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NEUROBYTES: Logo Reveal
Project Encephalon's very own Mobile Application

PRANJAL GARG

NeuroBytes is the upcoming android mobile application developed by the technical team of Project Encephalon. It provides easily accessible gist of scientific articles and interesting facts from the domain of neuroscience and allied fields. Hereby we officially announce the logo reveal of this exciting new venture of Project Encephalon!

NEURORANTS
Engaging the Neuro-Twitterati!

SUSAN AJITH

NeuroRants is a discussion group to further simplify academic discourses beyond the journal club's aims, thereby making them accessible to undergraduates. While it started as an internal study group, NeuroRants is now active on Twitter and Discord as platforms for everyone to join and discuss various research topics. The goal is to have more diverse and inclusive discussions! Subdomains of behavioral and molecular neuroscience such as the role of BNDF on depression, the role of astrocytes and glia in neuroinflammation, and microRNA and cell specifications have been discussed so far. The topic for the upcoming session is microRNA and synaptic plasticity.
FROM THE DESK OF THE EDITOR

ANUSHREE KRISHNAMURTHY

It’s been just over one year since Project Encephalon started out, and I’m extremely proud to have seen it grow by leaps and bounds in that timeframe. Almost every month, PE has had something new to bring to the table and July, in particular, was a very happening month at PE. I am beyond excited to present this collaborative report of the same.

With this month, PE’s resolve to make neuroscience accessible to all, has reached a new high with the launch of its very own mobile application that now brings neuroscience to your fingertips, anytime, anywhere! I would like to laud the editorial team for their diligent and systematic work in providing content for everything, from PE’s app to supervising PE’s blog to brewing up this newsletter, month after month. We have tried to put together a haul of relevant and insightful content for you this time round too, and it is with utmost pleasure that I present this July edition of the Neuroletter.

VOLUNTEER OF THE MONTH

PROFILE BY ANUSHREE KRISHNAMURTHY

Maalavika has been an indispensable part of the Editorial team of Project Encephalon. She has excelled in her work as the Executive Editor of PE and has played an instrumental role in kick-starting NeuroNotes, PE’s blog series.

She is, and has always been a trustworthy colleague and is someone who can always be counted upon to do justice to the work at hand. Her sociable and dynamic nature coupled with her great communication skills and fresh perspective makes her a great asset to Project Encephalon.

Maalavika Govindarajan

EXECUTIVE EDITOR
What is the brain?

A 3lb organ composed of nerves and tissue that integrates sensory and motor responses? Right, simplify that.
A mass of nervous tissue divided into lobes, that controls all behavior? Simplify that again.
A network of neurons that is connected to form trillions of synapses...

Perfect. Stripped down to its roots, the brain is simply a network. A “network algorithm” so beautifully configured that it earned itself the reputation of being the seat of intelligence itself. Undeniably, we live in a complex world. From the cells we are made up of, to the ecosystems we make up, we form innumerable connections and interactions rendering the whole greater than the sum of its parts, and is somehow significantly different from its parts. These connections and interactions converge into a system of their own and this intricate clockwork is known as a complex system.

In essence, the complex systems theory in data science studies how the society is greater than the sum of its people or, how an online community is different from its isolated connections or even, how the brain is so much more than a network of neurons.

Read the complete blog article here: https://www.projectencephalon.org/post/the-brain-as-a-complex-system
One of the most important forms of sensory perception, the one responsible for an organism’s survival, is pain. Pain is not a one-dimensional experience, it is nuanced and complex, both in the ways in which it is transmitted through our body and in the manner that we perceive it. Over millennia, several pathways have evolved for its signals to travel through our body, which are a combination of different kinds of sensory fibres, neurotransmitters, and locations that these signals are relayed to. These differences in structure and function enhance our perception of pain and enable us to assess its location and severity. In this article, we will explore two of the main pain pathways, what makes them unique, and how that translates to our own experiences of pain perception.

Read the complete blog article here: https://www.projectencephalon.org/post/pricks-pangs-and-paroxysms-the-pathways-of-pain-perception
3. Only Time will Tell

SU KANYA CHAKRABORTY

As cryptic as the concept of time may be, the average human mind is adept at making sense of it in ways presently unknown to scientists. The search for the answer to how our mind seamlessly decodes time, and sometimes even twists it, has unmasked many surprising findings over the years, while also leaving several mysteries unresolved. Could it be individual cells that track time tirelessly? Or complex circuits working in unison that dial in temporal information to our conscious experiences? Or both? In this article, we explore the journey of science as it strived to understand this fundamental function of our brain and recount a few of the hallmark experiments in the field.

Read the complete blog article here: https://www.projectencephalon.org/post/only-time-will-tell
4. The Battle of Procrastination

ANGARIKA BALAKRISHNAN

Procrastination is a trait that causes individuals to delay tasks indefinitely, either when feeling overwhelmed or when a more pleasurable task is at their disposal. There are several different kinds of procrastinators: active, passive, arousal and avoidant, to name a few. A battle between the Limbic System and the Prefrontal Cortex (PFC) is what regulates the procrastination trait, with the PFC being a negative regulator and the Limbic System being a positive regulator for the same. Thus, it is hypothesized and proven that failure of the cognitive control system leads to the generation of the procrastination trait. Additionally, resting-state functional magnetic resonance imaging studies have uncovered another region of the brain, the Default Mode Network, which is also found to be a positive regulator of procrastination. Therefore, procrastination does not simply equate to being lazy, it is a tightly regulated process with several neural substrates.

Read the complete blog article here: https://www.projectencephalon.org/post/the-battle-of-procrastination?postId=5583e126-7ed9-4887-9c97-7771bf22a017

Write for Project Encephalon!

NeuroNotes is a new blog initiative brought to you by Project Encephalon, that aims to create awareness on neuroscientific research writing by accepting and publishing submissions in all allied arenas of the field. The aim is to provide readers with a holistic perspective on neuroscience as well as give an opportunity to understand how peer review may work to help finesse the writing skills of many novice scientific communicators. Through this, PE would like to reach out to passionate neuroscience enthusiasts to explore the world of brain sciences in a captivating and scientifically correct manner. For queries contact us at:

- editor@projectencephalon.org.
- info@projectencephalon.org.

Guidelines available at https://www.projectencephalon.org/neuronotes
The Discord community of Project Encephalon is a vibrant space for members from interdisciplinary backgrounds, united by their enthusiasm for Neuroscience. Discord utilises channels covering a vast range of sub-disciplines within the field that provide a platform for synthesis of ideas between like minded people who share research ideas, papers and have intriguing and compelling discussions. Discord also promotes sharing of resources and collaborative initiatives among members.

It is a cohesive and safe space where everyone is willing to accept responsibilities and share a common vision for the future of Neuroscience and intellectual growth of an individual.

Human consciousness at the molecular level is encoded by the calcium activity of our brain neurons. The image shows fluorescent calcium activity of group of human stem cell derived cortical neurons acquired using a confocal microscope. Neurons were loaded with the calcium indicator Fluo-4 and subjected to depolarization which mimics neuronal activity. Image represents volume view of calcium activity over 30-minutes blended using depth color coded alpha algorithm as a function of time.

This image was submitted as a NeuroPiction entry. If you would like us to feature such images, head over to our website: https://www.projectencephalon.org/neuropiction
Neuron encountered a major accident and is in a lot of pain as her body is full of toxins.

Neuron and oligo want to dance at prom together. But neuron is not well.

Rockabye baby! Don’t you cry!

Neuron, Let’s go to Dr. Microglia

I am hurt! Will you help me?

They tell everything to Dr. Microglia. He immediately employs the oligoprogenitors (OPCs) and prepares cytokine soup.

Microglia convinces neuron that he can do anything and go to any extent to relieve her pain. Poor neuron trusts him.

Don’t worry just come with me!

Dear OPCs, have this soup with growth factors and treat neuron soon.

Weak neurons are delicious treat!

Thanks to Dr. microglia. We’re rocking!!

Microglia proves his words and goes to “any extent” to relieve her pain.
PERSEVERANCE THROUGH AN ERA OF UNCERTAINTY
Anecdotes of trials and triumphs in research

How did the COVID-19 Pandemic affect your research?

My research work came to an abrupt halt as I was just starting in full swing, and the lockdown was imposed. A few weeks into it, I realized this to be a perfect opportunity to steer the wheel in a different direction. I started adapting by resorting to bioinformatics while building a hypothesis, which has faired me well.

- Upasana Gupta (She/Her)
  SASTRA University
  Area of Research: Developmental neurobiology

I was quite excited to work in a full-fledged research lab for my internship but I had to restrict my experimental methods to in-silico work. It was slightly less engaging as I couldn’t work on the problems that I wanted to in the first place. Nevertheless, the experience I had this summer (2021) was extremely valuable and it gave me a lot to learn.

- Jay Verma (He/Him/His)
  Maulana Azad Medical College
  Area of research: ATP7B trafficking in Wilson disease, and investigating potential drug targets.

I missed the chances of working in 3 of my favourite labs in the country. Also, the pandemic situation didn’t allow me to work on developing my lab skill set. Ultimately, it has also taken a toll on my mental health, which might have affected my research indirectly.

- Ankush Chakraborty (He/Him/His)
  Panjab University
  Area of Research: Depression
PERSEVERANCE THROUGH AN ERA OF UNCERTAINTY
Anecdotes of trials and triumphs in research

How did you persevere/adapt during this time?

This period gave me enough time to build a hypothesis to anchor my project. Days into the lockdown, I felt demotivated and disconnected from the benchwork, but the endearing passion for research drove me to pursue new methods to address questions.

- Rishika Tiwari
University of Haifa
Area of Research: Neuroscience

I started learning a new programming language, python, from the basics to its application in machine learning. Currently, I am learning about signal processing in python. After this, I plan on asking my supervisor for some raw data from the lab to process (It’s a systems neuroscience lab, they have electrophysiological data). I also started teaching science to school students.

- Upasana Gupta (She/Her)
SASTRA University
Area of Research: Developmental neurobiology

Luckily for me, I had forged a few important connections during my time as an undergrad. Having completed internships in the Bangalore ‘neuroscience circuit’ (IISc, NIMHANS, NCBS), I knew that my home city had my back. Instead of sitting aimlessly, I participated in the inaugural edition of Neuromatch Academy, where I met amazing teammates and a great mentor in Patrick Mineault. Following this, I continued upon previous work at NIMHANS, while preparing for interviews at IISc. My efforts paid off, and in January 2021, I was selected for IISc’s Brain and AI (BAI) PhD program.

- Sveekruth Pai (any)
Indian Institute of Science (IISc), Bangalore
Area of Research: Neuroscience
What measures did you take to stay safe and ensure the safety of others around you?

When we realised how fast rumours and fake news spread around, me and my batchmates, as representatives from our college, became a part of a scientific engagement community. We raised awareness about over the counter medications, antibiotics and their misuse by organising various lectures and competitions.

- Meghana J
  Yuvaraja's College, University of Mysore
  Area of Research: Molecular biology/Neuroscience

Mostly masks, sanitizers and distancing physically. Other than that I've tried to lend an ear to whoever needs it during these stressing times, while learning how I can help them better.

- Ankush Chakraborty (He/Him/His)
  Panjab University
  Area of Research: Depression

I live in a village in India. People here have never used surgical masks. They were used to washing and reusing them until I explained how this was an unhygienic practice and taught them the correct use. Also, I made them understand why mixing water to hand sanitizers to increase their volume is not a good practice, bringing to light the concept of concentration (i.e., 70% ethanol and isopropanol). This has led to better preventive measures in the community.

- Rishika Tiwari
  University of Haifa
  Area of Research: Neuroscience
PERSEVERANCE THROUGH AN ERA OF UNCERTAINTY
Anecdotes of trials and triumphs in research

What is one general thing that you wish people understood about research and academia, in general?

Starting from the high school level, students (especially in the natural sciences) should understand the diversity of careers and fields in science, and explore the available research opportunities to gain exposure. According to me, this aspect is amiss due to the plight of interactions in daily life. We often get to interact with engineers and doctors, but less so with say a neuroscientist.

- Jay Verma (He/Him/His)
Maulana Azad Medical College
Area of research: ATP7B trafficking in Wilson disease, and investigating potential drug targets.

A curiosity to understand things around us drives a researcher. Academia does require many years of study but is essential for any nation to progress. People also fail to understand the struggles a student from a village has to face, much more so if the student is a female.

- Meghana J
Yuvaraja's College, University of Mysore
Area of Research: Molecular biology/Neuroscience

One thing I wish people understood about research and academia in general, is that we too are human beings with hobbies. There is an unfortunate stereotype that scientists are lab coat and spectacles wearing nerds; absent-minded recluses that don’t fit into everyday reality. You would be surprised to see how diverse and interesting our community is!

- Sveekruth Pai (any)
Indian Institute of Science (IISc), Bangalore
Area of Research: Neuroscience
What is your take on mental health in the current scenario?

While doing research, prioritizing mental health is a must. It is also advisable to maintain a good professional relationship with the co-workers in the lab and the principal investigator (PI). Lastly, no question is a silly question, and we shouldn't hold back on reaching out to people for help.

- Sharmistha Panda (She/her)
  National Brain Research Centre (2018-2020), currently PhD applications in progress
  Area of Research: Neuroinflammation/Alzheimer's.

Mental health matters. If you don't feel okay, please understand, it's okay to not feel okay. You're NOT alone. Take your time to heal, as long as you want. Self-care is how you take your power back.

"What mental health needs right now is more sunlight, more candour, and more unashamed conversation."

- Jhillika Trisal (she/her/her)
  Shoolini University
  Area of Research: Social Neuroscience and Stem Cell Biology

This is an exclusive series for Project Encephalon’s Neuroletter, which aims to highlight the trials and tribulations faced by students and early career researchers in academia during and after the COVID-19 Pandemic, and provide some hope to others, facing the same. These anecdotes do not intend to cause any offense, personal or otherwise to any person/academic body in the field of research, but instead, is an attempt to bring to light the perseverance of passionate researchers during these uncertain times.

If you would like us to feature your anecdotal experiences in the upcoming newsletters, please fill up this form: https://forms.gle/oow9J55frqzre5ED7
I don’t believe in plans. I believe in trying the hardest and making the best out of situations.

Catch the article here: https://www.projectencephalon.org/post/shriya-palchaudhuri

Do not be afraid to walk your own path, whether in science or not.

Catch the article here: https://www.projectencephalon.org/post/yajing-xu