InCognito

For all your study-related needs and feeds

June 2019

Suggestions, feedback, or comments? Let us know at newsletter.cognito@gmail.com.

Brains abroad: Annelieke Muller in Canada

By Birte Zuidinga

As second-year student of MBCS, Annelieke went to Vancouver for a research project at the University of British Columbia – BC Children's hospital. In this interview she shares some of her experiences with us.

How did you find the position and funding?
I was interested in research groups that use human brain material. During my first internship at prof. dr. Dick Swaab's lab (NIN) he told me about scientists from British Columbia that were working on human brain tissue. After checking the university's website, I contacted several researchers, I had a few Skype meetings, and I decided on the most appropriate lab to acquire new lab skills. As for funding, I had a meeting with the student counsellor. She knew a lot about specific possibilities to get funding for your research project. I came up with some possibilities to get funding, but she knew exactly the ones that will or won't work. So, it is very useful to make an appointment with the student counsellor!

What kind of research did you do in your internship?
My research was about presynaptic proteins and the inhibitory pathways in hippocampal sclerosis. Cell culture, brain sectioning, immunostainings, ELISAs, and western blots were part of my daily life. Apart from that, I was involved in a Downtown study that clinically assessed homeless people with drug abuse and psychiatric comorbidities in the Downtown area of Vancouver.

How were your experiences with the lab you were in? What did you like and dislike?
My lab was a relatively small lab and I got a great responsibility. Also, a lively neuroscience community brought a lot of interesting stuff. Many conferences could be attended. My supervisor was a very intelligent person and I learned a lot from him. However, my internship did not start smoothly due to the fact that my supervisor got ill and one technician and a post-doc that shared my project both left accidentally just before I arrived. To get started in a totally new lab is hard in such circumstances, but a good challenge too.

How valuable do you think this internship abroad was for your further career? Do you intend to carry on with the type of research you performed there?
Working in a new environment is really valuable! You meet different cultures and people might behave differently. It makes you realize how you deal with different situations. It was a great experience and I enjoyed the type of research I did, so I might probably continue within this field of research.

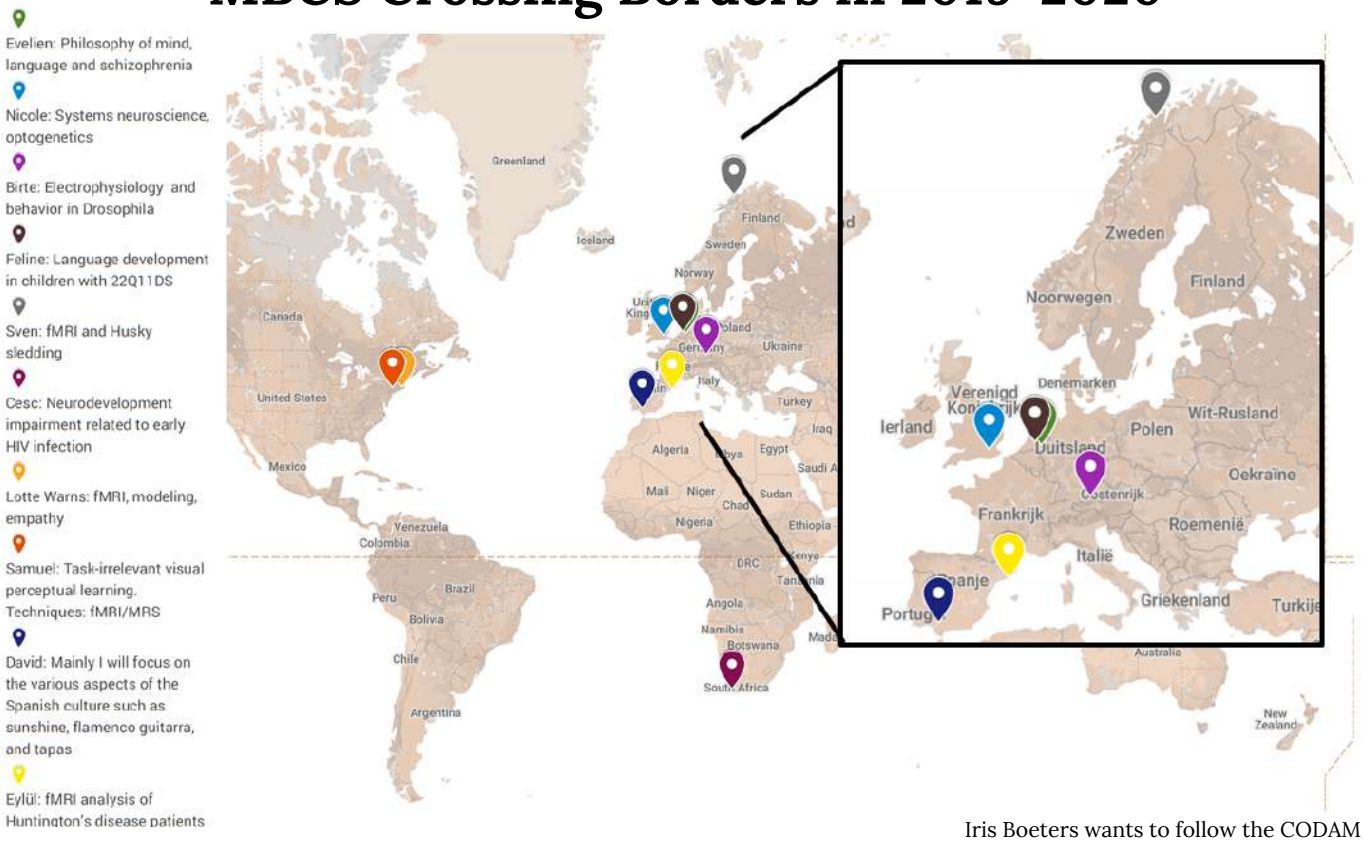
How does the research atmosphere in Canada compare to the one in the Netherlands?
Canadians are extremely friendly! It creates a very good atmosphere, although sometimes it was hard to get direct feedback. Furthermore, at our hospital in Vancouver, one main thing I noticed was the hierarchy (because Canada is the second largest country and the western part seems to differ pretty much from the eastern part, I will confine myself to Vancouver). When a PI entered the room, everyone got silent and hardly anybody dared to argue or disagree (despite the fact that Vancouverites are doing really well in small talks!), whereas in my opinion it is valuable to be equal and to be able to discuss different opinions. Co-workers were surprised that Dutch people are so assertive, while in the Netherlands it is quite common to be outspoken. Here, it is rather supported to be critical while I did not experience that in the research institute.

What was your daily life like besides the internship? Are there activities you would recommend doing in Canada?
I would recommend a bunch of activities! Vancouver and its surroundings are stunning, you should preferably spend a whole year so that you can experience all seasons. Every weekend I was hiking, making trips to the top of mountains. When it started snowing, I still made snowshoeing trips in the mountains. The best thing to do after a day at the lab was driving for only half an hour and going nightskiing!

What advice do you have for other students looking for internships abroad? Any specific advice for Canada?
It is totally worth it, so if you have a plan to study abroad, just go for it! One advice might be to do a really good search to how labs function, because the internet alone might mislead you. Some labs that (from the internet) looked interesting and of high quality appeared to be kind of a catastrophe in real-life. So, try to find references to make sure that you will be part of a well-functioning lab.

Anything else you would like to share about your internship abroad?
No, I just wish you all a very nice experience abroad or in the Netherlands :) You can always contact me for questions!

MBCS Crossing Borders in 2019-2020



By Sven Wientjes & Birte Zuidinga

What will the current first-year's students be up to next year? You are probably as curious as we are, so we asked around to find out!

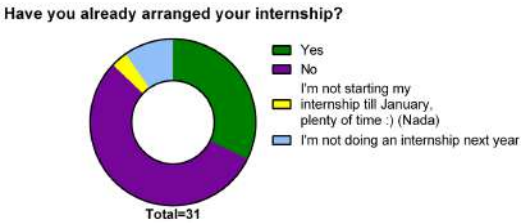
The most interesting metric is of course the amount of borders that will be crossed. Ten students already know where exactly they will do their internships next year (see world map). It seems that students going abroad have arranged this earlier than the ones staying in the Netherlands, which is logical of course and nice to see. If we measure the borders that are crossed from Amsterdam straight to the specific internship places, it is clear that Cesc wins: he will do his internship in Cape Town!

Another interesting finding is that, of all possible universities in the US, Lotte and Samuel both chose to go to Brown University in Providence. What a coincidence!

We are impressed and a bit envious of David, who seemingly got his flamenco internship in Sevilla approved by the board of examiners...

Our two lovely linguists Evelien and Feline both stay in the Netherlands, but not in Amsterdam. Evelien will go to Nijmegen and Feline to Utrecht.

Nicole will leave the Netherlands to do optogenetics at University College Londen, and Birte will go to the Max Planck institute in München. Sven will primarily focus on Husky sledding in Tromsø but also do some fMRIs. Maybe Eylül made a better choice, she found an fMRI internship in the nice Mediterranean city of Barcelona, instead of ice cold Norway...



Most students that replied have not arranged their internships completely. This means you are not alone! Some do have ideas, preferences, or other ambitious and nice plans.

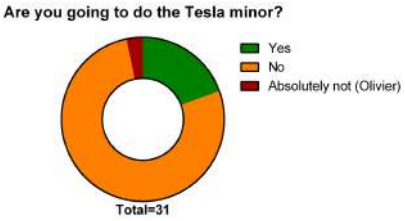
This year we have highly practically minded students: As many as 6 of our interdisciplinarians are going to take a shot at the Tesla Minor! Eva, David, Feline, Ieva, Merel and Jill have all signed up! Let's show the world what neuroscientists can contribute, we hope you kick some fresh buns out there.

Some students already have a topic for their literature thesis in mind. Barbara wants to make a model of the evolution of whales, a very ambitious and interesting effort. Lotte already has a thesis arranged about 22q11DS.

Two of us have gotten inspired by our recent Summer School: Iris Bosch would like to do a thesis on complexity, and Ann speculates on investigating complex network modeling of neural networks in her next internship.

As true pupils of the interdisciplinary ways, three of us have decided to broaden their horizon drastically next year.

Iris Boeters wants to follow the CODAM program, a free educational institute to learn (non-scientific) programming, Merel thinks about following a course on management and journalism at the VU, and Floor probably wants to follow a full major on science and society, also at the VU.



Evan is speculating about doing another internship at the VU. This means both his internships will have taken place at our rival university. Christina wants to go to the a coma research group in Liege, to study consciousness (or the absence of it). Kanthida wants to do something with MRI, preferably in Spain. Maybe David or Eylül have some connections for her ;). Bo aims to finish this master soon, in half a year. We hope to still see her around after this! Gina hopes to finally sequence some genomes if someone will let her. We vouch for you! Tiffany wants to do her second internship at the experimental economics center in Amsterdam (CREED), similar to her first internship. It is good she has found her passion, but be wary to stay interdisciplinary!

This newsletter concludes our first year as MBCS students. As you can see, many exciting things are still waiting to happen, but we also hope you do not forget every cool thing that has already happened! A year can go by so quickly, yet be filled with so much. To those we may not see anymore, we wish you all the best!

Neuroscience Joke

What is a myelinated neurons favourite kind of music?
- Wrap

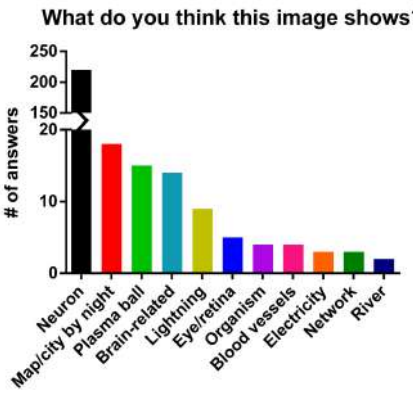
What do you think this image shows...?

By Birte Zuidinga

As a neuroscience master student, I suspect you to think about a neuron when looking at this image. You would be right. I made this image during my internship at the VU, in the Functional Genomics department where I worked with cultured neurons. More specifically, this neuron is fluorescently stained for MAP2 in green (labelling dendrites) and synaptophysin in blue (labelling synapses). The axon was not stained here.

Having spent four years in neuroscience, many things in the environment remind me of neurons: the elaborate network of branches in trees that I pass while cycling, the spider web hanging in front of my window, and the strands of spaghetti on my plate at dinner. It is so ingrained in my system by now that I cannot conceive of any different interpretation of this image then that it would be a neuron. However, upon talking to family and friends about my study while showing them pictures like these, I frequently heard very different associations from them.

This intrigued me. To find out what people from outside the neuroscience field associate with this image, I embarked on small quest. Since I have already conditioned my own social circle to respond with 'neuron' to such images, I posted a questionnaire on the internet and acquired responses from all over the world. Let's look at the most interesting results!



In total, there were 261 respondents, who could give multiple interpretations of the image. I was amazed by the amount of people that correctly identified a neuron in this picture: 220! Another 14 did not specifically write the word neuron but mentioned that it was related to the brain.

These results show that even individuals not dealing with neuroscience in daily life have at least some knowledge about the brain, which I think is a positive thing. One of the reasons could be the current state of science communication, like one of the respondents remarked: "*I think it is also kinda easy to recognise by now because popular science articles LOVE their neuron pictures*". Yes, I am guilty...

However, we should keep in mind that about 20% of the respondents indicated that their current occupation is related to biology to a greater or lesser extent, and most characterize

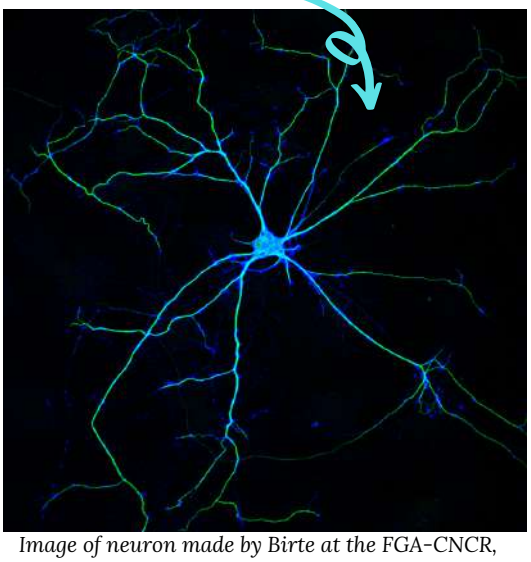
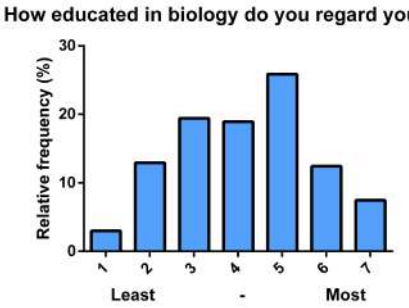


Image of neuron made by Birte at the FGA-CNCR, Vrije Universiteit Amsterdam.

their biological knowledge as quite high (see histogram). While this sample thus probably does not reflect society, the other results remain interesting to discuss.

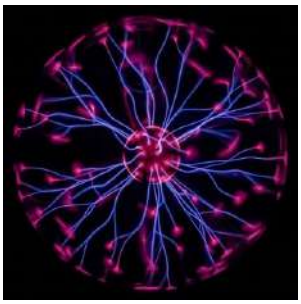


Some difficulties with interpreting the image are the colors and the absence of the axon. When asked how this picture differed from their own ideas about the appearance of neurons, several respondents mentioned that they did not think neurons would be green and blue. Of course, they were right. The fluorescent staining, microscopy technique, and computerized algorithms to translate this to an image gave the picture artificial colors.

Some respondents did not even believe that it was real. One wrote "*I believe this is just an artistic rendering*", an other respondent said "*This is a computer generated illustration of a neuron*", and another added "*Perhaps it is just art. It doesn't need to be anything in particular, just art*". Regarding the shape, many people thought neurons looked more like the textbook cartoons: small and few dendrites, large and round soma, and a long axon: "*I didn't realize there were so many branches*", "*The arms are a lot thinner/longer than I imagined*", "*I pictured a circle*", "*(It) goes off in lots of directions rather than just one*".

Let us dive into the different interpretations of the image that were suggested besides a neuron. Several respondents saw a kind of map. Someone mentioned: "*Looks like a map of highways surrounding a metropolitan area*", and another said: "*Roads illuminated by streetlights from above*". Fifteen respondents mentioned that it looked like a plasma globe, those glass balls that were especially popular in the 80s where you can touch the outside to guide lightning-like sparks inside. I had never made this connection myself but comparing the two pictures I would say that they look very similar indeed. Related to that, several respondents mentioned electricity or lightning. Other ideas were of a more biological nature, for instance: "*the veins in an eyeball*", "*a massive daddy long leg spider*", and "*a cell thingie*". The remaining responses involved the more general notion of networks, or rivers.

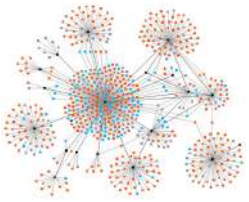
Plasma globe. Just look at the resemblance!



But why does the shape of these tiny neurons resemble the shape of major traffic routes in a city? While these seem like very different things at first glance, after some contemplation I noticed that the variety of interpretations of the neuron-image share fundamental organizational properties. Neurons, as well as roads, veins, lightning, and rivers, are all means to connect locations with each other. For neurons these connections are used to distribute information from one brain area to another. Roads are ways to move people through cities, and lightning transports electrical energy from sky to ground.

The crucial part of these connecting networks is that they are built up in such a way to maximize connectivity while reducing the costs of connections. This optimal organization is called a small-world network. In such a network several central nodes connect to each other and to more local nodes.

Representation of a small-world network



Such networks can arise spontaneously in nature, which is why seemingly different systems like neurons and rivers can show strikingly similar shapes (more information here: https://www.pbs.org/wgbh/nova/ video/the-pattern-in-natures-networks). Therefore, it is very logical that some people interpreted the neuron as one of these other networks.

The next time will I see an elaborately branched tree, I will of course still think of the neurons I see through the microscope daily. However, due to this funny exploration of other people's perceptions, I suspect my brain's small-world network has elaborated itself to incorporate rivers, eyes, city plans, and lightning as well. The cycling trips have suddenly become a lot less boring!

Summer Announcements

By Evan Lewis-Healey

For all you first years: well done! You've made it this far. Time has flown by in the blink of an eye, and I'm sure next year will be the same. To the second years: you're almost a certified master's graduate in Brain and Cognitive Sciences. Congratulations! Now into the scary and unfamiliar world of work (or more likely, the familiar and not so scary world of academia). Finally, to all you alumni: thanks for still reading the newsletter! Your thirst for brain-based knowledge doesn't go unnoticed.

And if it is brain-based knowledge that you're looking for, you've come to the right place. As summer draws in tight like a hot and sweaty hug, you might be thinking, "How am I going to keep my mind satisfied!?". Fortunately for you, we live in one of the most culturally rich and diverse cities in the world, with plenty happening over this academic gap to quench that thirst. Here are a few things you can do to keep those brain cells firing in the two months ahead:

CREA
cultureel studentencentrum

Neuroscience of Digital Distractions at Crea - Saturday 13th July, 11am
Crea welcomes Dr Anastasia Dedyukhina, Huffington post blogger and author of Homo Distractus. She will be pondering how our lives have changed due since the widespread integration of digital devices into our world. Touching on subjects like sleep, attention and behaviour, this is an afternoon that will cover a range of topics not strictly constrained to neuroscience. Tickets are €10 for students, and €20 for regulars. The event link is below: https://www.crea.nl/events/neuroscience-of-digital-distractions-amsterdam/?lang=en&var=ri-0.l-L2

NETHERLANDS INSTITUTE FOR NEUROSCIENCE
Master the mind

Neuroscience Symposium at the NIN - Friday 5th & 12th July, 4pm
The ability to be able to openly share and discuss cutting edge research is the key to progression in modern science. This is why the Netherlands Institute for Neuroscience (NIN) have a symposia on different subjects investigated by top-level cognitive (neuro)scientists. Every week, the floor is given to different researchers, who pose a question and attempt to answer it in the given timeframe.

As the summer school or other aspects of the course/your internship may have piqued your interest in these more open formats of discussion, these symposias would be a great way to network with researchers or entertain different avenues of thought. Researchers scheduled to speak in July are Chritsian Lohmann (5th) and Christiaan Levelt (12th). Lohmann specialises in using high res imaging and electrophysiology to ascertain how neurons establish specific connections, while Levelt uses animal models to study how inhibition can regulate cortical plasticity. The symposia will be held at the NIN at 4pm.

iBBA
Institute Brain and Behavior Amsterdam

'The Quest for a Bionic Hand' Colloquium at the VU- Thursday July 18th, 4pm
Not strictly neuroscience, but if you're interested in prosthetics, bionics and cutting-edge science, then this is probably the place for you. Professor Silvestro Micera gives a talk at the Institute for Brain and Behaviour, detailing the way that amputees can be almost fully rehabilitated. Specifically, he talks about transradial amputations (below the elbow), and how far we have come in the field of prosthetics. Professor Micera will talk about how sensory feedback mechanisms such as proprioception were restored in amputees. He will also discuss how, in the future, it might be possible to fully integrate bionics within amputees to completely restore sensory feedback. Futuristic and interesting stuff, the colloquium will be held at the MF building, room A311. https://ibba.institute/events/colloquium-prof-silvestro-micera-thursday-july-18th-16-00-mf-a311/

Neuroscience Joke

"I once thought about cloning a new, more efficient brain, but then I realized that I was getting a head of myself."
- Anonymous

Message from the Newsletter Committee

Summer School is almost over, which means that the summer itself is just about to start! Sadly, this also means that this is the last edition of the Newsletter of the 2019-2020 Academic Year... :(

We have had a great time coming up with article topics and writing about anything we liked. We hope you have enjoyed reading it as well.

We want to wish you all a great summer and we hope to see you again next year!

Newsletter Committee 2019-2020

Evan Lewis-Healey
Birte Zuidinga
Nutsa Nanuashvili
Sven Wientjes