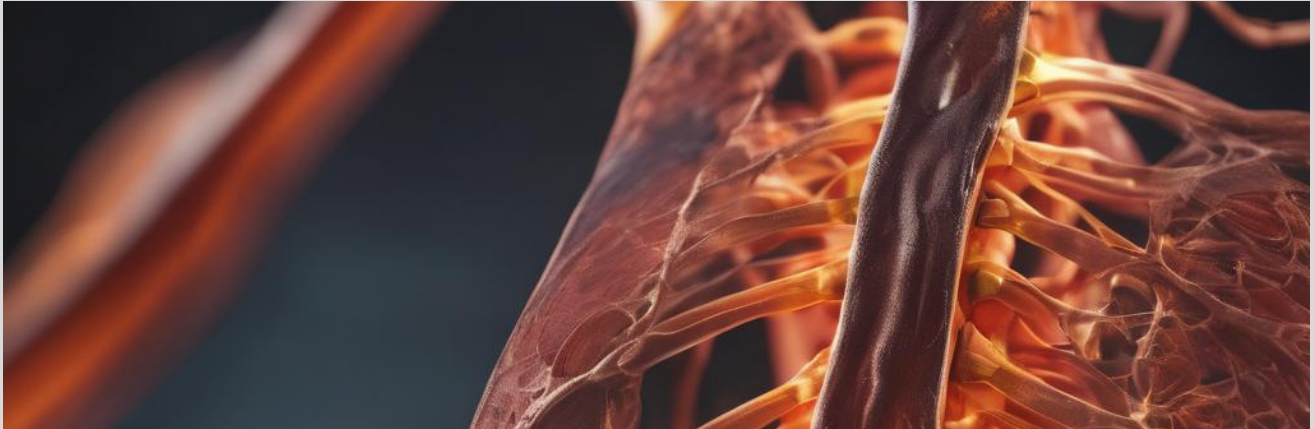


THE BRAIN BLAST

UBC Undergraduate Program in Neuroscience Newsletter

EDITION 1 - NEUROANATOMY

10/01/23



Welcome to the first edition of the The Brain Blast! To the new cohort, congratulations on getting accepted to the neuroscience major, you have an exciting year ahead! To incoming third years: welcome back! This year, your newsletter has a new look and name. We are bringing a ton of new and exciting content: interviews with professors, student spotlights, neuroscience in popular media, interactive polls, the neuroscience student lounge, and wellness resources! Okay, we'll stop talking now, time to dive in.....



THIS MONTH'S THEME: NEUROANATOMY

FOR OUR FIRST MONTH, WE'LL BE EXPLORING THE NEUROANATOMY OF THE NEUROSCIENCE PROGRAM. IF YOU'RE CURRENTLY LOOKING TO GET MORE INVOLVED IN THE NEUROSCIENCE COMMUNITY, RESEARCH, CLUB EVENTS, AND EVEN MAKE NEURO STUDY-BUDDIES, THEN THIS EDITION IS FOR YOU!

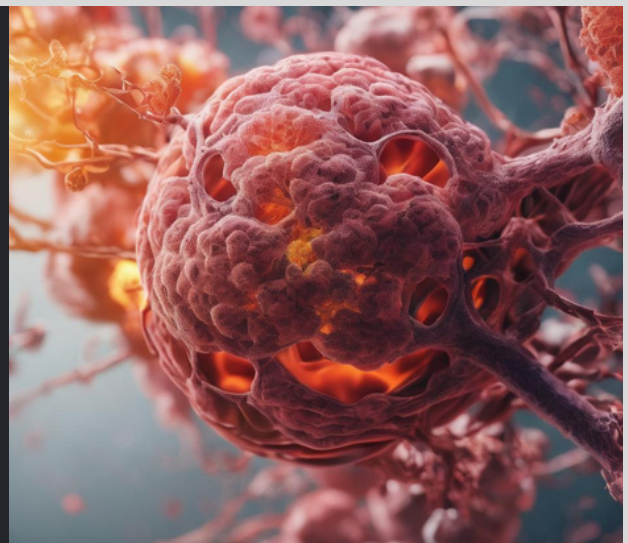


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THIS MONTH IN NSCI 200: INTRODUCTION TO CELLULAR AND MOLECULAR NEUROSCIENCE

Tim and Angie each presented a lecture, the first of which was on cellular structure, and the second diving into neuroanatomy. In the first lecture we learned about the basic parts of a neuron, including the soma, axon, dendrite, and presynaptic terminals. In the second lecture on neuroanatomy we talked first about anatomical directions, then moved to structure in the hindbrain, going over the medulla, pons, and cerebellum. We also had a lab where we examined different structures in the nervous system underneath the microscope.

THIS MONTH IN NSCI 300: LABORATORY TECHNIQUES FOR THE NEUROSCIENCES

For the first week, we used a simulation to play with the resting membrane potential to get a deep understanding of its functions by looking at the Na⁺/K⁺ ATPase pump and the Na⁺ and K⁺ leaky channels. To follow up with this, in the second lab we discussed the roles of various components of the membrane such as the Na⁺/K⁺ ATPase pump, Na⁺ and K⁺ leaky channels, voltage-gated Na⁺ and K⁺ ion channels, permeability ratios and gradients to again better understand all of the components that play a part in creating an action potential.



THE NEURO REVIEW @ UBC

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

Steven gave us very concise lectures on the various functional and structural brain imaging techniques that are used. He briefly went over some neuroscience history regarding certain (unethical) experiments that were done in the past and talked about the importance of these past experiments. We finished that lecture by talking about the statistical issues that arise from brain imaging techniques. Synonymously with this, we learned about neurological examination techniques a neurologist would use for various lesions/dysfunctions of the brain (cranial nerves, somatosensation, MSE).

THIS MONTH IN NSCI 311: ADVANCED NEUROANATOMY

Dr. Krebs introduced us to how we develop from embryos into humans who can move, feel, and adapt to the world around us. We took a close look at the spinal cord and even built one ourselves! We explored how sensory and motor information is organized and how it travels to and from the brain. Recently, we oriented ourselves within the brainstem and were introduced to cranial nerves V and VII. To finish off the month, we consolidated our learning in the neuroanatomy lab and observed the brain from different perspectives.

RESEARCH ARTICLES

Dive into this month's two highlighted research articles covering spinal cord injuries and emerging findings on microtubules. These are both topics that are currently being covered in NSCI 200 (Fundamentals in Cellular Neuroscience) and NSCI 311 (Advanced Neuroanatomy).

A CLINICAL PRACTICE GUIDELINE FOR THE MANAGEMENT OF ACUTE SPINAL CORD INJURY: INTRODUCTION, RATIONALE, AND SCOPE

The goal of these guidelines is to improve outcomes and standardization of care for patients with acute spinal cord injury. These evidence-based recommendations of the management of acute spinal cord injury discuss how SCI treatment has evolved over time and addresses controversies in SCI treatment such as the intervention of surgery, role of imaging, and timing of rehabilitation treatment.

MICROTUBULES IN NEURONS AS INFORMATION CARRIERS - PMC

One of the topics we covered in our first NSCI 200 lecture was the function of microtubules. Microtubules are typically thought of as important for two primary functions, structure and support, and transportation of organelles and proteins. This article provides some insight into possible additional functions of microtubules.

PODCASTS AND MEDIA

RESTORING A LOST SENSE OF TOUCH

Brandon Prestwood lost his arm to a conveyor belt and underwent an experimental procedure that gave him the ability to move and feel via a prosthetic arm. In this interview, Brandon's story illustrates the mechanisms behind human touch and the important role it plays in our daily lives.



**MUSIC
& YOUR
BRAIN**



HUBERMAN LAB

HOW TO USE MUSIC TO BOOST MOTIVATION, MOOD & IMPROVE LEARNING - HUBERMAN LAB

As midterm season will be soon upon us, creating good habits when it comes to study strategies is especially key. For many of us, music is a constant companion to the many hours of studying that goes into preparing for midterms. This recent podcast episode from the Huberman Lab goes over, among other topics, music's effect on motivation, cognitive performance, and a question I've always asked myself, whether or not it is better to study with music or to study in silence.

DR. BRIAN KWON



The Kwon Lab at ICORD focuses on translational acute and traumatic spinal cord injury (SCI) research. Dr. Kwon and his team aim to improve guidelines for the management of patients with acute SCI and gain insights into the pathophysiology of SCI and biomarkers of injury severity. The Kwon lab has also developed the International Spinal Cord Injury Biobank (ISCIB).

HISTORICALLY, THE KWON LAB HAS TAKEN UNDERGRADUATES AS CO-OP STUDENTS.

LAB WEBSITE

NEUROSCIENCE LABS OF THE MONTH

The Pavlidis lab lies at the intersection of bioinformatics and neuroscience, also known as neuroinformatics. In studying the relationship between genes and behaviour, they work on integrating and interpreting genomics with data on networks, cells, structures, connections and phenotypes. They then apply these approaches to increase understanding of human conditions such as schizophrenia, depression, autism and Alzheimer's disease.

DR. PAVLIDIS HAS INDICATED THAT HE IS INTERESTED IN WORKING WITH UNDERGRADUATES, AND HAS TAKEN UNDERGRADUATES AS CO-OP/WORKLEARN STUDENTS BEFORE. LAB WEBSITE

DR. PAUL PAVLIDIS





MEET YOUR DIRECTOR: DR. STEVEN BARNES

IF YOU COULD TRAVEL BACK IN TIME AND GIVE YOUR UNDERGRADUATE SELF SOME PIECE OF ADVICE WHAT WOULD IT BE?

It may be easy to say this now, but I would say to not put certain things to the side due to school. I sacrificed a lot of things for good grades. I sacrificed painting, drawing, and biking. It took me a while to come back to art, and I regret that. Don't put aside the things that you love.

WHAT'S ONE THING STUDENTS WILL BE SURPRISED TO LEARN ABOUT YOU?

People may be surprised to learn that I lead an international organization that studies psychosocial issues/BPD instead of neuroscience-related. The platform is called Crest.BD (<https://www.crestbd.ca/>).

WHAT LED TO YOU STUDYING NEUROSCIENCE?

So, it was sort of an accident, but not really. In my first year of undergrad, I took standard first-year science courses (math, biology, chemistry, etc.), and I didn't like any of them. When looking at majors, I looked at something that wasn't one of those. Somewhere in between art and science. I chose Biopsychology (which is called behavioural neuroscience now).

What kept me in the field was my supervisor in my third year of undergrad. I stayed with him through undergraduate and graduate school. He gave me inspiration as a researcher, and a passion as teacher.

WHAT IS YOUR FAVOURITE BRAIN REGION AND WHY?

The Basolateral Amygdala (BLA) was the primary focus of my research as a PhD student. Great thing to study in the context of learning and memory, emotion, and epilepsy. I also love the mossy fibre pathway.

WHAT'S YOUR FAVOURITE MOVIE?

Donnie Darko - I love it because it has an interesting take on mental illness. It also deals with time travel and various cool stuff.

STUDENT SPOTLIGHT: NAHANNI MUSIANI

Nahanni is a 3rd year neuroscience student who is passionate about human connection. She is interested in the role of the brain in the ways we act towards ourselves and each other.

WHY NEUROSCIENCE AT UBC?

Outside of the awesome professors and beautiful campus UBC has to offer and the fact that neuroscience is just flat out cool, doing neuroscience at UBC is a great stepping stone for your career. You really feel that the Neuroscience program team is there to see you succeed. The courses are designed to prepare you for life outside of undergrad by incorporating guest speakers (neuropsychologist, speech pathologists and others) in lectures and creating assignments focused on extracurricular pursuits. The neuroscience advising and directing team are accessible and supportive. Neuroscience at UBC provides you with opportunities that you can not find elsewhere : directed studies, Co-op, research Colloquiums.

WHAT ADVICE WOULD YOU GIVE TO 2ND YEAR STUDENTS ENTERING THE NEUROSCIENCE PROGRAM?

I would give 3 pieces of advice to a new student within neuroscience:

The first is to get involved early. And yes, I mean labs and academic clubs. But I also mean reaching out to professors, joining sports teams. All in all, get connected in any way that interests you. These things matter and each experience leads to new open doors.

The second is to dare to do the things you are nervous to do. Dare to ask for the position. Dare to push the envelope of what is possible. If you don't ask, you don't receive. Raise your hand in class, email that professor you look up to. Do it all, do it a hundred times. Eventually it'll become easy.

My biggest lesson and my final advice to you is to find balance between life and school. At times, it is important to weigh the costs and benefits of spending that extra afternoon in the library instead of watching a movie at home with your roommates. I have found that paradoxically the more time I put into doing the things that make me happy, the better I do at school. If the only thing you learn in university is the lecture materials, you are missing out on the true learning university has to offer you.



get in touch: nahannimusiani@gmail.com

WHAT IS SOMETHING YOU'RE LOOKING FORWARD TO THIS YEAR?

I am so excited to be directing ASTU 400M 201: The Psychology of Modern Dating. This course will be held in Term 2 and will be a 3-credit seminar based course where we will be investigating the role of technology in our modern dating world. All upper year students are encouraged to apply! I designed this course to create a space where these conversations can be held and explored scientifically.

Course Description: Technological communication is seemingly impacting all aspects of human experience. In this seminar we will be diving into the psychology behind dating apps, websites and social media to answer the question: What are the new dating scripts within technological platforms and how are they changing our pre-existing dating behaviours? This course will compare online and offline dating psychology to analyze the impacts of technology on dating practices. We will be exploring concepts of self marketing, online attraction, matching algorithms and digital courtship through scientific articles and textbook "The Psychology of Modern Dating" (2020) by psychologist Shawn Blue. The course syllabus is inclusive to all sexuality, gender and identity experiences.

If you enjoy discussion based learning, are looking for an upper year elective and are interested in themes of online dating please register to the course in SSC. It will be held Mondays and Wednesdays from 5:00pm -6:30pm. I look forward to learning with you!

Student Spotlight: James Drover



James Drover is a 2nd year neuroscience student from St. John's, Newfoundland. He has a wide array of interests and talents, including mountain biking, skiing, mountaineering, rock climbing, and playing the guitar, and harmonica.

WHY DID YOU CHOOSE NEUROSCIENCE AT UBC?

A High School AP psychology course piqued my interest in neuroscience. After that, it was really a decision between the East and West Coasts. Honestly, UBC won because of its natural beauty - and I thought moving far away would be a good opportunity for growth.

TELL ME ABOUT YOUR EXPERIENCE WITH BEE RESEARCH

This summer, I worked as an apiary research and education intern for Ensure Hive Future. One of the major threats to the western honeybee (*Apis mellifera*) is the Varroa Mite, a small red crab-like parasite that causes disease and the collapse of colonies. My main responsibility this summer was making daughters from queens with the Varroa Sensitive Hygiene trait (VSH), which is a behavioural trait in which they groom themselves and other bees to remove mites. This involved the delicate process of grafting, in which you manually select larvae only hours old to become new VSH queens. Whether a larva becomes a worker or queen depends on the diet, so when I introduce these fresh larvae to a queenless colony, they will feed them royal jelly instead of worker jelly to fill the empty throne. These mite-resistant queens would then be distributed around B.C. with the hopes of moving to sustainable, treatment-free beekeeping.

The job also involved a large education component. I would set up a booth at different farmer markets, selling honey while promoting the benefits of strong treatment-free bees and the importance of native plants and pollinators. The alternative solution against mites is to spray acid on colonies, which is non-fatal, but can damage the immune system of queen bees and shorten their lifespan, as well as contaminate honeycrops. The other side of the education component involved reaching out to farmers across B.C. to essentially market these bees. I worked across North, West, and Downtown Vancouver, on top of green apartment buildings, with some field work in Sayward, Langly, and Vancouver Island.

WHAT IS SOMETHING YOU ARE EXCITED ABOUT?

A friend and I are currently working on a project to design a low cost aeroponics cultivation system. An aeroponic system involves cultivating plants without soil, instead they are suspended and fed a nutrient rich mist. Typically, an aeroponic system for 1 plant costs hundreds or even thousands of dollars, however our plan is to design a system that can affordably grow four plants. The advantage of aeroponics is that crops have a significantly higher yield than crops grown in regular soil and use up to 98% less water. Contrary to many other available aeroponics systems, we are also utilizing piezoelectric atomizers, which eliminates the need for expensive, high-maintenance pumps and allows for the finest mist for optimal nutrient absorption.

EVENTS OF THE MONTH

OCTOBER'S NEUROSCIENCE RESEARCH COLLOQUIUM

OCT 6

Dr. Julia Schulze-Hentrich: At the nexus of genes, ageing and environment: Understanding transcriptomic and epigenomic regulation in health and disease

OCT 13

Dr. Denise Cai: The brain in motion: stability and flexibility of memory engrams across time and experience

OCT 20

Dr. Randy McIntosh: Hidden Repertoires in Cognitive Function and Dysfunction

OCT 27

Dr. Alla Karpova: Encoding of Structured Knowledge in Anterior Cingulate Cortex

Rudy North Lecture Theatre, Djavad Mowafaghian Centre for Brain Health

Zoom:

Meeting ID: 91512 289258

Passcode: 289258

Get ready for the ultimate showdown of brainpower at our Neuroscience Team Trivia Night! We've combined all your favorite game show elements into one thrilling event. Test your knowledge of brain trivia and guess the price of organs, and see what happens when you remove a brain region in our lightning round. It's a night of excitement and learning you won't want to miss.

Date: Friday, October 6th

Time: 6:00-8:00pm

Location: Ponderosa Commons North 1001

The winning and losing teams of the night will win prizes

Teams will be 3-4 people (if you don't have a team don't worry we'll put you with people!)

RSVP by: Thursday, October 5th:

[RSVP LINK](#)

THE UBC NEUROSCIENCE CLUB AND THE SYNAPSE SUPERSTARS: A SENSATIONAL SHOWDOWN!

NEUROSCIENCE STUDENT LOUNGE

Have you ever gone to the Nest or IKB and can't find any spots to study? Well, you're in luck! We've created a new study lounge with tea, pop, and awesome people! The best part? Only students in the Undergraduate Program in Neuroscience can access this room. Come on down! For now, we have limited opening hours. As we expand over the coming months, we expect the number of opening hours to increase!

Wednesday: 4:00-7:00pm (UNC exec present)

Fridays: 12:30-3:30pm (Ryan Bouma present)

Location: UBC Hospital Koerner F170

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

RESOURCES:

WELLNESS RESOURCES

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