressful medical simulations.

This involves breathing and cognitive techniques. Training participants receive instant feedback on their heart rate and heart rate variability; this makes the training more effective. A(N)IOS are already training a lot with medical simulation education. In addition to functioning medically, stress resistance can now also be strengthened without too much effort.

<https://www.youtube.com/watch?v=YsGF9MLdic8>



Catheleine van Driel

## Research Innovation Award for Sonja Pyott: The Contribution of Cellular Aging to Acquired Hearing Loss

Marco Demaria and Sonja Pyott jointly developed a study to assess the effect of a new strategy to prevent and reduce drug-acquired hearing loss. In this research they want to characterize the patterns of cell aging in cochlear pathology in acquired hearing loss. They will also test the safety and efficacy of drugs that remove aging cells, so-called senotherapeutics, to prevent or reduce acquired hearing loss.

<https://www.youtube.com/watch?v=G4GOCGNeINk&t=1s>

# Can a computer tell you when you are attentive or distracted?

Attention plays a vital role in our day to day lives. It is essential for something as trivial as getting someone's name right in a noisy place to something as crucial as avoiding making mistakes in a dangerous factory environment. Attention is a fluid state in the sense that the amount of attention we pay to a task tends to decrease over time and this gradual and natural decrease can have detrimental consequences, for example leading to traffic accidents, medical mistakes, factory incidents, etc. Given the importance of attention in everyday life, it would be helpful to track attentional states in real time.

*"A deep learning classifier was able to differentiate between the two states with 95% accuracy"*

Various (neuro)physiological signals have been used to this end, with electroencephalography (EEG), being the most widely used. However, most of these studies involve recording the EEG signals in a lab, comparing conditions during which participants are distracted with external stimuli to conditions in which they are not. The common finding amongst these studies is that non-periodic EEG activity in the parietal,

occipital and fronto-central regions of the brain is a good representative of attention. It is also important to point out that most of these studies use EEG data collected in a laboratory setup where participants are given computerized tasks with carefully controlled stimuli, and constraints are also placed on for example, movement (should be avoided) and speech (should also be avoided) of the participants. This means that the inferences obtained may not generalize to the real-life scenarios in which we want to track attention to prevent errors or optimize performance. Another gap is that most of these studies interrupt the task to obtain self-assessment reports from the participants to derive the instances of attention (on-task) and distraction (off-task for example, mind wandering). This not only disrupts the attention of the participant during the task but these self-reports can be biased and/or unreliable.

To address these gaps, a study was conducted, collecting EEG data in a naturalistic setting with (48) participants involved in monastic debate. Monastic debate is practised by Tibetan monks in India and is a contemplative debating practice that is different from the Western debate, not only in terms of its physical setting, but also in its essence. It is not aimed towards convincing the opponent of a standpoint but rather to find out inconsistencies in their reasoning. Monastic debates are accompanied by periods that are relatively boring since one goes through lines of reasoning systematically, as well as periods that are quite exciting when debaters tease each other or when they have almost demonstrated an inconsistency. The labels (attention/distracted) were based not on the judgement provided by the participant themselves, which are very invasive, but instead by a second-person observer, which is much less intrusive and can even be done by post-hoc analysis of videos recorded during the task.



Setting of a monastic debate

Statistical analysis on the EEG data showed that significant differences exist between attention and distraction states amongst individuals. A deep learning classifier (known as “Long Short Term Memory”) was able to differentiate between the two states with 95% accuracy. This does indicate that there is a possibility that with the help of AI we can indeed point out if a person is attentive or not. Though more experiments need to be done with a larger sample of participants, nonetheless it does make me hopeful that one day a computer program can track our attention and help us to be more productive.

- BY PALLAVI KAUSHIK
- PHOTO BY: MARIEKE VAN VUGT

*“Action is the foundational key to all success.” – Pablo Picasso*

## NEW STAFF WRITER

## PALLAVI KAUSHIK



Hi there!

This is Pallavi and I am enrolled as a double PhD candidate at the Department of Artificial Intelligence, RuG and the Department of Computer Science and Engineering, at the Indian Institute of Technology, Roorkee (IITR), India. I believe that the future lies in interdisciplinary research as most of the real-world problems are too complicated and entangled to be solved by focusing on a single field. I have applied this philosophy in my PhD, in which I explore the potential of machine/deep learning in helping understand Major Depressive Disorder (MDD) and to build tools that can one day potentially aid the psychiatrist in their prediction and tracking. However, this requires understanding of cognitive neuroscience to understand the brain, clinical psychology to understand the behavioral aspects of depressed patients and computer science to develop models. The joint nature of my PhD has facilitated in some wonderful collaborations with experts from various fields working towards the same goal which has made my PhD journey so far very insightful and exciting.

Apart from academics, I enjoy playing basketball and reading a good crime novel. I am always excited to learn something new and currently, I am trying my hand at photography. I am also part of the animal welfare society at IITR where we work towards supporting the stray animals (majorly dogs) on campus paving a path for balanced coexistence.

I am glad to join the amazing team of BCN magazine and looking forward to talk more about science :)

● PALLAVI KAUSHIK

# PHD AND OTHER NEWS

## Compensation Arts Faculty for teaching BCN courses

We already informed you that the compensation for teaching has been arranged for the BSS. Now we would like to inform you that this is also the case for the Faculty of Arts. So good news for all instructors with a BCN heart! This brings us to the next item:

## BCN is looking for instructors of the BCN Project Management Course

We are still looking for instructors, in particular for the Project Management course. A course that will help your PhD student(s) to plan their project and to deal with problems on their path. It will give you an idea what is going on in the PhD community.

Please send me an email if you are interested!

## Winners BCN Awards

The 3 best posters during the BCN Winter Meeting were made by Eline van den Brandhof, Tingting Chen and Wei Tang. You will find the posters in this edition of the BCN Magazine.

For the first time since BCN introduced the BCN Dissertation Award, we have not one but two winners: Renske Lok and Michael Wollf. If you are curious who has won this award over the years: take a look at the BCN hall of fame: <https://www.rug.nl/research/behavioural-cognitive-neurosciences/education/phd/bcnawards>.

Malte Borggrewe and Elouise Koops were the runner ups of the BCN Dissertation Award. A team of the BCN Research Masters knew the most answers in the amazing BCN Pub Quiz. Well done! Congratulations to all winners!

## Good news for MD/PhD students

The information system that checks whether you are eligible for a University Card now allows MD/PhD students to get a UG PhD card. You will receive the card by uploading a passport photograph on this website: [mijnrugas.rug.nl](http://mijnrugas.rug.nl). With this card you cannot only prove that you are a PhD student, but it also offers a number of benefits.

## BCN Nothing but the Truth 2023

We look back on a successful Symposium, which took place on November 1st 2021. In fact, it tastes like more! We have already started to prepare a new edition for 2023! Longer and bigger, so we will call it a BCN Conference. We will keep you informed!

## Agenda BCN Activities

Every Thursday: BCN Lunch Lectures series: 12:00 – 13:00 hrs.

● BY DIANA KOOPMANS



# NEW BCN PHD COUNCIL CHAIR

## Message from the new BCN PhD Council Chair: Nad'ka Majernikova

Hello all BCN colleagues and friends!

My name is Nad'ka and you may remember me as the person who gives you coins for free drinks during the social events organized by our lovely PhD council! I have enjoyed being a member of the BCN-PhD council for more than a year, and now, it is my pleasure to be appointed as the new chair! Thank you Emile d'Angremont for showing me the perfect example and good luck with finishing your PhD with lots of success. I am excited to take this opportunity and I am looking forward to seeing many of you at our BCN lunch lectures and social events in 2022.

We are all in this together! Cheers,

Nad'ka Majernikova

Photo taken during the PhD speed dating event, Nad'ka, the new chair (on the right) with Emile, the prior chair (on the left) and Alejandro, current member of the PhD council (in the middle).



# NEWS FROM THE BCN PHD COUNCIL

Hello fellow PhD student!

The BCN PhD Council hosted some networking events since our last update in the magazine. We are so happy to have met many more of you! Although the size of our events has been limited due to the corona regulations at the time, we have managed to meet new people in every event as well as to put fellow PhD students in contact to start friendships. Also, we are sorry if you were ever put on our waiting list! Hopefully soon we can be more relaxed and easily accommodate everyone who is interested in our events. We hosted drinks at the DOT last October, we could mingle around and got to know people from other faculties. Yes, BCN is not only UMCG-based! It also includes the FSE and the Faculty of Arts for example. Our next activity was ice-skating in November. November was cold, but because our lakes were not frozen already, we decided to summon ice-skating enthusiasts to the Kardinge ice-skating rink to have some Dutch fun! Afterwards we had a gezellige time enjoying some hot chocomel together. Last but not least, we had an amazing Christmas borrel at the Baxbier brewery! We met some very enthusiastic people that got in contact with the council and now we have a new member: welcome Martinica Garofalo.

As you can see we are busy organizing events and activities that add to the academic activities that you join BCN for, such as the BCN lunch lectures. We hope you can join us in the future! We have some openings to join the PhD council, if you are interested, send us an email ([phdcouncilbcn@rug.nl](mailto:phdcouncilbcn@rug.nl)) or contact us on linkedin (<https://www.linkedin.com/company/bcn-research-school>).

Finally, it is the time for our chair to say good bye and retire from his duties: Good bye Emile D'Angremont, we wish you lots of success in your next steps. There is a new BCN PhD Council chair: Nad'a Majernikova! In upcoming events, you will get to meet her and the rest of the PhD council!

Until the next time!  
The BCN PhD council



# BCN THESIS DEFENCES

## A computational view of the brain plasticity at rest

### PHD STUDENT

A. Invernizzi

### THESIS

A computational view of the brain plasticity at rest

### PROMOTORS

Prof.dr. F.W. Cornelissen

Prof.dr. N.M. Jansonius

### COPROMOTOR

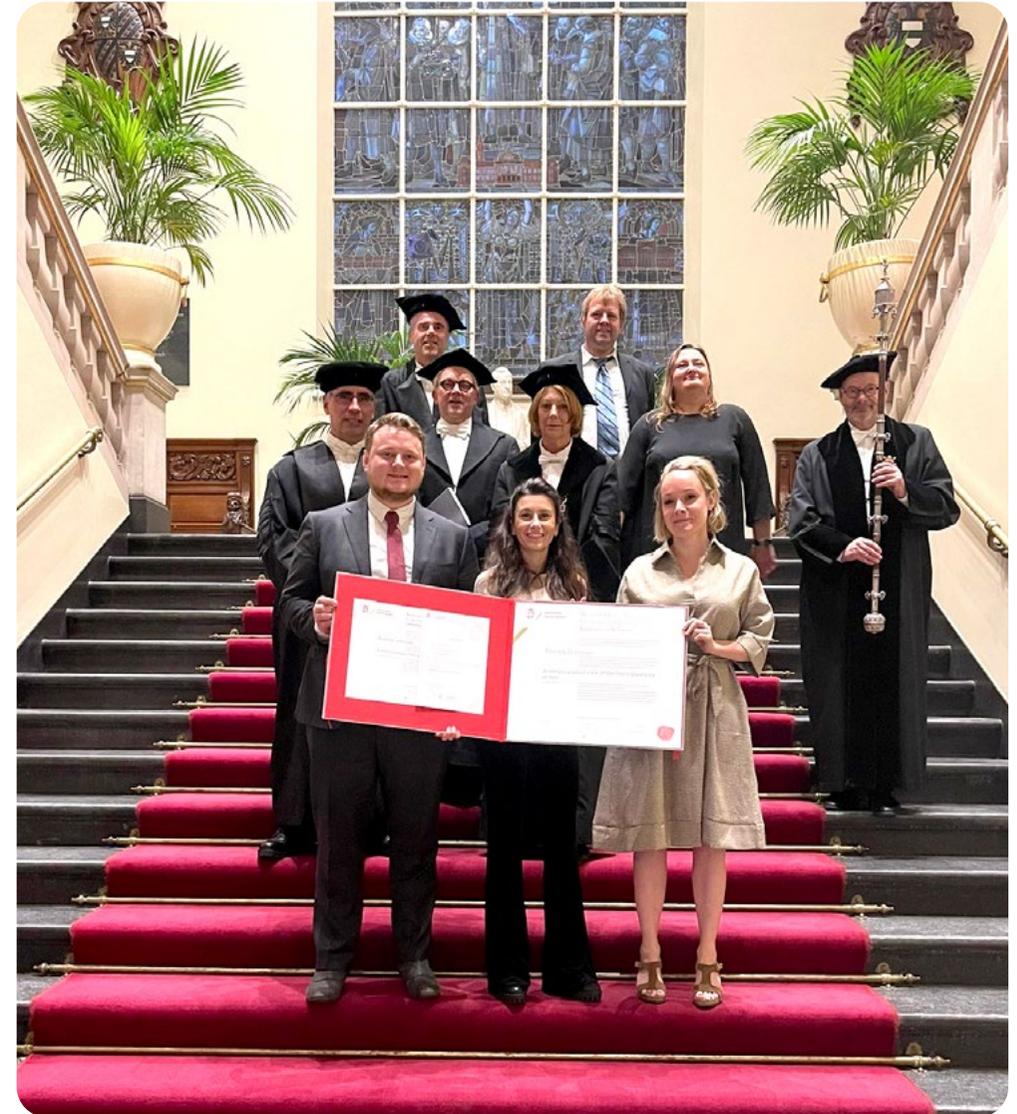
Dr. R.J. Renken

### FACULTY

Medical Sciences

Even when the human brain is at rest, its activity continues to change spontaneously. We know very little about the neuroanatomical structures and the biological mechanisms involved. Such knowledge is important for understanding human perception and brain changes, both in healthy people and in disease. Therefore, the overall aim of my research was to expand our understanding of the biological and computational mechanisms underlying the plasticity of spontaneous human brain activity. I specifically focused my research on developing methods to analyze small-scale interactions between visual brain regions and large-scale interactions at

the level of brain networks. A commonly used tool for brain research in humans is functional magnetic resonance imaging. This allows researchers to register brain activity in a non-invasive way and in a relatively short time, also in people who are in a resting state (rs-fMRI). Based on the measured activity, the functional relationships between different brain regions can be mapped without the need to present a stimulus. Another advantage is that rs-fMRI requires very little effort from the participant. Together, this makes rs-fMRI very useful to investigate the consequences of neuro-ophthalmic diseases on the brain, even at an advanced stage (eg in case of glaucoma in near-blindness). Therefore, in my dissertation, I focused on the use of rs-fMRI. In my dissertation, I demonstrate the fundamental and clinical relevance of measuring changes in spontaneous brain activity using rs-fMRI. The new methods that I have developed make it possible to investigate small-scale and large-scale functional connections in the brain. Moreover, they make it easier to apply rs-fMRI clinically in both the early and later stages of a disease. My methods can help future studies to increase our understanding of the functional connections of the healthy visual cortex and changes therein due to disease. They



● PHOTO BY KIM WESTRA

enable researchers to translate their knowledge about how the brain works into new, sophisticated diagnostic applications and therapeutic interventions.

**Azzurra Invernizzi** defended her thesis on November 1, 2021.

## Insulin signaling and microglia in the young and aged brain

### PHD STUDENT

C. Branco Haas

### THESIS

Insulin signaling and microglia in the young and aged brain

### PROMOTORS

Prof.dr. B.J.L. Eggen

Prof.dr. J.D. Laman

### FACULTY

Medical Sciences

Since the discovery of insulin as treatment for diabetes, observations showed that diabetic patients have higher chances to develop neurodegenerative disorders as Alzheimer's disease. The role of insulin in the central nervous system is an important topic of interest in the molecular and cellular neuroscience research field. Microglia are the macrophages of the central

nervous system with immunological functions and play an important role in neuroinflammation. Insulin signaling resistance in the aging brain and insulin signaling in astrocytes are more recent findings that broaden the perspective of the role of insulin in the brain. Insulin is an important factor that in addition to astrocytes also affects neurons, and its function can be altered or (partially) lost during life. In the studies presented in this thesis, new molecular and cellular mechanisms of insulin signaling in the hippocampus and its effects on microglia and neuroinflammation in both young and aged brains were identified. New insights into insulin effects on microglia metabolism followed by a new strategy to access microglia oxygen metabolism and mitochondrial function were also objects of study. Present data show that microglia are sensitive to insulin in both cell culture and in vivo with a protective pro-inflammatory effect. Complementarily, it was found that insulin modulates microglia oxygen metabolism and the production of reactive oxygen species in both a mitochondrial-dependent and -independent manner. In this thesis, the inflammatory signaling of insulin and the metabolism of microglia was investigated in the brain.

**Clarissa Branco Haas** studied Biochemics at the Universidade Federal do Rio Grande do Sul in Brazil. She did her doctoral research at the department of Biomedical Sciences of Cells and Systems at the institute Brain and Cognition of the University Medical Center Groningen. She defended her thesis on November 3, 2021.

## Studies on sleep patterns and sleep homeostasis in birds: An Ecological Approach

### PHD STUDENT

S.J. van Hasselt

### THESIS

Studies on sleep patterns and sleep homeostasis in birds: An Ecological Approach

### PROMOTOR

Prof.dr. T. Piersma

### COPROMOTORS

Dr. P. Meerlo

Dr. N.C. Rattenborg

### FACULTY

Science and Engineering

The findings of Sjoerd van Hasselt in birds indicate that sleep is highly sensitive to environmental factors and suggest a great deal of flexibility in the regulation of sleep under natural conditions.

Van Hasselt: 'Sleep is a complex phenomenon that consists of two completely different and alternating states, slow-wave sleep (SWS) and rapid-eye-movement sleep (REM sleep). Each of these two states is thought to play an important role in supporting brain and bodily functions. Yet, how exactly sleep fulfills these functions is a topic of ongoing research and debate. Most of what is known about sleep is derived from studies that were done in mammals under strictly controlled laboratory conditions. However, sleep is not restricted to mammals but is thought to be present in all living animals. Moreover, studies in a laboratory setting may not provide a complete picture of the regulatory processes and functions of sleep under natural conditions. For that reason, I measured sleep in three bird species under both laboratory conditions and semi-natural conditions: the European jackdaw (*Coloeus monedula*), the European starling (*Sturnus vulgaris*) and the barnacle goose (*Branta leucopsis*). The results provide evidence for homeostatic regulation of SWS in birds is similar to what has been reported for mammals, but also produced unexpected findings. For example, the geese only showed a rebound of SWS after brief sleep deprivation in summer but not in winter. Also, both geese and starlings displayed strong seasonal

variation in the overall amount of sleep. The starling in particular slept 5h per day less in summer than they did in winter. Moreover, both geese and starlings slept about 2h less during full moon nights than new moon nights. Another intriguing finding was the strong variation in REM sleep between the 3 species, which ranged from hardly any REM sleep in starlings to a much higher, mammalian-like amount of REM sleep in jackdaws. Such findings are difficult to reconcile with current theories in the function of REM sleep that are largely based on studies in mammals. Together, these findings in birds indicate that sleep is highly sensitive to environmental factors and suggest a great deal of flexibility in the regulation of sleep under natural conditions.'

**Sjoerd van Hasselt** defended his thesis on November 5, 2021.

## On the role of galectin-4 in (re)myelination and multiple sclerosis

### PHD STUDENT

C.G.H. Meijer-de Jong

### THESIS

On the role of galectin-4 in (re)myelination and multiple sclerosis

### PROMOTORS

Dr. W. Baron

Prof.dr. D. Hoekstra

### FACULTY

Medical Sciences

Multiple sclerosis (MS) is the most common demyelinating diseases of the central nervous system. Remyelination is a regenerative process and is most efficient when recruited oligodendrocyte progenitor cells (OPCs) mature and re-supply the denuded axon with myelin. A tight regulation and cooperative communication between neurons and glial cells contribute to successful remyelination. In MS, cell dysfunction and/or an inhibitory environment leads to impaired differentiation of OPCs into myelinating oligodendrocytes. The persistent loss of neuroprotective and insulating myelin results in neurological deficits and disease progression.

Previous findings indicate that secreted neuronal galectin-4 negatively regulates the timing of OPC differentiation during development. Using experimental models for de- and/or remyelination, we revealed that neuronal galectin-4 is transiently re-expressed on demyelinated axons, while persistently present on axons in inactive MS lesions. In addition, in the demyelinated areas galectin-4 was present in microglia and macrophages. Whether microglia and macrophages are cellular sources of galectin-4 remains to be determined. Preliminary data indicate that a distinct isoform of galectin-4 may exist in the CNS. Surprisingly, in contrast to their individual activities as negative regulators or (re)myelination, our findings indicate that the simultaneous presence of galectin-4 and fibronectin promoted myelin membrane formation. To obtain more insight in the underlying mechanism, we identified at the cell surface of immature oligodendrocytes, two galectin-4 binding sites, UGT8 and contactin-1. UGT8 is an enzyme responsible for the synthesis of the major myelin lipid galactosylceramide. Hence, modulating galectin-4 signaling in MS lesions, among others by modulating its interactions with UGT8 and contactin-1, may be attractive approaches to promote remyelination.



**Charlotte Meijer-de Jong** studied Biomolecular Sciences at the Vrije Universiteit in Amsterdam. Her doctoral research took place within the Baron Group of the department of Biomedical Sciences of Cells and Systems at the University Medical Center Groningen. She now works at ASQA Subsidies B.V. as project coordinator. She defended her thesis on November 8, 2021.

## Genetic and environmental correlates of Tourette Syndrome

### PHD STUDENT

M. Abdulkadir

### THESIS

Genetic and environmental correlates of Tourette Syndrome

### PROMOTORS

Prof.dr. P.J. Hoekstra

Prof.dr. J. Tischfield

### COPROMOTORS

Dr. A. Dietrich

Dr. G. Heiman

### FACULTY

Medical Sciences

Tourette Syndrome is a heritable neuropsychiatric disorder characterized by motor and vocal tics. Decades of research also implicate environmental factors in the occurrence of tics; most notable are complications during and around pregnancy. In this thesis I aimed to further our understanding of the genetic and environmental causes of tics. To this end, I have used data from the ongoing Tourette International Collaborative Genetics (TIC Genetics; <http://tic-genetics.org/>) study and data from the Avon Longitudinal Study of Parents and Children (ALSPAC). The TIC Genetics study



● PHOTO BY ELISE KARSSIES

is a large international multicenter study led by clinicians and researchers in the field of Tourette and the ALSPAC study is a population-based birth cohort designed to understand the environmental and genetic determinants of health and development. I found no evidence for the involvement of single genes in tics but rather that an aggregate score of many signals across the genome, a polygenic risk score, is associated with tics. I also found that tics along a spectrum from non-clinical to clinical levels share a similar genetic background. Regarding the environmental

factors, I found that a cumulative score of pregnancy complications better captures risk for tics rather than single pregnancy complications. Furthermore, I studied the polygenic risk score and the pregnancy complications together and found that the analyses of both factors better capture the risk for tics compared to studying them separately. The studies in this thesis highlight the importance and benefits of studying environmental and genetic risk factors jointly in understanding the causes of tics.

**Mohamed Abdulkadir** studied Molecular Life Sciences (Bachelors and Masters) at the University of Maastricht. He did his doctoral research at the department of Psychiatry at the institute Brain and Cognition of the University Medical Center Groningen. His doctoral research was in collaboration with Rutgers University in New Jersey. Meanwhile he works as postdoctoral researcher at the University of Geneva, Switzerland. He defended his thesis on November 8, 2021.

## Eye movement behaviour of patients with visual field defects

### PHD STUDENT

B.F. Gestefeld

### THESIS

Eye movement behaviour of patients with visual field defects

### PROMOTORS

Prof.dr. F.W. Cornelissen

Prof.dr. N.M. Jansonius

### COPROMOTOR

Dr. J.B.C. Marsman

### FACULTY

Medical Sciences

People with a visual field defect suffer from reduced sensitivity or even complete blindness in parts of the visual field. Two common causes of visual field defects are glaucoma: a neurodegenerative disease in which peripheral vision slowly declines due to damage to the optic nerve, and homonymous hemianopia (HH): blindness in one half of the visual field, which is caused by damage to the visual pathways after the optic chiasm. In this dissertation, Gestefeld explored two questions. The first question was whether visual field defects can be detected based on eye movements. In her research, Gestefeld found that based on the eye movements,



she could determine whether a video clip had been viewed by someone with a (simulated) visual field defect or with normal vision. This indicates that the eye movements contain sufficient information to diagnose visual field defects.

Her second question was whether virtual reality and eye-tracking can be used to support people with a visual field defect during their rehabilitation. People with a visual field defect learn in rehabilitation to compensate for their visual field defect by making a certain viewing rhythm. Participants who tried a VR headset or a mobile (head-mounted) eye tracker during various mobility exercises had a positive experience and saw benefits from using these technologies. The same was true for the occupational therapists. So it makes sense to further explore how virtual reality and eye-tracking can be used to improve rehabilitation. In summary, Gestefeld has found that eye movements can be used to determine the presence of a visual field defect in a very simple way. Thus, this could potentially lead to simpler methods of performing visual field measurements, for example in people for whom the current standard methods do not work well. In addition, they can also be used to compensate for a visual field defect.

**Birte Gestefeld** defended her thesis on November 10, 2021.

## The nature and evolution of humoral immune responses to influenza virus

### PHD STUDENT

F. Sicca

### THESIS

The nature and evolution of humoral immune responses to influenza virus

### PROMOTORS

Prof.dr. A.L.W. Huckriede

Prof.dr. E. Hak

### FACULTY

Medical Sciences

Influenza epidemics and pandemics have been and will be a major public health problem. In the course of life, everybody experiences several infections with influenza virus. However, these infections provide insufficient immunity against new infections since the virus constantly changes. How consecutive infections shape our repertoire of influenza virus-specific antibodies and how this affects the response to a newly encountered virus strain is poorly understood. In this thesis we used blood samples from young, adult and elderly individuals from the Lifelines



● PHOTO BY UWE GESTEFELD

cohort to study the antibody responses to 5 influenza virus strains which circulated between 1934 and 2009. We observed that very potent but highly virus strain-specific antibodies were highest against a virus strain encountered early in life for all age groups. Yet, other antibodies, less potent but also less specific for a certain virus strain, were highest against recently encountered strains. We could show that these latter antibodies, so far often overlooked, could provide partial protection against infection with a new virus strain. Our observations imply that influenza vaccines should be designed to induce broadly reactive antibodies, even if moderately potent, to protect against newly emerging influenza virus strains.

**Federica Sicca** studied Molecular Sciences at the department of Molecular Biotechnology and Health sciences at the University of Turin. Her doctoral research took place at the department of Medical Microbiology & Infection prevention of the University Medical Center Groningen. Meanwhile she works in Assen at ICON. She defended her thesis on November 17, 2021.

## The impact of dyslexia in higher education

### PHD STUDENT

L.L.M. Rouweler

### THESIS

The impact of dyslexia in higher education

### PROMOTOR

Prof.dr. B.A.M. Maassen

### COPROMOTORS

Dr. B.J.A. de Groot

Dr. W. Tops

### FACULTY

Arts

Good literacy skills are a prerequisite for higher education. Even though reading and writing are considered subconscious processes, some students fail to perform well on these skills, and therefore experience problems during their studies. Higher education students who suffer from these difficulties are frequently diagnosed with dyslexia. The understanding of the neurocognitive profiles of higher education students with dyslexia has increased. Previous research showed that these students encounter difficulties with word reading and word spelling, but also with other skills ranging from phonological processing to working memory. Nonetheless, the impact of dyslexia is wider. Students with dyslexia



● PHOTO BY MIGUEL SANTÍN

also demonstrate problems with reading comprehension, writing and second language (L2) learning, skills that are essential for academic success. However, research on these topics is limited, as few studies have focused on these so-called secondary consequences of dyslexia. This thesis investigates the wide-range impact of dyslexia in higher education,

such as its effect on word and text reading – investigated by means of the novel Flamingo Test – as well as L1 (Dutch) and L2 (English) reading comprehension and writing. By comparing students with dyslexia to a matched control group, we found that students with dyslexia perform significantly poorer on word and text reading in Dutch. Both groups perform

similarly on answering true/false and open questions after reading a text in Dutch, but poorer in English. Summary writing showed to be significantly more difficult in both languages for the students with dyslexia. Altogether, these findings stress the wide-reaching impact of dyslexia in higher education.

**Liset Rouweler** defended her thesis on November 18, 2021

## Towards genetic screening for glaucoma: Using data-driven strategies to screen for and study ocular disorders in cohort settings

### PHD STUDENT

A. Neustaeter

### THESIS

Towards genetic screening for glaucoma: Using data-driven strategies to screen for and study ocular disorders in cohort settings

### PROMOTORS

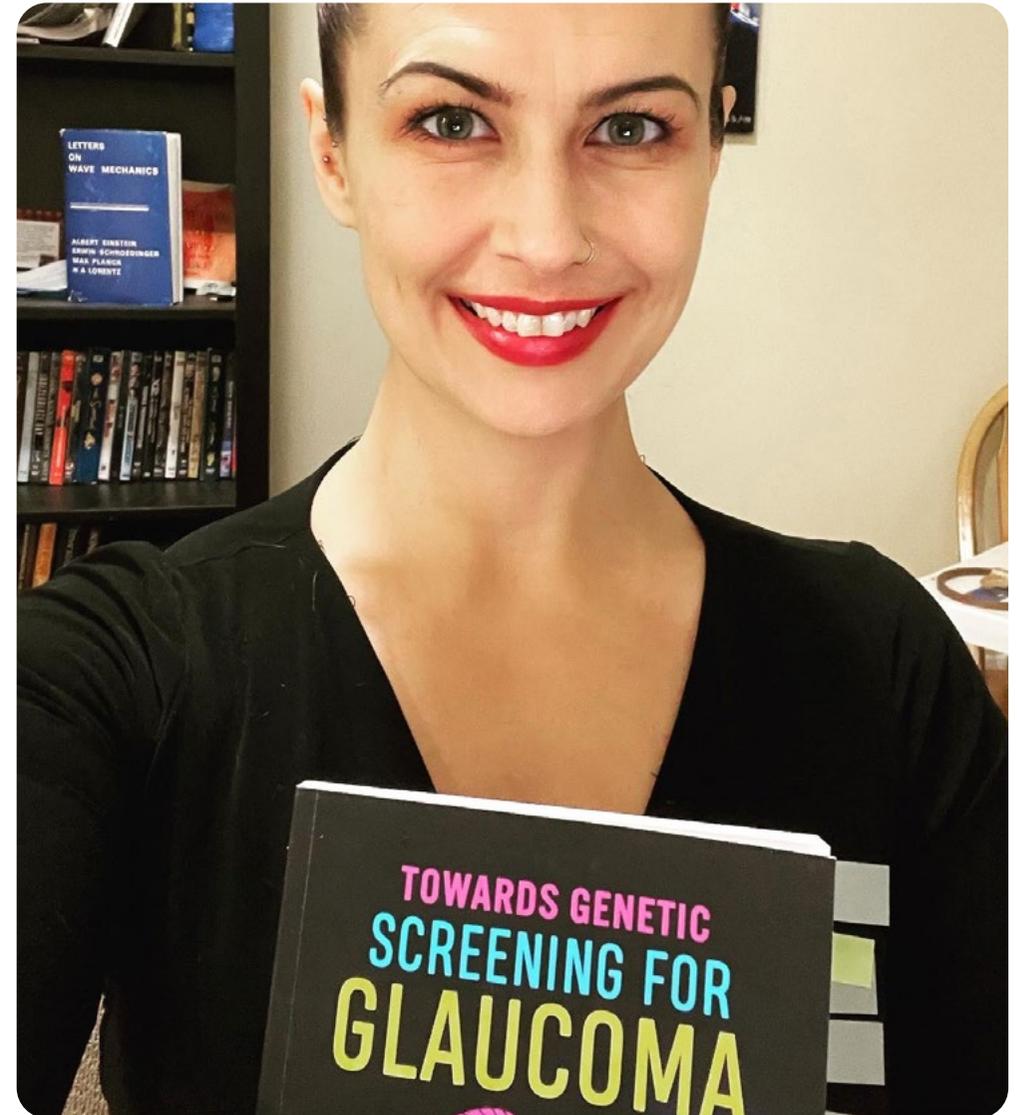
Prof.dr. N.M. Jansonius

Prof.dr. H. Snieder

### FACULTY

Medical Sciences

Glaucoma is the second-leading cause of blindness in the world. It is a slow, insidious, and irreversible disease. Up to half of people with glaucoma are not aware of it. This delays diagnosis and is dangerous, precisely because we cannot undo the damage that glaucoma does to the eye, but we can slow it down. Glaucoma patients tend to first lose their peripheral vision and vision in poor light. We can obtain this information, in the form of everyday questions like “do you struggle to see things off to the side while going for a walk?” in order to create a way



● PHOTO BY ANNA NEUSTAETER

to identify people who may have glaucoma and even those who may not know it. When we ask these, and other, questions to a lot of people in the population, we can find out if glaucoma is linked to other things, like issues with the heart or ringing in the ears. Looking at a lot of data from a lot of people is called “big data”. We can also use big data to see who may get glaucoma based on their genetic risk. Genes are not the only deciding factor when it comes to glaucoma, but we can use genetic knowledge to determine who may be at a higher risk for developing glaucoma. We can screen people with a high genetic risk for glaucoma and take action early and preserve their sight for longer. A study investigating the value of such an approach is currently underway.

**Anna Neustaeter** received her Bachelor’s degree at the University of Guelph in Ontario, Canada, with a specialization in animal biology. At the same University she received her Master’s degree, in which she did genomic analyses in Holstein cattle studying a neuromuscular disease in adults, called the spastic syndrom. Her doctoral research took place at the Ophthalmology department as well as at the Genetic Epidemiology department at the University Medical Center Groningen,

within the European Glaucoma Research and Training (EGRET) programme. She now works as postdoctoral researcher in the Mount Sinai Hospital in Toronto, where she is investigating different aspects of risk in Crohn disease in the Crohn’s Colitis Canada - Genes, Environment, Microbial (CCC-GEM) cohort. She defended her thesis on November 23, 2021.

### **Arm swing in healthy and Parkinsonian gait: Explorations on brain, muscle and movement level**

#### **PHD STUDENT**

J.B. Weersink

#### **THESIS**

Arm swing in healthy and Parkinsonian gait: Explorations on brain, muscle and movement level

#### **PROMOTORS**

Dr. B.M. de Jong  
Prof.dr.ir. N.M. Maurits

#### **FACULTY**

Medical Sciences

Human bipedal gait exhibits a coherent four-limb movement pattern comparable to that observed in quadrupedal gait, with upper limbs swinging in anti-phase with both opposite upper and ipsilateral

lower limbs. Although the role of these upper limb movements in bipedal gait is not as obvious as in quadrupedal gait, one proposed advantage concerns the modulation of neural control to maintain the cyclic gait pattern. This dissertation broadens the knowledge on this supporting role of arm swing in gait control in healthy participants and patients with Parkinson’s Disease (PD), a neurodegenerative disease that affects both lower-limb gait and gait-related arm swing. We used a multi-level approach including electroencephalography, electromyography and gait analyses to explore how this is organized within and between brain, muscle and movement level, respectively. We demonstrated that arm swing can drive and shape lower limb muscle activity via subcortical and cortical pathways, in which the supplementary motor area plays a central role. As a result of this neural interlimb coupling, we found that disturbed upper and lower limb movements in PD gait are correlated. These findings provide neural support for the observed facilitating effect of arm swing instructions on gait initiation and continued gait in PD patients. Overall, this dissertation supports that arm swing instructions or exercises could potentially be used as an effective non-invasive gait rehabilitation method in PD patients.

**Joyce Weersink** studied Behavioral and Cognitive Neuroscience and Medicine at the University of Groningen. Her doctoral research took place at the department of Neurology at the University Medical Center Groningen. During her internships she made the choice to become a general practitioner. Therefore she combined the rounding off of her thesis with a part time job as medical doctor at the general practice Boermans in Losser. She defended her thesis on November 24, 2021.

### **The key to mental fatigue: monitoring and counteracting performance decline during prolonged office work**

#### **PHD STUDENT**

M. de Jong

#### **THESIS**

The key to mental fatigue: monitoring and counteracting performance decline during prolonged office work

#### **PROMOTOR**

Prof.dr. M.M. Lorist

#### **COPROMOTOR**

Dr. J. Jolij

#### **FACULTY**

Behavioural and Social Sciences

Patterns in typing behavior are sensitive



● PHOTO BY MARLON DE JONG

to the effects of mental fatigue, both in an experimental setting and in a work environment. Psychologist Marlon de Jong concludes this on the basis of extensive research into patterns in typing behavior and underlying brain activity during office work. In her research, De Jong shows that younger people type slower and less accurately when they are working for a longer period of time. Older people, on the other hand, continue to perform as accurately after two hours of typing as when they first started the task, however, they do become slower over time. These changes in typing behavior can be used to provide feedback to the employee, but also provide valuable information for research in the work environment. Behavior can be monitored continuously without having to interrupt regular work activities. This makes it possible to investigate how (older) employees could be supported in creating more optimal working conditions, for example by planning breaks at the right time. In addition to the well-known positive effect of breaks, caffeine could be used to counteract mental fatigue. De Jong and colleagues have shown that it is better to focus attention on important information in the environment after a cup of coffee. This is an advantage in a dynamic work environment, where it

is important that information that is vital for the task at hand is properly processed.

**Marlon de Jong** studied Psychology at the University of Groningen. She did her PhD research at Experimental Psychology within the Faculty of Behavioral and Social Sciences (BSS) of the University of Groningen (UG) and the research institute BCN-BRAIN of the University Medical Center Groningen (UMCG). The research was part-financed by the European Regional Development Fund, the province and municipality of Groningen and the province of Drenthe. De Jong now works as a researcher and data manager at Gronings Perspectief and will start working as a data protection consultant at the new Digital Competence Center (DCC) of the University of Groningen in 2022. She defended her thesis on November 25, 2021.

## Visual pathway white matter alterations in glaucoma

### PHD STUDENT

S.A.M.M. Haykal

### THESIS

Visual pathway white matter alterations in glaucoma

### PROMOTORS

Prof.dr. F.W. Cornelissen

Prof.dr. N.M. Jansonius

### COPROMOTOR

Dr. B. Curcic-Blake

### FACULTY

Medical Sciences

Glaucoma is one of the leading causes of irreversible blindness worldwide. While glaucoma has been traditionally viewed as an eye disease, studies have shown that the entire visual pathway of glaucoma patients exhibits evidence of degeneration. Our understanding of the cause and structural nature of this degeneration, however, is still limited. In my thesis, I addressed this issue by utilizing cutting-edge magnetic resonance imaging (MRI) techniques to analyze white matter (WM) degeneration of the visual pathway in glaucoma patients. Additionally, I conducted the first longitudinal study of visual pathway WM degeneration in glaucoma, which is essential for

understanding the source and pattern of spread of this degeneration over time. The results of my work revealed that visual pathway WM degeneration in glaucoma starts at the level of the eyes and then spreads in the direction of the brain to affect the entire visual pathway. Additionally, I found that the anterior and posterior segments of the visual pathway are not affected simultaneously by this degeneration. Rather, an observable time lag seems to exist between the degeneration of these segments along the course of the disease. This finding could have an impact on the development of novel neuroprotective and stem cell-based treatments of glaucoma. Furthermore, I found that in glaucoma patients the MRI-based measures of visual pathway WM degeneration correlate strongly with standard clinical measures. This suggests that in glaucoma, MRI could potentially serve as a complementary diagnostic tool in cases where current clinical approaches do not perform adequately.

**Shereif Haykal** studied Biomedical Imaging at the University of Turku in Finland. He did his doctoral research at the Lab for Experimental Ophthalmology of the University Medical Center Groningen. He was promoted on November 30, 2021.

## Hemodynamics in the circle of Willis and prognostic factors in subarachnoid hemorrhage

### PHD STUDENT

Y. Shen

### THESIS

Hemodynamics in the circle of Willis and prognostic factors in subarachnoid hemorrhage

### PROMOTOR

Prof.dr. J.M.C. van Dijk

### COPROMOTORS

Dr. M. Uyttenboogaart

Dr. R.P.H. Bokkers

### FACULTY

Medical Sciences

Since stroke is a major cause of death worldwide, understanding its underlying pathology and determining prognostic factors is essential. The circle of Willis (CoW) is a critical arterial relay system located at the base of the brain. Therefore, hemodynamics within the CoW play an important role in the pathology of stroke. In this thesis, CoW anatomy and internal carotid artery (ICA) stenosis are pointed out to influence cerebrovascular territory perfusion. This is clinically relevant if the ICA-stenosis grade is more than 70%. With a numerical model, hemodynamics in the CoW can be simulated. This thesis

introduces a simplified numerical model for personalized CoW hemodynamics. The CoW-model is explained and validated, against the background of a systematic review of the literature. Since there is an extensive heterogeneity between proposed numerical models, in current studies hemodynamic parameters based on CoW-configuration still cannot be associated with the development of anatomical causes for stroke, such as intracranial aneurysm. Additional simulation accuracy is warranted before the numerical model can be applied in clinical practice. Finally, in this thesis, myosteatosis was found to be associated with the clinical severity of a subtype of stroke, the subarachnoid haemorrhage. However, muscle atrophy and myosteatosis were not associated with neurological outcome nor long term survival. In conclusion, this thesis is a next step in the association between hemodynamics in the CoW and several stroke types, and thus in personalizing and optimizing stroke management.

**Yuanyuan Shen** studied Medicine at Tongji Medical College, Huazhong University of Science and Technology, China, and attended a training in order to become a neurosurgeon at the University of Zhejiang. Thereafter she worked as a



neurosurgical intensivist at the Second Affiliated Hospital of Zhejiang University. Her doctoral research took place at the department of Neurosurgery of the University Medical Center Groningen. Following her thesis defense she will work as neurosurgeon at the First Affiliated Hospital of Zhejiang University. She defended her thesis on December 1, 2021.

## A transdiagnostic comparison of hallucinations

### PHD STUDENT

J.L. Schutte

### THESIS

A transdiagnostic comparison of hallucinations

### PROMOTOR

Prof.dr. I.E.C. Sommer

### COPROMOTOR

Dr. R.C.W. Mandl

### FACULTY

Medical Sciences

Hallucinations present in a wide range of clinical disorders, including psychiatric, neurological and other medical disorders. Hallucinations also occur in a minority of the general population. As hallucinations are not unique to one disorder, there has been growing consensus that

hallucinations should be investigated using a broader transdiagnostic approach.

Transdiagnostic research is currently hindered due to the lack of a suitable measurement tool. In part I of the thesis, a new transdiagnostic questionnaire - the Questionnaire for Psychotic experiences (QPE) - was developed. The QPE enables assessment of severity, frequency and phenomenology of psychotic experiences across disorders. The results showed that participants with various disorders reported hallucinations, which confirms that hallucinations should be considered a transdiagnostic phenomenon. A comparison of hallucinations across disorders confirmed previous findings that similar phenomenological characteristics can exist between disorders, and that phenomenological characteristics can differ within a diagnosis. This suggests the existence of subtypes of hallucinations that transcend diagnosis.

In part II of the thesis, the neural mechanism of hallucinations was investigated across participants with a schizophrenia-spectrum disorder, bipolar disorder and non-clinical individuals. Previous studies report similar phenomenological characteristics of hallucinations across these participants,

suggesting a similar underlying neural mechanism. Our results do not support this hypothesis. Non-clinical individuals and schizophrenia patients with hallucinations show similar alterations of the functional connectome, whereas differential alterations were reported for bipolar disorder patients with hallucinations. This suggests a different underlying neural mechanism for hallucinations in bipolar disorder as compared to non-clinical individuals and patients with schizophrenia.

**Maya Schutte** studied Psychology at the University of Utrecht. Thereafter she finished her research master Neuroscience & Cognition. Her doctoral research took place in the lab of prof.dr. Iris Sommer at the department Biomedical Sciences of Cells and Systems of the University Medical Center Groningen. She now works as a freelance illustrator. She defended her thesis on December 14, 2021.

## Dealing with perimetric variability in clinical glaucoma care

### PHD STUDENT

F.G. Jonoy Montolio

### THESIS

Dealing with perimetric variability in clinical glaucoma care

### PROMOTORS

Prof.dr. N.M. Jansonius

Prof.dr. J.M.M. Hooymans

### FACULTY

Medical Sciences

Glaucoma is a slow progressive eye disease that may cause irreversible blindness. Because glaucoma affects the visual field, visual field testing is necessary to diagnose and to distinguish stable from progressive disease state. This test, called perimetry, is a subjective test and therefore subject to variability. This thesis investigates this variability from different angles to help clinicians in daily practice and ultimately to prevent patients from blindness.

**Francisco Junoy Montolio** studied Medicine as of 2003. First in Amsterdam (VU) for a short period and then at the University of Groningen. In 2005 in the second year of his medical education

he did a mandatory assignment at the Ophthalmology department. In 2008, in the second last year of his Masters, he did an internship at the Ophthalmology department at the Tjongerschans Hospital in Heerenveen, from where he decided to finish his Masters in Medicine at the Ophthalmology department of the University Medical Center Groningen (UMCG). The scientific internship which started that year formed the base for this thesis. During this doctoral research he finished his specialism in Ophthalmology and the fellowship in vitreoretinal surgery. Now he works as an ophthalmologist in the UMCG. He defended his thesis on December 14, 2021.

## Effectiveness of social skills training for children with autism spectrum disorder

### PHD STUDENT

V. Dekker

### THESIS

Effectiveness of social skills training for children with autism spectrum disorder

### PROMOTORS

Prof.dr. P.J. Hoekstra

Prof.dr. M.H. Nauta

### COPROMOTOR

Dr. A. de Bildt

### FACULTY

Medical Sciences

Children with an autism spectrum disorder (ASD) have limitations in social communication and interaction. In clinical practice, social skills training (SST) is applied as treatment to improve these skills. This dissertation describes a study with 122 children with ASD, aged 9-12 years, into the effectiveness of SST directly after the training and on the longer term, and into the effect of involving parents and teachers in the training. Social skills and cooperation improved more in children who had participated in the training compared to children who had only received regular care. This improvement was modest.



● PHOTO BY LOES LUINSTRA

Contrary to my expectations, based on what parents reported, I found no differences between children whose parents and teacher were involved in the SST compared to children who were trained without parent and teacher involvement. Teachers reported something different: they reported significantly more improvement in children who participated in the SST with parent and teacher involvement than in children who participated in the SST without this involvement. We found no improvement six months after the training of either form. Further examination of the group of children who improved after SST showed that this group was younger, verbally stronger, and less anxious. In addition, their parents reported that these children experienced the social communication skills that they learned during the training as less difficult before the start of the training.

**Vera Dekker** studied Psychology at the University of Groningen. She did her doctoral research at the department of Psychiatry at the institute Brain and Cognition of the University Medical Center Groningen. She now works as a psychologist at Molendrift. She defended her thesis on December 17, 2021.

## Quantification methods for brain imaging with novel and repurposed PET tracers

### PHD STUDENT

N. Ghazanfari

### THESIS

Quantification methods for brain imaging with novel and repurposed PET tracers

### PROMOTORS

Prof.dr. E.F.J. de Vries

Prof.dr. R.A.J.O. Dierckx

### COPROMOTORS

Dr. J. Doorduyn

Dr. A. van Waarde

### FACULTY

Medical Sciences

The number of people suffering from brain disorders is annually increasing. Knowledge about the molecular processes in the healthy and diseased brain is essential for a better understanding of disease conditions, treatment selection, and drug development. Positron emission tomography (PET) is a noninvasive imaging technique that can be used to



● PHOTO BY RUG

acquire information about processes that are essential for normal brain functioning, but are altered in neurodegenerative diseases. Quantitative information about specific targets inside the brain, such as the density, activity, or occupancy of particular enzymes, transporters, or receptors, can be obtained by pharmacokinetic modeling of PET data. In the present study, we assessed quantification methods for brain imaging with novel and repurposed PET tracers. A PET tracer for inflammation in the brain, called [11C]SC-560, was evaluated, but overexpression of the inflammatory marker COX-1, could not be detected in the inflamed rat brain. Thus, more efforts to find an appropriate tracer are required. Next, we determined the optimal method for quantification of histamine H3 receptors in the rat brain, using PET and the radiotracer [11C]GSK-189254. Blockade of these receptors may improve cognition in patients with dementia. [11C]GSK-189254 PET and [11C]raclopride PET were subsequently used to measure the dose-dependent occupancy of histamine H3 and dopamine D2 receptors in the brain of living rats by the investigational drug AG-0029. D2 receptors play an important role in motor control. Since AG-0029 blocks histamine H3 receptors and stimulates dopamine D2 receptors, AG-0029 is a

candidate drug for treatment of Parkinson disease. Finally, we evaluated the feasibility of quantifying the expression of estrogen receptors in the brains of postmenopausal women with [18F]FES PET. We were able to detect estrogen receptors in brain regions with a high density of the receptor (i.e., the pituitary). The methods described in this study may be used to enhance knowledge about the brain, the treatment of brain diseases and the development of novel drugs.

**Nafiseh Ghazanfari** defended her thesis on December 23, 2021.

## The kaleidoscope of microglia phenotypes: microglia transcriptional phenotypes from development to disease

### PHD STUDENT

L. Kracht

### THESIS

The kaleidoscope of microglia phenotypes: microglia transcriptional phenotypes from development to disease

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Microglia are relatively long-lived and self-sustainable macrophages of the central nervous system (CNS). Microglia functions exceed the non-specific defense functions classically associated with the innate immune system and their main function is to maintain CNS homeostasis. In recent years, gene expression profiling technology has progressed rapidly and now allows for the detection of the transcriptome and epigenome of single cells. The main aims of this dissertation were 1) to identify and characterize transcriptional phenotypes of microglia subtypes in



● PHOTO BY SOEREN KRACHT

human development and Alzheimer's disease, 2) to reveal how postnatal stress affects microglia development and functions in adulthood, and 3) how epigenetic mechanisms control microglia transcriptional phenotypes. In chapter 2, it is shown that human microglia

transition from activated towards mature cells during the early second trimester of gestation and likely exhibit (partial) immune-sensing properties. In chapter 3, it is described that early-life stress changes the microglia transcriptome in adult mice and affects microglia development and responsiveness to an immune challenge with LPS. In chapter 4, it was identified that the transcriptomes of microglia acutely isolated from post mortem control and Alzheimer's disease CNS tissue do not differ. This finding is likely caused by technical limitations, rather than the underlying biology. In chapter 5, transcriptomic and epigenetic profiles of tolerant and trained microglia and transcription factor networks driving these phenotypes were identified. Overall, this thesis illustrates the transcriptional heterogeneity and specificity of microglia during the human and mouse lifespan.

**Laura Kracht** studied Behavioral and Cognitive Neurosciences at the University of Groningen. Her doctoral research took place at the department Biomedical Sciences of Cells and Systems of the University Medical Center Groningen. Thereafter she will work as postdoc at the department Precise Genetic Medicines of Stanford University, United States. She defended her thesis on January 10, 2022.

## The wandering mind: Investigating what drives self-generated thinking and determines its adaptive or maladaptive consequences

### PHD STUDENT

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### THESIS

The wandering mind: Investigating what drives self-generated thinking and determines its adaptive or maladaptive consequences

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In this thesis we investigated the kinds of thought that come up while already being engaged in an activity. Such self-generated thoughts are not a nuisance, but occupy a large portion of our waking lives. A process that consumes so much of our time likely plays a key role in our daily functioning. This thesis provided new insights on the mechanisms that drive self-generated thinking and its consequences for ongoing and upcoming activities. We learned that self-generated thought is a process that competes for limited

resources with the ongoing activity. The availability of working memory and long term memory at a particular moment creates the opportunity for self-generated thought to arise. Conversely, engaging in self-generated thought limits working memory and long term memory use for the ongoing activity, potentially resulting in costs. The likelihood for self-generated thought to arise can be increased by processing information associated with our self-concept and being exposed to personal concerns.

In essence, self-generated thought is a process of memory retrieval. Which memories are retrieved during self-generated thought is not random. The selection of memories for self-generated thought is prioritized for future relevance determined by a history of past relevance and association with current goals. Subsequently, the retrieved memories can be used to strengthen, update or construct memory structures with potential future utility. These two mechanisms, the prioritization of memories for self-generated thought and the ability to strengthen and construct memory structures during self-generated thought, may allow for adaptive functioning of self-generated thought.



● ART BY PIET PAIZE

**Stefan Huijser** did his doctoral research at the department of Artificial Intelligence of the Bernoulli Institute, financed by the European Research Council. He now works as teacher/researcher at the Saxion Hogeschool. He defended his thesis on January 24, 2022.

## Quantified speech as a marker: Computational linguistics in schizophrenia-spectrum disorders

### PHD STUDENT

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### THESIS

Quantified speech as a marker:  
Computational linguistics in schizophrenia-  
spectrum disorders

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Speech contains a wealth of information about the speaker's state of mind, not only in the words used, but also in the way these words are pronounced. Recent developments in Natural Language Processing (NLP) have paved the way for rapid, systematic recording and analysis of quantifiable properties of spoken language. Schizophrenia spectrum disorders, a collection of serious psychiatric disorders, involve different aspects of language. Abnormalities in language are used by practitioners to make a diagnosis or to estimate the severity of complaints. By using NLP

techniques it has become possible to make these deviations objective and quantifiable, so that subtle changes can

also be detected. This thesis contains a number of studies on the application of NLP techniques to the spoken language

of people with a schizophrenia spectrum disorder. The focus of the research presented here is mainly on semantics (what is told) and phonetics of speech (how is told). These aspects are used to distinguish individuals with schizophrenia spectrum disorders from healthy controls, to investigate the relationship between speech features and specific symptoms, the relationship with clinical subtypes, as well as the relationship with antipsychotic medication.

**Alban Voppel** studied philosophy at the University of Utrecht and Brain & Cognitive Sciences at the University of Amsterdam. He did his doctoral research at the Department of Biomedical Sciences of Cells & Systems at the institute Brain and Cognition of the University Medical Center Groningen (UMCG). He now works as postdoctoral researcher at the Cognitive Neurosciences Center in Groningen. He defended his thesis on January 31, 2021.

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



# CHEEKY PROPOSITIONS

*“As it turns out, none of us had 2020 vision after all.”*

[Anna Neustaeter](#)

*“If we knew what we were doing, it would not be called research, would it?”*

[Albert Einstein]

[Birte Gestefeld](#)

*“The fact that we live at the bottom of a deep gravity well, on the surface of a gas covered planet going around a nuclear fireball 90 million miles away and think this to be normal is obviously some indication of how skewed our perspective tends to be”*

[Douglas Adams: “The Salmon of Doubt: Hitchhiking the Galaxy One Last Time.”]

[Mohamed Abdulkadir](#)

*“Reading, after a certain age, diverts the mind too much from its creative pursuits. Any man who reads too much and uses his own brain too little falls into lazy habits of thinking.”*

(Albert Einstein)

[Liset Rouweler](#)

*“The challenges of a PhD project can lead to personal growth if you dare to grab the bull by the horns.”*

[Marlon de Jong](#)

*“As with many things in life, self-generated thought is most healthy in moderation.”*

[Stefan Huijser](#)

*“The scariest moment is always just before you start.”*

[Stephen King]

[Liset Rouweler](#)

# COLOPHON

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