

# THE BRAIN BLAST

UBC Undergraduate Program in Neuroscience Newsletter

## EDITION 3 - REWARD AND THE VTA

12/23/23



Welcome to the third edition of the The Brain Blast! This month we're talking all about reward circuitry. This edition, we have three interviews, one from PhD student Daria Oleinichenko, as well as interviews with familiar faces Tim and Angie from NSCI 200. We hope final exam season went well for you readers, and that you have a break free from studying!



### THIS MONTH'S THEME:

#### REWARD

FOR OUR THIRD MONTH, WE'LL BE EXPLORING REWARD. AS EXAMS GET WRAPPED UP AND THE HOLIDAYS NEAR, WE'RE SURE YOUR VTA-NUCLEUS ACCUMBENS PATHWAY IS HOT RIGHT NOW! THIS MONTH, WE'LL FOCUS LESS ON ACADEMICS AND HAVE SOME FUN!! HAPPY HOLIDAYS. (HOW MANY SANTA CLAUS'S CAN YOU SPOT IN THIS EDITION'S NEWSLETTER?)



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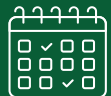


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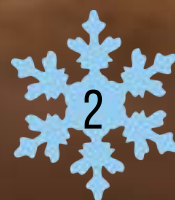
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## **THIS MONTH IN NSCI 200: INTRODUCTION TO CELLULAR AND MOLECULAR NEUROSCIENCE**

We had an exciting month in NSCI 200, with multiple guest lecturers and speakers coming into our class. The first was Dr. Kurt Haas, who spoke on research methods, covering everything from brain imaging techniques to single cell recording devices. The next presentation was an introduction to neuroethics given by Dr. Julie Robillard. We then had Dr. Stan Floresco lecture on dopamine, where many were surprised to hear dopamine is NOT the 'pleasure' neurotransmitter. Lastly, we had 3 graduate students come into the glass for a 'data blitz', where they talked about their research for about five minutes each.



## **THE NEURO**

## **THIS MONTH IN NSCI 300: LABORATORY TECHNIQUES FOR THE NEUROSCIENCES**

In our last month with NSCI 300, we hooked ourselves onto EMG and EEG machines, gave ourselves electric shocks, and measured our cortical/nerve activity. We also performed classical experiments with the Aplysia sea slugs to determine mechanisms of sensitization and habituation. It was amazing to be able to learn about complex neurobiology/behavior with simple experiments. We want to take a moment to thank our amazing prof - Dr. Waise, and our amazing TA's - Shalini, Jackson, and Judy for an amazing term.

## **REVIEW @ UBC**

## **THIS MONTH IN NSCI 302: MECHANISMS OF NERVOUS SYSTEM FUNCTION AND RECOVERY**

Over these last two months, we wrote our second midterm (woohoo!) and Steven had a bunch of guest lecturers come in and talk about some fascinating topics such as neuropsychology, concussions, artificial intelligence and Huntington's disease. Steven also provided some lectures on language dysfunctions, Autism Spectrum Disorder, neuropsychiatric disorders and LSD. We would like to thank Steven for an amazing semester and we hope to see him again soon!



## **THIS MONTH IN NSCI 311: ADVANCED NEUROANATOMY**

This month in NSCI 311, we put together our past knowledge about the cerebellum and basal ganglia to better understand sensorimotor integration and the balance between our exteroceptive and interoceptive awareness (3 steps forward!). We took a deep dive into why we experience stress, love, and emotional memories thanks to the limbic system! We returned to the multi-purpose laboratory to put together all the anatomical puzzle pieces from the past few months and consolidate a more three dimensional understanding of the brain and cerebral blood supply. To finish off the course, we celebrated all our hard work this term through presentations and the Neuroscience Carnival, exploring topics like love, cannabis, creativity, music, and much more.



# Meet your Intern Director:

## Tim O'Connor



Tim teaches NSCI 200, Introduction to Cellular and Molecular Neuroscience with Angie O'Neill. He will also be taking the role of Interim Director while Steven is away for next term. Below are some insights into his journey and career, and some advice to aspiring undergraduate students to help them on their own journey.

### What made you want to go into neuroscience?

Initially, Tim had no idea he would go into graduate school, thinking that many of his graduate students TA's were geeky and research wouldn't be something he wanted to do. His first taste of research started in the summer after the third year, when his professor called up some of the students after a mid-term and told them about an opportunity to get paid to do research over the summer. Although his first choice project was snapped up just before he was able to select it, he completed another project examining how sensory neurons refer pain in migraines. From here, it naturally flowed into continuing on at this lab through 4th year, and at the end of that, his supervisor talked to him about doing a masters and Tim agreed. The research he was doing in his masters grew on him immensely over the first year, and he advised that just because you aren't super passionate about research initially doesn't mean it won't grow on you over time. People often say they have to "find their passion" but sometimes your passion finds you when you put the time and effort into something.

### What were you like as a student?

Although academics were important to Tim, he was known for his enthusiasm for sports and social gatherings. He played hockey for one of the UofT colleges and he ended up being the President of his college residence. Only his close friends knew that he was as academically driven as he was.

### What current part of neuroscience research happening here at UBC or elsewhere is most exciting to you?

Tim recently had a paper published that examined the function of semaphorin genes in adult neurons. In development, semaphorins function to guide growing axons to their target synapses. Tim found that when you turn these genes off in mature neurons, something really interesting happens. The neuron dies, leading one to believe that perhaps these semaphorins are more important than we initially thought in the adult brain.

### What are some of your passions outside of neuroscience?

Outside of neuroscience, Tim enjoys both hockey and wine. He played hockey for the University of California as a postdoc, and still plays pick-up games twice a week each morning at 7:00am. He also has experience making his own wine when he was living close to the Napa Valley.

### If you could travel back in time and give your undergraduate self on piece of advice, what would it be?

"Do the degree you want to, not the degree you feel you should do." When Tim first came to UBC, he taught in the Medical School for a number of years, and came across many students that had chosen Medicine due to external pressures rather than pursuing the degree they were interested in. His second piece of advice was to travel more. "Sometimes students come and ask me, what do you think of me travelling, my answer is always yes you should." What many students don't realise is that "Each stage as you go along, the opportunity to take time off becomes less and less." If you are pursuing a job as a professor, institutions prefer not to see publication gaps. There used to be 300-400 applications for one assistant professor job because the ratio of post-docs to positions was so high and alternative careers in biotech were not yet available. Although still difficult, the competition for professor jobs has declined since then, as the job market in the neuroscience industry has since surged. However, one does not need to despair that they'll always be swamped with work and never get to travel. Tim has often had the opportunity to travel through presenting at different conferences.

### What is something you think I should ask you about?

Students should know that research success depends on two things, hard work, and your ability to write. Success rates for different grants and awards are typically less than twenty percent, and often one grant is not enough to fund a lab alone. Once you are awarded different grants, there is then a pressure to produce and write papers. Also, you need to be constantly reading, as it is important that your research is up to date and your papers are advancing knowledge in the field.

# Meet your Professor: Angie O'Neill



Angie teaches NSCI 200, Introduction to Cellular and Molecular Neuroscience with Tim O'Connor. Below are some insights into her journey and career, and some advice to aspiring undergraduate students to help them on their own journey.

## What made you want to go into neuroscience?

Angie's path to neuroscience wasn't always a straight one, in her first three years as an undergrad she switched from wanting to be a doctor, to studying physics, to studying human nutrition. Through nutrition she ended up taking a comparative physiology course, where she learned about how neurons generate action potentials. This is what first interested her in neuroscience, and she ended up doing her masters in Zoology at UBC, further involving herself in comparative physiology with a project examining how the midbrain controls breathing patterns in fish.

## What is your favourite brain region, or a region you think is under appreciated and why?

Regions like the cerebral cortex are well loved because of the sophisticated roles they perform in complex things such as cognition and behaviour. However, the medulla is underrated and overlooked because some people think of it as "primitive." Our ancestors had a medulla very similar to ours, as do all vertebrates, but this doesn't mean it is less important. The medulla is one of the brain regions that is essential for keeping us alive through its many roles, including regulating heart rate and blood pressure and controlling breathing. The word "primitive" has a negative connotation, "ancestral" is a better term.

## What current part of neuroscience research happening here at UBC or elsewhere is most exciting to you?

Some of the work happening with ICORD on spinal cord injuries is really intriguing. The body's response to injuries in different parts of the nervous system is fascinating. One can injure a neuron in the peripheral nervous system and glia will help it to recover by supplying growth factors and giving it structural support, but if the same thing happens in the central nervous system, some glia will secrete substances that inhibit regrowth of damaged axons and can kill the neuron and surrounding neurons. This type of research could have huge implications for treating spinal cord injuries in the future.

## What were you like as a student?

I was surprised to hear Angie was very shy as a student. She never attended office hours until her fourth year, when she was in a small summer class of 20 students. If she could give advice to her undergraduate self, she would tell herself to learn from her mistakes and go to office hours. Professors are just people who are also interested in the material. Office hours can be more than just going over course material, your professors are a wealth of knowledge, and you can ask them to go further in-depth on specific topics, or on their advice about careers and such. I was also surprised to hear that Angie didn't think she studied enough as a student. If she wasn't interested in a topic such as biochemistry or maths, she didn't put as much effort into it. These courses are required in your degree for a reason, and they can turn out to be incredibly useful in the future. Students tend to dislike courses they struggle with, but if you take the time to understand these topics and how they apply to material that you do like, they start to become more fun and you see the use in them.

## What are some of your passions outside of neuroscience?

Angie has a pet blue-tongued lizard, Haku. Haku is an adorably grumpy skink whose favourite hobbies involve napping in secret hiding spots and climbing Angie's furniture. She is also passionate about photography, with many of her animal pictures showing up in slide decks for her classes. She also has other artistic hobbies, including singing and playing the guitar, and is starting to experiment with sketching as a way to challenge herself.

## Is there anything you use from neuroscience in your role in course development and teaching?

As a student, Angie would sometimes fall asleep in class, even in those she found most interesting. From her experience as a student, she tries to keep students engaged through activities like the clicker questions and discussion questions, since by giving time in class for students to talk to each other about the course material, and to use this material to solve problems, this will help students to learn the material much more effectively than just passively listening to a lecture. In her organic chemistry class in undergrad, on the first day the professor told them to "look to your left, look to your right, look at yourself, one of you will fail." Students already have enough stress and anxiety in their lives so she tries to be approachable as possible. Another strategy is to not have all the information on the slides, as otherwise class is less engaging as you can just read the slides at home. By having to actively take down notes and reorganise new information in your brain you are helping yourself to learn and consolidate the material.

# ASK A RESEARCHER: Daria Oleinichenko



Daria Oleinichenko is a PhD student in the Phillips Lab and Snutch Lab at UBC. Her work revolves around exploring drug-assisted withdrawal using rat models. In this interview, Daria discussed her own research experience and shared many pro tips about getting into research.

## Research-focused Questions

### What inspired you to pursue research in drug-assisted withdrawal?

My interest combined with my supervisor's suggestions led me to focus on studying the pain syndrome that arises during withdrawal and how that can lead to the relapse of drug use. I have a lot of undergraduate background in behavioural neuroscience with a focus on addiction and depression (Daria also has a BSc in pharmacology), so I have a bit of experience with pain models. That really appealed to Anthony Phillips when I applied to his lab. He proposed co-supervision with Dr Terrance Snutch, an expert in calcium channels, which would allow my work to become more molecular in the future. The work I am doing right now is perfect because it is a combination of things I did before and understood well. Research on drug-assisted withdrawal is also an interesting field with a clear social impact. Plus, I started my first lab experience working with rodents so I have always wanted to work with rats. (Daria told us that she is an overqualified rat mother, which we can totally see as being true).

### Can you give us a brief overview of your research?

My master's degree started with trying to evaluate morphine withdrawal-induced hyperalgesia, which is an increase in pain sensitivity that arises from chronic administration of opiates in clinical populations and rodent models. The Phillips lab was very interested in exploring whether the compound I-THP, or I-tetrahydropalmatine would work in this model. It's a unique compound derived from a herb used in traditional Chinese medicine (here, Daria mentioned how folk knowledge such as traditional Chinese medicine can be a very interesting avenue for drug discovery). It acts as a dopaminergic antagonist presynaptically but actually makes cells in the nucleus accumbens release more dopamine. In the context of withdrawal, it can prevent a hypodopaminergic state while acting as an analgesic (pain-relief medication). It ended up working well at reducing hyperalgesia in the chronically morphine-treated rats!

After the work on I-THP, I added another drug to the project. It's called Z944, a calcium channel antagonist studied by the Snutch lab. Z944 is a promising antiepileptic agent which is actually a good candidate drug for modulating neuropathic pain. Again, it worked in my model!

So the major question I would like to address next (for Daria's PhD project) is to identify where these drugs work in the brain and whether there is a neural pathway that is particularly significant for the mechanism of action of these drugs. These are still a work in progress.

### What do you wish you had known before entering research?

I wish I knew statistics better. It's a big thing...Understanding the concepts of different statistical tests is important. If the only thing you are comfortable with is t-testing...it's probably not enough. You want to be able to understand ANOVAs and different types of statistical corrections and know the difference between concepts.

I also wish I had more confidence and understood that I am valuable. There's something I caught on pretty quickly: professors see me as a science baby. The second I got here (UBC) I stopped being like, 'I don't belong here, I'm not good enough' - no, actually people expect me to not know all these things because I'm just starting my journey and everyone is really understanding about this. That mindset freed up a bunch of brain space to ask questions, propose ideas, and be wrong.

### What advice would you give to undergrads wanting to do research?

Start exploring your interests early and go in different directions, especially in terms of research. Don't think there's always more time because, well, research takes a while. Say you are in your mid-third year of university, you have a year and a half left until graduation, and you already started picking up small projects at a lab. By the time you are graduating, you might be talking to your potential supervisors already (because your rich experience helped shape your goals and interests).

If you are going straight to grad school, you don't have a lot of room to explore because the undergraduate curriculum itself is not enough to prepare you for research. For example, if you are so convinced you want to do Alzheimer's research because you learned about it in class and have been volunteering at an Alzheimer's facility. Then you enter a lab and they do a bunch of modeling using rats, and you realize... you just can't handle them. What are you going to do at that point? So start early and find something that motivates you in your undergrad if you want to go into research.

# Graduate School Questions

## Why did you choose grad school?

Well, a big part of it was my experience during a co-op year, where I gained some work experience. It wasn't meant to be directly research-focused, but I managed to make it academically relevant by working in a lab. It was shaping up to be a really cool project with great publication potential.

Like mentioned, I am super interested in neuroscience, particularly addiction. I believe it's crucial to find something that you're passionate about. If a research topic gives you 'dark thoughts' or makes you want to scream and cry, it might not be the right fit. The key is to pursue something that, despite its difficulties, keeps you engaged and excited. That's how I knew I had found my niche in academia and why I chose to go to grad school.

When it came to picking a graduate program, I knew I didn't want to stay at the University of Toronto (U of T) because they don't have a designated neuroscience graduate program. You can do neuroscience research, sure, but it's under programs with overlapping interests, not as a focused course of study.

## How to get reference letters?

In order to obtain quality reference letters, it's best that the writer of the letter knows you in both personal and research capacity for some time. Therefore, it is best to start building professional relationships early. In my case, my reference letters are from the PIs whom I worked with in my graduate years because I worked under them and they know me in an academic context. Ask for your reference letters early (at least 2 weeks before the application deadline) and prepare for the professors to do it last minute because of their schedule.



## Can you apply to multiple programs in multiple disciplines?

When applying to graduate school, you're definitely allowed to apply to multiple departments. However, keep in mind that each university has its own set of rules, so there might be a limit on how many departments you can apply to at each school. Also, a big thing to consider is the cost of applications. They're not cheap, typically around \$150 each, so applying to a bunch of places can get really expensive.

Applying to grad school can be a bit of a headache, honestly. It's not just filling out forms; you've got to really think about each school's requirements, and the costs can add up. But once you get past that and actually start grad school, it's a whole different story. Most people find the grad school experience itself way more enjoyable than the application process. So, yeah, it's tough, but many find it's worth it in the end.

**If you are interested in her research and want to chat more, you can reach her at**

**[oleinich@student.ubc.ca](mailto:oleinich@student.ubc.ca)**

## What is the application process like?

Applying for graduate programs primarily involves two key steps. First, securing a supervisor is crucial, as having someone interested in taking you on board accounts for the majority of the application's success. Second, applicants must navigate through the paperwork aspects of the application process, which includes obtaining reference letters from individuals who can vouch for their academic and research capabilities, while meeting various institutional deadlines. Additionally, most graduate programs have a minimum GPA requirement for applicants, which varies by institution; for example, UBC might require around a B+ average, although this is a general estimation and may not be exact.

If an applicant hasn't found a supervisor by the time of application, departments may create a shortlist of impressive candidates and distribute it to potential supervisors (PIs) who are seeking students. Sometimes, a supervisor might select a student from this pool. However, it's advisable to find a supervisor early in the process.

## Grades VS finding a supervisor?

In the context of graduate school applications, particularly when it comes to impressing a potential supervisor, GPA can play a significant role, especially if you haven't established a prior connection or networked with them. For supervisors who don't know you personally, your academic record might be one of the first things they look at to see your abilities and potential. However, it's important to note that GPA is not always the best indicator of a person's potential in graduate studies, and if you have established a professional relationship with the PI already, they are probably going to consider your grades less.

In summary, finding a PI who is willing to take you is probably more important than your grades given that your grades meet the minimum requirement of the program.

## Does undergraduate work influence grad school applications?

A lot of people end up staying in the same labs they worked in during their final year. They might start a directed study, really enjoy the work, get good results, and have a clear research direction. If the professor has the funding, they just stay on as grad students. But for me, moving on seemed like the right choice. It felt like the world was my oyster, and I was ready to explore new opportunities in grad school as I switched from pharmacology to neuroscience studying addictions!

## Any insights on working with rodents in your research?

Working with mice and rats is all about building mutual understanding, but you also need to remember that you are the boss. This doesn't mean being forceful, but rather guiding them with assurance and steadiness. The key is to be both calm and firm. It's important to have confidence in handling them, which definitely comes with practice. Mice can be feisty and a bit unpredictable, especially before they get used to you. So, when you're working with them, it's crucial to maintain a steady hand and be calm. Over time, as you get more accustomed to handling them, and as they become more familiar with you, the process becomes smoother.





**DR. SCHÜTZ**



The B.R.A.I.N. Lab seeks to understand the psycho-neurobiological mechanisms that underlie cognitive, affective, and stress-associated aspects of decision-making and impulsivity. Using novel approaches like retraining approach habits, electrophysiological treatments and integrated psychotherapeutic and psychedelic interventions, the B.R.A.I.N. Lab aims to develop more effective interventions for individuals living with substance use and mental disorders.



## NEUROSCIENCE LABS OF THE MONTH



**DR. CORNELIA LAULE**

Dr. Cornelia Laule works at ICORD at VGH and has focused her research on spinal cord injury, neurodegeneration, and myelin. Using myelin water imaging, she has made a variety of discoveries on different histological measures of myelin.







Study of Eating

# ALZHEIMER'S DISEASE & MEDITERRANEAN DIET

## Introduce The Study

A research study by Agarwal et al. (2023) investigates autopsied participants to look at the association between Alzheimer's pathology and the Mediterranean diet.



Mediterranean diets have long been associated with slowing down and delaying cognitive decline.

**Why study this?**



## MEDITERRANEAN DIET

The term, “Mediterranean diet”, describes the dietary pattern of individuals who live around the Mediterranean Sea (Rishor-Olney & Hinson, 2023). The food choices are mainly plant-based, and also includes healthy fats such as olive oil. Research has shown that Mediterranean diets reduce the risk of a lot of health conditions, including Alzheimer's disease.



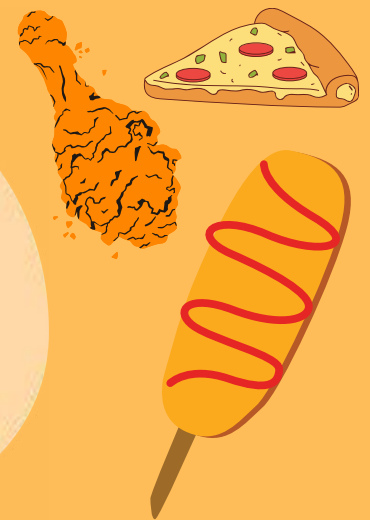
### ALZHEIMER'S DISEASE (AD)

Alzheimer's disease (AD) is a progressive neurodegenerative disorder characterized by cognitive dysfunction and dementia. Classic neuropathological hallmarks are amyloid beta plaques and neurofibrillary tangles.

Since AD dementia cannot be diagnosed until post-mortem neuropathologic evaluation, Agarwal et al., (2023) hoped to examine the Mediterranean diet and Mediterranean-DASH Intervention for Neurodegenerative Delay (MIND) association with AD pathology in post-mortem patients.

Alzheimer's disease (AD) is a progressive neurodegenerative disorder characterized by cognitive dysfunction and dementia. Classic neuropathological hallmarks are amyloid beta plaques and neurofibrillary tangles.

Conversely, fried food and sweets/pastries food groups are positively correlated with more AD pathology. The overall intake of the diet is associated with lower AD pathology than the consumption of a particular food group.



## RESULTS AND DISCUSSIONS

### METHODOLOGY

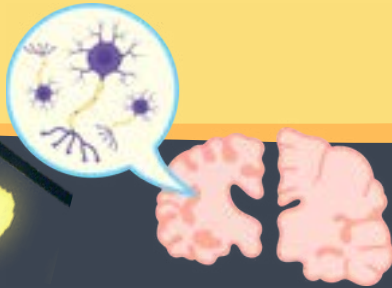


Participants record their dietary data by completing a food frequency questionnaire with a decade of follow-up before death. MIND diet is defined into 10 brain-healthy food groups and 5 unhealthy food groups, while the Mediterranean diet includes 11 dietary components. 14 food groups such as green leafy vegetables, beans and legumes, whole grains. Processed meat were also analyzed for correlations with AD pathology.

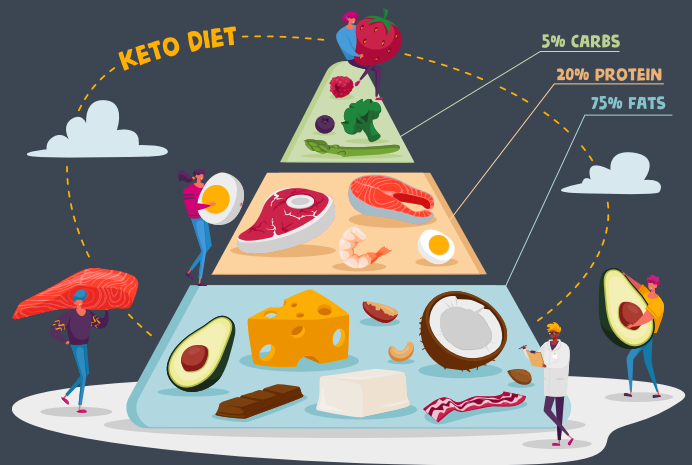
# CONCLUSION



The mechanism between diet and AD neuropathology remains unknown. Previous literature has shown that consumption of green leafy vegetables is associated with slower cognitive decline (Morris et al. 2017). This may be due to certain nutrients in green leafy vegetables which may have protective mechanisms in the brain.



Moreover, both MIND and the Mediterranean are low in fat. These diets may lead to a reduced formation of amyloid beta plaques since high-fat diets show increases the inflammatory response in the neuronal tissues and amyloid beta deposits in the brain (Busquets et al., 2017).



Although there is still a lot to be discovered, Mediterranean diets are shown to reduce the progression of Alzheimer's disease pathology. Having more green leafy vegetables and less high-fat food may be a way to improve brain health.

# EVENTS OF THE MONTH

## JANUARY'S NEUROSCIENCE RESEARCH COLLOQUIUM

JAN 12

Dr. Joshua Berke:  
Time, Space, and  
Dopamine

JAN 19

Dr. Khaled  
Abdelrahman:  
Decoding the  
intricacies of GPCR  
signaling in  
neurodegenerative  
diseases

JAN 26

Dr. Anthony Phillips:  
Assessment of novel  
drugs for  
attenuation of opioid  
withdrawal-induced  
hyperalgesia

FEB 2

Dr. Daniela  
Palombo: Neural  
correlates of  
emotional memory:  
basic findings and  
implications for  
PTSD.

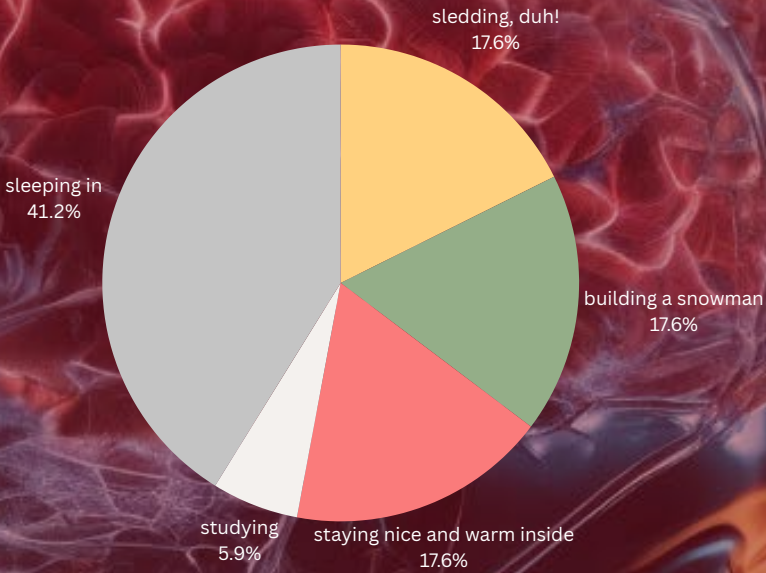
## THE NEUROSCIENCE RESOURCE BAY

Hello neuroscience second and third years! Have you ever been in need of extra study materials, but didn't know where to find any? Or perhaps, you wish you'd had a reference example for an assignment, but the class was so new there weren't any? The Neuroscience Resource Bay, currently in development, is geared to effectively tackle these common challenges. This Resource Bay website's purpose is not only to assist current students in our program but also to benefit future students navigating the same coursework. However, to ensure a rich variety of resources and perspectives, we need your help. We are asking neuroscience students to submit anything they feel could be helpful to another student! Click the link below for more information on this project and to submit resources. Think flashcard decks, youtube accounts, and study guides. Your submissions will play a crucial role in making this resource-rich website a reality. Any submission makes a difference!

[SUBMIT YOUR RESOURCES](#)

INQUIRIES: Contact Maxime Bedard at  
[maximebedardd@gmail.com](mailto:maximebedardd@gmail.com)

## IT'S SNOWSTORMING OUTSIDE AND CLASS IS CANCELLED! WHAT ARE YOU DOING?



## WHAT'S YOUR FAVOURITE WINTER HOLIDAY TREAT?



# RESULTS: OCTOBER STUDENT POLLS

[SUBMIT POLLS FOR NEXT MONTH](#)

## WHAT IS A HOLIDAY TRADITION IN YOUR FAMILY?

- Opening presents one at a time
- Family dinner
- Going on vacation
- Christmas morning breakfast feast!
- My family celebrates New Year, so we usually spent Jan 1st playing card games or Mafia
- Snowshoeing at Cypress
- Gift giving
- Playing Driedel
- Playing Michael Buble's Christmas album on loop
- Putting the star on the Christmass tree
- Opening one present on Christmas Eve
- Skiing!

**UNTIL NEXT TIME!**

**GET TO KNOW YOUR NEUROSCIENCE PEERS!**

fill out our

**NEUROSCIENCE STUDENT POLLS**

**THANKS FOR READING!**

Do you have any questions, feedback, or suggestions about the Neuroscience Newsletter or the Neuroscience Program? Want to be featured in the next Neuroscience Newsletter?

**LET US KNOW IN THE NEUROSCIENCE NEWSLETTER FEEDBACK FORM**

**OFFICE HOURS:  
RYAN BOUMA**

If you have any program-related questions, please direct them to Ryan, the program advisor at [advising@neuro.ubc.ca](mailto:advising@neuro.ubc.ca)

**RESOURCES:**

WELLNESS RESOURCES  
SEXUAL ASSAULT RESOURCES  
EQUITY/HUMAN RIGHTS RESOURCES

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