When citing an abstract from the 2024 annual meeting, please use the format below.

[Authors]. [Abstract Title]. Program No. XXX.XX. 2024 Neuroscience Meeting Planner. Chicago, IL: Society for Neuroscience, 2024. Online.

Theme J Poster

TJP01: History of Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP01.01SU/V17

Topic: J.01. History of Neuroscience

Title: Aristotle's Relevance for Neuroscientific Research on Consciousness

Authors: *F. WOOD;
Emeritus Professor, Wake Forest Med. Sch., Winston Salem, NC

Abstract: Aristotle's relevance for neuroscientific research on consciousness. Aristotle rejected both dualistic metaphysics and unitary materialism; instead defined natural objects, whether animate or inanimate, by their functions. In that context, five principles are derived from his writings: they constitute an Aristotelean Continuity Theory of Consciousness. These principles are: (a) nature, and consciousness within nature, is a continuum across living organisms, hence including human infants and animals; (b) conscious awareness is sensation *per se*; (c) conscious awareness must always include touch and is multisensory in all organisms except those whose sensations are limited to touch alone; (d) every conscious act or percept, however brief, is nonetheless time consuming; and (e) any act of conscious awareness, however brief, includes a form of self-perception. Demonstrations of these principles in the work of three historic neuroscientists (William James, Charles Sherrington, and Walter Freeman III) are then followed by selected contemporary works. The latter category especially includes analyses of multisensory convergence in adult and infant humans and in various animal species. After some larger pro and con theoretical controversies are noted, recommendations are offered for how the use of the above Aristotelean principles would benefit future neuroscience research. Of special relevance in the recommendations are the requirements for: (a) multisensory convergence in consciousness research, always including touch; and (b) the recognition of continuities across animals, human infants, and adults. Keywords: *animal consciousness, frontal cortex, functionalism, human infant consciousness, machine consciousness, multimodal sensation, parietal cortex, somatic sensation.*

Disclosures: F. Wood: None.

Theme J Poster

TJP01: History of Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP01.02SU/Web Only

Topic: J.01. History of Neuroscience

Title: Initial study and perceptual implications of JS Bach's observance of doubling rules in pieces with five or more voices

Authors: *E. ALTSCHULER[1], E. LATHAM[2];
[1]Metropolitan Hosp., New York, NY; [2]Music Studies, Temple Univ., Philadelphia, PA

Abstract: Neuroscience has benefited greatly from advanced technologies such as CRISPR, high resolution fMRI and multi-photon microscopy. However, along with their intrinsic interest, historical sources can provide perspective and data sets still potentially useful in uncovering still new or unknown neuroscience principles which can ultimately then be tested with current methods. One of the first rules ("laws") learned by intermediate or advanced music theory, composition or musicology students is that parallel (perfect) fifths or octaves are forbidden. That is, no pair of voices can have consecutive fifths or octaves. The reason for this prohibition is that two voices moving in parallel with perfect intervals collapse to the sound of one voice. The great composer JS Bach (1685-1750) obeys this rule to one chord in 10^5 and any exceptions reveal another perception that can override the effect of the parallels (Altschuler 2024 and refs. therein). Now, Christoph Wolff (Wolff 2004a https://www.americanbachsociety.org/ Newsletters/BachNotes01.pdf p. 11. A new Bach source via the internet and regular mail 2004; Bach-Jahrbuch Vol. 90 87-99 2004; Bach's Musical Universe W. W. Norton & Company 2020 pp. 286-287) students of Bach (1685-1750) Johann Kirnberger (1721-1783), Lorenz Christoph Mizler (1711-1783) and Johann Friedrich Agricola (1720-1774) documented that starting in the late 1730s Bach worked on exploring and systematizing voice leading rules for pieces with pieces with five or more voices. In particular, Bach proscribed that the intervals augmented second, augmented fourth, diminished fifth, augmented sixth, seventh, and ninth should not be doubled. Presumably these rules avoid excessive dissonances and harmonically unstable chords. As an initial study the question of how closely Bach observed the doubling rules I looked at five pieces: The b-flat minor and c-sharp minor fugues, both 5-voice fugues, from Bach's Well-Tempered Clavier Book One (1723), the 5-voice Fugue in E-flat Major (BWV 552/2) and the chorale prelude BWV 686, a 6-voice ricercar (old style fugue) from the Clavier-Übung Vol. (1739) and the 6-voice Ricercar from the Musical Offering (BWV 1079, 1747). I found only: a doubled diminished fifth note in m 109 of the c-sharp minor fugue, in BWV 686 a doubled diminished fifth in m 10, 21 and 30 and in the 6-part Ricercar a doubled diminished fifth in m 26 and 96. Bach uses another perception to override the violation of the doubling rule, e.g., a German augmented sixth chord to resolve the diminished fifths in m 26 of the 6-part Ricercar. Analysis of more pieces by Bach and other composers, and psychophysical studies of the doubling rules is warranted.

Disclosures: E. Altschuler: None. **E. Latham:** None.

Theme J Poster

TJP01: History of Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP01.03SU/V18

Topic: J.01. History of Neuroscience

Title: Julius Caesar Arantius (1530-1589): pioneering contributions to neuroanatomical terminology

Authors: *G. SENGUL[1], E. CANDAR[2], I. DEMIRCUBUK[3], V. TURGUT[2];
[1]Ege Univ, Sch. Med., Izmir, Turkey; [2]Neurosci., Ege University, Inst. of Hlth. Sci., Izmir, Turkey; [3]Ege Univ., Izmir.

Abstract: Julius Caesar Arantius, also known as Giulio Cesare Aranzi or Aranzio, was a distinguished Italian anatomist, physician, and surgeon who lived from 1530 to 1589. He held the prestigious position of professor of anatomy and surgery at the University of Bologna starting in 1556. Arantius made significant strides in understanding human anatomy through his extensive research on various anatomical structures, including the orbit, nose, larynx, pharynx, thorax, abdomen, and fetus. His contributions extended to the realm of neuroanatomy, where he played a pivotal role in shaping the terminology used to describe the intricate structures of the brain. One of his notable achievements was the naming of the nodules of Aranzio, which became synonymous with the semilunar valves of the heart. Additionally, Arantius introduced several terms that have since become integral to neuroanatomical discourse. Notably, he coined the term "hippocampus" to describe a structure within the brain, likening its shape to that of a seahorse. He also referred to it as "vermis bombycinus" or "silkworm," and introduced the term "bombicine appendix" as a synonym for the hippocampus. Arantius' contributions extended beyond the hippocampus. He identified structures such as the gracile tubercle and made significant observations regarding the ventricular system of the human brain. Arantius utilized terms like "hippocampal ventricle" and "silkworm ventricle" to describe specific regions of the brain, distinguishing them from the lateral ventricles. He accurately described the choroid plexus of the third ventricle and differentiated between the cerebral aqueduct and the third ventricle. Furthermore, Arantius elucidated the cerebellar cistern, now known as the cisterna magna, and introduced the term "ventricle of Aranzi" to describe the floor of the fourth ventricle, corresponding to the rhomboid fossa. His meticulous observations and precise terminology continue to be revered for their invaluable contributions to the field of neuroanatomy.

Disclosures: G. Sengul: None. **E. Candar:** None. **I. Demircubuk:** None. **V. Turgut:** None.

Theme J Poster

TJP01: History of Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP01.04SU/V19

Topic: J.01. History of Neuroscience

Support: JSPS KAKENHI Grant Number JP18K03182

Title: William James’s theory of emotion as a pioneer work of affective neuroscience: Sollier's cases and correction of James's emotion theory in 1894

Authors: *T. SATO;
Psychology, Edogawa Univ., Nagareyama, Japan

Abstract: The author reviewed books and papers written by William James while analyzing James's theory of emotions. In an 1894 Psychological Review article, James detailed the content of the emotion theory he and Lange developed separately, as well as criticisms from researchers such as Wundt, Irons, and Worcester, and his responses to them. The author also considered cases of general paralysis presented by Berkley and Sollier and a case of hypnotic induction by Sollier. These cases informed the author's examination of how James revised and refined his theory of emotions, as discussed in the latter part of this paper. Based on Sollier's case report, James modified his study on the mechanisms generating emotions in two significant ways: 1) He emphasized that visceral reactions are paramount in emotion generation, stating, "when it is solely visceral, the emotion is abolished almost as much as when it is total; thus, the emotion depends almost exclusively on visceral sensations." 2) He noted that depending on the context, motor responses of voluntary muscles might be less important for emotion generation, asserting "When the anaesthesia is solely peripheral, the emotion takes place with almost normal strength." Additionally, in an 1884 Mind article, James argued that the motor responses of voluntary muscles are as significant as visceral responses in emotion generation, a perspective revised after considering Sollier's findings.

Disclosures: T. Sato: None.

Theme J Poster

TJP01: History of Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP01.05SU/Web Only

Topic: J.01. History of Neuroscience

Title: James Clerk Maxwell (1831-1879) on color vision and his philosophical heritage from Sir William Hamilton (1788-1856)

Authors: *C. Q. WU;
Perception and Cognition Res., San Francisco, CA

Abstract: Maxwell is a pioneer in experimental study of human color vision. In a paper published in Nature in 1871, his opening paragraph is as follows: "ALL vision is color vision, for it is only by observing differences of color that we distinguish the forms of objects. I include differences of brightness or shade among differences of color" (p.13). This paragraph contains three main ideas: 1. The term "color" should include the visual sensation along the black-gray-white dimension; 2. Color is the basis of form and object perception; 3. By "vision", Maxwell was referring to conscious vision. Thus, his statement about color vision can be expressed in two equations: (1) consciousness = sensation + perception, where sensation is always non-empty and perception can be empty; (2) visual sensation = color sensation. We can trace these ideas to his

philosophical mentor Sir William Hamilton when Maxwell was attending University of Edinburgh during 1847-1850. From Hamilton, we can trace these ideas in turn to some earlier Scottish philosophers, such as Thomas Reid (1710-1796), during the Scottish Enlightenment period, and then to even earlier philosophers such as Thomas Hobbes (1588-1679), Rene Descartes (1596-1650), and Nicolas Malebranche (1638-1715). Hamilton's philosophical lectures were posthumously published as "Lectures on Metaphysics and Logic" (1860). The above-mentioned proposition that consciousness consists of sensation and perception as two distinct components has usually been attributed to Reid; but as Hamilton traced out the history of this proposition, it is quite apparent that many earlier philosophers (including Platonius, Descartes, and Melchanran) had expressed it. This proposition was still there in one of Edwin Boring's classic works on the history of psychology "Sensation and Perception in the History of Experimental Psychology" (1942); but unfortunately, this idea has been lost or dismissed in the current vision research literature [e.g., see Goldstein and Bruckmole's discussion about sensation versus perception in their excellent textbook "Sensation and Perception" (2024)]. In my opinion, Maxwell's view concerning color vision, including the idea of separating sensation and perception, is critical for understanding human visual consciousness-therefore, we should revive this view. Particularly, as many visual phenomena (such as binocular color rivalry, binocular color transparency, and McCollough effect) imply that color sensation must occur at a monocular or bi-monocular stage in the human visual system, we can conclusively map the neural substrate of color sensation to V1-L4 (i.e., layer 4 in the visual cortical area V1).

Disclosures: C.Q. Wu: None.

Theme J Poster

TJP01: History of Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP01.06SU/V20

Topic: J.01. History of Neuroscience

Title: Schwann: cell, sheath, and cell theory?

Authors: *B. BAKKUM;
Illinois Col. of Optometry, Chicago, IL

Abstract: Neurolemmocytes (sometimes spelled: neurilemmocytes) are almost universally known by their eponymous term: Schwann cells. They are the glial cells that myelinate axons and support unmyelinated axons in the peripheral nervous system. On the other hand, the eponymous term: sheath of Schwann is less commonly used for the neurilemma (sometimes spelled: neurolemma). This represents the cytoplasm of the Schwann cells (including the major organelles, e.g., the nucleus) that is located in the periphery of the Schwann cells and forms the true surface of myelinated peripheral nerve fibers. These eponymous terms are to honor the person who was (kind of) the first person to describe them: Theodor Ambrose Hubert Schwann (1810-1882). Generally, though, Schwann was better known among his colleagues for his

pioneering work on cell theory, which had resulted in his famous 1839 monograph: Mikroskopische Untersuchungen über die Uebereinstimmung in der Struktur und dem Wachstum der Thiere und Pflanzen, translated in 1847 under the title: Microscopical Researches into the Accordance in the Structure and Growth of Animals and Plants. The year before its publication, the botanist Matthais Schleiden (1804-1881), demonstrated that plant tissues are composed of and developed from groups of cells, and he considered the nucleus (or "cytoblast") to be the most important feature of these cells. Schwann gave full credit to Schleiden for informing him about the presence of nucleated cells in plants, which gave Schwann the idea of looking for the same thing in animal tissues. Even though the concept of the "cell" had been previously proposed, e.g., Jan Evangelista Purkyně (1787-1869) – Körper ("bodies"), it was Schwann that generalized that "all tissues are formed of cells." He even coined the term: cell-theory. In the 1839 treatise he also gave a clear description of the cells that accompany and ensheath the myelinated nerve fibers of peripheral nerves. Even though he did not name them, they soon became known as Schwann cells and the sheath of Schwann. It should be noted, and was acknowledged by Schwann, that
Robert Remak (1815-1865), had previously described peripheral nerve fibers and had noted "corpuscles" (presumably nuclei) associated with them and that there was "an extremely pellucid, pale band" surrounding the "white nerve fibers" (again presumably the neurilemma or more probably the endoneurium). None the less, seemingly according to their peers, Schwann rightly was given credit for their discovery. On the other hand, even though the cell and sheath carry Schwann's name, it is undoubtedly his foundational contribution to the idea of the cell theory for which he should probably be remembered.

Disclosures: B. Bakkum: None.

Theme J Poster

TJP01: History of Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP01.07SU/V21

Topic: J.01. History of Neuroscience

Title: The History of Trepanation: Neurosurgery's Oldest Procedure

Authors: *S. MANNE, J. CURRIE;
Univ. of Texas Med. Br., Galveston, TX

Abstract: Trepanation is an ancient neurosurgical procedure of drilling or scraping a hole into the skull dating back thousands of years. It may be the oldest cranial surgical procedure with archaeological evidence. In the late 1860s, trepanned skulls from the Neolithic period were found in France. They drew the interest of two French physicians, Paul Broca who ended up publishing many articles on the skulls hypothesizing that the procedure may have been performed to treat seizures, which people at the time may have attributed to demons inside of the head. Second, they drew the interest of Victor Horsley, who helped modernize the field of

neurosurgery; he studied the skulls when they were housed at Broca's Museum of Anthropology. He noted that the skull pieces removed were often right above Broca's area, and proposed the idea that trepanation could be curative for traumatic epilepsy.
Evidence of ancient trepanation can also be found in Peru and China. The evolution and progression of cranial surgery in ancient times to the 1800s was due to the need to treat head trauma. More trepanned skulls have been found in Peru than anywhere else in the world, as they date back to 400 BC to the 1500s. A study done by anthropologists showed that many of the trepanned skulls had a traumatic injury. In China, there has also been evidence of trepanned skulls that date between the Neolithic period and the Bronze Age. In many of these skulls, there is evidence that patients survived the procedures attributed to bone remodeling that was evident after the procedure.
Later, the first recorded instances of trepanation were attributed to the Greeks and Romans. It was first recorded by Hippocrates and the procedure was to release pressure on the brain after injury, or to release evil spirits from the head. His disciple Celsus, developed his own unique methodology for the procedure. In the middle ages, Persian physicians described trepanation and very specific methods for the procedure. They detailed the dangers of piercing the dura mater during the procedure. The 18th century was often known as the era of trepanation, especially in Europe where many physicians became curious and started using the procedure. By the 19th century, the procedure had fallen out of favor, but it was performed often during the American Civil War.
The procedure of trepanation persists to this day, although now it has evolved into the craniotomy. Many of the basic principles of why the procedure is performed has not changed much from ancient times - the idea is to relieve pressure on the brain. Now the excised piece of skull will often be replaced once the brain pathology returns to normal. The procedure's history reveals the true age of the field of neurosurgery.

Disclosures: S. Manne: None. **J. Currie:** None.

Theme J Poster

TJP01: History of Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP01.08SU/V22

Topic: J.01. History of Neuroscience

Title: The history of Danish Neuroscience

Authors: *O. B. PAULSON[1], A. SCHOUSBOE[2], H. HULTBORN[3];
[1]Neurobio. Res. Unit, Rigshospitalet & Univ. of Copenhagen, Copenhagen, Denmark; [2]Dept. of Drug Design and Pharmacol., [3]Dept of Neurosci., Univ. of Copenhagen, Copenhagen, Denmark

Abstract: The history of Danish neuroscience starts in the 17th century. Thomas Bartholin was the first Danish neuroscientist and his disciple Nicolaus Steno became one of the most prominent neuroscientists. From the start, Danish neuroscience was linked to clinical disciplines. This

continued in the 19th and first half of the 20th century with new initiatives linking basic neuroscience to clinical neurology and psychiatry in the same scientific environment. Subsequently, from the middle of the 20th century, basic neuroscience was developing rapidly within the preclinical university sectors. Clinical neuroscience was reinforced during this period with important translational research and a co-operation between basic and clinical neuroscience. This history was recently reviewed in an editorial in the European Journal of Neuroscience (2023;58:2893-2960). This presentation highlights some major achievements from the 400 years history of Danish neuroscience. Steno (1638-1686) was active in many scientific fields. One of his main contributions to neuroscience was related to the investigation of the anatomy of the pineal gland. René Descartes had proposed that the pineal gland was the seat of the soul, acting by rotation to distribute "animal spirits". Steno demonstrated that the pineal gland was merely grey matter with black spots. Steno also proposed that muscle shorten when its fibres shorten; trivial nowadays, not in the 17th century. In the 19th century Carl Lange (1834-1900) made main contributions in neurology and psychiatry. He investigated spinal diseases and was the first to use lithium in the treatment of depression. He wrote a book in Danish, "On emotions - Psycho-Physiological Study" in 1885 (subsequently translated to German, French and English). Fritz Buchthal (1907-2003) had a main role in the Danish and international development of clinical neurophysiology and especially electromyography. However, he also recruited people covering basic electrophysiology, anatomy and behaviour establishing a strong basic neuroscience environment to the newly founded Institute of Neurophysiology. Niels A. Lassen´s (1926-1997) main research field was the cerebral circulation. His first main contribution was to describe autoregulation of cerebral blood flow (normally blood flow is rather independent of blood pressure within wide limits). Later he, his group and collaborators were the first to demonstrate that activation led to blood flow increase, functional activation. Finally, Jens Christian Skou (1918-2018) introduced neurochemistry with his discovery of the sodium-potassium pump with the first publication in 1957. He received the Nobel Prize in 1997.

Disclosures: O.B. Paulson: None. **A. Schousboe:** None. **H. Hultborn:** None.

Theme J Poster

TJP01: History of Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP01.09SU/V23

Topic: J.01. History of Neuroscience

Support: NEI/NIH EY30155

Title: The history of the neural encoding of color: a skeptical re-evaluation

Authors: *C. TYLER;
Smith-Kettlewell Brain Imaging Ctr., Smith-Kettlewell Eye Res. Inst., San Francisco, CA

Abstract: In ancient Greece, philosophers such as Aristotle attempted represent the colors in one-dimensional space characterized by their typical brightness, a formalism that persisted through the mediaeval period and could even be found as late as the 19th century from the philosopher Schopenhauer (1816). It was Newton (1704) who first took the radical step of wrapping the linear spectrum of the refractive spread of colors into a circle, where the reds span across through the non-spectral purples to the blue colors (Fig. 1A). Newton validated this circular conception of color mapping through his experiments on color mixture, which showed that colors opposite to each other around the spectral circle tended to neutralize each other towards a colorless grey, thus defining a continuous color space. The next development in the field was the trichromatic theory, which is universally associated with Thomas Young and Hermann von Helmholtz, but was actually first proposed by Le Blon (1725) for three-color printing. Young (1802) proposed that phenomenal color across the spectrum was mediated by three wavelength-selective receptor types (later identified as cones) and Maxwell (1857) proposed that the resulting colors should be mapped onto a triangular color space. This space was reconfigured into the familiar lozenge shape of the CIE 1931 color space, which was later morphed into a variety of nonlinear distortions in the attempt to provide a uniform mapping of local color discrimination. Goethe (1810) and later Hering (1878), on the other hand, continued the development of the Newtonian concept of the color circle, though with different phenomenal geometries of the color organization within this space. This concept was formalized Hurvich & Jameson (1957) and later by Derrington, Krauskopf & Lennie (1984) into the Opponent Color Circle, which is universally considered to be an adequate mapping of both the phenomenal geometry of color and its mapping to neural activation specificities. The relationship of the formalized opponent color circle to the original color triangle of Maxwell and subsequent trichromatic mappings has remained inchoate, however, and cannot be satisfactorily resolved. For example, there is no defined mapping of the spectrum locus into the color circle. A re-evaluation of the analytic validity of the Maxwell triangular color space now provides an appropriate psycho-physical and neuro-physical mapping geometry to resolve the longstanding discrepancies in the field of the geometry of color representation.

Disclosures: C. Tyler: None.

Theme J Poster

TJP01: History of Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP01.10SU/V24

Topic: J.01. History of Neuroscience

Title: Neuromodulatory effect of enriched environment and Tribulus terrestris in restoring cognitive deficits

Authors: *B. R. T. B. BARAKA, JR[1], R. VASUDEV[2], T. KRISHNAMURTHY[2], V. BHAGYA[3];

[1]Pharmacol., KLE Col. of Pharm., BANGALURU, India; [2]Pharmacol., KLE Col. of Pharm., Bengaluru, India; [3]Pharmacol., KLE Col. of Pharm., Bengaluru, Bangalore, India

Abstract: Neuromodulatory effect of enriched environment and *Tribulus terrestris* in restoring cognitive deficitsMajor depressive disorder is a mental health condition that causes a persistently low or depressed mood and a loss of interest in pleasurable activities. Chronic stress causes a harmful effect on hippocampus and prefrontal cortex functioning which is associated with cognitive deficits, depression and anxiety. Enriched Environment (EE) stimulates the brain by physical and social interaction, sensory and cognitive stimulation. EE enhances neuronal functioning, boost hippocampal neurogenesis, improve memory and cognitive performance. Phyto-therapeutic approaches have been widely proposed to improve mental health. *Tribulus terrestris* (TT) and EE are combined to reduce the impacts of anxiety and behavioral changes brought on by stress. The main objective of this work is to address the behavioural and neurobiological effects of EE along with herbal plant TT on chronic immobilization stress (CIS) induced depression, anxiety and cognitive deficits in rats. The findings showed that CIS increased anxiety and depression, impaired cognitive functions. Chronic treatment with TT with EE improved CIS-induced cognitive deficits and reduced anxiety and depression. Also, the expression of biomarkers improved followed by the combined treatment of TT and EE. This study shows that the enriched environment enhances the beneficial effect of *Tribulus terrestris* in restoring stress-induced cognitive deficits.

Disclosures: B.R.T.B. Baraka: None. **R. Vasudev:** None. **T. Krishnamurthy:** None. **V. Bhagya:** None.

Theme J Poster

TJP01: History of Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP01.11SU/V25

Topic: J.01. History of Neuroscience

Title: The neuroscience of reality: addressing reductionism in neuroscience by building an AI-assisted scientific ontology

Authors: C. YOKOYAMA[1,2], *M. SHEHATA[3,2,4];
[1]Intl. Ctr. for Brain Sci., Fujita Hlth. Univ., Toyoake, Japan; [2]Filiciti, Inc., La Crescenta, CA; [3]Caltech, Pasadena, CA; [4]Institute for Research on Next-Generation Semiconductor and Sensing Science, Toyohashi University of Technology, Toyohashi, Japan

Abstract: In the last century, neuroscience made remarkable progress in understanding the mammalian brain. These advances were the consequence of material reductionism, a scientific orientation positing that complex systems are explainable by studying the interactions of their components. However, despite these successes, there are also fundamental limitations to reductionism that have not been directly addressed by the neuroscience community. Therefore,

many if not most phenomena of higher cognition and consciousness remain inaccessible to investigation. Here, we review the historical limitations of material reductionism in neuroscience and propose a solution based on artificial intelligence (AI) processing of brain data into a realistic natural ontology. The underlying problem of reductionism is it does not allow integration of experimentally reduced data and concepts into a holistic ontology of reality. Instead, reductive models produce fragile, artificial scientific ontologies, contributing to the replication problem in science. The use of the English language plays a major role in the inaccurate classification and representation of laboratory phenomena and data. Consequently, language-based ontologies create intractable research problems and place artificial constraints on scientific discourse in areas as broad as metabolic networks to the hard problem of consciousness. Thus, a massive amount of data remains unexplored that could illuminate brain function and allow coherent integration of the neuroscience literature. Here, we propose a solution to this historical epistemology problem in neuroscience. The core element is: (1) collection of large-scale brain, behavior, and cognitive state data from realistic experimental settings and its organization into a natural ontology of the human brain, (2) Analysis of this data by a language-neutral transdisciplinary AI algorithm for classification with a mathematical framework. (3) AI-driven integration of the neuroscience literature for ontological coherence with current and historical data. The proposed computation-informatic manifold will initiate a scientific knowledge generation cycle and promote the fusion of neuroscience with psychology and psychiatry. Such a "reality neuroscience" paradigm will supersede reductionism by constructing a borderless epistemology for integrating fragmented knowledge across neuroscience into a unified, accurate, and self-updating model of the brain.

Disclosures: C. Yokoyama: None. **M. Shehata:** None.

Theme J Poster

TJP01: History of Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP01.12SU/V26

Topic: J.01. History of Neuroscience

Title: The basis of studies and theoretical approaches to Consciousness

Authors: *C. A. CASTAÑEDA NAVARRETE;
Univ. of Guadalajara, Guadalajara, Mexico

Abstract: The basis of studies and theoretical approaches to Consciousness
Castañeda Navarrete Cesar A.11.Doctorado en Derechos Humanos Centro Universitario Cutonala, Universidad de Guadalajara.
Email: myxomatosis_dr@hotmail.com**Introduction**Consciousness is one of the greatest mysteries for the human being, the search for its explanation have been a constant within the different branches of human knowledge.**Aim**The purpose of this work is to carry out a systematized bibliographic review under the different theories and their authors who have taken

human consciousness as an object of study.**Methodology**The PRISMA statement (20202) is used as a guide for the selection of various publications, as inclusion criteria for the documents analyzed: Using consciousness as a keyword, from theory; philosophical, psychological, functional neuroanatomical and Neurobiological. A theoretical selection was carried out using electronic databases (PubMed, science direct, Nature, science, springer).**Results**An exhaustive search was carried out for publications and authors who have worked on human consciousness, under philosophical, psychological, and neurobiological theories, using as the initial axis the author's first publication and his theory of study, up to the present.

Disclosures: C.A. Castañeda Navarrete: None.

Theme J Poster

TJP01: History of Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP01.13SU/V27

Topic: J.01. History of Neuroscience

Support: Grant CUAltos-UdeG 2023 To JGAA
Grant CUAltos-UdeG To JGAA

Title: C. elegans, the tiny and transparent worm

Authors: J. ACEVES ARIAS[1], S. A. GUTIERREZ-RUBIO[2], M. REVELES GONZÁLEZ[3], L. A. RAMIREZ CONTRERAS[3], D. AGUILAR OCAMPO[4], T. A. GARCIA[5], L. ANAYA ESPARZA[6], S. SANCHEZ[7], L. HERNANDEZ[8], *G. CAMARGO HERNÁNDEZ[9];
[1]Univ. de Guadalajara, Atotonilco el Alto, Mexico; [2]Deparamento de Fisiologia, Univ. de Guadalajara, Guadalajara, Mexico; [3]Univ. de Guadalajara, Tepatitlan de Morelos, Mexico; [4]Univ. de Guadalajara, Guadalajara, Mexico; [5]Fisiologia, Univ. de Guadalara, Zapopan, Mexico; [6]Ciencias Pecuarias y AgrIcolas, Univ. de Guadalajara, Tepatitlán, Mexico; [7]Clinicas, Univ. de Guadalajara, Tepatitlan de Morelos, Mexico; [8]Fisiología, Univ. de Guadalajara, Guadalajara, Mexico; [9]CUAltos Univ. DE GUADALAJARA, Guadalajara, Mexico

Abstract: The objective of this scientific dissemination work is to present to the general population, with the support of a didactic model, the work we do with the model organism *Caenorhabditis elegans* (*C. elegan*s) at the Los Altos University Center of the University of Guadalajara (UdeG). *C. elegans* is a round worm, tiny and transparent, it feeds on bacteria, there are hermaphrodites and males. Hermaphrodites have 959 cells and males have 1031. It is an important model organism for scientists studying the biological mechanisms underlying brain development, and cell development, and is easy to house and reproduce in the laboratory. It has a short life cycle, and its life expectancy is 21 days, which allows us to carry out experiments quickly. *C. elegans* was the first model organism to have its genome completely sequenced. From 60 to 80% of the disease-causing genes in humans have orthologs in the fruit fly genome, and a very close number in the nematode genome. The transparent skin of the nematode allows

you to observe its vital organs through a stereoscope. *C. elegans* has become a valuable and widely used research tool in science, providing us with greater understanding of the cellular development of a multicellular organism and its nervous system. 131 *C. elegans* cells self-destruct during development; This discovery earned him the Nobel Prize in Medicine and Physiology in 2002 for the discovery of programmed cell death or apoptosis. The discovery of antisense (RNAi) was also discovered in *C. elegans*, which earned him another Nobel Prize. The ability to identify and monitor individual cells allowed researchers to map the connections between nerve cells. While the human brain has approximately 80,000 million neurons, the hermaphrodite *C. elegans* has 302 perfectly mapped neurons, which synthesize almost all the neurotransmitters that the vertebrate brain does.

Disclosures: J. Aceves Arias: None. **S.A. Gutierrez-Rubio:** None. **M. Reveles González:** None. **L.A. Ramirez Contreras:** None. **D. Aguilar Ocampo:** None. **T.A. Garcia:** None. **L. Anaya Esparza:** None. **S. Sanchez:** None. **L. Hernandez:** None. **G. Camargo Hernández:** None.

Theme J Poster

TJP01: History of Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP01.14SU/V28

Topic: J.01. History of Neuroscience

Title: Medical Illustration in Neuroscience: A Historical Perspective

Authors: *M. A. DE LA FLOR[1], S. WELDON[2];
[1]Pharmacol., Univ. of Texas Hlth. Sci. Ctr., San Antonio, San Antonio, TX; [2]Div. of Cardiothoracic Surgery, Baylor Col. of Med., Houston, TX

Abstract: Medical illustrators have been key in the progress of neuroscience by providing clear imagery of complex neurological concepts that are difficult to communicate through words alone. Here, we explore the history of medical illustration in neuroscience, highlighting its impact on discovery, research and education.The origins of medical illustration in neuroscience are firmly rooted in the earliest studies of human anatomy. During the Renaissance, artists like Leonardo da Vinci produced detailed anatomical drawings that paved the way for future neuroanatomical exploration. By the 16th century illustrations began to focus on the brain and nervous system. Andreas Vesalius' "De Humani Corporis Fabrica" (1543) and Thomas Willis's "Cerebri Anatome" (1664) were among the first to produce insights into the structures of the nervous system.The importance of neurological illustrations grew with neuroscience in the 20th century. Pioneers like Santiago Ramón y Cajal advanced neuroscience by using drawings to depict his findings. Max Brödel, father of modern medical illustration, not only greatly contributed to the body of neuroanatomical and neurosurgical illustrations but also developed innovative techniques and stressed the importance of collaboration and mentorship. Any history of medical illustration must include Frank Netter's extensive work, covering nearly every aspect

of human anatomy, including the brain and nervous system. Netter’s illustrations, compiled into numerous atlases, continue to be used in medical education around the world today.In the late 20th century, computers revolutionized both neuroscience and medical illustration. The introduction of graphics software allowed medical illustrators to create and disseminate highly detailed and accurate images more efficiently. 3D modeling and animation have enabled the production of interactive media and virtual reality systems, offering new ways to explore and interact with neurobiological processes and neuroanatomical structures. Despite these technological advancements, it is still the artist's skill in highlighting and clarifying the essential elements of the story that truly defines medical illustration.The impact of medical illustration on neuroscience has been profound. Visual representations have not only aided in teaching and communicating complex neurological concepts but have also been instrumental in advancing neurosurgical techniques, thus improving patient care. Medical illustrations have bridged the gap between cutting-edge neurological research and clinical practice, ensuring that complex findings are accessible to a broader audience.

Disclosures: M.A. de la Flor: None. **S. Weldon:** None.

Theme J Poster

TJP01: History of Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP01.15SU/V29

Topic: J.01. History of Neuroscience

Title: The History of Implantable Long-term Electrodes for Brain Computer Interfacing

Authors: *P. KENNEDY;
Neural Signals Inc, Duluth, GA

Abstract: In 1986 the first trial of a cortical electrode designed for lifetime recording from a human was tested in rats by implanting it in the vibrissa cortex (1). This electrode was unlike any others in that it grew the neuropil into the glass tip of the electrode. Gold wires, Teflon insulated, inside the tip recorded neural signals that responded to deflections of the vibrissae. After a decade of study in rats and monkeys, it was implanted in 1996 in a locked-in human who was paralyzed and mute. She showed that she could control the recorded neural signals by increasing or decreasing their firing rates on command (2). In 1998, another locked-in participant was implanted. He demonstrated that he could control the cursor on the computer screen and spell words (3).
In 2004, the first human was implanted with the Utah array (4). This is a different approach because it places a bed of 100 tines into the cortex. The subject was able to control the computer cursor to provide access to the computer.
However, over the years a marked difference in longevity became apparent. The electrode that grew the neuropil into the brain and recorded passively from ingrown axons has shown no evidence of gliosis over 13 years when the patient died (5). The Utah array had loss of its single

units over 36 months with only 10% remaining (6).
Thus, biologically connected electrodes are preferred over metal electrodes for lifetime implants.
1] A long-term electrode that records from neurites grown onto its recording surface. P.R. Kennedy, J. Neuroscience Methods, 1989, 29:181-193.
2] Restoration of neural output from a paralyzed patient using a direct brain connection. P.R.Kennedy and R.A.E.Bakay. NeuroReport 9,1707-11, 1998
3] Direct control of a computer from the human central nervous system. Kennedy PR, Bakay RAE, Adams K, Goldthwaite J, and M. Moore. IEEE Trans. Rehab. Eng., 8(2), 198-202, 2000.
4] Neuronal ensemble control of prosthetic devices by a human with tetraplegia. Leigh R Hochberg 1 , Mijail D Serruya, Gerhard M Friehs, Jon A Mukand, Maryam Saleh, Abraham H Caplan, Almut Branner, David Chen, Richard D Penn, John P Donoghue. Nature. 2006 Jul 13;442(7099):164-71. doi: 10.1038/nature04970.
5] Histological confirmation of myelinated neural filaments within the tip of the Neurotrophic Electrode after a decade of neural recordings. Gearin M and Kennedy PR. Front. Hum. Neurosci. 21 April 2020 https://doi.org/10.3389/fnhum.2020.00111.
6] Longevity and reliability of chronic unit recordings using the Utah, intracortical multi-electrode array. Sponheim C, Papadouakis V, Collinger JL, Downey J, Weiss J, Pentousi L, Elliott K, Hatsopoulos NG. J. Neural Eng., 2021, Dec 28; 18(6):10.1088/1741-2552.

Disclosures: P. Kennedy: None.

Theme J Poster

TJP01: History of Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP01.16SU/V30

Topic: J.01. History of Neuroscience

Support: NIH R01-NS081118
NIH R01-NS094206
NIH P50-NS123109,
NIH 1T32EB031512-01

Title: Illustrated History of Deep Brain Stimulation

Authors: *S. J. HOFFMAN[1], M. D. JOHNSON[2];
[1]Univ. of Minnesota, Twin Cities, Minneapolis, MN; [2]Biomed. Engin., Univ. of Minnesota, Minneapolis, MN

Abstract: For almost a century, we have treated or attempted to treat a variety of brain disorders with intracranial electricity. While electrical stimulation served early on as an intraoperative screening tool prior to neurosurgical lesioning, chronically implanted electrodes are now used to deliver electrical stimulation both continuously and on-demand. Advances in surgical planning, patient selection, identification of therapeutic targets, and the design of implantable devices can

be attributed in large part to the pioneering work of clinical teams led by Pool, Spiegel, Wycis, Cooper, Hassler, Heath, Sem-Jacobsen, Hosobuchi, Mazars, Bechtereva, Siegfried, Benabid, and others. Since its inception, chronic electrical deep brain stimulation has been applied to treat movement disorders, neuropathic pain, epilepsy, and psychiatric disorders; however, a variety of other disorders including stroke recovery, minimally conscious state, addiction, obesity and memory disorders are being explored as potential indications for electrical stimulation. As the community pursues these aspirations, it is important to be mindful of those anatomical brain structures that have previously been investigated so that we can learn from previous successes and failures. Here, we provide an updated historical perspective on the seminal DBS case studies from the 1950s-1980s showing illustrated reconstructions of the targeting approaches used to stimulate those deep brain structures.

Disclosures: S.J. Hoffman: None. **M.D. Johnson:** None.

Theme J Poster

TJP01: History of Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP01.17SU/V31

Topic: J.01. History of Neuroscience

Support: National Natural Science Foundation of China (31930042)
National Natural Science Foundation of China (82130032)
National Natural Science Foundation of China (82021002)

Title: Opioid system in the ventrolateral orbital cortex regulates chronic pain and aversion

Authors: *Z. ZHOU, Y. LANXING, Y. CHANG;
Fudan Univ., Shanghai, China

Abstract: Objective Chronic pain presents a significant challenge to global public health, with high prevalence and treatment resistance. Patients enduring long-term pain often suffer from concomitant mental disorders, exacerbating the need for advanced clinical interventions. Opioid peptides and receptors, widely distributed throughout various brain regions including the ventrolateral geniculate nucleus, amygdala, and ventral tegmental area, play pivotal roles in pain regulation and emotional processing. While our previous research revealed substantial expression of enkephalin and opioid receptors in the ventrolateral orbital cortex (VLO), their specific roles in chronic pain and emotional regulation remain elusive. **Methods** We induced chronic constriction injury of the sciatic nerve (CCI) to establish a neuropathic pain model. Subsequently, employing viral tracing, pharmacological interventions, electrophysiological recordings, fluorescence in situ hybridization, chemogenetic manipulations, and behavioral assays, we systematically investigated the contributions of enkephalinergic neurons and opioid receptors to neuropathic pain and aversion. **Results** (1) The majority of enkephalinergic neurons in the VLO are excitatory, directly dampening chronic pain and aversion upon activation. (2)

Local administration of μ-opioid receptor agonists or δ-opioid receptor agonists within the VLO mitigates neuropathic pain but does not impact aversive behaviors. (3) The analgesic effects induced by activating enkephalinergic neurons in the VLO are countered by administration of μ-opioid receptor antagonists or δ-opioid receptor antagonists. **Conclusion** Enkephalinergic neurons and opioid receptors emerge as promising therapeutic targets for clinical interventions targeting chronic pain and pain-associated aversive states.

Disclosures: Z. Zhou: None. **Y. LanXing:** None. **Y. Chang:** None.

Theme J Poster

TJP01: History of Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP01.18SU/V32

Topic: J.01. History of Neuroscience

Title: Pharmacological inhibition of IKK2 modulates voltage-gated Na+ channel 1.7 function in hiPSC-derived sensory neurons

Authors: *A. K. SINGH, J. SINGH, F. LAEZZA;
Pharmacol. & Toxicology, Univ. of Texas Med. Br. (UTMB), Galveston, TX

Abstract: Nuclear factor-kappa B (NF-kB), a family of transcription factor proteins, is considerably conserved from insect to human and plays crucial roles in a large variety of cell physiological and pathological processes, including neurodegenerative diseases, memory storage, immunity and cancer, and chronic pain. Composed of two serine-threonine kinases (IKKα and IKKβ) and the regulatory subunit NEMO (also known as IKKγ), the IKK complex integrates signals from all NF-κB activating stimuli to catalyze the phosphorylation of various IκB and NF-κB proteins, as well as of other substrates. Among the nine isoforms of voltage-gated Na+ (Nav) channels, the tetrodotoxin-sensitive (TTX-S) Nav1.7 channel has proven critical for excitability and chronic pain, being highly expressed in dorsal root ganglion (DRG) neurons. The active form of NF-kB interacts reversibly with Nav1.7 channels, and TNF-α/NF-kB signaling contributes to the chronic hyperexcitability of DRG neurons. NF-kB regulates Nav1.7 channel functions in a non-transcriptional manner, which is critically implicated in various neurophysiological processes and diseases. Based on this premise, we hypothesize that pharmacological inhibition of the IKK2/Nav1.7 complex could contribute to IKK2-dependent modulation of Nav1.7 functions. To test this hypothesis, we employed a combination of techniques including in-cell split-luciferase assay (LCA), pharmacological interrogation, and whole-cell patch-clamp electrophysiology in hiPSC-derived sensory neurons expressing AAV-sh-Control or AAV-shIKK2. Bay-11-7082 (IKK inhibitor) significantly inhibited IKK2/Nav1.7 complex assembly with an IC_{50} value of 347 nM, as observed using the LCA. Furthermore, whole-cell patch-clamp recordings conducted in hiPSC-derived sensory neuronal cells expressing Nav1.7 and treated with the Nav1.8 blocker (A-803467) revealed that Bay-11-7082 selectively regulated peak current density, tau (τ) fast inactivation, voltage-dependent activation,

steady-state inactivation, long-term inactivation curves, as well as cumulative use dependency of Nav1.7. Silencing IKK2 abolished all functional regulations of Bay-11-7082 observed in sensory neurons expressing AAV-shControl. These studies lay the groundwork for the development of novel neurotherapeutics based on the modulation of the Nav1.7 channel by IKK2.

Disclosures: A.K. Singh: None. **J. Singh:** None. **F. Laezza:** A. Employment/Salary (full or part-time):; Professor, UTMB. B. Contracted Research/Research Grant (principal investigator for a drug study, collaborator or consultant and pending and current grants). If you are a PI for a drug study, report that research relationship even if those funds come to an institution.; NIH R01MH124351 (FL),R01MH132226 (F.L.), R01 MH111107 (F.L.), U18DA052504 (FL)..

Theme J Poster

TJP01: History of Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP01.19SU/V33

Topic: J.01. History of Neuroscience

Support: National Natural Science Foundation of China (31930042)
National Natural Science Foundation of China (82130032)
National Natural Science Foundation of China (82021002)
STI 2030-Major Projects (2021ZD0203200-5)
Shanghai Municipal Science and Technology Major Project (No.2018SHZDZX01),

Title: Integrating ECC0509 in Pain Management: Educational and Societal Impacts

Authors: *Y. CHANG, Z. ZHOU, Y. LANXING;
Fudan Univ., Shanghai, China

Abstract: This study assesses ECC0509, a novel Semicarbazide-sensitive amine oxidase (SSAO) inhibitor, and its implications for pain management, focusing on its educational and societal impacts. SSAO's role in modulating inflammatory pain through activation of transient receptor potential subtype V1 (TRPV1) receptors suggests significant potential for ECC0509 in enhancing treatment protocols. Utilizing a mouse model, inflammatory pain was induced with complete Freund's adjuvant (CFA). ECC0509's efficacy was evaluated through behavioral assays and molecular analysis, examining its impact on SSAO and TRPV1 expressions and DRG neuron excitability. ECC0509 significantly mitigated inflammatory pain symptoms by reducing SSAO and TRPV1 activity and decreasing neuronal excitability. The absence of TRPV1 negated ECC0509's analgesic effects, confirming its mechanism of action. ECC0509 shows promise as an effective analgesic with minimal side effects, highlighting the need for integrated educational programs to better inform healthcare providers and patients about new pain management options. The study advocates for multidisciplinary approaches, involving biochemists, educators, and

policymakers, to translate scientific discoveries into practical healthcare solutions. This could improve patient outcomes and optimize treatment practices in pain management.

Disclosures: Y. Chang: None. **Z. Zhou:** None. **Y. LanXing:** None.

Theme J Poster

TJP01: History of Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP01.20SU/V34

Topic: J.01. History of Neuroscience

Support: Daniel & Ada Rice Foundation

Title: Global trends in stem cell clinical trials for spinal cord injury

Authors: D. KIM, R. G. FESSLER, *B. T. DAVID;
Rush Univ. Med. Ctr., Chicago, IL

Abstract: Spinal cord injury (SCI) is one of the most devastating types of neurological disorders, resulting in a loss of nervous tissue that affects motor, sensory, and autonomic function. Though there is no effective treatment currently, over the past decade, researchers worldwide have made significant efforts to explore stem cell-based therapy of SCI through clinical trials. Despite the numerous preclinical studies recently published on stem cell interventions in SCI, few have led to clinical trials domestically. Here we present a comprehensive review of all ongoing and completed clinical studies for SCI-related stem cell therapy registered with the National Institutes of Health Clinical Trials Database (National Library of Medicine, clinicaltrials.gov). We first discuss global trends of stem cell trials in the context of geographic distribution, cell resources used, and current ongoing trials. We also review the status of completed, recruiting, and terminated studies - analyzing how and why many trials did not reach completion. Further, we analyze the advantages and shortcomings of stem cells used thus far in SCI trials, focusing on genetic and cellular components that prevent efficient differentiation and integration of transplanted cells.

Disclosures: D. Kim: None. **R.G. Fessler:** None. **B.T. David:** None.

Theme J Poster

TJP01: History of Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP01.21SU/V35

Topic: J.01. History of Neuroscience

Title: Neurodegenerative Alterations After Ozone Exposure: A Narrative Review

Authors: *S. VIDAL[1], A. LOPEZ, Sr.[1], C. MARTÍNEZ ZAMORA[1], G. GONZALEZ-GARIBAY[1], L. MARIN-CASTAÑEDA[1], C. R. OSORNIO[2], N. SERRANO[3], H. M. ROMO-PARRA[4], J. G. ROJO ALFARO[5];
[2]Neurophisiology, [3]Lab. de Neurobiología, [1]Inst. Nacional de Neurología y Neurocirugía INNyN, Mexico City, Mexico; [4]Univ. Muenster, Muenster, Germany; [5]Neurophysiol., Inst. Nacional de Neurología y Neurocirugía, Mexico City, Mexico

Abstract: Ozone (O3) is an environmental pollutant with well-documented detrimental effects on human health. Previous research has highlighted its potential to induce oxidative stress in the central nervous system (CNS), contributing to the development of diverse neurodegenerative disorders. Targeted interventions aimed at attenuating oxidative damage and restoring redox homeostasis hold promise for mitigating the adverse neurological effects of ozone pollution, however understanding the mechanisms underlying ozone-induced oxidative stress in the CNS is crucial for further research on therapeutic interventions. This review highlights the relationship between ozone exposure and oxidative stress in the CNS. We explore multiple pathways through which ozone provokes oxidative damage to lipids, proteins, and DNA, disruption of antioxidant defense mechanisms, and activation of inflammatory cascades. Additionally, we evaluate the role of environmental and genetic factors in modulating susceptibility to ozone-induced CNS oxidative stress, highlighting future research gaps to be addressed.

Disclosures: S. Vidal: None. **A. Lopez:** None. **C. Martínez Zamora:** None. **G. Gonzalez-Garibay:** None. **L. Marin-Castañeda:** None. **C.R. Osornio:** None. **N. Serrano:** None. **H.M. Romo-Parra:** None. **J.G. Rojo Alfaro:** None.

Theme J Poster

TJP01: History of Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP01.22SU/V36

Topic: J.01. History of Neuroscience

Support: the development of technologies for electroc euticals, funded by the Ministry of Healc h&Welfare and Ministry of Science and ICT, Republic of Korea(grant number: HI22C019900, 2022M3E5E9082303)

Title: Exploring the Development trends in Bioelectronic medicine: A scoping review

Authors: *S. MIN[1], W. CHOI[1], C. SHIN[2], M. PARK[2];
[1]Devision of New Hlth. Technol. Assessment, [2]Natl. Evidence based Healthcare Collaborating Agency, Seoul, Korea, Republic of

Abstract: Background: Bioelectronic medicine, which electronically modulates specific neural circuits instead of drugs, is a field that is expected to gain attention because it is applied to all diseases that can stimulate nerves and has a wide range of applications, but it lacks definition and the clear mechanism of nerve stimulation has not been identified. Therefore, we aimed to explore Bioelectronic Medicine Clinical Research as a scoping review to inform the research and development of Bioelectronic Medicine. **Methods:** This review was conducted using the scoping review methodology according to JBI guidelines and searched in 5 databases (Embase, Medline, Cochrane Library, KoreaMed, KMBASE). Scoping review is used to scope the wide literature base to answer to: 1)'What is the concept of bioelectronic medicine as presented in the existing literature?', 2)'What are the scope of medical devices being developed and commercialized as bioelectronic medicine?', 3)'What is the current status of human clinical research on bioelectronic medicine in healthcare?'. **Results**: Bioelectronic medicine has been used in various forms, including first-generation pacemakers, but since 2013 it has been referred to as electroceutical, a combination of electronic and pharmaceutical. In the 33 studies selected from the 551 articles searched, few of them provided the basis for the concept of bioelectronic medicine, but they could be compared and summarized through the literature on neurostimulation (6 studies) and wound care (9 studies). In addition, the number of clinical studies has increased since 2018, and clinical studies have been conducted with a relatively wide variety of methodology types, and the scope of application has expanded beyond the brain to include the gastrointestinal tract, skin, eyes, and legs. **Discussion:** This study is significant because it provides a necessary basis and direction for future bioelectronic medicine research by confirming the overall characteristics of the study. In addition, by confirming the comprehensive concept, it is expected that it can serve as a basis for refining the definition of bioelectronic medicine in the future.

Disclosures: S. Min: None. **W. Choi:** None. **C. Shin:** None. **M. Park:** None.

Theme J Poster

TJP02: K-12 Teaching and Outreach

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP02.01SA/V37

Topic: J.02. Teaching of Neuroscience

Support: NIH Grant R25GM132910
Grable Foundation, Pittsburgh

Title: Neuroscience and Stories of Discovery for School Age Children and the Public

Authors: B. KANTORSKI[1], *J. A. POLLOCK[2];
[2]Biol. Sci., [1]Duquesne Univ., Pittsburgh, PA

Abstract: Fundamental neuroscience research spans discovery from evolution of life-forms to new innovations in computational modeling. Neuroscientists explore population genetics and behavior, activity of the human brain, and atomic resolution of essential molecules. As a

community, neuroscientists have the unique capacity to be best able at sharing the importance of these discoveries with young people and the public at large. Doing so in an accessible way not only informs the public audience, but can also inspire more active engagement in STEM careers. The Partnership in Education at Duquesne University creates analog and digital learning tools for students 10 years old and up. Kids learn through our games and stories that can be used in the classroom, in after-school programs, or at home. Several of the projects are focused on neuroscience topics which relate to neurobiology that kids experience such as; needing sleep[1], sports related concussion[2], anxiety and stress. By engaging the students from the perspective of their own world view, the anticipated outcome is that they will find that they can understand the science and that it is okay to ask questions and expect answers about how the world works. The current collection of resources includes iOS/Android apps, table-top boardgames, live-action television, infographics, student readings, complementary short animated videos on YouTube (www.youtube.com/@ThePartnershipinEducation) and standards aligned curriculum all available for free at the project website thepartnershipineducation.com. Projects are evaluated through pre- post- testing and focus groups to identify knowledge gains, shifts in attitudes as well as the level of fun/enjoyment. This overall approach was recently summarized in eNeuro[3].
Supported by the Grable Foundation and NIH NIGMS Science Education Partnership Award (SEPA R25GM132910) to JAP.
1. Kantorski, Brinley, et al. "Backward design as a mobile application development strategy." *Educational Technology Research and Development* 67 (2019): 711-731.
2. Kantorski, Brinley, et al. "The use of a mobile application to teach concussion-related health knowledge." *Journal of STEM outreach* 3.1 (2020).
3. Pollock, John A. "Telling the Stories of Neuroscientific Discovery to Schoolchildren and the Public Can Make an Impact." *eneuro* 11.4 (2024).

Disclosures: B. Kantorski: None. **J.A. Pollock:** None.

Theme J Poster

TJP02: K-12 Teaching and Outreach

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP02.02SA/V38

Topic: J.02. Teaching of Neuroscience

Support: NSF 2236366
NIH 1U24NS133077

Title: Allen Institute Education & Engagement Program: Goals, successes, and lessons learned

Authors: *K. CASIMO, L. ALFILER, M. MEULER, C. T. WEICHSELBAUM, A. WIENER; Educ. & Engagement, Allen Inst., Seattle, WA

Abstract: The Allen Institute is a biomedical sciences independent nonprofit research institute with focus research areas in neuroscience, cell biology, and immunology. The Allen Institute

practices open science, releasing data, analysis tools, protocols, and other resources publicly, which are primarily intended for research applications, but which also have high utility in educational settings.
The Allen Institute has practiced open science since it was founded and has long offered professional training for scientists, though the Education & Engagement Program was only formally established in summer 2022. Since then, we have developed a formal program mission and goals, implemented new offerings such as our Teacher Academy educator professional development series, conducted evaluation across new and existing offerings, and learned generalizable lessons about effective program design and implementation.
The goal of the Program is to educate, engage, and inspire learners by empowering the use of open science resources, reaching K-12 and undergraduate students and educators, working scientists including graduate students and postdocs, and the public. Program staff are trained as both scientists and educators, so principles of effective teaching such as backward design are implemented across audiences and formats. Crucially, because the team works across a range of audiences, our work is informed by deep awareness of learners' prior experience as well as competencies needed for success at later career stages.
We evaluate our impact via instruments such as surveys, structured feedback activities/in-program focus groups, and informal participant comments. One of the most common themes across audiences is the value of interaction with Allen Institute staff. For K-12 students and teachers, this provides science career exposure; for working scientists, opportunity to ask deep questions about methods/techniques underlying the open science and build professional networks; and for the public, to learn about research being done in their community. We have also found that across audiences, high-structure introductory resources (such as technical walkthrough documents or videos that help users get started, and ideas/inspiration of feasible research questions or education projects) support a key transition period from passive awareness of open resources to active user status. However, feedback indicates that while these materials are consistently popular and helpful for introductory content and for specialized, advanced technical detail that benefits from replay, they are not as helpful for intermediate learners who need interactivity to make progress.

Disclosures: K. Casimo: A. Employment/Salary (full or part-time):; Allen Institute. B. Contracted Research/Research Grant (principal investigator for a drug study, collaborator or consultant and pending and current grants). If you are a PI for a drug study, report that research relationship even if those funds come to an institution.; NSF: Award #2236366, NIH: Award #1U24NS133077. **L. Alfiler:** A. Employment/Salary (full or part-time):; Allen Institute. **M. Meuler:** A. Employment/Salary (full or part-time):; Allen Institute. **C.T. Weichselbaum:** A. Employment/Salary (full or part-time):; Allen Institute. **A. Wiener:** A. Employment/Salary (full or part-time):; Allen Institute.

Theme J Poster

TJP02: K-12 Teaching and Outreach

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP02.03SA/W1

Topic: J.02. Teaching of Neuroscience

Title: Nurturing future neuroscientists in a high school: Evaluation of attachment and internship programmes in neuroscience-related business and laboratories

Authors: *K. SUEN[1], *K. SUEN[1], T. LIU[1], W. TANG[1], K. K. YUNG[2], R. CHANG[3]; [1]Po Leung Kuk Laws Fndn. Col., Hong Kong, China; [2]Sci. and Envrn. Studies, The Educ. Univ. of Hong Kong, Hong Kong, China; [3]Sch. Biomed. Sci., Lab. of Neurodegenerative Diseases, LKS Fac. of Medicine, Univ. of Hong Kong, Hong Kong, China

Abstract: We are a pioneer high school in Hong Kong to establish gifted education and enrichment programmes in neuroscience areas for students (Suen et al., 2010; Suen et al., 2017; Suen et al., 2019). In our previous reports, cell culture activities (Suen et al. 2008), research-based learning mode (Suen et al. 2010) and live-cell imaging experiments (Suen et al. 2015) were effective learning strategies for students to acquire neuroscience-related knowledge and skills in gifted education lessons in a high school. In addition, neural stem cell science was introduced into our science curriculum using Renzulli's Enrichment Model in junior form science lessons and Purdue Three-Stage Model in neuroscience lessons for gifted students (Suen et al. 2019). To further strengthen students' experiences and understanding in development of research ideas, advancement in technologies for scientific research and connections with science-related business, our students are enriched with attachment and internship programmes in which students with great interest in science can acquire work and practical experience in neuroscience-related business and laboratories. To evaluate these enrichment programmes, questionnaires and interviews on student's interest in science and Nature of Science were adopted. Assessments by neuroscientists and university professors were done to observe what elements could be further strengthened in the attachment and internship programmes and school's gifted neuroscience lessons in high schools for nurturing future neuroscientists. Results indicate that students' learning interest towards neuroscience, curiosity on scientific issues and career development as a scientist can be promoted by the neuroscience-related attachment and internship programmes.

Disclosures: K. Suen: None. **K. Suen:** None. **T. Liu:** None. **W. Tang:** None. **K.K. Yung:** None. **R. Chang:** None.

Theme J Poster

TJP02: K-12 Teaching and Outreach

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP02.04SA/Web Only

Topic: J.02. Teaching of Neuroscience

Support: NINDS 1R25NS120283-01

Title: Implementation of Social Emotional Learning Curriculum in the REACH Program

Authors: *A. SADIA[1,2], K. BOYER[2], S. ABDULLOEV[2], J. DEONARINE[2], D. MISHAN[3], R. DELALOYE[6], J. M. ALARCON[4], J. M. LIBIEN[4], M. RODRIGUEZ-ALVAREZ[5]; [1]SUNY Downstate Med. Ctr., Brooklyn, NY; [2]Col. of Med., [3]Sch. of Grad. Studies, [4]Dept. of Pathology, [5]Dept. of Med., SUNY Downstate Hlth. Sci. Univ., Brooklyn, NY; [6]Emory Univ., Atlanta, GA

Abstract: The underrepresentation of *PEERs* (*persons historically excluded because of their ethnicity or race*) in STEM graduate programs is attributed to various factors, including inadequate academic tools to navigate educational and professional pathways (Edwards et al., 2024). In response, the Research and Education in Autism for College and High School Students (REACH) program was established in 2017 at SUNY Downstate Health Sciences University (DHSU). REACH integrates multiple training modalities, including lectures, clinical exposure, cultural competence, and health disparity education, and a research experience. Emphasizing mentorship, the program employs a multi-tiered peer mentoring approach involving previous REACH graduates, MD and PhD students, and post-graduate researchers, at a 1:2 mentor-mentee ratio. The overall structure includes four main cores: Research, Lecture, Clinical, and Career Development, with the recent addition of a fifth core focusing on personal development. This fifth core aims to better address previously documented obstacles experienced by *PEERs* in STEM, such as lack of representation, stereotype threat, internalized bias, lack of support, cultural competencies, and imposter syndrome. To do so, DHSU collaborated with Emory University to integrate Social Emotional and Ethical learning (SEE learning) tools into the REACH program to foster resilience-based and compassionate outcomes. By cultivating awareness and compassion, SEE Learning and Cognitive Based Compassion Training (CBCT) can positively shape mentoring and research experience by building a shared language and culture of compassion. This was structured with additional weekly lessons involving small group and independent sessions for medical student mentors and trainees on wellness, attention training, conflict resolution, and compassion to empower students and help them engage ethically as part of a global community. A personal plan was developed by each mentee and discussed weekly with the medical student mentors, culminating in a final presentation. Based on descriptive student feedback at the end of the program, students reported improvement in teamwork dynamics, self-awareness, and managing emotions. Moving forward, the program is committed to further integrating mentorship and SEE learning tools to nurture skills essential for pursuing careers in STEM. This collaboration between DHSU and Emory University sets a precedent for incorporating compassion-focused approaches into pathway programs, enhancing the support systems needed for achieving inclusivity in Neuroscience careers.

Disclosures: A. Sadia: None. **K. Boyer:** None. **S. Abdulloev:** None. **J. Deonarine:** None. **D. Mishan:** None. **R. Delaloye:** None. **J.M. Alarcon:** None. **J.M. Libien:** None. **M. Rodriguez-Alvarez:** None.

Theme J Poster

TJP02: K-12 Teaching and Outreach

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

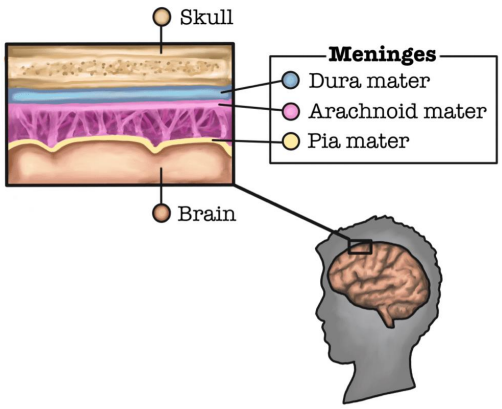
Program #/Poster #: TJP02.05SA/W2

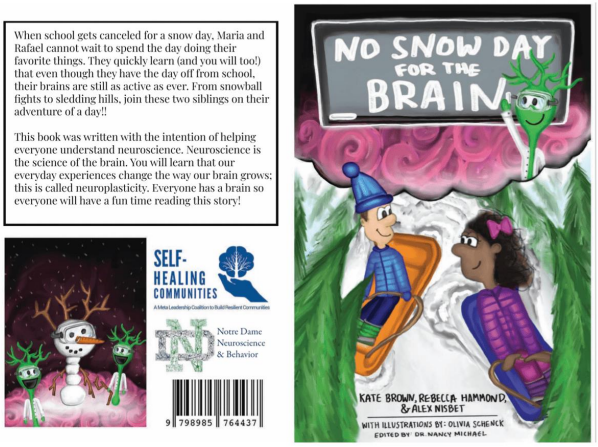
Topic: J.02. Teaching of Neuroscience

Title: Bridging neuroscience research and public understanding through illustration

Authors: *O. SCHENCK[1], N. MICHAEL[2], E. BLEAKMAN[3];
[1]Univ. of Notre Dame, Fishers, IN; [2]Biol. Sci., Univ. of Notre Dame, South Bend, IN; [3]Teachers Col., New York, NY

Abstract: Visual representation is important for mediating both the accuracy and encoding of complex information. As a neuroscience illustrator, I develop neural visuals for various resources to aid in the general public's understanding of neuroscience research. Everyone has a brain, and everyone deserves to understand the neuroscience behind their everyday experiences. With Self-Healing Communities of Greater Michiana (SHCGM), I illustrated a published neuroscience children's book titled *No Snow Day for the Brain.* While the book is about two siblings who navigate a snow day, the story is accompanied by explanations that encompass the underlying neural processes of the siblings' experiences. The visuals I contributed serve to mediate both the readers' story engagement and science comprehension. The book is available both online for purchase and in public libraries. I continue to illustrate for SHCGM, providing neural visuals for community presentations such as *The Neuroscience of Anticipatory Grief* and *Brain Care is Self-Care and Our Mortality.* The presentations have been given in the South Bend community. With Bright Light Neuro, I develop neural visuals that simplify brain science for both students and teachers. The illustrations are made in collaboration with both neuroscientists and educators with the goal of increasing science literacy among the public and tackling various societal issues. We are developing lesson plans that can be integrated into existing curricula, ultimately bringing neuroscience material into traditional subjects. We are seeking to empower students as young as kindergarten with tangible skills to navigate the challenges they encounter.





Disclosures: O. Schenck: None. **N. Michael:** None. **E. Bleakman:** None.

Theme J Poster

TJP02: K-12 Teaching and Outreach

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP02.06SA/W3

Topic: J.02. Teaching of Neuroscience

Support: Dana Foundation Neuroscience and Society Initiative Grant

Title: "Ethics + Neuroscience + Education = ?:" A Scoping Review of Neuroethics Education Initiatives in High School STEM Programs

Authors: *D. L. MORGAN[1], V. E. CALLAIS[1], E. M. WAKEFIELD[2], S. M. WEBBER[3], J. VUKOV[4], M. ROCHLIN[5];
[1]Higher Educ., [2]Psychology, [4]Philosophy, [3]Loyola Univ. Chicago, Chicago, IL; [5]Biol., Loyola U. Chicago, Evanston, IL

Abstract: Retention and success of individuals underrepresented in neuroscience is an issue for the field (Akil et al., 2016). We present a scoping review aimed to refine a novel approach to neuroscience education for wider use: Loyola University Chicago's Ethics-based Teaching Helps Optimize STEM (ETHOS). ETHOS couples introductory neuroscience concepts to discussion of ethical dilemmas in afterschool sessions to foster STEM identity among underrepresented high schoolers (Garibay, 2015). Our review covers analyses of ethical education, neuroscience education, and STEM after-school programming using Arksey and O'Malley's (2005) 5-stage scoping study approach. Stage 1 (guiding question): How does ETHOS relate to and expand on prior approaches integrating neuroscience and ethics education? Stages 2 and 3 (literature search and review): We identified 16 relevant publications from 2011-2024. Stage 4 (analysis): We charted the data and used a descriptive-analytic approach to identify themes across the studies. Stage 5 (reporting results). In general, research around neuroeducation has centered on informing teacher pedagogy (Babinski et al., 2018), increasing deeper thinking and student interest (Pollock et al., 2017), optimizing online learning (Doukakis and Alexopoulos, 2021), and real time assessment (Ruisoto and Juanes, 2019). STEM after-school education literature demonstrates the importance of early and continued exposure to STEM topics (Chittum et al., 2017). Research pertaining to neuroscience after-school education and ethical education was limited, but showed significantly positive impacts (Allen et al., 2019). Likewise, after-school education programming for specific populations (e.g., Urban High School Students) showed a significant impact on STEM knowledge and skills (Duran et al., 2014). Together, these studies motivate further exploration of the synergies possible when STEM education is coupled with ethical discussion in an informal after-school setting. ETHOS provides a next-level approach that can invigorate STEM education, making STEM research more inviting to high school students historically underrepresented in STEM, thereby impacting the training they seek as undergraduates, and ultimately their career choice. Neuroscience, owing to its ability to inform us about who we are, is a particularly effective topic with which to lead this novel approach (Webb et al., 2022).

Disclosures: D.L. Morgan: None. **V.E. Callais:** None. **E.M. Wakefield:** None. **S.M. Webber:** None. **J. Vukov:** None. **M. Rochlin:** None.

Theme J Poster

TJP02: K-12 Teaching and Outreach

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP02.07SA/W4

Topic: J.02. Teaching of Neuroscience

Title: Usa brain bee engages teens in neuroscience

Authors: *M. O. YASSA[1], N. R. MYSLINSKI[2];
[1]Ctr. for the Neurobio. of Learning and Memory, Univ. of California, Irvine, Irvine, CA; [2]Neural and Pain Sci., 8th floor, Univ. of Maryland Dent. Sch., Baltimore, MD

Abstract: The 2024 USA National Brain Bee Championship convened 54 local chapter winners from 32 states for two days of neuroscience. Harini Venkatesh, representing the Upper Valley Brain Bee, emerged as the national champion, with Rishi Suresh and Anvi Jampani securing second and third place respectively. Directed by Dr. Norbert Myslinski and Dr. Manuella Oliveira Yassa, the USA Brain Bee serves as a platform for teenage neuroscience enthusiasts, nurturing their passion through local and national competitions. The championship, held this year at the University of Central Florida, featured rigorous tests including a written exam, lab practicum, and patient diagnosis, alongside engaging activities such as keynote lectures, sheep brain dissections, and panel discussions. Reflecting on the event, participants expressed gratitude for the opportunities to connect with peers, mentors, and faculty, highlighting the invaluable experiences beyond the competitive arena. Quantitative and qualitative data from post-program evaluation of participants and their parents reveal satisfaction with the championship logistics and events as well as perceived increases in knowledge, attitudes and practice related to neuroscience and the path to a career in science.

Disclosures: M.O. Yassa: None. **N.R. Myslinski:** None.

Theme J Poster

TJP02: K-12 Teaching and Outreach

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP02.08SA/W5

Topic: J.02. Teaching of Neuroscience

Support: International Brain Research Organization
Dana Foundation
1517 Foundation
STEM Advocacy Institute

Title: Simply Neuroscience: an interdisciplinary approach to early-career neuroscience education, outreach, and awareness

Authors: *C. BALUSU[1,2], P. BLONIASZ[3], F. ANIKA[4], M. CHIANG[5], M. FENG[6], T. MAHAJAN[7], M. OGUMA[8], S. RAKHMONOVA[9], T. AL SHAMMAA[10], S. TUNSIRICHAROENGUL[11];
[1]Simply Neurosci., New York, NY; [2]Epidemiology, Columbia Univ., New York, NY; [3]Neurosci., Boston Univ., Boston, MA; [4]Fac. of Med., Sir Salimullah Med. Col., Dhaka, Bangladesh; [5]Virginia Commonwealth Univ. Sch. of Med., Richmond, VA; [6]Univ. of Chicago, Chicago, IL; [7]Purdue Univ., West Lafayette, IL; [8]Univ. of Washington, Seattle, WA; [9]Drexel Univ., Philadelphia, PA; [10]Mol. Sci., Queen's Univ., Kingston, ON, Canada; [11]Neurosci., Harvard Univ., Cambridge, MA

Abstract: Neuroscience's potential stems from the youth of today - the future scientists, ethicists, technologists, artists, and clinicians who are driven to explore interdisciplinary thought and creatively confront difficult questions about the brain. However, the field significantly lags behind other scientific domains in the quantity and quality of resources available to youth. Outside of North America and Europe, it is rare for relevant courses such as "Introduction to Neuroscience" to be offered at public schools.

Not only do most neuroscience resources contain intimidating jargon, but they are hidden behind paywalls or academic institutions. Beyond this, resources do not take into account the learning needs of pre-college students, students with disabilities, and those from non-English backgrounds. The noticeable lack of early learning materials also emphasizes the need for comprehensive, accessible resources outside of the classroom.

In response, we have developed Simply Neuroscience, a student-led non-profit organization investing in young students' passion for the brain. Through diverse initiatives such as The Synapse Podcast, Humans of Neuroscience series, Action Potential Advising Program, Brain Resource Creation, and the NeuroNovember Convention (in partnership with Project Encephalon), we help students navigate their individual "brain" journey rather than implementing a one-size-fits-all approach. We recognize that aspiring neuroscientists have different means for engaging with the field and accommodate this need by developing virtual "fireside chat" events with speakers, informal learning interviews, jargon-free visual materials, etc. Our social media post and guide series highlight intersections of neuroscience from computational systems to architectural psychology and beyond, building a welcoming atmosphere that transcends traditional learning boundaries.

Since our start in 2019, our efforts have reached 45,000 students from across all 50 U.S. states and 142 countries/territories, with our social media presence gathering over one million impressions. Now, we are working to bridge the gap between global and grassroots communities through our on-the-ground ambassador program, as well as bolstering hybrid learning environments across the world.

Join us in pursuing the brain and unlocking the future - one neuron at a time.

Disclosures: C. Balusu: None. **P. Bloniasz:** None. **F. Anika:** None. **M. Chiang:** None. **M. Feng:** None. **T. Mahajan:** None. **M. Oguma:** None. **S. Rakhmonova:** None. **T. Al Shammaa:** None. **S. Tunsiricharoengul:** None.

Theme J Poster

TJP02: K-12 Teaching and Outreach

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP02.09SA/W6

Topic: J.02. Teaching of Neuroscience

Support: Dana Foundation Neuroscience and Society Initiative Grant

Title: Developing a Measure of Neuroethics Knowledge

Authors: *K. REMPALA[1], D. MORGAN[2], V. CALLAIS[2], E. WAKEFIELD[3], S. WEBBER[4], M. W. ROCHLIN[4], J. VUKOV[1];
[1]Philosophy, Loyola Univ. Chicago, Chicago, IL; [2]Sch. of Educ., Loyola Univ. Chicago, Chicago, IL; [3]Psychology, Loyola Univ. Chicago, Chicago, IL; [4]Biol., Loyola Univ. Chicago, Chicago, IL

Abstract: Developing a Measure of Neuroethics Knowledge
Authors: K REMPALA[1], DL MORGAN[2], VE CALLAIS[2], EM WAKEFIELD[3], SM WEBBER[4], MW ROCHLIN[4], J VUKOV[1]
[1]Philosophy, Loyola Univ Chicago, Chicago, IL, [2]School of Education, Loyola Univ Chicago, Chicago, IL, [3]Psychology, Loyola Univ Chicago, Chicago, IL, [4]Biology, Loyola Univ Chicago, Chicago, IL
Disclosures: K Rempala: None, DL Mogan: None, VE Callais: None, EM Wakefield: None, SM Webber: None, MW Rochlin: None, J Vukov: None
Funding: Dana Foundation Neuroscience and Society Initiative Grant
Neuroethics is an emerging field of social and ethical inquiry. The field is composed of (1) the ethics of neuroscience – the ethics of the design, execution, and impact of work in neuroscience – and (2) the neuroscience of ethics – the use of neuroscience to investigate questions in ethical theory (Roskies 2002). As the field solidifies its self-understanding and core knowledge areas, it is crucial to develop tools for measuring the acquisition of this knowledge. This project thus aims to develop and study a novel measure of neuroethics knowledge development. In preliminary work, ten 5-point Likert scale survey items were developed in collaboration with neuroethics experts. To pre-test the measure, we administered the items to 19 high school students prior to their participation in an after-school workshop series focused on social and ethical issues in neuroscience (e.g., the ethics of study drugs; the neurobiology of love; the ethics of brain-computer interfaces). After the students complete the workshops in spring of 2024, the items will be administered a second time. Due to practical constraints, a traditional ‘think-aloud’ approach to cognitive testing (Collins, 2003) of the survey items was not used, but participants answered the prompt, “Please briefly explain why you chose your answer” to determine whether the items

were being interpreted systematically across respondents, and as intended. Preliminary pre-intervention data suggest that the items were mostly interpreted by students as intended. After post-intervention measures are taken, we will consider whether there is consistency in understanding of the items across the two timepoints. While this measure is still in development, we will also determine whether the workshop intervention increased self-reported neuroethics knowledge. Ultimately, the project aims to validate a novel instrument for measuring the acquisition of neuroethics knowledge, particularly among high school students.
Collins (2003) “Pretesting survey instruments: An overview of cognitive methods”, *Qual Life Res*, 12, p.229.Roskies (2002) “Neuroethics for the New Millennium”, *Neuron*, 35, p.21.

Disclosures: K. Rempala: None. **D. Morgan:** None. **V. Callais:** None. **E. Wakefield:** None. **S. Webber:** None. **M.W. Rochlin:** None. **J. Vukov:** None.

Theme J Poster

TJP02: K-12 Teaching and Outreach

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP02.10SA/W7

Topic: J.02. Teaching of Neuroscience

Title: Neuroscience 101 Workshop: Empowering High School Students Through Neuroscience Education

Authors: *K. RAMDEO[1], F. ADAMS[2], A. J. NELSON[3];
[2]Kinesiology, [1]McMaster Univ., Hamilton, ON, Canada; [3]Dept Kinesiol, McMaster Univ., Stoney Creek, ON, Canada

Abstract: The *Neuroscience 101* workshop is a program that was developed to help bridge the gap between Canadian high school students located in Hamilton, Ontario and neuroscience exposure including fundamental concepts, technology-based applications, and potential career pathways. This workshop used a team-based approach where fifty senior high school students (grade 11&12) were split into teams of 6 students to engage with graduate student mentors. The aim of this workshop was to expose students to various neuroscience activities. Mentors included graduate students, at the PhD and MSc level, pursuing degrees in multimodal research investigating sensorimotor neural plasticity. Mentors conducted hands-on workshops designed to expose students to research techniques and neurotechnology currently being utilized in the laboratory to advance the understanding of basic and clinical neuroscience. The workshop began with an overview of the brain’s structure and function followed by interactive trivia. This was followed by a series of interactive demonstrations and experiments, whereby students had the opportunity to witness neuroscience principles in action. Each team was exposed to activities demonstrating concepts of machine learning and neuroscience which included an augmented reality sensorimotor training and electromyography biofeedback- gaming interface. Furthermore, students learned and participated in neuroscience concepts relating to neural control of balance (Balance Assessments & Training via BTrackS^{TM}), sensory processing and perception

(Corticometrics via BrainGauge™ & Von Frey Test) and a demonstration of non-invasive brain stimulation (Transcranial Magnetic Stimulation). Survey data was obtained from the students following the program, which rated each activity based on enjoyment level. The results demonstrate students have an increased enjoyment for neuroscience approaches utilizing technology, with the augmented reality sensorimotor training receiving the highest rating. These data demonstrate the necessity for future workshops aimed at engaging students in neuroscience to incorporate technology-based learning and interactive activities. Such approaches can enhance student understanding while fostering active participation and collaboration among students. The *Neuroscience 101* workshop serves as a catalyst for positive exposure to neuroscience, aiming to create a lasting impact on students in the hopes of motivating them to explore higher education and careers in neuroscience and technology.

Disclosures: K. Ramdeo: None. **F. Adams:** None. **A.J. Nelson:** None.

Theme J Poster

TJP02: K-12 Teaching and Outreach

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP02.11SA/W8

Topic: J.02. Teaching of Neuroscience

Support: Dana Foundation Neuroscience and Society Initiative Grant

Title: Does Augmenting Introductory Neuroscience Education with Neuroethical Discussion Promote STEM Identity in High School Students?

Authors: *S. M. WEBBER[1], E. M. WAKEFIELD[2], D. L. MORGAN[3], V. E. CALLAIS[3], J. VUKOV[4], S. KAUFMANN[5], M. ROCHLIN[1];
[1]Biol., Loyola Univ. Chicago, Chicago, IL; [2]Psychology, Loyola Univ. Chicago, Chicago, IL; [3]Sch. of Educ., Loyola Univ. Chicago, Chicago, IL; [4]Philosophy, Loyola Univ. Chicago, Chicago, IL; [5]Fine and Performing Arts, Loyola Univ. Chicago, Chicago, IL

Abstract: Traditional STEM pedagogy promotes reductionist thinking, alienating students considering neuroscience careers, especially those who have been historically minoritized in STEM fields. Here, we take a novel approach to increasing high school students' (1) desire to pursue STEM careers and (2) confidence in their STEM skills. We do this through a 10-week after-school workshop series at an urban, neighborhood school where 89% of students identify as a racial minority. During 1-hour workshops, students participated in discussion- and experiential-based learning around neuroethical dilemmas relevant to societal issues (e.g., use of study drugs; brain/computer interfaces). Of 21 students who attended workshops, 19 consented to participate in program evaluation. This evaluation included pre- and post-workshop series surveys assessing students' STEM identity, attitudes towards science and math courses, and neuroethical understanding. The evaluation also included semi-structured interviews exploring what students hoped to gain from the workshops (pre), and their experience in the workshops (post). During the

program, students completed surveys assessing retention and enjoyment of 3 workshops that varied in format: (1) a discussion-based approach (2) a movement-based approach, and (3) an immersive virtual-reality experience. Surveys were administered one week following selected workshops. Preliminary thematic analysis of pre-workshop series interviews revealed that over half of the students interviewed (57%) joined because they were interested in neuroscience and hoped to gain general neuroscience knowledge. Students also hoped the program would provide community (38%) and would support or help them discern their college/career goals (54%). The survey items indicated that students generally enjoyed math and science courses and felt confident in their abilities in STEM. However, they showed room to grow on measures of neuroethical knowledge and STEM identity. Post-workshop interview and survey administration is ongoing. Once collected, we will ask whether the program improved students' knowledge of neuroethics and supported their STEM identity. Analyses about specific workshops revealed that students were significantly above chance on both basic and application questions related to workshop topics ($p < .05$), but format did not predict learning outcomes. Overall, our evaluation of this workshop series will ask whether introducing neuroscientific topics as they connect to ethics and societal issues is a useful approach to supporting high school students' persistence in neuroscience.

Disclosures: S.M. Webber: None. **E.M. Wakefield:** None. **D.L. Morgan:** None. **V.E. Callais:** None. **J. Vukov:** None. **S. Kaufmann:** None. **M. Rochlin:** None.

Theme J Poster

TJP02: K-12 Teaching and Outreach

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP02.12SA/W9

Topic: J.02. Teaching of Neuroscience

Title: Using a Logic Model to Design, Implement, and Evaluate K-12 Outreach and Education Programs: A Case Study of the Irvine Brain Bee

Authors: *R. E. HOKENSON[1], A. B. MOREHOUSE[2], W. NING[3], M. A. COBURN[4], M. O. YASSA[4];
[1]Anat. & Neurobio., Univ. of California, Irvine, Irvine, CA; [2]Cognitive Sci., Univ. of California, Irvine, Irvine, CA; [3]Neurobio. and Behavior, Univ. of California, Irvine, Irvine, CA; [4]Ctr. for the Neurobio. of Learning and Memory, Univ. of California, Irvine, Irvine, CA

Abstract: The Brain Bee is a neuroscience competition for high school students with the goal to inspire and motivate students to pursue careers in basic and clinical neuroscience. Each year, high schoolers around the world participate in local Brain Bee competitions. The winners of these regional Brain Bees advance to compete in the USA Brain Bee, whose winner participates in the International Brain Bee. The initial stage of this competition, the regional Brain Bee, presents an excellent opportunity for institutions to engage local high school students in neuroscience. K-12 science engagement outside of the school can positively impact students'

KAP (knowledge, attitudes, and practices) toward science. Regional Brain Bees offer a unique opportunity to teach students neuroscience, introduce them to higher education and build connections with faculty and students, expose them to careers in neuroscience, and stimulate a passion for science and learning. Logic models are tools that can be used to plan, implement, and evaluate programs, including outreach and education programs. Using the Irvine Brain Bee as a case study, we propose a logic model for a regional Brain Bee. Here we outline the inputs, activities, outputs, and outcomes (short, medium, and long-term) that are necessary for a successful outreach program. This logic model can be adapted by other institutions to establish or improve regional Brain Bees and other K-12 neuroscience outreach programs.

Disclosures: R.E. Hokenson: None. **A.B. Morehouse:** None. **W. Ning:** None. **M.A. Coburn:** None. **M.O. Yassa:** None.

Theme J Poster

TJP02: K-12 Teaching and Outreach

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP02.13SA/W10

Topic: J.02. Teaching of Neuroscience

Support: NW Noggin
Dana Foundation

Title: The Neuroscience Club of Portland State University 2024

Authors: *K. SMITH[1], C. AUSTIN[1], C. FITZPATRICK[2], L. TANGREDI[1], M. CHENARD[3], A. GONZALEZ[1];
[1]Portland State Univ., Portland, OR; [2]Portland State Univ., Portland, OR, ; [3]Portland State Univ., PORTLAND, OR.

Abstract: The Neuroscience Club (NC) at Portland State University (PSU) is an interdisciplinary student organization dedicated to providing highly accessible neuroscience education for all. We welcome individuals from any discipline, representing a full spectrum of academic interests across all ten colleges at PSU. NC is committed to supporting PSU students in and beyond academia by connecting them with resources that enable future success in STEM fields.The Interdisciplinary Neuroscience Minor was established by NC and is PSU's first official neuroscience track of study. Its unique design is open to students of any major, with differing curriculum for varying academic pathways. Currently, NC is advocating for both the addition of a PSU Neuroscience Major and a designated neurodiverse safe space aimed at increasing academic inclusivity. We've developed a survey for the student body to gauge interest levels and have generated faculty support for the major's programming. During the 2023-2024 academic year, the NC worked with the government at the local and federal level, advocating for vulnerable populations by informing state senators and a congressional STEAM caucus about neuroscience research on topics ranging from the effects of time changes on the brain and sleep

cycles to the importance of art-based STEM education for offsetting economic disparity on a communal level. Through our partnership with NW Noggin, a nonprofit educational outreach organization, NC members volunteer in the community, teaching neuroscience via tactile art projects and participant-directed Q & A sessions at low-income schools, youth shelters, correctional facilities, and otherwise marginalized populations. NC holds weekly events to extend the neuroscience education at PSU, which are open to the public and aimed at expanding the accessibility of current research to the community at large. Along with officer-led STEAM events, NC hosts experts from fields including pharmacology, biomedical engineering, and mind-body medicine, who present their research and personal experiences in academia and industry, allowing students to learn directly from those in fields that align with their interests, as we strive to strengthen collaboration between PSU, partnering institutions and the greater community.

Disclosures: K. Smith: None.

Theme J Poster

TJP02: K-12 Teaching and Outreach

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP02.14SA/W11

Topic: J.02. Teaching of Neuroscience

Support: NSF RET award: EEC-1801666

Title: Integrating high school curricular modules with neuroscience, computer science, and engineering content to expand student engagement

Authors: *H. K. RASHEED[1], D. HOWELL[2], A. MOHAN[3], G. GLICKERT[4], S. S. NAIR[5]; [1]Technol. and Robotics, Athens Acad., Athens, GA; [2]Columbia Independent Sch., Columbia, MO; [3]Illinois Mathematics and Sci. Acad., Aurora, IL; [4]Neural Engin., Univ. of Missouri, Columbia, Columbia, MO; [5]Electrical & Computer Engin., Univ. of Missouri, Columbia, MO

Abstract: High school students often spend their computer science courses building specific coding skills, without exposure to the practical and interdisciplinary applications of computer science. For this reason, many students struggle to understand how they can utilize their computer science skills in other contexts, and thus lose engagement in the course. Furthermore, students are often not exposed to higher level scientific concepts such as neuroscience and artificial intelligence until much later in their education, if they choose to pursue upper-level scientific coursework in college. Similarly, the students study neuroscience/biology largely without appreciating its linkage to computer science and engineering principles that govern the functioning of the nervous system. To address these concerns, we have developed high school activity plans that introduce neuroscience in computer science courses, and vice versa to develop truly integrative modules that are in line with Next Generation Science Standards (NGSS). Such modules can be used in both computer science and biology curricula, with varying emphasis on

the components. In one such integrated module, students use microcontroller-based kits to explore electromyography (EMG) signals and machine learning through the design of a basic human-human interface in an inquiry-based activity. In a second integrated module, students will explore the neuroscience of panic attacks using pulse sensors to monitor heart rate while developing novel stimuli to mitigate the fight or flight response through activation of its counter response: rest and digest. In parallel, the connection to computation in the push-pull between the sympathetic-parasympathetic systems will be shown in code using a micro-bit. Our findings will explore student engagement, students' interest in interdisciplinary work, and the impact of hands-on, practical experiments in the classroom. These activity plans will be a first step in introducing students, especially those from marginalized backgrounds, to upper-level scientific concepts and to the scientific process. Our aim is to expand student engagement in the fields of neuroscience, computer science, artificial intelligence, and engineering, leading to talent with integrated skills in these growing fields.

Disclosures: H.K. Rasheed: None. **D. Howell:** None. **A. Mohan:** None. **G. Glickert:** None. **S.S. Nair:** None.

Theme J Poster

TJP02: K-12 Teaching and Outreach

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP02.15SA/W12

Topic: J.02. Teaching of Neuroscience

Support: NSF RET award: EEC-1801666

Title: An integrative curricular design: An interdisciplinary initiative towards incorporating neuroscience into the Computer Science classroom and vice versa:

Authors: *A. MOHAN[1], N. PANDYA[1], N. ROSS[2], S. S. NAIR[3];
[1]Mathematics and Computer Sci., Illinois Mathematics and Sci. Acad., Aurora, IL; [2]Outreach, Illinois Mathematics and Sci. Acad., Glen Ellyn, IL; [3]Electrical Engin. and Computer Sci., Univ. of Missouri, Columbia, MO

Abstract: Adopting interdisciplinary STEM curricula is often difficult in public high schools that have stringent pacing criteria and standards. Further, high school students are not exposed to interdisciplinary courses (e.g., computer science integrated with biology) which are typically considered complex and expensive to curate. Currently opportunities to experience integrated, interdisciplinary curriculum/research are only available if students opt to pursue advanced graduate degrees or at major universities in lab courses. As a result, a large population of high schoolers are left with a poor understanding of key new interdisciplinary areas, (e.g., how the brain works), and, are not aware of a vast field of computational neuroscience research that needs our brightest and ethical minds to advance. The faculty at the Illinois Mathematics and Science Academy (IMSA) in collaboration with the University of Missouri-Engineering (MU),

have developed a K-12 curricular unit that has integrated topics that are in-line with the revised Next Generation Science Standards (NGSS) and state standards. Using robust, low-maintenance, microcontroller-based kits to study Electromyograms (EMG), we have integrated neurobiology, computer science and engineering curriculum into a unit that has three activities. The curriculum involves hands-on, inquiry-based, student-centered scientific investigation through problem design, hypothesis generation, group discussions, collecting and interpreting evidence, explanation and argument, generating inference from observations. This new learning environment will also focus on computational thinking through the lens of decomposition, pattern recognition and algorithmic thinking. We will also strengthen students' trust in their own investigations, students' views on working in research groups, via interdisciplinary work in the classroom. This effort will enable K-12 STEM students, including those from marginalized backgrounds and teachers with limited mathematical, programming and data skills, to strengthen their background. Importantly, this will empower them to ask thought-provoking questions from patterns hidden in real-world data and discover complex scientific phenomena. We believe such an investment offers a high cost to benefit ratio, will be long-lasting, advance our knowledge on the design and pedagogical guidelines of interdisciplinary learning environments that minimize cognitive load for novice K-12 learners while still maintaining compliance with district policies, and empower teachers to excite students in these fields that need talent.

Disclosures: A. Mohan: None. **N. Pandya:** None. **N. Ross:** None. **S.S. Nair:** None.

Theme J Poster

TJP02: K-12 Teaching and Outreach

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP02.16SA/W13

Topic: J.02. Teaching of Neuroscience

Title: Lessons from Louisville Science Pathways: A High School Summer Research Program

Authors: *J. WHITLEY, D. OAKES;
Univ. of Louisville Sch. of Med., Louisville, KY

Abstract: Early exposure to research in STEM fields is vital for the development of future scientists and engineers. To ensure high school students in Jefferson County, Kentucky have access to these fields outside of the classroom, graduate students in the department of Anatomical Sciences and Neurobiology at the University of Louisville (UofL) established the Louisville Science Pathways program (LSP) in 2017. LSP is a 6-8 week summer research internship for local high school students that provides hands-on experience and exposure to real-world applications of STEM research in fields ranging from neuroscience to bioengineering. This program reaches students at the earliest stages of career decision-making, which is especially crucial for our target audience of students who are underrepresented minorities in science. LSP aims to immerse students in the day-to-day activities of STEM professionals through seminars featuring guest speakers presenting both primary research talks, their career

paths, and professional development. Furthermore, participants receive basic lab safety training as well as guidance on leveraging their experience for college applications, future jobs, and scholarships. The program culminates in a Final Research Symposium where students present their summer projects, showcasing their research and the skills acquired in a research environment. Despite being driven by the voluntary efforts of graduate students and having no operating budget, the program has flourished and continued to adapt to the changing needs of students. In response to feedback, partnerships were forged with a Jefferson County youth jobs program (KentuckianaWorks) to provide hourly wages for participants, addressing a participation barrier for our students with low socioeconomic status. Feedback through the years has prompted further adjustments, including incorporating primary research presentations alongside career-oriented talks. Recruitment strategies were revamped, resulting in a doubling of applications and a 50% increase in available lab placements for students. Through these enhancements, the LSP program continues to broaden access to career advancement opportunities and crucial exposure to STEM research, especially for underrepresented minorities and low socioeconomic status students in Jefferson County, Kentucky.

Disclosures: J. Whitley: None. **D. Oakes:** None.

Theme J Poster

TJP02: K-12 Teaching and Outreach

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP02.17SA/W14

Topic: J.02. Teaching of Neuroscience

Support: NIH R25 MH135446-01
NSF #1908482
NSF #2241751

Title: Neuroscience for All: Designing neuroscience research opportunities for underserved youth through teacher-student-scientist-community partnerships

Authors: *P. F. BLONIASZ[1], G. CHATUFALE[2], F. PORTEOUS[2], F. ZERWAS[2], S. DIKKER[2], C. MATUK[2];
[1]Boston Univ., Boston, MA; [2]New York Univ., New York City, NY

Abstract: MindHive is a community neuroscience platform for researchers, students, educators, community-based organizations, and community members. We offer tools, mentorship programs, and educational materials to bring together experts and non-experts to co-design studies, collaborate in data collection and analysis, and communicate study outcomes. MindHive's mission is to help promote a healthy neuroscience ecosystem by including all stakeholders in the full range of science inquiry. Here, we present two of our courses that are compatible with the MindHive platform. The MindHive Environmental Neuroscience for All program combines online and in-person tools to support authentic research experiences for socio-

culturally diverse youth from both urban and rural schools across the US. Through this program, students will work with scientists and civic partners to design studies that explore the relationship between our brains and our environment (e.g., Can we help improve how we behave toward our environment by deepening our understanding of how the human brain is wired?). The program uses an open science and participatory science approach, training the next generation of scientists and communities to view environmental challenges not just as barriers, but as opportunities for research, innovation, and collaboration. Additionally, we are developing tools to promote data literacy in high school students by engaging them in learning about the Quantified Self - the practice of using technology to track and reflect on one's own behavioral, body, and brain data. Learning activities are designed to spark a broad interest in science and to help develop students' informed opinions about the role of human-generated data in public life. As such, we developed a browser-based application "You: Quantified" paired with lessons, hands-on STEM activities, and professional development materials with which students and teachers can explore, analyze, and create multimodal and interactive representations of data, recorded by wearable biosensors. Students will design and execute small exploration projects to answer their own questions and create offline and online artifacts to communicate their findings. Students will engage in discussions that consider the ethical implications of using data-fueled services, applications, and technologies and critically evaluate how their personal data is being used. During and after the project, instructors and students will have opportunities to connect with industry partners who work with biosensing and wearable technologies, and to access career and college readiness resources relevant to these and related data technology fields.

Disclosures: P.F. Bloniasz: None. **G. Chatufale:** None. **F. Porteous:** None. **F. Zerwas:** None. **S. Dikker:** None. **C. Matuk:** None.

Theme J Poster

TJP02: K-12 Teaching and Outreach

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP02.18SA/W15

Topic: J.02. Teaching of Neuroscience

Title: Empowering the next generation: Undergraduate experiences in neuroscience outreach

Authors: *N. KAUSHIK[1], M. ZHENG[1], M. COBURN[2], M. O. YASSA[2];
[2]Ctr. for the Neurobio. of Learning and Memory, [1]Univ. of California, Irvine, Irvine, CA

Abstract: Due to its interdisciplinary, and in many cases deeply personal nature, neuroscience is an innovative gateway to inspire people from all ages to engage in science. A report from the Dana Foundation in partnership with Research!America in 2023 found that though 37% of Americans rank mental health as a top health concern and an overwhelming majority were positive about brain research, 66% report having little to no knowledge about neuroscience. At the University of California, Irvine (UCI) Center for the Neurobiology of Learning and Memory (CNLM), the first research institution in the world exclusively dedicated to the interdisciplinary

exploration of the brain's learning and memory mechanisms, there as been a long standing commitment to community outreach and engagement. Through a volunteer organization called the Ambassador Program, led and founded by Dr. Manuella Oliveira Yassa, undergraduate students, graduate students, postdoctoral fellows, staff, and faculty have the opportunity to participate in neuroscience education and outreach initiatives and events held by the CNLM. At the undergraduate stage, building connections in the field of neuroscience, gaining important skills in scientific communication, and learning the importance of community outreach can be limited to competitive spots as research assistance in labs or through their professors. By engaging with the Ambassador Program, undergraduates are able to learn pedagogical practices in outreach, contribute to disseminating knowledge, and build social currency in the field of neuroscience through connections at all training levels In this poster, we explore the insights and experiences gained from participating in neuroscience education and outreach from the perspective of undergraduate CNLM Ambassadors committed to serving the community through neuroscience outreach, science communication, and educational activities. We surveyed participating undergraduate Ambassadors to assess the influence of participating in an education and outreach program on their knowledge, attitudes, and practices in engaging with the community while balancing a multitude of other responsibilities related to academic, personal, and professional endeavors. Through their participation, not only are they improving their own skills and inspiring the next generation of scientists, but also contributing to a more broader role of promoting scientific literacy, and fostering an environment of curiosity and discovery. Sharing these insights, we aim to reflect on, but also encourage the involvement of undergraduate students in flexible, innovative, and deep-rooted neuroscience outreach and education.

Disclosures: N. Kaushik: None. **M. Zheng:** None. **M. Coburn:** None. **M.O. Yassa:** None.

Theme J Poster

TJP02: K-12 Teaching and Outreach

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP02.19SA/W16

Topic: J.02. Teaching of Neuroscience

Support: Dana Foundation

Title: Igniting Young Minds: An Interactive Approach to Neuroscience Education for Elementary Students

Authors: *V. GRITSENKO[1], A. KOROL[2], S. BAHDASARIANTS[3], T. STUMP[4], R. J. NELSON[5];
[1]West Virginia Univ., Morgantown, WV; [2]Neurosci., West Virginia Univ., Morgantown, WV; [3]Human Performance, West Virginia Univ., Morgantown, WV; [4]Biomed. Engin., West Virgnia Univ., Morgantown, WV; [5]Neurosci., Sch. of Med., Morgantown, WV

Abstract: The Suncrest Elementary School in Morgantown, WV, has become a hub of neuroscience education, thanks to a collaborative effort by local neuroscience advocates. The West Virginia Chapter of the Society for Neuroscience, along with West Virginia University's faculty and graduate students from the Departments of Neuroscience, Human Performance, and Mechanical and Aerospace Engineering have come together to tailor an outreach program specifically for young learners. This initiative provides interactive educational experiences, aiming to ignite and sustain curiosity in neuroscience among students from kindergarten to 12th grade, with a focus on the Morgantown area and the broader Appalachian region. Drawing inspiration from the Brain Awareness Week, the program has been adapted to engage 2nd and 5th graders through hands-on activities. Over 150 students participated, with 2nd graders exploring brain lobes through playdough modeling and 5th graders diving into biomechanics and neuroscience via interactive experiments. The positive impact of this program is evident from the enthusiastic participation and feedback from students, teachers, and parents alike. Moreover, the graduate students leading these activities have enriched their mentoring and outreach skills, highlighting the value of early and continuous exposure to neuroscience to inspire future careers and maintain a lifelong passion in the field. In conclusion, our outreach program continues to have a positive impact on people of all ages in our community.

Disclosures: V. Gritsenko: None. **A. Korol:** None. **S. Bahdasariants:** None. **T. Stump:** None. **R.J. Nelson:** None.

Theme J Poster

TJP02: K-12 Teaching and Outreach

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP02.20SA/W17

Topic: J.02. Teaching of Neuroscience

Support: NIH R25 GM132961

Title: Start program provides authentic research and training to increase sense of belonging in neuroscience for underrepresented populations

Authors: *L. H. BRADLEY;
Neurosci., Univ. of Kentucky Col. of Med., Lexington, KY

Abstract: The STEM Through Authentic Research and Training (START) Program is a collaborative initiative designed to support first-generation and traditionally underrepresented students in entering college, specifically within the fields of science, technology, engineering, and mathematics (STEM). Our program achieves its goals by offering authentic research experiences and professional development opportunities throughout the year for both students and teachers. The program integrates academic knowledge with social and professional real-world applications, fostering a comprehensive pathway into higher education and eventually, into related professional arenas. Over the past 4 years, nearly 2,000 students (START

Ambassadors) were engaged with near-peer virtual and in-person demonstrations from University of Kentucky students on neuroanatomy, brain injury, Parkinson's disease, COVID-19 and immunology, nutrition, and other STEM topics. In addition, the START Program partnered with Higher Orbits to provide at home learning kits and an in-person 'Go for Launch' event, for students to learn and develop teamwork and science communication. START Apprentices continued with mentored, in-person authentic learning experiences in neuroscience, while START Teachers participated in STEM professional development. Near-peer mentors completed a College Reading and Learning Association (CRLA)-certified online mentor training program to provide START Apprentices insight into the college experience, academic strategies, soft skills, and available pathways, while modeling academic resilience and success. Collectively, our findings support that a sense of belonging in neuroscience and STEM is increased for high school students from underrepresented backgrounds through engagement, providing opportunity and minimizing barriers to authentic learning experiences, and trained near-peer mentoring to build a coaching-based partnership. This poster presents the creation of the START pipeline, chronicling the partnerships that have emerged from the START Program both on-campus and across the Lexington community.

Disclosures: L.H. Bradley: None.

Theme J Poster

TJP02: K-12 Teaching and Outreach

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP02.21SA/W18

Topic: J.02. Teaching of Neuroscience

Title: Can NeuroMuscular Electrical Stimulation serve as a primer to reduce sarcopenia in the aging nervous system? A systematic review

Authors: *S. DESHMUKH[1], R. PUROHIT[2], T. S. BHATT[2];
[1]Univ. of Illinois at Chicago, CHICAGO, IL; [2]Physical Therapy, Univ. of Illinois at Chicago, Chicago, IL

Abstract: **Objective:** We aimed to review evidence on the effects of neuromuscular electrical stimulation (NMES) or functional electrical stimulation (FES), or both, on muscle strength among middle-aged and older adults. Secondly, we also aimed to determine commonly used NMES/FES stimulation parameters for the same. **Methods:** 2 reviewers extracted studies from PubMed, Cochrane Library, and Scopus from the years 2017- 2023. **Study inclusion:** 1) included middle-aged/older adults (>45 years) with or without systemic pathology; 2) randomized controlled trials (RCTs); 3) Intact/healthy nervous system 4) used NMES or FES as a training tool; 5) at least one outcome of muscle strength; 6) reported at least one NMES/FES stimulation parameter (frequency/duration/amplitude) and 7) written in English. **Study Exclusion:** 1) not in English; 2) included adults with orthopedic and neurologic conditions. PEDro scale was used for risk of bias. **Data Synthesis:** 9 RCTs (PEDro scores 5-9, fair-good)

involved 335 participants aged 45-70. Studies included hemodialysis patients, healthy older adults, liver transplant recipients, pulmonary conditions, cancer, and post-COVID-19. 4 studies compared NMES/FES with traditional methods, 4 compared different stimulation parameters, and 1 compared with sham stimulation. Stimulation duration varied between 4-12 weeks. Major outcome measures were the 30s chair stand test and the Timed up and Go test. **Results:** 8 out of 9 studies showed greater improvements in outcomes of muscle strength with NMES/FES (5 studies used frequency: 50 Hz) compared to control conditions. Only 1 study compared outcomes between 50 Hz and 75 Hz frequencies and showed no significant differences. The stimulation parameters varied from 50-90Hz for frequency, 250-400 microseconds for duration, and 10-40 milliamperes for intensity, with quadriceps being the most targeted group. **Conclusion:** Using both NMES/FES alongside resistance training appears to yield greater gains in muscle strength compared to solely implementing resistance training in middle-aged and older adult populations. Also, a wide range of variability in the stimulation parameters (frequency/intensity) was noted without adequate justification for their selection. Thus, there is a need to standardize stimulation parameters for inducing optimal NMES/FES effects.

Disclosures: S. Deshmukh: None. **R. Purohit:** None. **T.S. Bhatt:** None.

Theme J Poster

TJP03: Teaching of Neuroscience: College I

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP03.01SU/W19

Topic: J.02. Teaching of Neuroscience

Support: NIGMS Grant P30GM145497

Title: Teaching rodent behavior research skills to UNEs undergraduate students

Authors: *D. GIUVELIS[1], A. FELIX[1], J. ZUKE[1], I. D. MENG[2], T. E. KING[2];
[1]Ctr. for Pain Res., Univ. of New England, Biddeford, ME; [2]Biomed. Sci., Univ. of New England, Biddeford, ME

Abstract: The Behavior Core (BC) at the University of New England (UNE) was created in 2012. The mission of the BC is to provide a comprehensive approach to behavioral models and measures needed for in vivo aspects of research projects. The BC works with UNE faculty and their trainees providing access to the highest level of expertise, training, and instrumentation. Across the past year, we focused on increasing integration of the BC into the undergraduate experience by offering a program to train in vivo skills to UNE undergraduate students. We envisioned a program focused on training in vivo research for development of critical skills prior to entering a UNE faculty member's laboratory. This led us to develop a semester long program to teach undergraduates hands on rodent handling/behavior, data collection/analysis, and presentation skills. Upon completion of this program the students were awarded a Credly Badge that can be displayed on their transcript and/or resume. The overall goal of this program is to

provide students with hands on research skills that are not taught in the classroom. These skillsets provide a foundation for future development in academic research, industry, and/or graduate education. Our first cohort of 5 students, a mix of freshmen and sophomores, successfully completed the 13-week program which concluded in a poster presentation of their findings at UNE's undergraduate research symposium. This program also served to develop connections between undergraduate students interested in a research experience and faculty with research programs. Currently, we have 11 students eager to partake in this program next semester. We are motivated by the interest in, and success of, this program so far and look forward to further expanding our reach among the undergraduate population.

Disclosures: D. Giuvelis: None. **A. Felix:** None. **J. Zuke:** None. **I.D. Meng:** None. **T.E. King:** None.

Theme J Poster

TJP03: Teaching of Neuroscience: College I

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP03.02SU/W20

Topic: J.02. Teaching of Neuroscience

Support: University of Dayton, Experiential Learning Innovation Fund for Faculty (ELIFF) mini-grant

Title: Crafting an Undergraduate Neuroscience Curricular Experience Emphasizing Cognitive Learning and Practical Wisdom

Authors: *A. TSOUMA, P. M. PITYCHOUTIS;
Dept. of Biol., Univ. of Dayton, Dayton, OH

Abstract: Recent curricular efforts at the University of Dayton (Dayton, Ohio, USA) have been directed towards building an undergraduate-focused neuroscience curriculum. The neurobiology lecture (BIO415) is a biomedically-oriented, 3 credit hour upper-level undergraduate course that has been consistently offered since the fall of 2013 at the University of Dayton. BIO415 has been very popular among our biomedically-oriented biology (BIO) and pre-medicine/dentistry (MED/DEN) majors, as well as our neuroscience (NSC) minor students. In the context of BIO415 students are exposed to the fundamental neuroscience principles of neurophysiology, neurochemistry, and neuroanatomy, as well to sensory neuroscience, neurobiology of sleep, learning and memory and neurobiology of disease. In order to complement the cognitive learning that occurs in the context of the neurobiology lecture, we further developed a 1 credit hour advanced neurobiology laboratory (BIO415) course; BIO415L has been specifically designed to offer active, hands-on, inquiry-based and reflective learning that provides students the opportunity to develop a conceptual understanding of standard experimental methods and research techniques used in the fascinating field of neuroscience. The two thirds of the BIO415L curriculum are devoted to knowledge and skill-building; specifically, students are exposed to

important neuroscientific concepts and techniques spanning different neuroscience fields (i.e., neurohistology, neurophysiology, neurochemistry, neuroanatomy, organismal models, behavioral neuroscience, sleep), while also gaining experience with using animal models. An educational strength of BIO415L revolves around the fact that the different laboratory practicals are effectively mapped to and aligned with the material delivered in the BIO415 lecture. Drawing upon their experience during the skill-building component of the course, and with continued guidance from the instructors, the students work effectively in small groups (i.e., 2-4 members) to carry out an independent research project. In the context of BIO415L students gain the opportunity to refine and exercise their research competencies along with scientific reading and writing communication skills, as well as to gain practical wisdom by applying the process of scientific inquiry to test a new research hypothesis.

Disclosures: A. Tsouma: None. **P.M. Pitychoutis:** None.

Theme J Poster

TJP03: Teaching of Neuroscience: College I

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP03.03SU/W21

Topic: J.02. Teaching of Neuroscience

Title: Time On Task is More Predictive of Undergraduate Success in a Neuropharmacology Course than Visual Spatial Ability

Authors: *J. HA[1], A. C. NICHOLAS[2];
[1]Biol. Sci., Univ. of California, Irvine, Irvine, CA; [2]Neurobio. & Behavior, Univ. of California, Irvine, Irvine, CA

Abstract: General education neuropharmacology courses typically expose students to novel content learning that is not dependent on prior mastery. Neuroscience and neuropharmacology courses require students to use spatial reasoning to visualize neuronal pathways, synapses, electrochemical signaling, and changes in receptor populations. Spatial reasoning has been considered a predictor of performance success in STEM courses like engineering, chemistry, biology, and mathematics. However, little is known about how spatial reasoning predicts success in neuroscience. To help students understand neuropharmacology course content, we developed homework assignments that prompted students to create visualizations of course subject matter using the software BioRender. BioRender assists users in creating high-quality scientific and biomedical illustrations for publication by providing a library of pre-made customizable elements common to biological sciences. To assess visualization, we assigned students the Purdue Spatial Visualization Test-Visualization of Rotations (PSVT:R), a timed test requiring the test-taker to imagine three-dimensional object rotations given object illustrations of varying complexity. Female students scored lower on PVST:R in our cohort, similar to previous findings. In the following study, we investigate how scores on tests of visual-spatial reasoning compare to time on task spent in BioRender to predict student performance on neuropharmacology exams

that incorporate illustration and multiple choice questions. Findings suggest that percent completion of BioRender assignments, though directly unrelated to test questions, was a greater predictor of student success than innate ability on PVST:R. We employed the Visual, Auditory, Reading, or Kinetic (VARK) test to identify student learning preferences. We also demonstrate that visual learning style preference determined in VARK did not correlate with visual-spatial ability or exam scores. Results suggest time spent illustrating neuroscience concepts in BioRender was a greater predictor of student success than innate visual-spatial ability, independent of learning style preference.

Disclosures: J. Ha: None. **A.C. Nicholas:** None.

Theme J Poster

TJP03: Teaching of Neuroscience: College I

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP03.04SU/W22

Topic: J.02. Teaching of Neuroscience

Title: Exploring cryoEM in undergraduate neuropharmacology: CREATE method module implementation

Authors: J. BONDAREVA[1], N. PITTMAN[2], ***R. E. PENTON**[1];
[1]Dept. of Psychology and Neurosci., Univ. of North Carolina at Chapel Hill, Chapel Hill, NC;
[2]Dept. of Biochem. and Biophysics, Univ. of North Carolina at Chapel Hill, Chapel Hill, NC

Abstract: Understanding protein structure is crucial in modern neuropharmacology. Pharmaceutical companies use computational modeling and molecular docking for lead compound identification and require these skills in the workforce (Black, 2020). The use of cryogenic electron microscopy (cryoEM) was predicted to outpace the use of x-ray crystallography for solving protein structures by this year (Callaway, 2020), and the abundance of recent cryoEM structures published has supported this. To keep current with the field, undergraduates need to learn how to read papers that use cryoEM to solve receptor protein structures. Here we report the implementation and assessment of a CREATE Method module and hands-on activities to teach undergraduates about cryoEM in an advanced neuropharmacology course.
The 9-lesson module was taught to 53 students in Fall 2023 and Spring 2024 Advanced Molecular Neuropharmacology at UNC Chapel Hill. Students in the course were primarily a mix of Junior and Senior Neuroscience Majors and Minors. The course already used the CREATE Method (Hoskins et al., 2007, 2011; Stevens and Hoskins, 2014) to analyze primary literature, so we developed the module using this as our primary teaching method. Students analyzed the following paper: “Structure and gating mechanism of the α7 nicotinic acetylcholine receptor” by Noviello, et al. 2021. We also developed hands-on activities representing two major components of cryoEM methods using the UNC BeAM Makerspace. Students in the Fall 2023 section had the opportunity to tour the UNC cryoEM core facility.

We have assessed student learning and their perception of this module using pre- and post-testing and retrospective pre-/post-survey answers. Student scores on a short content quiz were improved following the module (before: 46.38%; after: 63.04%; $p < 0.05$, paired t-test, $n = 46$). Student perception of the hands-on activities and cryoEM core facility tour were overwhelmingly positive, as assessed by the post-module survey. The majority of students agreed or strongly agreed that the hands-on activities and cryoEM facility tour helped them understand how samples were prepared in the paper and what kind of images the researchers saw on their computers. The majority of students also agreed or strongly agreed that they should be used again to teach students cryoEM. Additionally, students reported significantly increased confidence in meeting the six learning objectives of the module after completing the module ($p < 0.05$ for each pre-/post- pair, Friedman test with Dunn's multiple comparisons test, $n = 46$). Taken together, these data suggest that this module is effective for teaching students the basics of cryoEM.

Disclosures: J. Bondareva: None. **N. Pittman:** None. **R.E. Penton:** None.

Theme J Poster

TJP03: Teaching of Neuroscience: College I

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP03.05SU/W23

Topic: J.02. Teaching of Neuroscience

Support: NIH R25 NS130655

Title: Undergraduate research experience in computational brain science

Authors: *J. RITT[1], J. KIMBERLY[2], K. M. WEBSTER[1], S. R. JONES[3];
[1]Carney Inst. for Brain Sci., Brown Univ., Providence, RI; [2]Brown Univ., Providence, RI; [3]Dept. of Neurosci., Brown Univ., Providence, RI

Abstract: All areas of neuroscience research, whether at genetic, cellular, or system levels, increasingly incorporate cutting-edge computational techniques. Thus, competitive neuroscience training programs must teach these skills to support successful research careers. Women and historically underrepresented groups (HUGs) are less common in computational fields, and we will fail to achieve our full potential for neuroscience research if we cannot remove the barriers that disproportionately impact individuals from HUGs.
We describe our ongoing development of a novel summer program to provide world-class training in computational brain science and career building skills to undergraduate students. We aim to increase the readiness and competitiveness of trainees as they prepare for careers in the biomedical research workforce. We designed this nine-week program to enhance undergraduate research career trajectories through a coordinated set of elements focused on neuroscience research, computational fluency, and professional skills development. We recruit participants through The Leadership Alliance (TLA), an organization devoted to developing

underrepresented students into outstanding leaders and role models. Through TLA's Summer Research Program, undergraduates gain research experience and mentoring in the principles underlying the conduct of research to prepare them to pursue competitive applications to PhD or MD-PhD programs. The program aims to provide engagement in individualized research projects in an interdisciplinary research environment; enhancement of coding and computational research skills; exposure to a breadth of neuroscience methods and research; and skills development to prepare for careers in the biomedical sciences. To accomplish these goals, each participant joins a lab where they work closely with the faculty trainer and a near-peer mentor to conduct a research project. We enhance students' computational fluency through a specialized short course, spread across the first two weeks, that provides hands-on experience with fundamentals of research computing. To learn about the broad range of neuroscience topics, participants participate in weekly neuroscience research techniques series with faculty trainers. They build professional development skills through workshops with a graduate student mentor. Overall, this program merges individual lab experience in computational neuroscience with structured skill building and professional development. We summarize our experience so far and ongoing challenges and future refinements.

Disclosures: J. Ritt: None. **J. Kimberly:** None. **K.M. Webster:** None. **S.R. Jones:** None.

Theme J Poster

TJP03: Teaching of Neuroscience: College I

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP03.06SU/W24

Topic: J.02. Teaching of Neuroscience

Support: Schmidt Futures Foundation SF 857
National Human Genome Reserach Institute under Award number 1RM1HG011543
National Institutes of Health (NIH) under award number K12GM139185
NSF 2134955
UC Santa Cruz Chancellor's Postdoctoral Fellowship
CIRM Award EDUC4-12759

Title: Teaching cerebral organoid cell culture with virtual interactive laboratory experience

Authors: *D. EHRLICH[1], V. LY[2], J. SEVETSON[3], M. TEODORESCU[2], S. KURNIAWAN[4], S. SALAMA[5];
[1]Computat. Media, [2]Electrical and Computer Engin., [3]Genomics Inst., [4]Comptuational Media, Univ. of California, Santa Cruz, Santa Cruz, CA; [5]Molecular, Cell. and Developmental Biol., Univ. of California, Santa Cruz, Santa Cruz, CA, CA

Abstract: Undergraduate Trainees in laboratories using *in vitro* models are often required to rapidly master complex cell culture protocols, operate sensitive equipment, adhere to safety

standards, and learn and practice laboratory citizenship. The initial complexity of cell culture protocols can present a significant challenge, particularly for those entering the field without prior experience in scientific research. This virtual platform is designed to bridge knowledge gaps and foster inclusivity, providing a more equitable entry point into scientific research. Standardizing this training process also provides a challenge for scientific mentors. To address these challenges, we have created a virtual educational interactive laboratory, designed to teach students the cultivation and maintenance of cerebral organoids using protocols specific to our laboratory. The platform includes not only definitions and explanations about individual media components, but also provides guidance regarding general laboratory etiquette.
The underlying software of this virtual lab is based on an open-source framework that utilizes Javascript, which facilitates easy customization to meet similar protocols in other laboratories. The module offers a low-risk setting for trainees to practice and learn, serving as an accessible complement to scholarly scientific articles, which frequently pose formidable barriers to entry for beginners. By incorporating this interactive learning experience into training protocols, laboratory supervisors in highly specialized fields can more effectively and safely integrate new students into their laboratory environments. This approach not only enhances the training process but also ensures a smoother transition for both mentors and students, entering complex research settings.

Disclosures: D. Ehrlich: None. **V. Ly:** None. **J. Sevetson:** None. **M. Teodorescu:** None. **S. Kurniawan:** None.

Theme J Poster

TJP03: Teaching of Neuroscience: College I

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP03.07SU/W25

Topic: J.02. Teaching of Neuroscience

Title: Exploring visual coding with the Allen Brain Observatory: a new undergraduate curriculum unit teaching Python with open data

Authors: *C. WEICHSELBAUM, K. CASIMO, S. DE VRIES;
Allen Inst., Seattle, WA

Abstract: In this era of big data, it is increasingly important for students to learn computational skills required to work with large, complex datasets. Here we present a new curriculum unit that introduces undergraduates to programmatic analysis of open neurophysiology data from the Allen Institute through exploring the neuroscience of the visual system. The Allen Brain Observatory provides a standardized in vivo survey of physiological activity in mouse visual cortex, featuring visually evoked calcium responses from GCaMP6-expressing neurons in different visual areas, cortical layers, and cell types. Mice were presented with five types of visual stimuli across hundreds of two-photon calcium imaging sessions, resulting in a rich dataset that can inform a wide variety of research questions. The data may be browsed through

an interactive web interface as well as accessed through the Allen SDK for quantitative analysis. After orienting students to the dataset, this curriculum unit guides students through analyses of Allen Brain Observatory data using interactive Python notebooks. Students explore basic principles of visual coding as they compute tuning curves for neuronal responses to a drifting gratings stimulus, learning data visualization and analysis skills in the process. Students are introduced to widely used Python libraries such as numpy, matplotlib, and pandas and are provided with annotated examples from which to build their own code. In addition to the Python notebooks, the curriculum includes an accompanying slide deck, instructor guide, and behind-the-scenes video content featuring Allen Institute researchers. Beyond gaining coding skills and reinforcing neuroscience content knowledge, working with authentic data allows students to directly engage in the process of science. By lowering the barrier to entry for working with in vivo neurophysiology recordings, this curriculum has the potential to enhance access and promote equity in neuroscience, particularly for students who may not have the opportunity to collect physiology data themselves. Moreover, once students are comfortable analyzing data in Python, the Allen Brain Observatory provides countless possibilities for conducting independent research, empowering instructors and students to leverage the abundant opportunities of open data in the classroom and beyond.

Disclosures: C. Weichselbaum: None. **K. Casimo:** None. **S. De Vries:** None.

Theme J Poster

TJP03: Teaching of Neuroscience: College I

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP03.08SU/W26

Topic: J.02. Teaching of Neuroscience

Title: By students, for students: co-creating a cost-effective teaching laboratory for authentic and active learning

Authors: G. ARAGAO, E. CHEPEL, A. FOK, N. GAHOV, D. NASIR, S. NAZMI, E. SOARES, J. TURCHIARO, E. KANTINI, ***M. C. TUCCI**;
Seneca Polytechnic, King City, ON, Canada

Abstract: Providing undergraduate students with an authentic and active learning experience has the potential to stimulate curiosity and plant a seed for discovery in the next generation of neuroscientists. Seneca Polytechnic is a large, post-secondary institution located in Ontario, Canada. The first core neuroscience course within the Bachelor of Behavioural Psychology program will be offered in the very near future. Here, we describe the development of the laboratory component of this course. What is unique about our development process is that it scaffolds around three key components: student-faculty engagement in curriculum development, providing authentic and active learning opportunities, and finally, implementing the latter in a cost-effective manner. At the core of the laboratory development process was the collaboration between students and faculty. In doing so, an appropriate learning setting could be built that

matches students learning processes, content interest, and provides for differing modes of assessment. At the heart of this was the goal of adapting classic teaching and learning activities in the neurosciences to contemporary approaches that provide cost-effective, authentic and active learning opportunities. Three unique hands-on approaches were developed to immerse students in practical neuroscience activities, in an attempt to foster deeper engagement and understanding beyond theoretical instruction. In the first activity, students engage in real-time brainwave evaluation using the Muse 2 Headband and Mind Monitor app to evaluate the influence of mindfullness meditation on alpha wave modulation. Mindfullness meditation was selected based on evidence showing its impact on alpha power (Lomas et al., 2015). In the second activity, students utilize Sniffy The Virtual Rat, where they can design an experiment to test behavioural principles related to operant and classical conditioning in real-time. For the third activity, a 3D brain atlas (Neurotorium, n.d.) offered via neurotorium.org is used to visualize brain structure, and discuss function based on a neurological case study. This approach will also help to reveal the rich functional connectivity amongst brain regions, and its relationship to behaviour. Altogether, these authentic and active strategies go beyond traditional classroom learning, empowering students to develop a deeper understanding of the neurosciences using cost-effective resources. Furthermore, the laboratory development process was optimized by students and faculty working together on curriculum development, sharing their unique perspectives on teaching and learning.

Disclosures: G. Aragao: None. **E. Chepel:** None. **A. Fok:** None. **N. Gahov:** None. **D. Nasir:** None. **S. Nazmi:** None. **E. Soares:** None. **J. Turchiaro:** None. **E. Kantini:** None. **M.C. Tucci:** None.

Theme J Poster

TJP03: Teaching of Neuroscience: College I

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP03.09SU/W27

Topic: J.02. Teaching of Neuroscience

Support: UC Regents' Junior Faculty Fellowship Award
UCSB Faculty Research Assistance Program Award
UCSB PEER Award

Title: Implementing near-peer tutoring in a large undergraduate neuroscience course

Authors: D. LEWIS[1], J. GONZALEZ ESCOBAR[1], O. GIL DE BERNABE[1], D. ESCOBAR[1], M. SAFRONOVA[2], ***S. L. SCUDDER**[1];
[1]Psychological & Brain Sci. Dept., [2]Ctr. for Innovative Teaching, Research, and Learning, UC Santa Barbara, Santa Barbara, CA

Abstract: At many institutions across the country, the growing popularity of biopsychology and neuroscience has resulted in rapidly ballooning enrollments in introductory undergraduate

courses in these disciplines. At University of California Santa Barbara (UCSB), the introductory biopsychology course routinely enrolls over 300 undergraduate students per class, with minimal graduate Teaching Assistant support. The large size of such classes poses a challenge with regards to student engagement and community-building, as instructors are often limited to a traditional lecture-oriented teaching style with high-stakes multiple-choice assessments. Additionally, these challenging gateway courses, with their striking achievement gaps for students from marginalized and/or disadvantaged backgrounds, can serve as a barrier to student success. In particular, first-generation and transfer students can feel unsupported and unwelcome in the large, impersonal environment of these classes, which can impact performance and decrease retention in the major. Students in these courses vary drastically in previous biology/chemistry coursework and preparation and as such, it is crucial to provide strong support, mentorship, and opportunities to engage in active learning. To address these issues in UCSB's "Introduction to Biopsychology" course, we developed a new program involving small-group sessions led by Undergraduate Learning Assistants (ULAs), who were selected from an applicant pool of undergraduate students who were successful in a previous iteration of the course. After a two-week training period where ULAs completed a 1-credit course on basic pedagogical and mentorship principles, ULAs developed and led weekly structured and unstructured group sessions. Structured sessions included interactive activities such as content-based quiz games, group problem-solving, and sheep brain dissections. To fulfill a participation requirement worth 5-8% of the final grade, students in Biopsychology could choose to attend these sessions or complete online discussions. We found that the majority of students opted to attend ULA-led sessions and reported that they were helpful for their success in the course. In this presentation, we will share details on the structure and goals of this program and present recently acquired data regarding the efficacy of this program in impacting course performance, feelings of belonging, interest in neuroscience, and academic resilience.

Disclosures: D. Lewis: None. **J. Gonzalez Escobar:** None. **O. Gil de Bernabe:** None. **D. Escobar:** None. **M. Safronova:** None. **S.L. Scudder:** None.

Theme J Poster

TJP03: Teaching of Neuroscience: College I

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP03.10SU/Web Only

Topic: J.02. Teaching of Neuroscience

Title: A template in managing ACURE courses at the college level

Authors: *J. E. GARD[1], R. L. COOPER[2];
[1]Univ. of Kentucky, Crestwood, KY; [2]Dept Biol, Univ. of Kentucky, Lexington, KY

Abstract: The educational strategies in motivating and engaging students in learning at a college level have changed over time from didactic teaching to interactive and encouraging student participation. Depending on the discipline, this approach has involved explaining the content to

real world applications and hands-on activities. In many programs, experiences with the discipline involved becoming engaged in research projects that faculty conduct. However, there are more students than there are faculty which has resulted in trying laboratory style courses related to research. Unlike a traditional laboratory class going through and checking off the various subject content related to a lecture or a lab manual, a research laboratory class is more directed toward a research goal with learning the material as needed. The term CURE (curriculum undergraduate research experience) developed. This is then more like gathering the members in one's own research group and making a course out of it with a set goal. The difference is generally one does not have the same control in selection of lab personnel, and it occurs with a defined term (semester or trimester). Depending on the size of the class and resources such as research based courses can become unmanageable to be effective. We present what we have learned in building effective, efficient, and productive approaches to teaching what we term ACURE (authentic curriculum undergraduate research experience) courses. We have a layered approach in course management and teams which focus on subsets of projects and develop the projects to publication level articles with the goal of submission to peer reviewed, scientific based journals.

Disclosures: J.E. Gard: None. **R.L. Cooper:** None.

Theme J Poster

TJP03: Teaching of Neuroscience: College I

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP03.11SU/W28

Topic: J.02. Teaching of Neuroscience

Support: University of Pittsburgh Provost's Open Education Resource funding award to EE Fanselow
Generous technical support was provided by the University of Pittsburgh Open Lab, including Will Hinson and Sera Thornton.

Title: Developing compatible digital 3D models of nervous system structures and cross sections to enhance undergraduate neuroanatomy instruction

Authors: G. LAPORTA, A. M. COLLINS, R. V. PATEL, M.-L. WILLIAMS, J. WITRADO, ***E. E. FANSELOW**;
Neurosci., Univ. Pittsburgh, Pittsburgh, PA

Abstract: In order to teach undergraduate neuroscience students to visualize and understand the shapes of nervous system components and their spatial relationships, we developed digital 3D models of many external and internal brain and vascular structures, as well as cross sections of the whole brain in three planes. These models, along with a dedicated website for their display, were constructed by a University of Pittsburgh undergraduate student, in consultation with a neuroanatomy professor, as open education resources. The models are based on and scaled to the

MNI-152 standard human brain template. As such, the models of individual structures are spatially compatible with one another and can be digitally combined as needed for a given lesson. These models can be 3D printed and/or accessed in a digital format, providing flexible options for their integration into teaching. Undergraduate students contributed to the creation of numerous interactive exercises based on these models, including in-class lessons with physical, 3D printed models and step-by-step exercises on our dedicated website. These models have already been incorporated into classroom instruction, and their efficacy in helping undergraduate students master neuroanatomy will be formally tested in upcoming semesters.

Disclosures: G. Laporta: None. **A.M. Collins:** None. **R.V. Patel:** None. **M. Williams:** None. **J. Witrado:** None. **E.E. Fanselow:** None.

Theme J Poster

TJP03: Teaching of Neuroscience: College I

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP03.12SU/W29

Topic: J.02. Teaching of Neuroscience

Support: Coordination for the Improvement of Higher Education Personnel (CAPES)
National Council for Scientific and Technological Development (CNPq) Grant 312009/2022-4

Title: Neuroscience exposure and its impact on academic self-efficacy in undergraduate education

Authors: *F. E. PADOVAN-NETO[1], A. J. RIBEIRO, Sr.[2], V. SHIROMA[2], J. NOGUEIRA[2]; [1]Univ. of São Paulo, Ribeirao Preto, Brazil; [2]Univ. of São Paulo, Ribeirão Preto, Brazil

Abstract: Academic self-efficacy refers to undergraduates' belief in their abilities to execute the necessary actions to meet academic goals. Higher academic self-efficacy is linked to improved academic performance and positive emotions associated with learning. Studies suggest that academic self-efficacy plays a pivotal role in an undergraduate's development, affecting their integration, retention, and academic success. Research also indicates that understanding general neuroscience concepts can shape perceptions of efficacy and the motivation to overcome challenges and achieve success in the educational setting. Given this background, this study hypothesizes that exposure to neuroscience correlates with elevated levels of academic self-efficacy among undergraduates. Data from 412 undergraduate students were collected through electronic form responses. Participants completed a sociodemographic survey and another questionnaire concerning their prior exposure to neuroscience, evaluating the significance and frequency of their interactions with neuroscientific topics. The Higher Education Self-Efficacy Scale (AEFS) was used to measure perceptions of academic self-efficacy within the context of higher education. Additionally, a survey on neuroscience knowledge was carried out to ascertain

students' familiarity with this subject. The majority of students agree that understanding neuroscience is essential for their careers. They also emphasize the importance of dialogue between students and neuroscientists. Interestingly, a notable portion reported that they had not taken neuroscience courses during their undergraduate studies, did not attend any courses related to the field, or did not receive neuroscientific information from their academic institutions. Those with more comprehensive exposure to neuroscience, including participation in extracurricular courses and specialized disciplines, scored significantly higher on the AEFS and on the general neuroscience knowledge questionnaire compared to those unfamiliar with the neuroscience field. In conclusion, undergraduates clearly recognize the importance of both knowledge of and interaction with the field of neuroscience for their future careers. The results of this study indicate a positive relationship between familiarity with neuroscience and perceptions of academic self-efficacy. Given the crucial role of self-efficacy in academic success, strategies that introduce students to neuroscience could further enhance this perception, potentially boosting academic performance among undergraduates.

Disclosures: F.E. Padovan-Neto: None.

Theme J Poster

TJP03: Teaching of Neuroscience: College I

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP03.13SU/W30

Topic: J.02. Teaching of Neuroscience

Support: Faculty for Undergraduate Neuroscience

Title: The Journal of Undergraduate Neuroscience Education (JUNE): a peer-reviewed, PubMed listed, and open access journal published by the Faculty of Undergraduate Neuroscience

Authors: *E. R. REYNOLDS[1], R. L. RAMOS[2], B. R. JOHNSON[3], I. A. HARRINGTON[4], A. C. NICHOLAS[5], C. F. GAVIN[6], S. SERAPHIN[7];
[1]Lafayette Col., Easton, PA; [2]New York Inst. of Technol. Col. of Osteo. Med., Old Westbury, NY; [3]Neurobio. and Behavior, Cornell Univ. Neurobio. and Behavior, Freeville, NY; [4]Augustana Col., Rock Island, IL; [5]Neurobio. & Behavior, Univ. of California, Irvine, Irvine, CA; [6]Neurobio., Univ. of Alabama, Birmingham, Birmingham, AL; [7]Neurosci., Trinity Col., Hartford, CT

Abstract: The Journal of Undergraduate Neuroscience Education (JUNE; www.funjournal.org) is a peer-reviewed, PubMed-listed, and open-access journal published by the Faculty for Undergraduate Neuroscience (FUN; www.funfaculty.org). First established in 2002, JUNE presents and seeks articles addressing a wide range of topics focusing on innovation and best practices in undergraduate neuroscience education. These include topics around class design such as innovative ideas; student assessment; laboratory exercises using animal models and computer simulations; instructions for production of inexpensive, high-quality lab equipment;

reviews and assessment of media and teaching resources; classroom-based diversity, inclusion, and equity practices; and outreach and service-learning activities. Papers on structural issues such as developing programs and departments, and structural approaches to diversity, inclusion and equity are welcome. Finally, opinion pieces and editorials on issues of general concern for neuroscience education are published. In the late spring JUNE published a special issue on the FUN summer workshop held in July 2023. JUNE seeks submissions in any of the above areas and formats and is especially interested in the changing educational environment, including approaches to inclusive teaching and tools such as generative AI and other technologies. Please visit the JUNE homepage for more details, submission instructions, and free access to JUNE articles.

Disclosures: E.R. Reynolds: None. **R.L. Ramos:** None. **B.R. Johnson:** None. **I.A. Harrington:** None. **A.C. Nicholas:** None. **C.F. Gavin:** None. **S. Seraphin:** None.

Theme J Poster

TJP03: Teaching of Neuroscience: College I

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP03.14SU/W31

Topic: J.02. Teaching of Neuroscience

Support: NIH-NINDS 75N95022R00102

Title: Elevating underrepresented voices in STEM: A comprehensive curriculum's impact on student success and preparedness for summer internships in Puerto Rico

Authors: *M. P. MÉNDEZ-GONZÁLEZ[1], V. LOPEZ-QUILES[2], D. RIVERA[3], E. DIAZ[2]; [1]Natural Sci. Dept., Univ. of Puerto Rico at Aguadilla, Aguadilla, Puerto Rico, Puerto Rico; [2]Univ. of Puerto Rico at Aguadilla, Aguadilla, Puerto Rico; [3]Biochem., Univ. Central del Caribe Sch. of Med., Bayamon, PR

Abstract: In the pursuit of diversifying the scientific landscape, underrepresented students often encounter obstacles in accessing competitive summer internships due to limited exposure to research during their undergraduate studies. Tailored educational initiatives are imperative to equip these students with the essential skills and knowledge necessary for successful participation in such opportunities.
We hypothesize that implementing a neuroscientific focused curriculum within the Scientific Research and Preparatory Program (SRPP) will yield significant enhancements in content knowledge among freshman and sophomore undergraduate students with limited research exposure. The SRPP endeavors to empower underrepresented students within the scientific community through a strategic design tailored to equip them for competitive summer internships in the United States. The curriculum includes components such as Introduction to Research, Biology Exploration with a neuroscience emphasis, Professional Development, College Readiness, and Career Exploration.

A rigorous evaluation methodology assessed both professional resources and student progress, revealing significant increases in content knowledge, particularly during Weeks 2 and 4. Despite variations, the majority of students consistently exhibited heightened knowledge, affirming the curriculum's effectiveness in addressing the identified educational gap.
In conclusion, the implementation of a neuroscientific focused curriculum within the SRPP has proven highly effective in addressing the educational gap faced by underrepresented students in accessing competitive summer internships. Through this initiative, students demonstrated significant enhancements in various critical aspects, including research principles, biology with a neuroscience focus, and professional skills such as communication and networking. Additionally, the curriculum has prepared students for college and career readiness, empowering them to make informed decisions about their future pathways. These findings underscore the importance and efficacy of tailored educational initiatives in equipping underrepresented students for successful participation in the scientific community.

Disclosures: M.P. Méndez-González: None. **V. Lopez-Quiles:** None. **D. Rivera:** None. **E. Diaz:** None.

Theme J Poster

TJP03: Teaching of Neuroscience: College I

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP03.15SU/W32

Topic: J.02. Teaching of Neuroscience

Title: Faculty for Undergraduate Neuroscience: who we are, what we do, and where we are

Authors: *Y. KANG;
Univ. of Houston Downtown, Houston, TX

Abstract: FUN (Faculty for Undergraduate Neuroscience) is a global organization dedicated to advancing neuroscience research and education at the undergraduate level. Since our founding in 1992, our mission has been to expand undergraduate involvement in neuroscience research, share educational innovations, celebrate excellence in teaching, and establish both national and regional networks that support undergraduate neuroscience education, research, and faculty development. To this end, FUN has facilitated numerous initiatives, including the Journal for Undergraduate Neuroscience Education (JUNE), an equipment loan program, travel awards for undergraduates, poster sessions, summer workshops, mentoring networks, and social events. These activities are often conducted in collaboration with partners in the neuroscience industry and other organizations. Our community is diverse and inclusive, comprising individual faculty and pre-faculty from a range of institutions—private liberal arts colleges, community colleges, primarily undergraduate institutions, and research universities—as well as institutional members from neuroscience programs and departments. We invite faculty, pre-faculty, and professionals who are passionate about nurturing the next generation of neuroscientists to explore and join our organization.

Disclosures: Y. Kang: None.

Theme J Poster

TJP03: Teaching of Neuroscience: College I

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP03.16SU/W33

Topic: J.02. Teaching of Neuroscience

Title: Neuroscience at Lake Forest College: A model for student organizations' contributions to academic experience in support of brain awareness all-year-round

Authors: H. KAPOOR, K. DORJI, N. IMOMDODOVA, O. GODEK, L. MONROY, M. VERMA, L. ZAJMI, M. KELLEY, M. A. SCHWALBE, D. MOORE, ***S. K. DEBBURMAN**; Neurosci., Lake Forest Col., Lake Forest, IL

Abstract: As undergraduate neuroscience programs grow nationwide, a common challenge is how multiple academic student organizations (honor societies and others) co-exist and thrive to provide co-curricular support. The Neuroscience Program at Lake Forest College (started in 2009) immediately becoming associated with two such organizations: Synapse, focused on interdisciplinary outreach, in 2009, followed by *Nu Rho Psi (*the National Neuroscience Honor Society) in 2011. Both organizations collaborate with the academic program to raise brain awareness in our larger community, in formal and informal ways, all year round, focused on three goals: ***1) focus on students' career and professional interest development, 2) raise public awareness of urgent issues of neuroscience, and 3) give back to the community.*** We anchor a broad and diversified portfolio of interdisciplinary programming that routinely reaches an annual audience of over 1500, drawing from the college community, local elementary and high school students, and the larger public. Our most formal, concentrated outreach effort is the annual Brain Awareness Week (BAW) held each fall since 2003. Last year, BAW headlined a keynote lecture on how neuroscience can shape issues of climate change and a symposium that featured the scholarship of over 70 undergraduates. We hosted a year-long public seminar series featuring nationally noted speakers that educated the public on anti-racist neuroscience, exercise and the brain, brain-machine interface, equity research in neurodegeneration, and the circadian clock. We annually lead K-6 outreach teaching neuroscience basics to over thirty third-grade children from high-need school districts; impacting over 500 children since 2007. We annually support the national *Nu Rho Psi* education themes with art sculptures, open-mic events, and panels. We volunteer with non-profits providing services to adults with developmental disabilities and we raise money for neurological disorders. Here, we specifically discuss in- and out-of-classroom strategies that strengthened learning and teaching through curricular integration with student organization's activities. Overall, the combined success of both student organizations, with focused complementary goals, have positively strengthened the mission of the academic program, but not without challenges of division of organizational responsibilities and natural ebbs and flows within student leadership. Such student-driven outreach has resulted in a vibrant

student-scholar, service-oriented academic culture that has attracted over 375 students to major in neuroscience, as we complete our 15th year at our institution.

Disclosures: H. Kapoor: None. **L. Monroy:** None. **S.K. Debburman:** None.

Theme J Poster

TJP03: Teaching of Neuroscience: College I

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP03.17SU/W34

Topic: J.02. Teaching of Neuroscience

Title: An open educational resource textbook of neuroscience has the potential to transform undergraduate neuroscience education

Authors: A. HARRIS, *J. HUTCHINS;
Weber State Univ., Ogden, UT

Abstract: Neuroscience sits at the nexus of all four aspects of STEM: science (including biology, chemistry, psychology, and physics); technology (such as the instruments used in the laboratory); engineering (including engineering models in classical neuroscience teaching); and mathematics (for example, the Nernst Equation, the Goldman-Hodgkin-Katz Equation; Fick's First Law; Einstein's drift equation). It is imperative, as we extend STEM education to a broader population, that we are mindful of the social justice and equity aspects of how we deliver neuroscience education. Not all delivery methods have equal impact on learning, and not all delivery methods have an equal impact on students from diverse backgrounds. An open educational resource (OER) is one that is provided at no cost, or extremely low cost, to the student. We propose to create and maintain a high-quality OER textbook of neuroscience with ancillary materials for use in an undergraduate community college, college, or university setting. Instructors will be provided with a textbook, PowerPoints, formative activities, and summative exam questions.
OER materials increase the participation of women in STEM fields (Herman et al., 2018). A large plurality of college students in the US are now members of a minority population (estimated at 42% in 2021: CLASP, 2015). These students are impacted greatly by the cost of textbook materials. Cady (2016), in a study based on a student population at a midsize rural university in Oregon, found that 59% of students at her university were at risk of going hungry. As Cady puts it, "students shouldn't have to choose between books and food." In fact, textbook costs drive up the prevalence of failing grades ("the DFW rate") and can slow or halt student progress towards a degree. To take one example, 63% of college students in a 2019 PIRG study skipped buying a textbook, and 90% worried (correctly) that failing to buy a textbook for class would negatively impact their grade. About 1 in 9 students skipped meals due to the cost of textbook materials (PIRG, 2019). Open educational resources also drive open pedagogy. Open pedagogy is a learner-driven education which helps students contribute to the commonweal of public knowledge. When we use OER, "we aren't just saving a student money on textbooks: we

are directly impacting that student's ability to enroll in, persist through, and successfully complete a course." (Jhangiani & DeRosa, 2017). It is our belief that creation of an OER neuroscience resource will fundamentally transform undergraduate neuroscience education.

Disclosures: A. Harris: None. **J. Hutchins:** None.

Theme J Poster

TJP03: Teaching of Neuroscience: College I

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP03.18SU/W35

Topic: J.02. Teaching of Neuroscience

Support: CETL Scholarship of Teaching Grant, VT

Title: The Brain: An Owner's Manual for College Success

Authors: *J. R. RAINVILLE[1], R. A. DIANA[2];
[1]Sch. of Neurosci., Virginia Technol., Blacksburg, VA; [2]Psychology, Virginia Technol., Blacksburg, VA

Abstract: The COVID-19 pandemic forced students and instructors into distance education. Some students began their college instruction during the midst of the pandemic, and had not had in-person instruction for over a year. Much of the research on COVID-19 and education focused on coping with and adapting to distance learning, but to our knowledge, little research has been done on the transition back to in-person learning. Even before the pandemic, student attainment has been widely examined through a variety of approaches, including Carol Dweck's growth mindset, metacognition, and practice of high-yield study approaches. We posit that there is an untapped approach to bolstering student attainment. Although many interventions point to psychological and neurobiological outcomes related to improved learning outcomes, e.g., neuroplasticity and the growth mindset, to our knowledge, there are no interventions that equip students with both evidence-based tools to studying, along with the neurobiological and psychological mechanisms by which these tools are efficacious. Our intervention focuses on neuroscience and psychology students, who take a variety of STEM and general education courses. Students were given an initial survey to assess their study practices/strategies, metacognition, and growth mindset. Students participated in a series of sessions designed to teach them mechanisms of studying, learning, and performance, both from a neuroscience and psychology perspective. Students were taught several practices, such as self-testing, SMART goals, and attention management. A follow-up survey was administered to the same students at the end of the semester to assess changes in their study practices/strategies, metacognition, and growth mindset. Future follow-up will be conducted to see if the intervention had long-term impacts on any of the intervention measures, as well as course grades and overall GPA.

Disclosures: J.R. Rainville: None. **R.A. Diana:** None.

Theme J Poster

TJP03: Teaching of Neuroscience: College I

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP03.19SU/W36

Topic: J.02. Teaching of Neuroscience

Title: Trading Cards to Introduce the Breadth and Diversity of Neuroscience

Authors: *A. P. SHAH, J. BROWNING, E. T. GILBERT;
Virginia Tech., Blacksburg, VA

Abstract: Arguably, one of the most captivating draws to a scientific field lies in learning about fascinating research discoveries within the field, the people behind the scenes, and the unique approaches and model systems that enabled these discoveries. In order to engage students using this strategy in a large enrollment introductory course, I designed and implemented a group activity that would achieve this goal quickly while requiring limited prior skills in analyzing scientific literature.
Students enrolled in my Introduction to Neuroscience course were assigned a 'Model Organisms Trading Cards' group activity wherein each student group was assigned one of several experimental model organisms, ranging from hydrozoans to humans, to conduct their literature search on. Students were also provided with a trading card template that contained several categories requiring factual information about the assigned organism, such as scientific name, approximate number of neurons, coding genes, etc. Additionally, they were instructed to outline strengths and weaknesses of the model organism for research, cite an example research study, and name a scientist whose lab conducts research using the model organism.
This activity not only introduced students to the breadth and diversity of research questions, topics, and model organisms that are used in neuroscience research but also provided an opportunity to hone important skills. It required students to conduct a literature search to find specific information, evaluate the validity of their sources, and cite these sources. Summarized student feedback revealing the impact this activity had on them will be shared. Additionally, implementation strategies for semester-long assignments that build upon this initial activity, as well as adaptations that can be made by instructors in other STEM fields will be discussed. Finally suggestions for using this activity for science outreach purposes will be offered.

Disclosures: A.P. Shah: None. **J. Browning:** None. **E.T. Gilbert:** None.

Theme J Poster

TJP03: Teaching of Neuroscience: College I

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP03.20SU/W37

Topic: J.02. Teaching of Neuroscience

Title: Introducing community college students to career pathways in neuroscience research

Authors: *R. RAVENELLE[1,2];
[1]Columbia Univ. Irving Med. Ctr., New York, NY; [2]Psychiatry, New York State Psychiatric Institute, New York, NY

Abstract: In recent years there have been efforts to increase participation of underrepresented groups in neuroscience research careers. The Society for Neuroscience has several programs, such as the Neuroscience Scholars Program and Increasing Women in Neuroscience (IWiN), to promote advancement of female and underrepresented neuroscientists, however these target primarily graduate and early career scientists. Major grant funding institutions such as the National Institutes of Health have launched initiatives such as the Enhancing Neuroscience Diversity through Undergraduate Research Educations Experiences (ENDURE) program, but with some exceptions, these types of programs focus primarily on undergraduates at four-year institutions. Community colleges are highly diverse institutions that serve many underrepresented and non-traditional student populations however they are not typically included in neuroscience diversity initiatives. Research has shown that for community college students, informative career exposure and knowledge regarding future job opportunities are important factors in choosing a STEM related major and career (Wang et al., 2020; Zahner 2023). The City University of New York (CUNY) is the nation's largest public urban university system comprised of twenty-five campuses, including seven community colleges. CUNY offers extensive educational and research opportunities in neuroscience at several four-year colleges and the Graduate Center; however, the neurosciences is inadequately represented at the community college level. As a first step in engaging a diverse student population in neuroscience and research-related career paths, 'Meet the Neuroscientists' informational panels will be held on site at community colleges within the CUNY system to inform students of neuroscience-related career options. Panelists will represent a diverse group of researchers from academia and industry. The panel will also include a former CUNY student and/or instructor that can speak to how opportunities at CUNY facilitated pathways to their current professional position. Follow-up surveys (Jotform) of participating students will be used to gauge if the panel influenced interest in neuroscience and STEM majors or careers, desire to transfer to a four-year institution, and interest in engaging with undergraduate research.

Disclosures: R. Ravenelle: None.

Theme J Poster

TJP03: Teaching of Neuroscience: College I

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP03.21SU/W38

Topic: J.02. Teaching of Neuroscience

Support: NIH Grant T32MH020068
NIH Grant P30GM149405
Brown UTRA/SPRINT Program

Title: Developing an Introductory Computational Neuroscience Course

Authors: C. MOYER, B. JI, M. L. LINDEN, ***D. L. SHEINBERG**;
Neurosci., Brown Univ., Providence, RI

Abstract: Computational Neuroscience is a deeply interdisciplinary field incorporating mathematics, neuroscience, philosophy, computer science, engineering, physics, and increasingly advanced machine learning techniques such as convolutional neural networks and transformers. Given the rapid evolution of the field, introductory courses in computational neuroscience must adapt while ensuring equitable access for students from diverse backgrounds and experience levels. This project describes how we designed a new introductory course in computational neuroscience at Brown, as part of a new undergraduate major. We developed this course through a unique collaboration between two undergraduates and two neuroscience faculty members. We outline a process for developing learning objectives along with their corresponding assignments and projects. We also discuss how we incorporated concepts that are key to students' success as computational neuroscientists such as scientific communication, collaboration in a team, and a broader understanding of the ethical implications that their work may entail. Central to this course is the idea of a collaborative project where students can apply the skills they've learned and showcase their development throughout their class. This project also addresses the obstacles in making a course that is accessible while providing students with a proper interdisciplinary survey of the field as it began, where it stands, and where it is going. Our work can be utilized by other institutions looking to develop similar courses in computational neuroscience.

Disclosures: C. Moyer: None. **B. Ji:** None. **M.L. Linden:** None. **D.L. Sheinberg:** None.

Theme J Poster

TJP04: Teaching of Neuroscience: College II

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP04.01SA/X1

Topic: J.02. Teaching of Neuroscience

Title: Transformative potential: Undergraduate peer advising in neuroscience

Authors: *P. M. SIMONE;
Neurosci., Santa Clara Univ., Santa Clara, CA

Abstract: Undergraduate peer advising programs can be pivotal components of higher education, facilitating student development through mentorship and support (e.g., Chan et al.,

2019). This project presents the multifaceted benefits of peer advising, supported by theoretical frameworks and empirical evidence. Cognitive benefits of peer advising are well-documented. Research by Yeager and Walton (2011) underscores the role of social belonging in academic success, indicating that peer advisors, through relatable narratives, foster a sense of inclusion and academic engagement among advisees. Moreover, peer advising programs have been shown to improve academic performance and retention rates by providing personalized guidance tailored to individuals (e.g., Hurtado et al., 2007). Socially, peer advising programs create supportive communities conducive to student well-being by serving the role as empathetic listeners, offering emotional support and fostering a sense of belonging among advisees. We have used peer advisors at a primarily undergraduate university for the past five years and have found a positive correlation between peer advising participation and student satisfaction with the major. Majors who utilized peer advising report feeling well supported academically and emotionally and more personally connected to the major. Furthermore, peer advising offers invaluable leadership opportunities for advisors. By assuming mentorship roles, peer advisors develop communication, interpersonal, and leadership skills essential for professional success and this contributes to their post-graduation success. In conclusion, the undergraduate neuroscience peer advising program has served as a transformative platform for student development fostering cognitive growth, social connectivity, emotional well-being, and leadership skills. By leveraging peer mentorship, institutions can enhance student engagement, retention, and overall collegiate experience.

Disclosures: P.M. Simone: None.

Theme J Poster

TJP04: Teaching of Neuroscience: College II

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP04.02SA/X2

Topic: J.02. Teaching of Neuroscience

Support: Tuition from participating undergraduates

Title: Las neuronas son bacanes interdisciplinary neuroscience in Valparaíso Chile

Authors: *W. GRIESAR[1], J. LEAKE[2];
[1]Northwest Noggin/PSU/OHSU, Astoria, OR; [2]Psychology, Northwest Noggin/Portland State Univ., Portland, OR

Abstract: Nonprofit nwnoggin.org organizes collaboration around interdisciplinary neuroscience, going places to explore brains, hear stories, make art and see where research discoveries can contribute. Portland State University in Portland, OR offers a minor in interdisciplinary neuroscience, where Noggin co-founders Dr. Bill Griesar and Jeff Leake both teach. In 2023, we reached out to artists and STEM colleagues at the Universidad de Valparaíso Chile. Along with the PSU Education Abroad Office and Academic Programs International we created Cerebrarte, the first international, homestay-based STEAM program exploring the rich

art and neuroscience traditions of the Valparaíso region. We brought 17 students and two faculty to Chile from July 27 - August 28, 2023. Through visits to labs and the historic complex at Montemar, we explored how research on the giant axons of Humboldt squid contributed to our understanding of the electrical signaling that links our perceptual and cognitive experiences to the world. We met Dr. Ramón LaTorre and Dr. Juan Saez (members of the National Academy of Sciences), Dr. David Naranjo, Dr. Jesús Olivares, Dr. John Ewer and Dr. Kate Whitlock, and graduate students and postdocs for discussions about olfaction, voltage-gated channels, spider neurons and potential therapeutic compounds in boldo tea. We welcomed Kings College London neuroscientist Dr. Richard Wingate, Editor of brainfacts.org, the outreach arm of Society for Neuroscience, who spoke about his 2023 book, "The Story of the Brain in 10 ½ Cells," with the ½ Cell referencing the giant axon. Valpo is home to exceptional research, and is a celebrated center of public art. Street art was legalized in 1990, and eye-catching murales are everywhere. Students examined art with thiscatcallededdie, explored regional museums, created engravings (grabados), and sewed arpilleras, woven depictions of challenging and sometimes traumatic experiences that allow emotional expression and create durable memories of events with artist Cecilia Araneda. We explored the neuroscience of perception, stress and trauma as it relates to personal experience (including aspects of culture shock), research, art and the 50th year since El Golpe, the US-backed coup that violently overthrew democratically elected President Salvador Allende in 1973. The program culminated in a visit to Ciencia al Tiro, a STEAM outreach nonprofit where we made pipe cleaner brain cells and took them to the streets to speak with residents of Playa Ancha sobre porque las neuronas son bacanes (why neurons are cool). Cerebrarte was an exciting, interdisciplinary, intercultural, international experience, and will occur again in 2025.

Disclosures: W. Griesar: None. **J. Leake:** None.

Theme J Poster

TJP04: Teaching of Neuroscience: College II

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP04.03SA/X3

Topic: J.02. Teaching of Neuroscience

Title: Nu Rho Psi - The National Honor Society in Neuroscience

Authors: *M. KERCHNER[1], T. M. FISCHER[2], B. RICE[3], S. N. CASSELLA[4], A. N. FRICKS-GLEASON[5];
[1]Washington Col., Chestertown, MD; [2]Psychology, Wayne State Univ., Detroit, MI; [3]Slippery Rock Univ., Slippery Rock, PA, ; [4]Neurosci., Loras Col., Dubuque, IA; [5]Dept. of Psychology & Neurosci., Regis Univ., Denver, CO

Abstract: Nu Rho Psi, The National Honor Society in Neuroscience, is a non-profit, grass-roots organization comprised of neuroscientists at all stages of their careers. With more than 12,500 members, representing 115 chapters in 32 States and the nation's capital, Nu Rho Psi is a

dynamic organization that aims to support the professional growth of its members. Most members are invited to join Nu Rho Psi during their undergraduate training, but qualified graduate students, faculty, and alumni are also welcome to join. Membership in Nu Rho Psi is granted exclusively through local Nu Rho Psi chapters. Nu Rho Psi has become a vibrant contributor to the neuroscience community through: (1) encouragement of professional interest and excellence in neuroscience, (2) recognition of outstanding scholarship, (3) advancement of the discipline of neuroscience, (4) encouragement of intellectual and social interaction between students, faculty, and professionals, (5) promotion of career development in neuroscience and related fields, (6) increased public awareness of neuroscience and its benefits for society, and (7) encouragement of service to the community. Nu Rho Psi goes beyond providing recognition of excellence in neuroscience scholarship and research. We offer our members a variety of grants and awards including competitive research grants to facilitate senior theses or other scholarly projects. Our chapters may apply for Nu Rho Psi Chapter Activity Grants to promote their educational and community outreach initiatives, including those that address our annual theme. The 2024-25 theme is *Social Media and The Brain***.** Members are also eligible for Nu Rho Psi travel grants to present their original research at the annual Society for Neuroscience meeting. Schools wishing to foster a chapter of Nu Rho Psi may contact the National Office located at Washington College (nurhopsi@washcoll.edu). Information regarding the charter application process may be found on our web page: https://nurhopsi.org.

Disclosures: M. Kerchner: None. **T.M. Fischer:** None. **B. Rice:** None. **S.N. Cassella:** None. **A.N. Fricks-Gleason:** None.

Theme J Poster

TJP04: Teaching of Neuroscience: College II

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP04.04SA/X4

Topic: J.02. Teaching of Neuroscience

Support: NSF Grant 2332375
University of Vermont, Biology Department

Title: Giving students a "taste" for research: using fruit fly chemosensation in a course-based undergraduate research experience (CURE)

Authors: *M. STANLEY;
Univ. of Vermont, Burlington, VT

Abstract: Course-based undergraduate research experiences (CUREs) are becoming an increasingly popular way to incorporate larger numbers of students into research while also enhancing the research productivity of faculty. Here, I share my approach as a new faculty member working to integrate my teaching and research activities through a new CURE in the undergraduate neuroscience and biology programs at the University of Vermont. My research

program uses the fruit fly, *Drosophila melanogaster*, as a model organism to study the neurobiology of chemosensation which is a topic that is extremely approachable to students (we all understand using taste and smell to eat). Yet the genetic tools available in this organism allow students to perform cutting-edge neurobiology experiments. This 4-credit-hour advanced genetics lab focused on understanding the molecular and cellular mechanisms behind one class of chemical detection, amino acids. All twelve students performed the same simple behavioral experiments to quantify amino acid taste and feeding but in different genotypes, as each student investigated a set of candidate sensory neurons or chemosensory receptors using genetically modified flies in semi-independent projects. Together, we discovered new information about the combinatorial mechanisms for amino acid taste encoding that were shared at a student research conference and will soon be submitted for publication with students as co-authors. Course assessments centered around learning to think, communicate, and perform like scientists (Delventhal and Steinhauer, 2020) and surveys were given at the start and end of the semester to compare students' self-reported confidence in these areas. Results from the first two semesters of this CURE show considerable improvements in these areas with students overwhelmingly reporting that this course increased their interest in a career in science. I also discuss the practical considerations for implementing this type of CURE and give examples of how to adapt this CURE for a single lab in a lower-level course. Overall, the outcomes of this CURE provide further support that this model benefits students, faculty, and the field of neuroscience.

Disclosures: M. Stanley: None.

Theme J Poster

TJP04: Teaching of Neuroscience: College II

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP04.05SA/X5

Topic: J.02. Teaching of Neuroscience

Title: Teaching Neurohistology and Inferential Statistics Through Case-Based Learning

Authors: *B. FRY;
Burnett Sch. of Biomed. Sci., Univ. of Central Florida, Orlando, FL

Abstract: ZOO4753C (Human Histology) is a designated research-intensive laboratory course in the Burnett School of Biomedical Sciences at the University of Central Florida. While the course has previously focused on whole body histology as relevant to pre-med students, I recently piloted a redesigned form which focused on immunohistological techniques and statistical analysis used in contemporary neuroscience research. In my course, students learned to section tissue via freezing microtome, orient themselves to brain regions viewed in-situ, operate a fluorescent microscope, and perform Nissl stains as well as a variety of immunofluorescence analyses for proteins of interest. The use of brains from a murine model of Huntington's Disease (Q175FDN) allowed for a case-based design to the course in which modules focused on utilizing the various techniques to uncover differences between the transgenic and wild-type mice. At the

end of the course, students were expected to carry out their own independent research project using the mouse model, complete with specific aims, publication quality photomicrographs, inferential statistical analysis, and all sections required of a typical APA style publication. In this poster, I will present a breakdown of the costs associated with running the course, assessment rubrics, and modules. I will discuss which activities worked well in the classroom setting and which did not (including suggestions for how to make certain histological protocols function on a shortened timeline), as well as provide some example data collected by my students for their independent projects. Finally, I will present data regarding student attitudes and outcomes in the course.

Disclosures: B. Fry: None.

Theme J Poster

TJP04: Teaching of Neuroscience: College II

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP04.06SA/X6

Topic: J.02. Teaching of Neuroscience

Support: Hope for Depression Research Foundation
NIDA 5U01DA043098
Office of Naval Research (ONR) N00014-19-1-2149
The Pritzker Neuropsychiatric Disorders Research Consortium
Grinnell College Center for Careers, Life, and Service
University of Michigan Undergraduate Research Opportunities Program

Title: The Brain Data Alchemy Project, year 3: Public release of a pipeline for teaching research reproducibility and discovery science while mining gold from archived genomics data

Authors: D. NGUYEN[1], *M. HAGENAUER[2], T. DUAN[1], E. I. FLANDREAU[3], C. RHOADS[4], J. XIONG[1], A. BADER[1], T. M. GYLES[5], B. W. HUGHES[7], C. MCLAIN[8], E. GEOGHEGAN[9], A. DROZMAN[10], M. R. BHUIYAN[2], S. ESPINOZA[11], A. LEWIS[12], S. MENSCH[2], L. CHENNUPATI[13], E. J. NESTLER[6], S. J. WATSON[14], H. AKIL[2];
[1]Grinnell Col., Grinnell, IA; [2]Univ. of Michigan, Ann Arbor, MI; [3]Psychology Dept., GVSU, Allendale, MI; [4]NIMH, Bethesda, MD; [5]Friedman Brain Inst., [6]Neurosci., Icahn Sch. of Med. At Mount Sinai, New York, NY; [7]Icahn Sch. of Med. at Mount Sinai, New York, SC; [8]Icahn Sch. of Med. At Mount Sinai Grad. Training Program In Neurosci., New York, NY; [9]Columbia Univ., New York, NY; [10]Duke Univ., Durham, NC; [11]Grand Rapids Community Col., Grand Rapids, MI; [12]Univ. of Detroit Mercy, Detroit, MI; [13]Grand Valley State Univ., Allendale, MI; [14]MNI, Michigan Neurosci. Inst., Ann Arbor, MI

Abstract: During the past decade, the landscape of neuroscience research has undergone two major transformations in the way that data are collected, analyzed, and interpreted. First, there has been an intensive push to reform scientific practices to improve research reproducibility.

Second, accelerated growth in computing power and ‘omics knowledge has led to a blossoming of "discovery science". In this new landscape, trainees need to acquire skills that are not included in traditional curriculum.
We have addressed this need by creating an intensive summer program that provides direct, hands-on experience with experimental design and statistical issues related to research reproducibility and discovery science. During the program, trainees conduct a systematic meta-analysis focused on a chosen neuroscience topic using a burgeoning trove of publicly available transcriptional profiling datasets (>15,000 microarray and RNA-Seq datasets).
We successfully piloted the program in 2022 (n=6 trainees), 2023 (n=5 trainees), and 2024 (n=8 trainees). Across a single summer session of 9-10 weeks, participants learned R coding, literature survey, and completed comprehensive genomics meta-analyses capable of serving as either preliminary data for grants or small-scale publications The topics chosen by the trainees for their meta-analyses were diverse, spanning areas such as antidepressant usage, cocaine exposure, chronic stress, and glioblastoma. Each of the meta-analyses revealed a set of differentially expressed genes that can shed light on neuropsychiatric or neurological disorders.
Following three successful pilots, we have standardized the curriculum and meta-analysis pipeline, making them publicly available. For the curriculum, we have provided a week-by-week overview of the activities, readings, and resources used to guide the summer research projects. For the projects, we have registered the meta-analysis pipeline on Protocols.io and Github in a manner that can be easily referenced, reproduced, or adapted, including templates for pre-registering the projects within the Open Science Framework (OSF.io), creating PRISMA diagrams for search terms and inclusion/exclusion procedures, and standardized reporting of results.
In our poster, we will provide a tour of these publicly-available materials as well as a detailed example of a meta-analysis project following our pipeline from beginning to end.

Disclosures: D. Nguyen: None. **M. Hagenauer:** None. **T. Duan:** None. **E.I. Flandreau:** None. **C. Rhoads:** None. **J. Xiong:** None. **A. Bader:** None. **T.M. Gyles:** None. **B.W. Hughes:** None. **C. Mclain:** None. **E. Geoghegan:** None. **A. Drozman:** None. **M.R. Bhuiyan:** None. **S. Espinoza:** None. **A. Lewis:** None. **S. Mensch:** None. **L. Chennupati:** None. **E.J. Nestler:** None. **S.J. Watson:** None. **H. Akil:** None.

Theme J Poster

TJP04: Teaching of Neuroscience: College II

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP04.07SA/X7

Topic: J.02. Teaching of Neuroscience

Title: Influence of first-generation status on student metacognition and academic performance in undergraduate biology education

Authors: *J. LIU, A. C. NICHOLAS;
Neurobio. and Behavior, Univ. of California, Irvine, Irvine, CA

Abstract: First-generation (FG) college students are less prepared for what to expect in college coursework, and therefore may struggle with academic performance and confidence. Alignment of a student's confidence with performance reflects their metacognition, or awareness of what one knows. The intention of this design is to elucidate whether FG students exhibit different metacognitive patterns of confidence in their knowledge relative to non-FG students. Little is known about how FG status informs confidence in academic performance relative to non-FG students. Previous studies analyzed student confidence levels using pre- and post-exam surveys about overall exam performance, revealing lower confidence and academic performance for FG students. Our novel study evaluates confidence relative to individual exam questions categorized by Bloom's taxonomy to investigate the impact of FG college student status on metacognition, confidence, and academic performance in undergraduate neuroscience education. The research sample includes FG and non-FG undergraduate students (49% FG) enrolled in an introductory neuropharmacology class. Students self-reported confidence levels following each of fifty multiple choice exam questions graded for accuracy. Exam questions were stratified by levels of Bloom's taxonomy: Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation. Metacognition was evaluated as the absolute difference between accuracy and confidence, termed "Judgment Inaccuracy" (JI). Individual student abilities to predict their accuracy based on confidence in their answers were quantified by JI. Student data was evaluated by ordinal logistic regression analysis to compare the relationship between student confidence and accuracy, while independent t tests were used to compare means for FG and non-FG measures of confidence, accuracy, and JI per Bloom's levels. Initial findings demonstrated a strong association between confidence and accuracy, independent of Bloom's level and FG status ($p < 0.0001$). Preliminary analysis indicated no significant differences between FG and non-FG students in accuracy, confidence, and JI across all levels of Bloom's taxonomy. Future studies will consider comparisons of additional demographic characteristics such as gender and ethnicity with a more homogenous distribution of exam questions across Bloom's taxonomy.

Disclosures: J. Liu: None. **A.C. Nicholas:** None.

Theme J Poster

TJP04: Teaching of Neuroscience: College II

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP04.08SA/X8

Topic: J.02. Teaching of Neuroscience

Title: A multidisciplinary approach to undergraduate neuroscience education

Authors: *S. C. SPANSWICK[1], N. CHIBRY[2], C. FLYNN[3];
[1]Psychology, [3]Dept of Biol. Sci., [2]Univ. of Calgary, Calgary, AB, Canada

Abstract: Neuroscience is an increasingly popular area of study for undergraduate students. As such, many post-secondary institutions are tasked with developing and maintaining neuroscience curricula. How best to provide undergraduate students with a meaningful pedagogical experience

during their degree progression is often a topic of discussion. Here we describe and present data regarding a multidisciplinary, research-focused undergraduate neuroscience program at the University of Calgary. The program represents a collaborative effort across the faculties of Art, Science, and Medicine, with the aim of affording students a variety of experiential learning opportunities throughout their degree. Our multidisciplinary approach means that students receive a broad background in neuroscience, as well as the ability to specialize in one of several topic areas, including concentrations in clinical neuroscience, physiological behavioral neuroscience, and computational neuroscience (coming soon). Importantly, our students are exposed to hands-on learning early in the program. We offer funding for summer research positions, as well as several laboratory-based courses that include neurophysiology, histology, and behavioral neuroscience. The program is scaffolded such that by the time students graduate they have had multiple opportunities to work in laboratories, collect and analyze data, and disseminate their results at conferences. We are currently poised to expand our program with the addition of a new multidisciplinary science hub building. The facility will house research scientists from several departments, as well as laboratory and educational space, all of which will be available to our undergraduates.

Disclosures: S.C. Spanswick: None. **N. Chibry:** None. **C. Flynn:** None.

Theme J Poster

TJP04: Teaching of Neuroscience: College II

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP04.09SA/X9

Topic: J.02. Teaching of Neuroscience

Title: Peer Mentoring: A Catalyst for Successful Academic, Social, and Emotional Transitions in Undergraduate Neuroscience Education

Authors: *P. L. QUIRK;
Biomed. Sci., Colorado State Univ., Fort Collins, CO

Abstract: Transitioning into university life poses multifaceted challenges for all undergraduate students in specialized fields such as neuroscience and it is particularly challenging for those coming from underserved populations. To address these challenges and facilitate a smoother transition, we implemented a peer mentoring program within our undergraduate neuroscience program. Over four years, we systematically evaluated the program's effectiveness in aiding students' academic, social, and emotional adaptation to university life.Our study surveyed participants across cohorts, examining their experiences and perceptions of the peer mentoring program. Results indicated significant positive impacts across various dimensions. Academically, mentees reported higher levels of engagement with coursework, increased confidence in navigating academic challenges, and greater satisfaction with their academic progress. Socially, mentees exhibited enhanced integration into the university community, fostering meaningful connections with peers and faculty members. Emotionally, mentees

reported reduced feelings of stress and isolation, citing the supportive mentorship as a crucial source of encouragement and guidance.Furthermore, qualitative analysis of mentee testimonials revealed profound insights into the transformative nature of peer mentoring. Mentees expressed gratitude for the personalized support and mentorship they received, emphasizing its instrumental role in their personal and professional growth. Mentors, in turn, articulated a sense of fulfillment in their roles, noting the reciprocal benefits of mentorship in fostering leadership skills and a deeper understanding of their discipline.These findings underscore the critical importance of peer mentoring programs in facilitating successful transitions into university life, particularly in specialized academic domains like neuroscience. By providing tailored support, fostering community engagement, and nurturing emotional well-being, peer mentoring emerges as a powerful tool in enhancing the undergraduate experience. As we continue to refine and expand our program, we advocate for the broader adoption of peer mentoring initiatives to promote holistic student success in higher education.

Disclosures: P.L. Quirk: None.

Theme J Poster

TJP04: Teaching of Neuroscience: College II

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP04.10SA/X10

Topic: J.02. Teaching of Neuroscience

Support: Brown University Undergraduate Teaching and Research Award

Title: Equitable incorporation of active learning and standards-based assessments into a large, “ungraded” undergraduate neuroscience course

Authors: Y. E. JEONG, ***M. L. LINDEN**;
Brown Univ., Providence, RI

Abstract: Creating equitable learning environments in neuroscience classrooms can be challenging, particularly in large-enrollment courses. Adding active learning to the classroom is a known intervention to help narrow the achievement gap for students from backgrounds underrepresented in STEM. Additionally, standards-based grading practices promote equity in the classroom. In 2021, an “ungrading” (pass/no record) system including the option to review and resubmit in-class assessments was implemented in a large-enrollment neuroscience course required for neuroscience majors. These changes were well-liked by students, perceived as less stressful and preferable to an A/B/C grading scale, and helped students meet course learning objectives. However, racial and gender disparities still existed in the course. In an attempt to address these disparities, team-based in-class problem solving was added to the course in 2023. We also added a standards-based grading approach, where students who met a threshold number of course learning objectives passed the class. Students were given multiple opportunities to meet each learning objective. At the end of the semester, we administered an in-class survey,

using a five-point Likert scale, to determine students' perceptions of the course format and their own learning. We also collected student demographic information. Overall, students found that group problem solving facilitated their learning. Additionally, data from 2021 and 2022 had indicated that male students perceived higher confidence and higher levels of preparation than female students. The course modifications appear to have ameliorated those differences. In terms of course performance, both male and female students met (93.4% vs 94.4%) and exceeded (60.0% vs 58.6%) a similar percentage of learning objectives. Similarly, Black and non-Black students met a similar percentage of course learning objectives (93.8% vs 94.6%). However, Black students exceeded fewer learning objectives than their non-Black peers (51.4% vs 60.9%). This suggests that our changes to the course led to mostly equitable outcomes for our students, preparing students with different identities for future neuroscience coursework. Future iterations of this course can focus on further minimizing remaining disparities.

Disclosures: Y.E. Jeong: None. **M.L. Linden:** None.

Theme J Poster

TJP04: Teaching of Neuroscience: College II

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP04.11SA/X11

Topic: J.02. Teaching of Neuroscience

Support: R25NS115532
College of Medicine
Neuroscience Graduate Program

Title: Building and Maintaining a Diverse Neuroscience Workforce through RISE UP: A Summer Undergraduate Research Training Program at the University of Cincinnati

Authors: *M. B. SOLOMON[1], T. M. REYES[2];
[1]Psychiatry and Behavioral Neurosci., Univ. of Cincinnati, Cincinnati, OH; [2]Pharmacol. and Systems Physiol., Univ. of Cincinnati, Col. of Med., Cincinnati, OH

Abstract: Undergraduate students underrepresented in the sciences may face additional barriers in pursuit of a neuroscience doctoral degree that are not addressed by conventional summer undergraduate research programs. To address this need, we created the Research Innovation in NeuroScience Education for Underserved Populations (RISE UP) summer research program. Our goal is to provide a unique learning experience to inspire undergraduates to pursue a career in neuroscience. Here, we review data from the first three years of our R25-funded summer program. Through targeted recruitment efforts, we have accepted 39 RISE UP scholars from across the United States. To date, 82% of our participants are from historically underrepresented backgrounds (e.g., first-generation, financially underprivileged, underrepresented racial/ethnic groups), meeting our recruitment goal of 80%. We supplemented our RISE UP scholars' research training with weekly workshops to (1) increase their preparedness for graduate school

and (2) address socioemotional issues (e.g., stress resilience) to reduce potential barriers when pursuing a doctoral degree. All scholars successfully completed the program and presented their research findings at our Capstone event. At the end of the program, students were given an anonymous survey to rate the program's effectiveness with a rating of 1 being poor to 10 being best. Students rated their overall experience (mean +/- SD; 9.4 (0.8)) and weekly workshops and seminars (8.5 (1.5)) as positive. They also were likely to recommend the RISE UP program to other students (9.8 (0.4)) and were likely to apply to our Neuroscience Graduate Program (8.8 (1.7). However, during the first two years, they noted the need for additional social outings. To tackle this issue, two neuroscience PhD students will coordinate additional social outings for our RISE UP scholars. Moving forward, we will include new programs to address the growing needs of our targeted demographic (e.g., financial literacy, mental health) and will monitor their placement (e.g., graduate school) beyond the program. Finally, we will expand recruiting efforts to more rural areas (e.g., Appalachia). Given the difficulty in retaining students from underrepresented backgrounds in the biomedical research pipeline, programs like RISE UP are critical to augment student interest in pursuing a career in neuroscience and to address unique challenges that may hinder their pursuit of this goal.

Disclosures: M.B. Solomon: None. **T.M. Reyes:** None.

Theme J Poster

TJP04: Teaching of Neuroscience: College II

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP04.12SA/X12

Topic: J.02. Teaching of Neuroscience

Support: NINDS Grant R25NS117365
Simons Foundation Educational Grant 675866

Title: Student learning outcomes and student perceptions from coursework in the BS/MS Program in Neuroscience

Authors: *M. BENVENISTE[1], T. TAN[2];
[1]Neurosci. Inst., Morehouse Sch. of Med., Atlanta, GA; [2]Neurobio., Harvard Med. Sch., Boston, MA

Abstract: The main objective of the BS/MS Program in Neuroscience at Morehouse School of Medicine (MSM) is to interest top-tier STEM students from surrounding undergraduate institutions in neuroscience research in the long-term aim of diversifying the field. Students from Morehouse College, Spelman College and Clark Atlanta University enter as Juniors and complete a rigorous graduate-level neuroscience coursework curriculum and thesis-driven research leading to a Master in Neuroscience degree, 1 year after graduating from their undergraduate institution. Coursework focuses on practicing skills of experimental design, data analysis and data interpretation. In addition, we have built a year long module to reinforce

quantitative thinking and analysis though simulations and Python programming. This culminates in a week-long quantitative bootcamp jointly taught by MSM and Harvard Medical School (HMS) faculty in which BS/MS and PiNBAC (HMS Neuroscience post-bac program) students participate together. Student selection for the program is done after completion of the first core neuroscience course, giving both instructors and students ample time to evaluate each other. Recruitment data indicates an upward trend until the Covid pandemic, with interest once again building in the past 2 years. In order to evaluate success in coursework of our first two flagship neuroscience core courses which focus on the skills mentioned above, we have evaluated outcomes in two ways: 1) we have characterized exam results in both courses quantitatively based on 4 student learning outcomes (SLOs) of our program; and 2) we have queried student perceptions of coursework in post-course evaluations. Trends indicate an approximate 25% increase in the data analysis and interpretation SLO and an approximate 10% increase in the experimental design SLO between the first and second course. This probably results from student selection which occurs between the first and second course as well as acquisition and practice of these SLO skills. Students also self-assessed their study habits and course difficulty. Interestingly, there was no correlation between final grades and time per week studying, nor was there a correlation between final grade and days ahead study preparation for an exam. Ultimate outcome of student success in the BS/MS Program in Neuroscience would result from post-program placement and eventual career. To date, 35% of participants entered or completed medical school and 30% are involved in research or started PhD studies. Limited evidence also indicates that some medical school graduates have taken advantage of research opportunities after medical school.

Disclosures: M. Benveniste: None. **T. Tan:** None.

Theme J Poster

TJP04: Teaching of Neuroscience: College II

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP04.13SA/X13

Topic: J.02. Teaching of Neuroscience

Support: NSF 2216386 to PK,SK, & WG

Title: A for effort? what do grades really measure?

Authors: *W. GRISHAM, J. WONG, C. MASSEY, P. KELLMAN;
Psychology, UCLA, Los Angeles, CA

Abstract: As instructors reflect upon grades across a term, their high degree of correlation on various assignments is notable, and perhaps disturbing. This correlation should make instructors pause and wonder what grades really measure. One possibility that looms large is differential preparedness. We were in a position to discern if differential preparedness could be a factor in determining grades on a neuroanatomy unit in a Psychobio lab course. A subgroup of our

students were Neuroscience majors (n = 24) who had taken a prior course in neuroanatomy and were much better prepared, whereas the rest were Psychobio majors (n = 103) who had only limited exposure. To assess the efficacy of our instruction to these two different populations, we focused on the material presented in the first week of the unit. Scores were obtained from an online multiple-choice pre-test, a posttest immediately after the week 1 lab experience, and a two-week delayed posttest, as well as open answer scores from the summative evaluation of the first week material and all three weeks of the neuroanatomy unit.
Neuroscience majors showed an overall superior accuracy relative to Psychobio majors, $F(1,121) = 16.83$, $p < 0.001$, $\eta^2 = 0.012$: pretest Neuroscience majors = 47%, Psychobio, = 28%, which is near chance. However, there was a significant interaction between the various assessments and major, $F(4,484) = 8.819$, $p < 0.001$, $\eta^2 = 0.065$--the differential performance diminished across sequential online assessments. As both groups increased their accuracy, the gap between them closed, ultimately revealing no significant difference between the two groups by the delayed posttest: Neuroscience = 74%, Psychobio = 65%. Also, neither group differed on the week 1 material or the entire summative assessment (Holm test, $p = 1.00$): on both week 1 and entire summative measures Neuroscience = 82%, Psychobio, = 77%. The obvious conclusion is that the effort of the Psychobio majors allowed them to catch-up to the Neuroscience majors. Our samples are well-matched, which helps reinforce our conclusion that differential preparedness ALONE does not give an advantage. Our sameness of samples, however, undermines our external validity. A very large portion of our students come from comfortable backgrounds and are highly selected to succeed in a major university. They were almost all seniors, so self-selection has mostly occurred by this point. Although we can question the effect of differential preparedness alone, differential preparedness in combination with other demographic factors could have different outcomes.

Disclosures: W. Grisham: None. **J. Wong:** None. **C. Massey:** None. **P. Kellman:** None.

Theme J Poster

TJP04: Teaching of Neuroscience: College II

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP04.14SA/X14

Topic: J.02. Teaching of Neuroscience

Title: A novel practical class for third year neuropharmacology students using crickets as a model system to demonstrate the pharmacological actions of central nervous system (CNS) active drugs

Authors: *N. JONES[1], J. E. CARLAND[2], G. HANNA[3], B. DANIEL[4], N. N. KUMAR[5]; [1]Sch. of Biomed. Sci., Univ. of New South Wales, Kensington, Australia; [2]Clin. Pharmacol. and Toxicology, St Vincent's Hosp., Sydney; UNSW Sydney, Sydney, Australia; [3]UNSW, Sydney, Australia; [4]Med. & Hlth., UNSW, Sydney, Australia; [5]Pharmacol., UNSW, Sydney, Australia

Abstract: Introduction. The domestic cricket (*acheta domesticus*) is an invertebrate organism that can be used to investigate neurobiology, physiology and behavior (Stevenson et al. 2000). Crickets use many of the same neurotransmitter systems as mammals, allowing their use as a model organism to teach pharmacological principles of drug action in an *in vivo* system. Locomotor activity in crickets is easily observable in a lab environment by naïve experimenters. We developed a practical class to provide students with hands-on experience at determining the actions of three central nervous system (CNS) active drugs in crickets (nicotine, caffeine and ethanol). Aims. To employ an invertebrate model (crickets) to demonstrate pharmacological action of CNS active drugs in an *in vivo* system to enhance student learning and engagement. Methods. Adult crickets of both sexes were used. Each student group (4-5 students) was provided with 4 crickets for the experiment. Baseline locomotor activity (time moving in the horizontal and vertical plane) of each cricket was measured for 15 minutes before intra-abdominal injection (20µl) of drug (water (control), nicotine (0.1 mg/ml), caffeine (50µM) or alcohol (30% w/v solution)). Locomotor activity of each cricket was then measured for a further 15 minutes. Student groups then graphed their data and answered questions about the generated data and drug mechanisms. A subsequent class in which students identified an unknown monoamine drug using pharmacological tools was also developed. Results. In the course feedback (2021, 2022), many students identified some of the "best features of the course" as the hands-on aspects of these cricket practical classes. Some of the experimental results were unexpected, which prompted interesting class discussions and helped to enhance student understanding of drug mechanisms in relation to the experimental data. This was evident in student responses to an exam question on this material. Discussion. This innovative new practical class allowed students to advance their lab skills using an invertebrate model to examine the *in vivo* effects of various CNS active drugs in a 3-hour practical class. This approach is readily adaptable to showcase behavioral responses to many different classes of CNS drugs.References. Stevenson AP, et al (2000) Journal of Neurobiology 43, 107-120.

Disclosures: N. Jones: None. **J.E. Carland:** None. **G. Hanna:** None. **B. Daniel:** None. **N.N. Kumar:** None.

Theme J Poster

TJP04: Teaching of Neuroscience: College II

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP04.15SA/X15

Topic: J.02. Teaching of Neuroscience

Support: Dana Foundation

Title: A Pilot Summer Undergraduate Research Experience in Neuroscience and Society: The Leadership Alliance Dana Neuroscience & Society Scholars Program

Authors: *K. WEBSTER[1], A. M. BROWN[4], A. R. KAMKWALALA[4], J. INDORF[2], C. E. SPEARIN[3], D. PIGGOTT[5], T. BINGHAM-HICKMAN[2];

[1]Carney Inst. for Brain Sci., [2]The Leadership Alliance, [3]Sociology, Brown Univ., Providence, RI; [4]Neurol. and Neurosci., Johns Hopkins Univ. Sch. of Med., Baltimore, MD; [5]Johns Hopkins Univ., Baltimore, MD

Abstract: The field of neuroscience has the potential to impact society on countless issues, from addressing addiction to protecting the environment, yet the field will not be able to achieve that potential until scientists from diverse backgrounds are fully included. Unfortunately, the demographics of PhDs in neuroscience does not yet reflect the population of the United States. The underrepresentation of scientists from many racial and ethnic backgrounds, such as Hispanic or Latine, American Indian or Alaska Native, and Black or African American, is broadly documented and tends to be amplified as people move through the scientific training pipeline. Only 13% of doctorates awarded to US citizens in 2019 and 2020 in the fields of neuroscience or neurobiology were awarded to persons from historically underrepresented racial and ethnic backgrounds. Ensuring that diverse perspectives are included can enable the field of neuroscience to engage deeply into societal dilemmas and discover creative and interdisciplinary solutions.

To accomplish these goals, we designed an innovative program that adopts The Leadership Alliance's (TLA) mentorship support model for undergraduate students from Minority-Serving Institutions, Historically Black Colleges and Universities, and tribal colleges with a specific research focus at the interface of Neuroscience and Society. The TLA Dana Neuroscience and Society Scholars Program uses a sustained mentoring model that supports a comprehensive system of exportable programs and resources in order to increase the number of underrepresented students pursuing research careers in neuroscience. Our objectives are to: (i) provide a nine-week research experience at the interface of Neuroscience and Society for undergraduate researchers, including those from underrepresented backgrounds; and (ii) provide the professional development training and network to support their successful pursuit and transition into graduate school with interdisciplinary focus at the intersection of Neuroscience and other academic disciplines.

We will leverage TLA's existing infrastructure and programming to create a cohort for students from our HBCU and MSIs partners specifically conducting interdisciplinary research that brings together Neuroscience with another non-natural science field, such as (but not limited to) Public Health, AI, Economics, and Ethics. Through this, we hope to inspire students to pursue interdisciplinary research at the intersection of Neuroscience and Society at the graduate level.

Disclosures: K. Webster: None. **A.M. Brown:** None. **A.R. Kamkwalala:** None. **J. Indorf:** None. **C.E. Spearin:** None. **D. Piggott:** None. **T. Bingham-Hickman:** None.

Theme J Poster

TJP04: Teaching of Neuroscience: College II

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP04.16SA/X16

Topic: J.02. Teaching of Neuroscience

Title: A novel rat model of sudden social withdrawal (experienced universally during the COVID pandemic) offers inclusive opportunities for behavioral and neurophysiological investigation by early stage college students that are experimentally accessible and diverse

Authors: *N. SPAGNA[1], A. S. YOUSO[1], D. S. KREISS[1,2];
[1]Binghamton Univ., Binghamton, NY; [2]Binghamton University First-year Research Immersion Program, Binghamton, NY

Abstract: The experience (shared by all during the COVID pandemic) of a sudden withdrawal from social interaction has effects upon cognitive/mental health in ways that are not yet fully understood. A novel rat model was developed to reflect the behavioral and neurophysiological changes incurred by sudden removal of high social enrichment during adolescence. For 5 weeks, juvenile rats were pair-housed in larger cages with multiple toys and underwent extra handling & 20-min playdates with 13 same sex rats. Afterwards, baseline scores were obtained for rearing, grooming, nose poking in a hole-board, time in the center of an open field, arm entry in an elevated plus maze, arm alternation in a T-maze, and novel object/place exploration (Trial 1). For the following 4 weeks, Control rats continued to experience high social enrichment, whereas Experimental rats were transitioned to standard enrichment with smaller cages, minimal handling, and no playdates. Behaviors were re-evaluated (Trial 2). Levels of norepinephrine (NE), serotonin (5-HT), and dopamine (DA) in post-mortem tissue from structures of cortico-basal ganglia-thalamic circuits were analyzed. Results from student projects demonstrate that response to reduction of social enrichment is markedly influenced by Sex. For example (Figure 1), reduction of high social enrichment decreased time spent in open arms by males, but not by females. Reduction of high enrichment increased NE levels in the hypothalamus and 5-HT levels in the dorsal striatum in males, but decreased the levels in females. This novel model offers an experimental paradigm with numerous advantages: wide-ranging usefulness for behavioral and/or neurophysiological projects; utilization of inexpensive and experimentally accessible methodology appropriate for first/second year students; application to topics directly relatable to students of all backgrounds; and potential to obtain results with translational value for better understanding of how psychiatric conditions are impacted by sudden social deprivation.

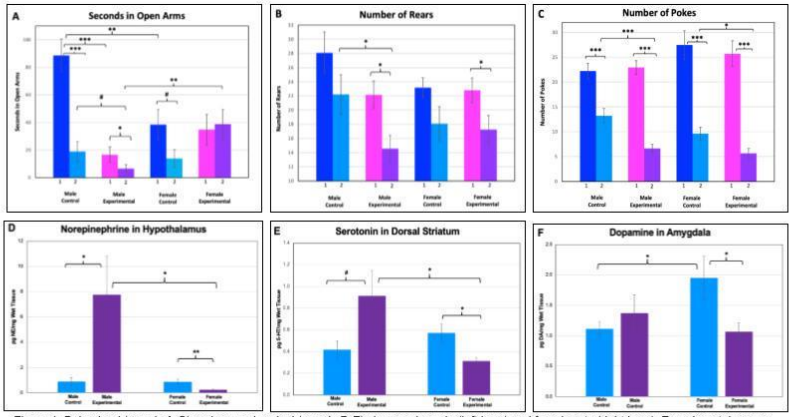


Figure 1: Behavioral (panels A-C) and neurochemical (panels D-F) changes in male (left bars) and female rats (right bars). Experimental groups (n=14) experienced high social enrichment for 5 weeks followed by 4 weeks of standard enrichment. Control groups (n=14) experienced continued high social enrichment. The number of seconds spent in the open arms (panel A), the number of rears (panel B), and the number of pokes (panel C) were observed over 5 minutes during Week 6 (Trial 1) and during Week 10 (Trial 2). Post-mortem levels of norepinephrine in the hypothalamus (panel D), of serotonin in the dorsal striatum (panel E), and of dopamine in the amygdala (panel F) were analyzed via high performance liquid chromatography. Bars represent mean ± S.E.M. Data ± 2 standard deviations from the mean were identified as outliers and removed. # 0.05<p<0.08; * p<0.05; ** p<0.01

Disclosures: N. Spagna: None. **A.S. Youso:** None. **D.S. Kreiss:** None.

Theme J Poster

TJP04: Teaching of Neuroscience: College II

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP04.17SA/X17

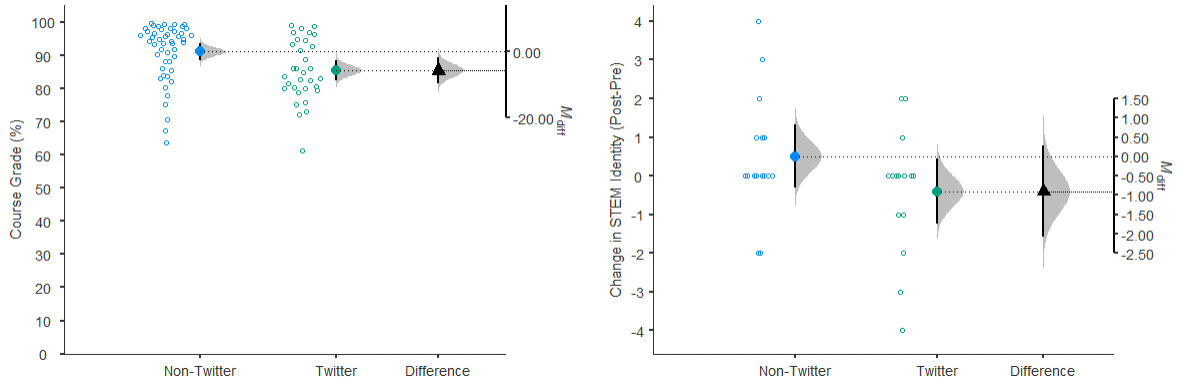
Topic: J.02. Teaching of Neuroscience

Support: Title III-F HSI STEM P031C210006

Title: Effect of Social Media as a Classroom Tool on Science Identity and Course Grades

Authors: L. GALARZA[1], P. DRIVER[1], T. CALDWELL[2], *A. KRAFNICK[1];
[2]Psychology Dept., [1]Dominican Univ., River Forest, IL

Abstract: Junco et al. (2011) found that utilizing Twitter (now called 'X') as a classroom tool in first-year pre-health professionals seminar course led to increased engagement and better semester grades than students in the same course that did not use Twitter. Dominican University is conducting a replication study of this paper as part of a Title III STEM Initiative grant in introductory STEM courses (Nutrition and Introduction to Neuroscience) beginning in Fall 2023. Here we present preliminary results of Dominican University students' STEM identity and how use of Twitter as a classroom tool impacts STEM identity (as measured using McDonald et al. 2019's measure of STEM Identity) and course grades. Students in all courses had introductory assignments asking them to connect with social affinity groups in their fields and professional organizations. Students in the Twitter sections then had a series of discussion based assignments on Twitter (~4 total low stakes assignments over a 15 week semester), while students in non-Twitter sections completed discussions on the Canvas LMS used at Dominican. Students enrolled in sections using Twitter during the semester had lower overall course grades (M = 85.5) than students in sections not using Twitter (M = 91.1). STEM Identity increased slightly over the course of the semester for students in the Non-Twitter sections (M_{diff} = 0.5), while students in the Twitter sections showed a slight decrease in STEM identity (M_{diff} = -0.4). These patterns held when only including students with intended majors in STEM and Healthcare.



Sample size here is still small (80 total students, 32 in Twitter sections), and data collection is ongoing through academic year 2024-2025 including from additional courses (such as Psychology Stats and Methods). While preliminary, these results suggest better course performance and STEM Identity growth for students who are not completing assignments on Twitter. Continued data collection and analysis will increase sample size and examine engagement and semester GPA as additional outcome variables.

Disclosures: L. Galarza: None. **P. Driver:** None. **T. Caldwell:** None. **A. Krafnick:** None.

Theme J Poster

TJP04: Teaching of Neuroscience: College II

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP04.18SA/Web Only

Topic: J.02. Teaching of Neuroscience

Title: Impulse is in its 21st year of publication and continues to give undergraduates the opportunity to publish and review neuroscience research

Authors: J. L. MCMANUS, R. M. SOUDERS, R. W. LLOYD, A. N. MARKLE, G. G. BECTON, ***M. C. ZRULL**;
Psychology, Appalachian State Univ., Boone, NC

Abstract: *IMPULSE*, the leading undergraduate neuroscience journal, gives students a unique opportunity to participate in manuscript submission, revision and publication. *IMPULSE* is an open-access journal indexed within the Directory of Open Access Journals, and authors retain ownership of their manuscripts after publication. The submission, revision and publishing experience prior to graduate education gives undergraduate students the opportunity to develop their writing skills in a publication setting. While undergraduate students often have the ability to participate in research and develop their own writing skills, publication is often a bit more difficult at the undergraduate level. *IMPULSE* provides an accessible avenue for attaining publication as well as allowing undergraduate students the opportunity to gain experience in the reviewing and editing processes as peer reviewers and associate editors (AEs). *IMPULSE* has a number of various review teams working out of various colleges and universities within the U.S. and in other countries. Students who wish to be a part of a review team, but are located at a college or university without an established review site can be assigned to other review teams and work with that team electronically. The undergraduate review teams are made up of designated AEs as well as faculty advisors (FAs). Multiple teams are tasked to individually review manuscript submissions with guidance from their FAs. Each AE works to compile their team's reviews which can be done individually or as a group and submit the compile review to the undergraduate Executive Editor on the *IMPULSE* editorial team. The Executive Editor combines the various review teams' reviews into a single document of suggested revisions which is sent to the author(s). The entire process is overseen by *IMPULSE'S* undergraduate Editor-in-Chief, who leads the editorial team. This revision process allows the manuscript author(s) to

learn what scientific journals require and look for in publications, and it gives access to dissemination of scientific knowledge and prepares students for future opportunities in their academic careers. *IMPULSE* is proud to celebrate its 21st issue in 2024, continuing to provide undergraduate students with an opportunity to hone writing skills, engage with peer review and experience the process of submitting neuroscience research to a scientific journal.

Disclosures: J.L. McManus: None. **R.M. Souders:** None. **R.W. Lloyd:** None. **A.N. Markle:** None. **G.G. Becton:** None. **M.C. Zrull:** None.

Theme J Poster

TJP04: Teaching of Neuroscience: College II

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 5:00 PM

Program #/Poster #: TJP04.19SA/X18

Topic: J.02. Teaching of Neuroscience

Title: Functional Near-Infrared Spectroscopy as a Tool to Promote Undergraduate Classroom-Based Research

Authors: *C. MIKKELSEN, M. ROSEN;
Smith Col., Northampton, MA

Abstract: Classroom-based research experiences can be an impactful tool for students to gather research experience. The availability of classroom-based research experiences is particularly important for students for whom access to research laboratories may be limited. Additionally, those students who do have the opportunity to participate in large-scale research projects often are not involved in the design of these experiments. This can be particularly true in experiments that conduct cognitive neuroscience with human subjects. Functional Near-Infrared Spectroscopy (fNIRS) is being increasingly used in research environments, because it is a portable, non-invasive neuroimaging technique that is conducive to naturalistic research. fNIRS provides a novel opportunity to involve undergraduate students in fNIRS research in a classroom setting. We present a sample curriculum that enables students to engage in neuroimaging data collection and analysis utilizing a fNIRS system. The sample curriculum will begin with an introduction to ethical principles, the importance of pre-registration, and a primer in how to collect and analyze data in a sample task. Students will then be supported in developing their own research questions from the literature. They will then explore their research questions utilizing their fNIRS skills. This will culminate in a final poster in which they present their results. With IRB approval, these results can be further presented at conferences to expand student experiences. This curriculum will encourage students to build skills in working with human subjects, project management, and communication skills. This outline can be implemented at both large and small institutions, to help students gain research experience in the classroom that will be critical for their future success as a scientist.

Disclosures: C. Mikkelsen: None. **M. Rosen:** None.

Theme J Poster

TJP05: Teaching of Neuroscience: College III

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP05.01SU/X19

Topic: J.02. Teaching of Neuroscience

Title: A non-lecture neurobiology course to elevate science communication

Authors: *J. C. TUDOR;
Biol., St. Joseph's Univ., Philadelphia, PA

Abstract: Courses in biology and neuroscience often complement the active experiential laboratory exercises with a passive lecture-based component. Are these passive lectures necessary to teach neurobiology? To answer this question, I created a new course at Saint Joseph's University, BIO 430 Neurological Disorders, which was first delivered in Fall 2021 and employed the following innovations: elimination of instructor-led lectures and relying solely on primary and secondary literature for biology course content. Initially, the students did not respond favorably to the elimination of traditional lectures. They felt that they were “doing all the work”. This comment suggested to me they were positively engaging with the material more so than in lectures. This was confirmed by responses to the IDEA survey (on a scale out of 5) that the course “stimulated students to intellectual effort beyond that required by most courses” (2021 4.78; 2022 4.75) and “gave projects that required original or creative thinking” (2021 4.67; 2022 4.88). Other student learning outcomes included that students would receive training in science communication orally and in writing (2021 4.78; 2022 4.75) and acquire skills in working with others as a team (2021 4.67; 2022 4.75). Another feedback I received from students was that they had difficulty organizing the information about neurological disorders from their classmates’ presentations. To address this concern in the following year, I added one summary presentation before each exam to consolidate the information for the students. In addition to this presentation, I also made available a study sheet that had questions that the students should be able to answer for each neurological disorder. Interestingly, I did not receive feedback that the readings were too difficult; just that there was too much. Thus, I assigned more secondary review articles and less primary research articles to reduce the amount of reading required. These refinements led to increased student satisfaction, but more importantly, student performance. Response on the IDEA survey prompt “Overall, I rate this course as excellent” rose from 4.33 (2021) to 4.88 (2022). Average final grades rose from 81.1 (2021) to 89.3 (2022). Better performance in 2022 did not correlate with students’ GPA. The average GPA of the students in the 2022 class was actually lower (3.19) compared to my 2021 class (3.36).

Disclosures: J.C. Tudor: None.

Theme J Poster

TJP05: Teaching of Neuroscience: College III

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP05.02SU/X20

Topic: J.02. Teaching of Neuroscience

Support: NSF DGE-1839285

Title: Hurdles non-biologists face in applying biology core concepts to neuroscience contexts

Authors: *K. W. COOPER[1], E. H. TRAN[2], C.-M. T. TAT[2], B. MCINTOSH[2], A. CHEN[3]; [1]Neurobio. and Behavior, Univ. of California, Irvine, Irvine, CA; [2]Univ. of California, Irvine, Irvine, CA; [3]Neurobio. & Behavior, Univ. of California, Irvine, Irvine, CA

Abstract: Core concepts are overarching principles that organize knowledge and can be applied to all sub-disciplines. To distill biological literacy throughout the life sciences, Vision and Change in Undergraduate Biology Education outlined five core concepts intended to guide undergraduate biology education (AAAS, 2011). These concepts - evolution, structure and function, information flow, energy and matter transformations, and systems - provide a framework for students to ground their learning and for educators to organize their instruction. Although neuroscience core concepts have been recently identified using an empirical approach (Chen et al., 2023), biology core concepts may be particularly relevant for non-major courses designated as life science general education courses. Introductory neuroscience courses, however, present a pedagogical challenge due to the heterogeneity of students' prior biological knowledge, making assessment of incoming knowledge levels challenging. To further elucidate the knowledge of biology core concepts in neuroscience contexts, undergraduate students (n=342) in a non-majors introductory neuroscience course were administered a newly developed survey. Using a grounded theory approach, we inductively identified emergent themes in student understanding. We also deductively coded whether student responses contained biology conceptual elements as articulated by Cary & Branchaw (2017) and appropriately applied biology core concepts to a neuroscience context. Our preliminary results suggest that student ability to apply the core concepts to a neuroscience context varies across the five concepts. In particular, students found it difficult to develop neuroscience-based examples of the core concept of ‘energy and matter transformation’. We observed trends of students applying limited portions of the biology core concepts to neuroscience contexts, as well as that students’ response theme was influenced by their major. Our findings provide options for scaffolding foundational information based on the student population’s background and guiding curricular decisions on whether to use biology core concepts or neuroscience core concepts in instruction.

Disclosures: K.W. Cooper: None. **E.H. Tran:** None. **C.T. Tat:** None. **B. McIntosh:** None. **A. Chen:** None.

Theme J Poster

TJP05: Teaching of Neuroscience: College III

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP05.03SU/X21

Topic: J.02. Teaching of Neuroscience

Title: Bridging neuroscience and computational methods in undergraduate education through vision

Authors: *Y. ZHU;
Neurosci., Pomona Col., Claremont, CA

Abstract: Computational and advanced quantitative methods are becoming indispensable in contemporary neuroscience research. However, traditional undergraduate neuroscience curricula often lack essential training in these methods, posing significant challenges for students aiming to comprehend research papers or pursue graduate studies. Recognizing this gap, a novel undergraduate neuroscience course was developed and implemented at Pomona College, requiring only a high school science background. The course adopts a unique approach that draws parallels between computational problem-solving using Python and neural processing in the visual system. Beginning with fundamental concepts of programming and neurobiology, the course relates single neurons and simple neural circuits to logical operations. Next, students delve into NumPy and basic image matrix manipulations, mirroring the “pixel processing” of photoreceptors and the retinotopy of the early visual system. By crafting filters and convolution functions akin to the receptive fields of retinal ganglion cells and simple, complex, and hypercomplex cells in V1, students solidify both the essential operations of programming and the essential functions of early visual processing. Advancing further, the curriculum introduces the scikit-learn library to apply methods such as dimensionality reduction and statistical machine learning to characterize neural population activity in higher areas of visual cortex. Finally, students use PyTorch to build neural network models, including convolutional neural networks, as models of primate vision for object / place / facial recognition tasks. Throughout the course, emphasis is placed on reading and discussing research papers that utilize these computational methods to address questions in vision. This interdisciplinary approach not only equips students with essential computational skills but also fosters a deeper understanding of neural mechanisms underlying vision. By integrating computational methods into undergraduate neuroscience education, we bridge the gap between theoretical knowledge and practical application, preparing students for the interdisciplinary challenges of modern neuroscience research.

Disclosures: Y. Zhu: None.

Theme J Poster

TJP05: Teaching of Neuroscience: College III

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP05.04SU/X22

Topic: J.02. Teaching of Neuroscience

Support: College of Arts and Sciences, Quinnipiac University
University of Connecticut

Title: The 37th Northeast Undergraduate and Graduate Research Organization for Neuroscience (NEURON) conference held at Quinnipiac University's Frank H. Netter M.D. School of Medicine in North Haven, CT

Authors: *A. BETZ[1], G. R. TANNER[2], J. L. HAIGHT[3], A. ECEVITOGLU[4], R. A. ROTOLO[5], K. SCHMIDT[6], A. C. KWAN[7];
[1]Quinnipiac Univ., Woodbridge, CT; [2]Physiol. and Neurobio., Univ. of Connecticut, Storrs, CT; [3]Psychiatry, Quinnipiac Univ., Hamden, CT; [4]Dept. of Psychological Sci., Univ. of Connecticut, Storrs, CT; [5]Psychological Sci., UCONN, Storrs, CT; [6]Psychology, Fairfield Univ., Fairfield, CT; [7]Biomed. Engin., Cornell Univ., Ithaca, NY

Abstract: The NEURON conference has a rich tradition of fostering the professional growth and educational advancement of both undergraduate and graduate neuroscientists, while also providing a platform for students to present their research findings. The 37th NEURON conference convened on April 21st, 2024, at Quinnipiac University's Frank H. Netter, M.D., School of Medicine. Dr. Alex Kwan, Associate Professor in the Meinig School of Biomedical Engineering at Cornell University, delivered the keynote address titled "Psychedelic Drug Action on Neural Circuits". Dr. Kwan's talk explored the effects of compounds like ketamine and psychedelics on dendrites and cortical microcircuits, with a focus on enhancing neural plasticity. Emphasizing open science, Dr. Kwan shares preprints and provides data and code for all recent lab studies. Following the keynote, attendees engaged in various workshop sessions, including discussions on Careers in Science, Intraoperative Neuromonitoring and Surgical Neurophysiology, Connectomics in the Classroom, and Leveraging AI in Psychological Sciences Research. Concurrently, undergraduate and graduate poster sessions, Data Blitz talks, and graduate school recruitment activities facilitated networking opportunities. The Tieman Outstanding Poster Awards recognized exemplary work by undergraduate and graduate students, while awards were also conferred for the best Data Blitz talks. Additionally, Nu Rho Psi, the national undergraduate neuroscience honor society, presented a poster award. Quinnipiac University serves as the host for NEURON conference resources, offering online access to registration, abstract submission, past talk archives, and image galleries. Visit www.quinnipiac.edu/neuron for details. The 38th NEURON conference is scheduled for Sunday, April 20th, 2025, at Quinnipiac University's Frank H. Netter, M.D., School of Medicine. Looking ahead, Quinnipiac's investment in a new academic building featuring a versatile, 700-seat auditorium underscores its commitment to NEURON's continued growth. This state-of-the-

art facility will host the conference in 2026. With steadfast support from local and regional faculty, dedicated to student outreach and mentorship in neuroscience, and co-sponsorship from Quinnipiac University—particularly the College of Arts and Sciences and the Psychology Department—and the University of Connecticut, NEURON has expanded its reach beyond its original Boston locations. Now, it boasts a diverse representation from the northeastern region and beyond. Stay updated by following us on Twitter @NEURONconference.

Disclosures: A. Betz: None. **G.R. Tanner:** None. **J.L. Haight:** None. **A. Ecevitoglu:** None. **R.A. Rotolo:** None. **K. Schmidt:** None. **A.C. Kwan:** None.

Theme J Poster

TJP05: Teaching of Neuroscience: College III

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP05.05SU/X23

Topic: J.02. Teaching of Neuroscience

Title: Can your students read a graph? (Are you sure...?):Using deliberate practice to improve graph reading and interpretation skills

Authors: *J. BELANGER, M. WITHERS;
Binghamton Univ., Binghamton, NY

Abstract: As educators, we expect that one of the skills science majors will possess when they graduate is the ability to read and interpret a graph. But with traditional lecture as the primary teaching mode in most post-secondary STEM classes, and class time devoted more to content delivery than skills acquisition, how many of our students can actually do this? During passive lectures, students typically listen to the instructor explain or demonstrate this skill without being asked to try it for themselves, until they get to an examination. In this study, we examined graph reading and interpretation skills and found that a majority of biology seniors at two state flagship schools were not very proficient. Asked to describe a graph with potentially 8-10 interesting points, most students could only describe two. Adding in-class, group exercises in which students engaged in the deliberate practice of describing and then interpreting graphs, significantly increased student performance. Even five exercises spread over a semester is sufficient for a majority of students to become proficient (i.e., to increase their grade on graph reading questions from ~50% to over 90%). Based on self-reporting in anonymous end-of-semester student evaluations, the students found the exercises interesting and worthwhile. They report that the exercises improved graph interpretation skills, problem solving skills, data analysis, and critical reasoning. They also report increased confidence in their qualitative and analytical reasoning skills. However, alignment between class exercises and exam questions is essential to foster the student “buy-in” necessary to acquire these skills.

Disclosures: J. Belanger: None. **M. Withers:** None.

Theme J Poster

TJP05: Teaching of Neuroscience: College III

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP05.06SU/X24

Topic: J.02. Teaching of Neuroscience

Title: An AI proof assignment to assess skill in reading and interpreting primary scientific literature in an upper division neurobiology course

Authors: *M. MYNLIEFF, K. TOBIN;
Biol. Sci., Marquette Univ., Milwaukee, WI

Abstract: In an upper division cellular neurobiology lecture course with 25 students, a group primary literature assignment was designed to allow students to demonstrate knowledge and skills gained over the semester in a different format than a traditional exam. The goal was to design an AI proof assignment that assessed students' ability to read scientific primary literature. During the semester students were challenged to analyze data that underlie the concepts in *Neuroscience* (7e, Augustine et al., 2024). This was achieved through lectures, group assignments that analyzed data figures, questions on exams that required analysis of data rather than straight memorization, and reading primary literature papers followed by group assignments in discussion section. In previous years, one assignment given required students to work on different information than what was presented in class using the knowledge and skills gained in class and was approximately equal in grade weight to an exam. This year, to avoid any AI generated assignments, the students were given a choice of papers that were at the end of the chapters covered in the textbook. Students were placed in groups of 3 or 4 where the average class grade for each group ranged from 73 to 81 percent. In general, students were not placed with the students they typically sat next to in class and therefore, likely to be friends. Students were given the paper 2.5 weeks prior to the assessment and instructed to work with their group to make sure everyone understood the paper including relevant definitions and each figure in detail (general methods, results, and conclusions). On the assessment day, students were allowed to bring one page of notes and were given a clean copy of their paper. For the assessment, students were given a sheet with 3 questions: 1) write a 1-2 sentence synopsis, 2) the definition of a specific term used in the paper, and 3) explain the methods, results and conclusion of a specific figure in the paper (chosen by the instructor). Answers were entered using the Brightspace (D2L) quiz function with the lockdown browser. The average grade on the assignment was 14 points higher than traditional exams in this class. 80% of the grade for each group member was based on their performance and the remaining 20% was based on the group average to incentivize group members to make sure everyone in the group understood the paper. Students were surveyed after the assessment on their opinion of the assignment, if it a good measure of their ability to understand the literature, what worked well and what did not work well, etc. Overall, the assignment was well received by the students and provided a mechanism to demonstrate their learning over the semester.

Disclosures: M. Mynlieff: None. **K. Tobin:** None.

Theme J Poster

TJP05: Teaching of Neuroscience: College III

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP05.07SU/X25

Topic: J.02. Teaching of Neuroscience

Title: Creation of Open Educational Resource Textbooks of Neuroanatomy and Cellular and Molecular Neuroscience

Authors: A. MARKER[1], L. AUNE[1], A. GRIJALVA[1], R. N. JESSOP[2], J. B. HUTCHINS[3], *T. BLACK[4];
[1]Weber State Univ., Ogden, UT; [2]Weber State Univ., Ogden, United Kingdom; [3]Hlth. Sci., Weber State Univ., Ogden, UT; [4]Psychological Sci., Weber State Univ., Ogden, UT

Abstract: As part of our ongoing project to develop an open educational resource (OER) of neuroscience with materials written at all levels of undergraduate education, students in Jim Hutchins' NEUR 3950 Cellular and Molecular Neuroscience class were invited to help in the creation of an OER textbook of cellular and molecular neuroscience. This open pedagogy project has produced several dozen chapters for the inchoate textbook, and we will continue to add resources as more students and faculty members contribute to the project. Additionally, Marker and Jessop are working on an OER textbook of human neuroanatomy, to be used to train both undergraduates in Weber State's NEUR 4444 (Human Neuroanatomy) course and in the Electroneurodiagnostics (END) Program affiliated with the University of Utah's Dept of Neurology (of which Jessop is a graduate). Students in the END program have an urgent need to learn the fundamentals of neuroanatomy to supplement their electroneurodiagnostics training and help them pass the American Board of Registration of Electroencephalographic and Evoked Potential Technologists (ABRET) certification examination. We will present three samples of this work so far, as representatives of the larger whole. We will present one chapter of the book used to train for ABRET certification and two chapters from the cellular and molecular neuroscience text. In addition, we will point Neuroscience attendees to the accompanying PowerPoints, formative activities, and summative exam questions representing the resources to be made available for free to instructors and students.

Disclosures: A. Marker: None. **L. Aune:** None. **A. Grijalva:** None. **R.N. Jessop:** None. **J.B. Hutchins:** None. **T. Black:** None.

Theme J Poster

TJP05: Teaching of Neuroscience: College III

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP05.08SU/X26

Topic: J.02. Teaching of Neuroscience

Support: PAPIME-DGAPA PE211423
IBRO
CONCYTEQ
CONAHCYT scholarship 1315079

Title: Neurosciences for everyone: how to reach rural communities

Authors: *L. DEL PILAR MARTÍNEZ[1], J. GUTIÉRREZ-LEDEZMA[2], E. DE LOS RÍOS[3], M. LOPEZ-HIDALGO[4];
[1]Lab. de Interacciones Neuro-gliales, Inst. de Neurobiología, Univ. Nacional Autónoma de México, Campus UNAM-Juriquilla, Querétaro, Mexico; [2]Lab. de Interacciones Neuro-gliales, Inst. de Neurobiología, Univ. Nacional Autónoma de México, Campus UNAM-Juriquilla, Queretaro, Mexico; [3]Inst. de Neurobiología, Univ. Nacional Autónoma de México, Campus UNAM-Juriquilla, Querétaro, Mexico; [4]Lab. de Interacciones Neuro-gliales, Escuela Nacional de Estudios Superiores unidad Juriquilla, Querétaro, Mexico

Abstract: Introduction: Despite global efforts to increase the diversity, equity and inclusion in neuroscience to make it accessible to all, there is an educational gap in Latin American when compared to developed countries, this due in part to the limited professional development support for the teachers and the lack of information and pedagogical resources for educators available in Spanish, impacting the quality of learning strategies provided to students. Even more difficulties are found in Latin American rural communities, for example, more than 90% of the rural schools in Mexico do not have a laboratory to perform experiments, limiting access to learning tools to motivate young students. Here, we show the results of the implementation of a program “Neurosciences for Everyone" to reach rural communities by training rural high-school teachers and providing a personal portable laboratory with materials, reagents and basic equipment to perform hands-on activities with the students. Results: We received 169 applications (62 in 2021 and 107 in 2022) from 28 out of 32 states of Mexico. Most of our applicants came from rural areas (59.2% vs 40.8% from semi-urban areas) with high degree of marginalization and unfavorable conditions (i.e. lack of drinking water and sanitation conditions). Furthermore, among the teachers selected, 9.5% reported not having school facilities and teaching in borrowed ones from another school, or a community building. During these two years, 42 teachers were selected (64.3% women and 35.7% men) reaching more than ~6,500 students from rural areas, that otherwise would be felt behind the educational system. The teachers selected for the program have reported using their portable laboratory in the classrooms (100%), in science fairs (19%) and visiting other schools in their communities (16%), including k-12 schools. In parallel, we also implemented Neurosciences Fairs, which involve visits to a

school in a rural community. In 2023, the fair took place in the community of Ixtepec, in the state of Puebla. Here we received and guide hands-on activities to a ~135 students. Although 83% of students are interested in continuing their studies at the college level, the students report obstacles such as economic problems. In addition to this, the lack of materials and laboratory scholar practices affect their motivation and attention in their classes. Conclusion: It is possible to reach rural students through the Neurosciences for Everyone program; however, more efforts need to put in extending these tools to more rural areas.

Disclosures: L. Del pilar martínez: None. **J. Gutiérrez-Ledezma:** None. **E. De los Ríos:** None. **M. Lopez-Hidalgo:** None.

Theme J Poster

TJP05: Teaching of Neuroscience: College III

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP05.09SU/X27

Topic: J.02. Teaching of Neuroscience

Title: Inquiry-based observations of memory and learning in Madagascar hissing cockroaches to assist students' memory and learning

Authors: A. CHEVRIER, A. WILSON, E. M. EVANS, *J. O. TAYLOR;
Behavioral Sci., Utah Valley Univ., Orem, UT

Abstract: Invertebrate models are frequently used in behavioral and life science courses to allow students the opportunity for engaged learning regarding a variety of topics. Working with these models and established procedures also helps students learn necessary skills for conducting and interpreting scientific research. In this project, we focused on creating an inquiry-based learning experience that required students to generate questions and apply their emerging knowledge to explore those questions. Our approach was to implement inquiry-based behavioral research regarding memory and learning with Madagascar hissing cockroaches (*Gromphadorhina portentosa*, MHC) in two groups of students: (1) students enrolled in an undergraduate Principles of Learning course, and (2) student research assistants working as volunteers or for research experience-related course credit. Throughout the course of the study, students learned to operationalize variables, design and conduct simple behavioral research, analyze resulting data, and propose alterations to improve their designs. Students were given guidance, but allowed wide flexibility in what they chose to investigate within the area of learning and memory as well as the methods by which the investigation would occur including the testing context, stimuli, and experimental procedures. Despite some inevitable frustrations, students widely reported enjoying and learning from the experience as part of their course work, and student RAs were able to successfully demonstrate behavioral changes that had led to continuing research. This framework can be used as a potential teaching tool for students who can use adaptations of this protocol to research behavioral, pharmacological, and biological manipulations in MHC

Disclosures: A. Chevrier: None. **A. Wilson:** None. **E.M. Evans:** None. **J.O. Taylor:** None.

Theme J Poster

TJP05: Teaching of Neuroscience: College III

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP05.10SU/X28

Topic: J.02. Teaching of Neuroscience

Support: NIH UM1NS132250
NIH U01NS132158

Title: Neurotrailblazers: illuminating pathways and empowering researchers

Authors: A. JAYABHARATHI[1], S. FLORYANZIA[1], B. WESTER[1], P. K. RIVLIN[1], ***W. GRAY RONCAL**[2,3];
[1]Johns Hopkins Univ. Applied Physics Lab., Laurel, MD; [2]Johns Hopkins Univ., Laurel, MD; [3]Johns Hopkins University Applied Physics Lab, Laurel, MD

Abstract: We believe that many students possess the talent and capability for success in STEM careers but are hindered by opportunity gaps that exist in post-secondary education. This, coupled with systemic psychological barriers such as stereotype threat or imposter phenomenon, leads to the underrepresentation of certain populations in STEM fields. At the same time, there is a national demand for STEM talent, and policy briefs also highlight diverse recruitment as a goal to meet this need. To address this issue, interventions can be implemented at each level of education. Here, we propose one such intervention for undergraduates.Leveraging our previously published CIRCUIT model, which engaged undergraduate students at a single site, we developed a new paradigm that improves accessibility and scalability. Specifically, we created an online toolkit consisting of curated information aimed at providing opportunities for trailblazing students to become involved in research and explore career opportunities in computational neuroscience and research more broadly. Our focus is on growing mentees' knowledge in foundational and emerging technical areas while developing their professional and career skills, particularly in areas such as self-efficacy and metalearning. This resource is combined with a dynamic mentoring framework that seeks to enhance representation and empower students through both low- and high-touch interventions, explicitly addressing many barriers historically marginalized students must navigate.This approach has been successfully piloted as part of an ongoing group undergraduate research course. We have also developed additional tools and capabilities to expand this engagement to other sites and ensure that mentors receive the training and background necessary to effectively support other trailblazing students.

Disclosures: A. Jayabharathi: None. **S. Floryanzia:** None. **B. Wester:** None. **P.K. Rivlin:** None. **W. Gray Roncal:** None.

Theme J Poster

TJP05: Teaching of Neuroscience: College III

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP05.11SU/X29

Topic: J.02. Teaching of Neuroscience

Support: Research Incentive Funds, Office of Research and Sponsored Projects
NIH Grant MH114961 (AMK co-I)
NIH Grant GM127251 (AMK PI)

Title: Embedding traditional printmaking methods as an instructional module within Brain Mapping & Connectomics, a course-based undergraduate research experience for freshmen-level neuroanatomy

Authors: A. RAMIREZ[1], *A. M. KHAN[2];
[1]Artist in Residence, UTEP Systems Neurosci. Lab., The Univ. of Texas at El Paso, El Paso, TX;
[2]Biol. Sci., The Univ. of Texas at El Paso, El Paso, TX

Abstract: For the past decade, >100 undergraduates have successfully completed our two-semester neuroanatomy lab course-based undergraduate research experience known as Brain Mapping and Connectomics (BMC). As BMC enters its second decade, we seek to refine our instructional methods to empower students with greater opportunities to understand methods of brain mapping. For this purpose, our laboratory has welcomed its first Artist in Residence to aid us in understanding better ways to engage students in specific brain mapping tasks. Such tasks are now usually performed in digital environments (Adobe Illustrator, Inkscape) where mapped data elements are drawn onto a series of transparent overlays over digital brain atlas templates. Here, we propose a new printmaking instructional module for the second semester of the 2024-2025 course (the first course of our second decade of instruction). Nine two-student teams in BMC will work on two projects while being taught traditional printmaking methods introduced by our Artist in Residence: (1) to create prints of published drawings of brain regions, distinct cellular morphotypes, and axonal pathways (from drawings of Ramon y Cajal or from Golgi-based drawings of hypothalamic cell types); and (2) to create prints of their own drawn cell populations and axonal pathways from class. The emphasis would be on mixed media approaches to create "layers" of data to emphasize the overlay process they use digitally. Two printmaking processes we envision for this purpose would be cyanotype and drypoint. Both methods allow one to use layers to help create a series or editions that can be added onto for future findings or used for comparison against each other. Cyanotype involves laying objects or negative images onto paper coated with a light-sensitive solution consisting of potassium ferricyanide and ferric ammonium citrate, that is then exposed to UV light and washed with water to expose a Persian blue color. This will be the first process taught as it lends itself as a blue print, allowing students to use specific images of parts of the brain to be printed then layered. Drypoint refers to a printmaking process which involves small incisions or indents in a plate, such that when ink is applied and then wiped off, the ink remains in the incisions and

creates an image. Drypoint will be the second process taught as students render images of their findings to print on the cyanotype that can be inked in different colors for multiple layers to help with color coordinating and to differentiate brain maps (e.g., Nissl vs. antibody labels). We present our planned curriculum and seek feedback from the neuroscience community before its implementation early next year.

Disclosures: A. Ramirez: None. **A.M. Khan:** None.

Theme J Poster

TJP05: Teaching of Neuroscience: College III

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP05.12SU/X30

Topic: J.02. Teaching of Neuroscience

Support: NSF RCN UBE incubator grant 2223470

Title: Surveying undergraduate instructors' grading and feedback practices to inform future approaches aimed to equitize retention in STEM

Authors: *M. L. LEMONS[1], H. URRY[2], B. DEWSBURY[3], L. FERGUSSON-KOLMES[4], L. WHEELER[5], S. CAVANAGH[6];
[1]Assumption Univ., Worcester, MA; [2]Tufts Univ., Medford, MA, ; [3]Florida Intl. Univ., Maimi, FL; [4]Portland Community Col., Portland, OR; [5]Univ. of Virginia, Charlottesville, VA; [6]Simmons Univ., Boston, MA

Abstract: The world needs a diverse, educated, and productive STEM workforce. Attrition from STEM fields across the academic trajectory is high for all students, but highest for women and racially minoritized students. Innovating pedagogy and grading reform may be fruitful avenues to address these inequities in the STEM field. Before we can innovate, we need to know the current state of play. What teaching practices are currently in use? What type of assessments and feedback are deployed? What barriers or constraints to innovation might instructors face? We chose to initially direct these questions to introductory biology instructors. Many undergraduate science majors, including neuroscience majors, are required to take an introductory biology course. This course often serves as a gateway to future science courses and can sculpt a student's decision to remain in a STEM field. Here, we report survey data from several hundred introductory biology faculty across the country and many different institution types. These data reveal that 1) much innovation is already occurring, but there is nonetheless a lot of room for improvement; 2) barriers and constraints are many but none more salient than limited time; and 3) improving feedback may be a fruitful avenue of intervention. Our future goals include working with collaborative teams of stake holders to enhance and expand feedback while being mindful of barriers to innovation that instructors may face.

Disclosures: M.L. Lemons: None.

Theme J Poster

TJP05: Teaching of Neuroscience: College III

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP05.13SU/X31

Topic: J.02. Teaching of Neuroscience

Title: A Case for the Use of Open Data as a Tool to Incorporate Socioscientific Topics into Neuroscience Education

Authors: *M. MEULER, K. CASIMO;
Educ. & Engagement, Allen Inst., Seattle, WA

Abstract: Education scholars have long advocated for an increase in classroom content that is culturally relevant to students. One aspect of culturally relevant pedagogy is the development of students' sociopolitical consciousness, whereby students feel empowered and encouraged to evaluate and solve real-world interdisciplinary problems. Here, we propose that open science datasets can serve as a valuable tool for neuroscience educators to foster students' ability to evaluate and solve real-world problems through a sociopolitical lens. Using the open data available through the Seattle Alzheimer's Disease Brain Cell Atlas (SEA-AD) as a case study, this project explores how open science can be leveraged as a tool to encourage socioscientific thinking amongst neuroscience students. We overview a collection of lessons created by the Allen Institute's Education & Engagement team that provide a scaffolded exploration of an open science resource exploring single-cell RNAseq and pathology data from postmortem human brain donations. The lessons introduced key science concepts required for interpreting the data as well as an introduction to socioscientific issues such as informed consent and brain donation processes. To evaluate student perceptions on these lessons, we facilitated an in-person workshop for undergraduate students to pilot the lessons. Through administering pre- and post-workshop surveys, we were able to gauge student interest, comfort with the material, and overall opinion of the lessons. The majority of students reported that these lessons held more socioscientific content than they were used to seeing in their science classes previously. Despite the atypical nature of the lessons relative to their typical class content, a majority of students reported that these interdisciplinary lessons were a good way of learning about the content as well as a good way to learn about how to navigate and interpret complex biological datasets. Most students indicated that they would be comfortable using Allen Institute open datasets to explore a research question of their own. Although students expressed a variety of beliefs as to whether or not humanities content was necessary in order to understand neuroscience, the overall reception of the lessons was positive from students. We believe that this type of open data-based exploration of both biology and of socioscientific issues provides a unique opportunity for neuroscience educators to adopt culturally relevant classroom content that is rooted in cutting edge, open scientific research.

Disclosures: M. Meuler: A. Employment/Salary (full or part-time):; Allen Institute. **K. Casimo:** A. Employment/Salary (full or part-time):; Allen Institute.

Theme J Poster

TJP05: Teaching of Neuroscience: College III

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP05.14SU/X32

Topic: J.02. Teaching of Neuroscience

Title: Integrative neuroscience curricula, or: What can neuroscience do for STEM education?

Authors: *A. BASU;
Col. of the Holy Cross, Worcester, MA

Abstract: Undergraduate neuroscience curricula require various courses across STEM disciplines, most of which are associated with high rates of attrition for students from marginalized or historically excluded social groups. Undergraduate neuroscience major programs are often designed around hierarchical STEM course sequences, resulting in large numbers of requirements and dense early exposure of students to learning environments outside of neuroscience. Neuroscience educators have an opportunity to address chronic inclusion challenges in STEM education by designing integrative curricula that create new opportunities for students to achieve STEM learning goals alongside their learning of neuroscience concepts, and to do so in cross-disciplinary learning environments curated using anti-deficit and anti-racist principles. To motivate resource allocation toward integrative neuroscience curricular design and implementation, educators should (1) articulate the proposed program's alignment with institutional and national goals for STEM education, (2) explore institutional and disciplinary barriers to STEM broadly within the institutional context to identify partners with common challenges and goals, (3) co-design and implement integrative courses in partnership with colleagues across disciplines, and (4) establish ongoing learning communities to continuously build the capacity of the institution to imagine the future from an anti-deficit perspective. This approach positions the growth of a neuroscience curriculum and program as a multi-pronged strategic priority for the institution by broadening access to STEM learning, and increases the scope for pedagogical innovation in neuroscience by creating collaborative opportunities for a broader swath of STEM faculty.

Disclosures: A. Basu: None.

Theme J Poster

TJP05: Teaching of Neuroscience: College III

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP05.15SU/X33

Topic: J.02. Teaching of Neuroscience

Title: Use of dogfish shark to reinforce knowledge of central nervous system organization in an undergraduate behavioral neuroscience lab

Authors: *P. T. ORR[1,2], S. C. DA COSTA[2], G. L. LLOYD[2];
[1]Psychology Dept., [2]Neurosci. Program, Univ. of Scranton, Scranton, PA

Abstract: Preserved sheep brain is a commonly used preparation in undergraduate neuroscience labs to teach neuroanatomy. Students often need additional reinforcement of gross structural patterns in the nervous system, but preparations which are large enough to hold and examine without magnification are difficult to obtain, and biological specimen companies do not stock many alternative or additional preparations. We piloted the use of preserved dogfish shark heads sourced from a comparative vertebrate anatomy course that ran during a previous semester. Although the dogfish shark nervous system is quite different from the mammalian nervous system, examining a system which shares an origin but developed in a different direction from the mammalian nervous system helped to reinforce large-scale, general patterns in vertebrate neuroanatomy (e.g., the five subdivisions of the brain, location of olfactory structures) and reinforced an emphasis on functionalism (i.e., nervous system features are shaped for a particular environmental context). Results of student feedback and assessment on basic neuroanatomy included.

Disclosures: P.T. Orr: None.

Theme J Poster

TJP05: Teaching of Neuroscience: College III

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP05.16SU/X34

Topic: J.02. Teaching of Neuroscience

Title: Designing and utilizing a concept inventory for neuroscience

Authors: *M. M. GAUDIER-DIAZ, S. V. PAREKH, S. D. ROBERTSON;
Psychology & Neurosci., Univ. of North Carolina, Chapel Hill, Chapel Hill, NC

Abstract: Neuroscience applies concepts from biology, chemistry, computer sciences, philosophy, physics, and psychology, to study the functioning of the nervous system. The rapid growth of this interdisciplinary field is evidenced by the expansion of neuroscience programs, all of which undergo accreditation processes to ensure that they adhere to quality standards. Content knowledge within a field is a commonly assessed variable for accreditation purposes. Nonetheless, a tool that measures neuroscience content knowledge was yet to be developed. To address this gap, we leveraged the eight (8) neuroscience core concepts to design a 57-multiple choice question Neuroscience Concept Inventory. Reliability and item analysis were conducted to evaluate the quality of the tool. Alpha reliability scores determining internal reliability of items within a core concept ranged from 0.51- 0.77, with 4 being within the acceptable range (>0.70). Item discrimination scores determining the quality of each item ranged from 0.65-0.10,

with 48 being within the acceptable range (>0.20). Utilizing the Neuroscience Concept Inventory, we were able to demonstrate learning gains in the Introduction to Neuroscience course (N=75) and through engagement with the neuroscience curriculum (N=186) at a large public university. Altogether, our project sets the groundwork for developing a reliable tool that facilitate content knowledge assessment of neuroscience programs and courses.

Disclosures: M.M. Gaudier-Diaz: None. **S.V. Parekh:** None. **S.D. Robertson:** None.

Theme J Poster

TJP05: Teaching of Neuroscience: College III

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP05.17SU/X35

Topic: J.02. Teaching of Neuroscience

Support: EVMS Incentive Research

Title: Informal Mentorship in Translational Neuroscience Research in Medical School

Authors: *A. MUSTO;
Eastern Virginia Med. Sch., Norfolk, VA

Abstract: Introducing translational neuroscience research in the schools of medicine offers educational opportunities to enhance the understanding of neurological diseases along with the development of new treatments encourage interdisciplinary collaboration and contribute to increasing scholarly products and community engagement. Students encounter neuroscientific translational research through various modalities such as courses, modules, seminars, or research activities in laboratories, centers, or institutes within schools of medicine. Most of these activities are part of the formal programs inside or outside of the schools of medicine during an unstructured academic time (summer break) or included as part of the M.D. / Ph.D. program. Current students require flexibility to engage in research, to tailor their interests, and to have the opportunity to explore curiosity and participate in scholarly products such as abstracts, poster presentations, and articles. Mentorship is undeniably crucial for success in scholarly activities, especially involving a diverse student population. The primary objective of this informal and longitudinal mentorship was to engage and train mentees in research endeavors and managing effectively their time for scholarly activities. This study describes how an informal mentorship impacts translational neuroscience research on mentees, mentors within a medical school. It demonstrates that this type of mentorship experience, running parallel throughout the entire educational training period, is not only feasible but encourages mentees to develop research skills, time management, and opportunities to participate in scholarly products, create synergism with the laboratory activities and at the institutional level, contributes to the institutional accreditation programs.

Disclosures: A. Musto: None.

Theme J Poster

TJP05: Teaching of Neuroscience: College III

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP05.18SU/Y1

Topic: J.02. Teaching of Neuroscience

Support: NSF Grant 2025257

Title: Supporting First Year Student Success using Course-based Undergraduate Research Experiences and Design Thinking training

Authors: A. CAMARILLO[1], ***P. A. VIEIRA**[2];
[1]Clin. Sci., [2]Psychology, CSU Dominguez Hills, Carson, CA

Abstract: The field of neuroscience lacks diversity stemming back to unsuccessful recruitment, retention and persistence of Underrepresented Minority (URM) students in higher education. This longitudinal study implemented an intervention targeting entering first year students at a Primarily Undergraduate (PUI), Hispanic and Minority Serving (HSI/MSI), urban comprehensive institution. Students enrolled in a First Year Seminar (FYS) course focused on the fundamentals of neuroscience engaged in Course-based Undergraduate Research Experiences (CUREs) using low-cost neuroscience tools. Concurrently, students were trained in Design Thinking (DT), developing strategic and practical plans for success in education and subsequent careers. Compared with matched controls, participants reported higher levels of confidence, motivation, self-efficacy, and identity of belonging in higher education and science. Students also had higher rates of retention, enrolling in subsequent semesters at the institution and persisting in their selected majors. Taken together, this study serves as a possible model for supporting the success of URM students in higher education to help diversify the field of neuroscience.

Disclosures: A. Camarillo: None. **P.A. Vieira:** None.

Theme J Poster

TJP05: Teaching of Neuroscience: College III

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP05.19SU/Y2

Topic: J.02. Teaching of Neuroscience

Support: NSF RCN-UBE Grant 2217333

Title: Connectomes for Undergraduate Neuroscience Education and Learning: Leveraging the Drosophila Female Adult Fly Brain electron microscopy data set to teach neuroscience principles

Authors: *A. BELLEMER[1], J. H. SIMPSON[2], D. BOCK[3], A. M. DACKS[4], D. SITARAMAN[5], K. J. COLODNER[6];
[1]Appalachian State Univ., Boone, NC; [2]Neurosci. Res. Institute/MCDB, Univ. of California, Santa Barbara, CA; [3]Neurolog. Sci., Univ. of Vermont, Burlington, VT; [4]Dept. of Biol., Case Western Reserve Univ., Cleveland, OH; [5]Psychology, California State Univ. East Bay, Hayward, CA; [6]Neurosci., Mount Holyoke Col., South Hadley, MA

Abstract: It is well understood that undergraduate STEM students benefit from access to authentic research experiences that provide practical insights into the research process and career paths in STEM fields. The widespread implementation of these approaches may be impeded by the need for investment in infrastructure, instrumentation, and instructor time, which may limit the types of institutions that are able to use these approaches. We have looked to connectomics, the rapidly growing subfield of neuroscience that seeks to create and analyze comprehensive maps of neurons and synaptic connections within the nervous system, as an opportunity to bring cutting-edge research data and practices into undergraduate classrooms. With the goal of making connectomics data and methods accessible for instructional purposes at a wide variety of undergraduate institutions, we have assembled the Connectomes for Undergraduate Neuroscience Education and Learning (CUNEL) network to bring together scientists and instructors who are interested in incorporating connectomics research into their undergraduate teaching. Using a complete serial section electron microscopy volume of a Female Adult Fly Brain (FAFB) and the Collaborative Annotation Toolkit for Massive Amounts of Image Data (CATMAID) software platform, we have designed active-learning modules that teach students how to navigate within a connectomics dataset while teaching fundamental neuroscience concepts. We have developed undergraduate laboratory modules that provide hands-on experience with navigation of the fly brain volume, fly neuroanatomy, interpretation of electron microscopy data, and analysis of neural circuits and synaptic connectivity. We have implemented these modules at multiple institutions in the past two years, including small liberal arts, regional public, and R1 institutions. Our initial assessment of these modules suggests that they provide students with a deepened connection to the processes and procedures of neuroscience research, and reinforce fundamental neuroscience concepts. We are currently working to expand the CUNEL network to include additional instructors and institutions in order to bring our instructional tools to more undergraduate students.

Disclosures: A. Bellemer: None. **J.H. Simpson:** None. **D. Bock:** None. **A.M. Dacks:** None. **D. Sitaraman:** None. **K.J. Colodner:** None.

Theme J Poster

TJP05: Teaching of Neuroscience: College III

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP05.20SU/Y3

Topic: J.02. Teaching of Neuroscience

Title: Learning resources for psychology and neuroscience online education

Authors: *T. H. GILBERT;
Psychology, Athabasca Univ., Athabasca, AB, Canada

Abstract: A major challenge associated with online and distance education is engaging independent learners with material that encourages persistent active learning, enhanced knowledge retention, and improved learning outcomes. In a distance learning environment, it is essential that the educational materials be designed properly to engage the student and promote learning. In an attempt to promote greater understanding of essential neuroanatomical structures and neurobiological processes for our learners, we have developed a repository of psychology and neuroscience resources. These online resources allow students to study neuroanatomy, physiology, pharmacology, and sensation/perception. Significant features of our tutorial repository have included interactive animations, auditory narrations, and self-tests. These online neuroscience educational resources provide the opportunity to further develop mastery of foundational neural concepts, mechanisms, and processes. A more recent addition was a Virtual Behavioural Neuroscience Laboratory (VBNL), enabling an immersive exploration of the tools and equipment of a model lab, allowing a dynamic learning experience that would not be possible otherwise. As a whole, these resources have been demonstrated to be useful in aiding learning, but growing financial constraints have restricted the ongoing maintenance and improvements required to keep up with technological demand. This has propelled us to look to Open Educational Resources (OER) for additional options. OER are educational materials that are freely available for use, reuse, adaptation, and sharing under open licenses that permit their free use and repurposing by others. OER can include a wide range of resources, such as textbooks, lecture notes, videos, quizzes, lesson plans, and interactive simulations, that are designed to support teaching, learning, and research. While there is a wealth of OER in digital space, not all OER is high quality and not authored by credible sources. To find the best OER, digital literacy is required to make informed choices and effective guidance is required to maximize the educational value of OER. We will share experiences with our own content-created educational resources, along with a summary of our journey into the vast OER landscape.

Disclosures: T.H. Gilbert: None.

Theme J Poster

TJP05: Teaching of Neuroscience: College III

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP05.21SU/Y4

Topic: J.02. Teaching of Neuroscience

Support: George I. Alden Trust Grant to Sarah Lawrence College, 2022

Title: Growing undergraduate research skills through a zebrafish-based laboratory course

Authors: *C. P. TORO;
Biol., Sarah Lawrence Col., Bronxville, NY

Abstract: Undergraduate students preparing for a future in biomedical research may have limited opportunities to receive significant research experiences outside of summer internships. These internships are often restricted to US citizens, highly competitive, and monetarily insufficient for those with financial pressures. To address this opportunity gap, I developed *Experimental Neurobiology and Physiology*, a yearlong course designed to provide more students with critical experiences in conducting original research as part of their college education. The course is centered around growing the conceptual and technical knowledge necessary to design and implement research projects using the zebrafish model organism. We meet twice a week for 2.5 hours, with class time devoted to discussing concepts in animal physiology and neurobiology based on textbook readings, primary literature articles, and lab work. The lab work in the first semester involves learning techniques to investigate neurobiology and physiology questions in zebrafish, complemented by a substantial writing assignment in which students craft an NIH-style grant application for a feasible novel research project. In addition, students learn about the ethical considerations and regulations regarding vertebrate animal research by preparing an IACUC protocol which must be approved by our college committee. During the second semester, we transition into class time that is solely devoted to the execution of their independent projects. At the end of the year, students present their work through a paper in the style of a scientific manuscript and a poster exhibited at a college-wide Science and Mathematics Symposium. Outcomes from the first cohort of students to complete this course include admission into MS and PhD programs at the Icahn School of Medicine at Mount Sinai and Harvard University, and internships and research assistantships at Rockefeller University, Cornell University, Columbia University, and New York University. This course thereby contributes to the preparation of research-oriented students for careers in science through deep engagement in all aspects of the scientific process.

Disclosures: C.P. Toro: None.

Theme J Poster

TJP05: Teaching of Neuroscience: College III

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP05.22SU/Y5

Topic: J.02. Teaching of Neuroscience

Support: NIH Grant GM127251 to AMK
NIH Grant MH114961 (AMK co-I)
NIH Grant OD030148 (MJK PI, AMK co-I)
UTEP College of Science (SB)
UTEP Research Incentive Fund (AMK)
Department of Biology, Lab Instructional Funds

Title: Close Encounters of the Third Kind: Incorporating tissue clearing, light sheet microscopy, and 3-D volume rendering as an instructional module to augment the 2-D-centered curriculum taught within a freshman-level neuroanatomy lab course

Authors: *S. BALIVADA, A. M. KHAN;
Biol. Sci., The Univ. of Texas at El Paso, El Paso, TX

Abstract: Exploring neuroanatomy at different scales and dimensions is essential in understanding systems-level organizational principles of the nervous system. For the past decade, we have taught Brain Mapping & Connectomics, a freshman-level two-semester undergraduate laboratory sequence in neuroanatomy that explores brain structure using histological sections in 2-D and atlas-based mapping techniques. However, our curriculum to teach mesoscale neuroanatomy has not yet fully benefited from recently acquired light sheet microscopic imaging technologies at our campus. Here, we present a prospective curriculum addition to our course in the form of a new instructional module focused on (1) experimental methods to perform 3-D imaging of mesoscale neuroanatomy, such as tissue clearing and light sheet microscopy, and (2) volume rendering for 3-D annotation and visualization of the datasets. The curriculum calls for formaldehyde-fixed Sprague Dawley rat brains to be used to teach mesoscale neuroanatomy. Students will perform aqueous tissue clearing methods using these brains and will stain them for vasculature, cranial nerves and their nuclei, or select groups of neurons. These methodologies will be described to the students with visual aids, along with basic theory behind the methods. Stained or unstained brains will be imaged by students using a SmartSPIM light sheet microscope (LifeCanvas) and they will be taught to prepare volume renders of the images obtained by using IMARIS software. Using these volume renders, mesoscale anatomy of the brain will be explored by the students in the UTEP Visualization Lab using high performance workstations and an ultra-high-resolution visualization system. They will also use syGlass virtual-reality headsets in our new Imaging and Behavioral Core Facility. Structural features in the tissue will be visualized by the students in varying planes and thicknesses of optical slices to aid students in acquiring a comprehensive visual understanding of the data. They will also render brain surface features and vasculature using semi-automatic surface-rendering algorithms. We present this curriculum to the neuroscience community for their feedback before its deployment and implementation in Spring, 2025.

Disclosures: S. Balivada: None. **A.M. Khan:** None.

Theme J Poster

TJP06: Teaching of Neuroscience: Graduate and Professional

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 1:00 PM

Program #/Poster #: TJP06.01SA/Y6

Topic: J.02. Teaching of Neuroscience

Title: Incf teachingspace: a resource for education in neuroinformatics

Authors: W. E. GRISHAM[1], F. PESTILLI[2], ***M. ABRAMS**[3];
[1]Dept Psychology, UCLA Chapter, Los Angeles, CA; [2]Psychology, The Univ. of Texas at Austin, Austin, TX; [3]INCF, Stockholm, Sweden

Abstract: The International Neuroinformatics Coordinating Facility (https://incf.org/) provides a very complete set of resources in neuroinformatics for instructors at all levels-from the novice to expert in its TrainingSuite. TrainingSuite consists of: 1. KnowledgeSpace, a data discoverability portal/encyclopedia that semantically links data resources such as the Canadian Open Neuroscience Platform, DANDI archive, and EBRAINS RI to PubMed and Wikipedia; 2. NeuroStars, a help/chatline of fellow neuroinformaticians willing to share their knowledge and experience; and 3. TrainingSpace, a hub of multimedia educational content from courses, conference lectures, and laboratory exercises from some of the world's leading neuroscience institutes and societies, as well as tutorials on tools and open science resources for neuroscience research. The popularity of TrainingSuite and the needs of the INCF Community have led to the development of TeachingSpace which aims to make all the resources in the INCF TrainingSuite available through a single, integrated portal. TeachingSpace will enable individuals, projects, and consortia the ability to customize the INCF TrainingSuite towards the needs of their communities, as well as serve as a community hub through TeachingSpace forum. TeachingSpace will provide users with video tutorials that range from the 20,000-foot level overviews to close-ups on computing languages that can be used in neuroinformatics analyses. Its topics include: general neuroscience, clinical neuroscience, computational neuroscience, neuroinformatics, computer science, data science, and open science. Besides courses and conference lectures in TrainingSpace, it links to prerequisite courses if needed, links to software described in or required for the course, and links to more advanced related courses. It will also explicitly provide resources for instructors: laboratory exercises, open science services, and publicly available datasets and models. The first community pilot of the INCF TeachingSpace will be launched in mid-2024 as Campus+ for the NeurotechEU Project. Learn more about TrainingSuite and TeachingSpace at https://training.incf.org/.

Disclosures: W.E. Grisham: None. **F. Pestilli:** None. **M. Abrams:** None.

Theme J Poster

TJP06: Teaching of Neuroscience: Graduate and Professional

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 1:00 PM

Program #/Poster #: TJP06.02SA/Y7

Topic: J.02. Teaching of Neuroscience

Support: intramural funding, Medical Faculty, Goethe University Frankfurt

Title: Integrating Biochemistry & Neurophysiology Curricula to teach Diabetes mellitus & Obesity in Medical School

Authors: L. MENDLER[1], *J. ROEPER[2];
[1]Inst. of Biochem. II, Goethe Univ. Frankfurt, Frankfurt, Germany; [2]Johann Wolfgang Goethe-University Frankfurt, Frankfurt, Germany

Abstract: Teaching the life science fundamentals in the first years of medical school is often segregated in parallel biochemistry and physiology curricula, whose boundaries after often historical and method-driven. We attempted a horizontally integrated approach to co-teach the fundamental life science of neuroendocrinology with a focus on glucose metabolism and its disorders including metabolic syndrome, obesity, HPA stress axis and diabetes mellitus. In a series of joint pilot-seminars to first and second year medical students, we constantly switched between the biochemical perspective of metabolic pathways and receptor signalling and the physiological focus of neuronal control. These joint-seminars were complemented by clinical colleagues who discussed patho-biochemical and patho-physiological concepts as well as the foundations of diagnosis, treatment and disease management. We will present results of student evaluation with pros and cons of our integrated teaching approach.

Disclosures: L. Mendler: None. **J. Roeper:** None.

Theme J Poster

TJP06: Teaching of Neuroscience: Graduate and Professional

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 1:00 PM

Program #/Poster #: TJP06.03SA/Y8

Topic: J.02. Teaching of Neuroscience

Support: Institutional Growth Mindset Grant

Title: Student Growth in Clinical Reasoning and Communication

Authors: D. A. COPAS[1], *D. PETERSON[2];
[1]Anatomy, Neurosci. & Hlth. Sci., Univ. of Findlay, Findlay, OH; [2]Biomed. Sci., Philadelphia Col. of Osteo. Med., Suwanee, GA

Abstract: The 6th leading cause of death in the US is brought about by ineffective inter-professional communication that leads to diagnostic errors. To help students grow this skill-set, 59 clinical neuroscience students were challenged by placing them into non-complimentary communication style groups to determine whether initiation of communication conflicts in a controlled environment could improve these skill-sets. **Methods:** Students were given a communication test, the "SELF profile", which divided individuals into one of 4 categories (S, E, L, and F) to help individuals identify how they best relate to others. Results from the profile were used to place students in teams that would maximally challenge their ability to work together. Groups remained the same during 2 neuroscience courses that met twice weekly for 16 weeks. Students were required to work together in all aspects of the course. Faculty continuously evaluated communication within teams and conflicts were noted in a daily logs. In addition, student feedback and peer assessment on communication competencies were collected during

week 10 and 16 of the course. **Results**: All teams had some form of communication challenge throughout the courses. By the end of the trial, 93% of students reported significant improvement in communication ability throughout the semester and believed that the experience would assist them as clinicians in the future. Our results indicate that placing students in teams designed to challenge their communication style may be helpful for the development of professional communication competency in professional curriculums. While communication was not the focus of the courses, these exercises helped students to practice and grow from each other in both their awareness of other communication styles as well as in their adaptability to to effectively communicate with communication styles that are opposite from their preferred communication modality.
Conclusion: Inter-personal communication can be promoted and taught in all classes, regardless of the focused subject matter.

Disclosures: D.A. Copas: None. **D. Peterson:** None.

Theme J Poster

TJP06: Teaching of Neuroscience: Graduate and Professional

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 1:00 PM

Program #/Poster #: TJP06.04SA/Y9

Topic: J.02. Teaching of Neuroscience

Title: Spartananatomy.org: an interactive MRI atlas that facilitates learning neuroanatomical relationships

Authors: *N. B. HABIB[1], C. A. VERA CRUZ[3], C. LEE[4], D. KELLER[2], H. KERVER[5]; [1]Michigan State Univ. Col. of Human Med., Grand Rapids, MI; [2]Michigan State Univ. Col. of Human Med., ; [3]Michigan State University, Col. of Human Med., Flint, MI; [4]Michigan State University, Col. of Human Med., Grand Rapids, MI; [5]Radiology, Div. of Human Anat., Michigan State Univ., East Lansing, MI

Abstract: PURPOSE
Teaching neuroanatomy through the lens of magnetic resonance imaging (MRI) sets medical students up for success. Many MRI learning resources currently available lack interactive and user-friendly functionality, require payment, or contain an overabundance of labeled structures. A free, user-friendly MRI atlas is needed, focusing on foundational structures for early medical students and allowing users to highlight single structures across multiple planes simultaneously.
METHODS
We created a web-based interactive atlas of neuroanatomical structures in MRI geared toward early medical education. The atlas, available at SpartanAnatomy.org, is free, public-facing, and serves as a supplemental resource for students to familiarize themselves with brain structures in MRI as a supplement to classroom learning. The website includes a built-in quiz function as well. We asked participants to interact with the website for an undetermined amount of time and surveyed their perceptions of this new resource, time spent on the website, and self-reported quiz

scores after utilizing the built-in quiz function.
RESULTS
49 students completed the survey, with half of the respondents being first-year medical students. Their perceptions of SpartanAnatomy.org were overwhelmingly positive, with free response answers citing the website's ease of use and ability to highlight brain structures in multiple views/planes simultaneously. Analysis of time spent utilizing the website and self-reported quiz scores indicate for every additional 15 minutes spent on the website, there is an average increase of 0.72 in the quiz score. When focusing solely on the data from first-year students, the quiz score increased by 0.88 per 15 minutes spent on the website.
CONCLUSION
SpartanAnatomy.org will be a beneficial resource for early medical education and is now publicly available for use. We have plans to improve and expand the website to include more features and atlases.

Disclosures: N.B. Habib: None. **C.A. Vera Cruz:** None. **C. Lee:** None. **H. Kerver:** A. Employment/Salary (full or part-time):; Michigan State University College of Human Medicine.

Theme J Poster

TJP06: Teaching of Neuroscience: Graduate and Professional

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 1:00 PM

Program #/Poster #: TJP06.05SA/Y10

Topic: J.02. Teaching of Neuroscience

Support: FJNU Research Start-Up Funds

Title: A Tale of Neuroscience Teaching Across Two Nations: From a Graduate Student to a Faculty

Authors: *B. YIN[1], B. YIN[2];
[1]Sch. of Psychology, Fujian Normal Univ., Fuzhou, China; [2]Psychology and Neurosci., Duke Univ., Durham, NC

Abstract: Drawing from a rich academic journey that spans two continents, this presentation offers a detailed exploration of my evolution from a systems and integrative neuroscience graduate student at Duke University to an Associate Professor at Fujian Normal University. During my doctoral studies at Duke, I acquired a multidisciplinary foundation in psychology and neuroscience, which was enriched by active involvement in cutting-edge research and collaboration across various scientific disciplines. My research at Duke not only deepened my understanding of systems and integrative neuroscience but also fostered a passion for teaching through various assistantships and mentoring roles. Transitioning to Fujian Normal University marked a significant cultural and professional shift. As a faculty member, I faced the challenge of adapting Western pedagogical approaches to a Chinese academic environment. This required a nuanced understanding of how to effectively engage students with different educational

backgrounds and expectations. By integrating interactive and research-based teaching methodologies, I aimed to encourage analytical thinking and foster a scientific mindset in my students. This journey also emphasized the importance of interdisciplinary teaching, a theme that resonates through my research on affective neuroscience, behavioral psychology, and the evolution of social behaviors. My recent work, including preprints and journal articles, reflects a commitment to advancing neuroscience education and research that aligns with global trends while being sensitive to local educational needs. This presentation will highlight the adaptability required to navigate diverse academic environments and the value of leveraging cross-cultural experiences to enhance neuroscience education. It underscores the role of interdisciplinary and integrative teaching methods in nurturing the next generation of neuroscientists in a rapidly evolving academic landscape.

Disclosures: B. Yin: None. **B. Yin:** None.

Theme J Poster

TJP06: Teaching of Neuroscience: Graduate and Professional

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 1:00 PM

Program #/Poster #: TJP06.06SA/Y11

Topic: J.02. Teaching of Neuroscience

Support: NINDS Grant 1T32NS121768-01

Title: Incorporating quantitative literacy into a T32 retreat: Lessons and considerations from experience

Authors: A. HALL, J. MCGRATH, ***J. S. SHUMSKY**;
Neurobio. and Anat., Drexel Univ. Col. of Med., Philadelphia, PA

Abstract: Regardless of discipline, quantitative literacy is a critical component of any scientist's skill set. A recent push from the NINDS has focused on enhancing and maintaining this expertise in trainees to enhance scientific fluency and to combat the reproducibility crisis. T32-funded programs often include off-campus retreats, providing an ample opportunity to integrate a quantitative literacy component or thematic focus. Here we will discuss the lessons and considerations learned from organizing a retreat focused on quantitative aspects of diagnostics for spinal cord injury. Survey results regarding retreat events and workshops reveal what were perceived to be successful by the student body. Events developed with active learning in mind that focused on collaborative problem solving and cross-discipline quantitative measures were well received by trainees. On the other hand, lectures and panel discussions were thought to be less effective in addressing objectives of boosting long lasting improvements in quantitative literacy. Taken as a whole, these experiences from incorporating quantitative literacy into a T32 retreat offer strategies to consider when designing coursework or events focusing on this topic.

Disclosures: A. Hall: None. **J. McGrath:** None. **J.S. Shumsky:** None.

Theme J Poster

TJP06: Teaching of Neuroscience: Graduate and Professional

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 1:00 PM

Program #/Poster #: TJP06.07SA/Y12

Topic: J.02. Teaching of Neuroscience

Title: Neurological conditions portrayed by faculty as a platform for critical thinking exercises in Neuroscience courses

Authors: *C. STEFAN;
Mol. Pathobiology, New York Univ. Col. of Dent., New York, NY

Abstract: One of the main educational goals in the healthcare professions is represented by an early and smooth transition between the learning of factual information and the ability to meaningfully apply the knowledge to concrete situations. Alone or in conjunction with other methodologies (e.g. case studies, videoclips, interviews conducted with real or standardized patients, simulation, etc.), the faculty's expertise and skills to portray/act like patients with various neurological conditions serves as a versatile platform for problem-solving exercises in Neuroscience courses with clinical focus. For this purpose, a layered pedagogical approach is designed according to the audience level, learning objectives, purpose of session, and available time. The role-playing instructor may portray only the patient or switch between two or more roles (patient, family member, caregiver, witness to an event, etc.). Each exercise is built up in a scaffolding manner. It could start with a key component of the clinical presentation that must be recognized and interpreted. It then adds more elements in how the patient is portrayed, plus information about history, imaging studies, and lab results. Each step offers a gradual immersion into the case and prompts the use of essential skills in the process of establishing a differential diagnosis, including observation, asking pertinent questions, requesting appropriate tests, methodical collection of data, analyzing, categorizing, and interpreting the various pieces of information in context. The concepts of signs, symptoms, syndromes, positive findings, and negative manifestations are reinforced. Ethical aspects and the impact the condition has on the patient, family, and society are also brought into discussion. As a higher-level pedagogical technique, a clinical feature/data that does not match the scenario may be purposefully introduced at one point or another, as a challenge for the audience to spot it, followed by discussions about circumstances under which such feature may fit into the scenario. The exercise may also expand to include elements related to management and therapeutics. These creative exercises are highly interactive, encourage critical thinking and communication, offer didactic flexibility, and give the instructor additional opportunities and perspectives to assess the audience.

Disclosures: C. Stefan: None.

Theme J Poster

TJP06: Teaching of Neuroscience: Graduate and Professional

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 1:00 PM

Program #/Poster #: TJP06.08SA/Y13

Topic: J.02. Teaching of Neuroscience

Title: Barriers to maximal utilization of neuroimaging tools

Authors: *C. A. VERA CRUZ[1], N. HABIB[3], C. LEE[2], D. KELLER[4], J. CHAUDHURI[5], H. KERVER[6];
[1]Michigan State University, Col. of Human Med., Flint, MI; [2]Michigan State University, Col. of Human Med., East Lansing, MI; [3]Michigan State Univ. Col. of Human Med., Orchard Lake, MI; [4]Michigan State Univ. Col. of Human Med., Flint, MI; [5]Univ. of Michigan, Mount Pleasant, MI; [6]Radiology, Div. of Human Anat., Michigan State Univ., East Lansing, MI

Abstract: PURPOSE: The purpose of this research is to determine the barriers to maximal utilization of neuroimaging tools, in addition to learning more about the tools and resources students find to be most effective for studying. We previously created a web-based atlas of neuroanatomy structures in MRI, located at spartananatomy.org. This interactive and publicly available resource allows medical students to learn the anatomy of the brain through MRI images as they concordantly learn the clinical correlates of those structures in class. When surveyed previously, 49 student respondents reported overwhelmingly positive ratings of the educational value, accessibility, and built-in quiz function. However, despite the positive responses in the survey, 49% of respondents used the website for only 15 minutes or less. We are interested in exploring the barriers to maximal student usage of this resource when learning neuroanatomy.
METHODS: The authors performed semi-structured focus groups with first- and second-year medical students from the College of Human Medicine at Michigan State University who reported utilizing this resource to varying degrees. Participants were asked a series of open-ended questions. The question topics ranged from non-identifiable demographics (year in medical school, gender identity, specialties being considered for residency), prior experience with neuroanatomy and/or neuroimaging, the resources they currently utilize to study, and how they go about locating other resources outside of the present curriculum. No directly identifiable information was collected from participants.
RESULTS: Preliminary data from the semi-structured focus groups revealed consistent themes of cognitive overload and an overabundance of other resources offered within the curriculum. Supplemental resources, regardless of discipline, are often overlooked by students. Results also indicated that students are more likely to utilize third-party resources that their earlier peers had already used and recommended.
CONCLUSIONS: When introducing new resources, it will be important to incorporate them into class work in the future. Adding supplementary resources to the curriculum materials only increases the amount of cognitive load and likely decreases the chances of students utilizing the resource. Direct incorporation of this MRI atlas into team-based case study work within the neuroanatomy portion of the curriculum may increase the utilization of neuroimaging tools.

Disclosures: C.A. Vera Cruz: None. **N. Habib:** None. **C. Lee:** None. **D. Keller:** None. **J. Chaudhuri:** None. **H. Kerver:** None.

Theme J Poster

TJP06: Teaching of Neuroscience: Graduate and Professional

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 1:00 PM

Program #/Poster #: TJP06.09SA/Y14

Topic: J.02. Teaching of Neuroscience

Title: Neuroscience Education in Doctor of Pharmacy Curricula Needs Boosting Amid the Growing CNS Therapeutics Market

Authors: *G. KHAN;
Pharmaceut. Sci., Appalachian Col. of Pharm., Oakwood, VA

Abstract: MOTIVATION: The CNS therapeutics market valuation is expected to grow from US$116.7 billion in 2022 to US$141.1 billion by 2026 (CNS Therapeutics market). With the evolving market of CNS drugs, pharmacy institutions face the challenge of effectively educating student pharmacists who would be able to cope with the demanding situation. Unlike most other pre-pharmacy disciplines, neuroscience background knowledge in student pharmacists remains largely uncharted territory. In our Doctor of Pharmacy (PharmD) program, we offer a section in the first foundational course to familiarize the students with some basic concepts of neurotransmission and neuronal signaling. The present study aims to evaluate students' performance in the neuroscience test component versus a control component (cell biology) of the course. Since the CNS drug market is growing at a rapid pace, a solid foundation in neuropharmacology is highly desirable. Identification of any deficit will help in planning mitigation of the problem at the outset at the foundational level. METHODS: A total of 127 students' scores for neuroscience-related questions and cell biology questions were assessed across three academic years between 2021 and 2023. The total number of neuroscience-related questions was 20 and cell-biology-related questions were 10. The component scores were compared for any statistically significant differences. In addition, students' scores in the "Pre-Assessment for Learning and Mastery" (PALM) test, mandatory for all matriculating students to identify their standing to peers, were used to assess if the two test components possessed comparable standards. RESULTS: The mean scores for the cell biology and the neuroscience components were 79 % and 71%, respectively which was significantly different ($P<0.001$). Linear regression analyses revealed a goodness of fit (R^2) of 0.15 between students' performance in the PALM test and the neuroscience test component and 0.23 between the PALM and the cell biology test component, indicating that both sets of questions had comparable standard and value parameters. CONCLUSION: Students' performance in the neuroscience component of the foundational course was significantly less than the corresponding cell biology component of the course. It may indicate a lack of appropriate pre-pharmacy neuroscience background and knowledge calling for greater efforts to boost them up.

Disclosures: G. Khan: None.

Theme J Poster

TJP06: Teaching of Neuroscience: Graduate and Professional

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 1:00 PM

Program #/Poster #: TJP06.10SA/Web Only

Topic: J.02. Teaching of Neuroscience

Title: Applying cognitive neuroscience research to occupational therapy introductory fieldwork training: A mixed-methods comparison

Authors: *S. LALA;
Nova Southeastern Univ., Clearwater, FL

Abstract: The Affordable Care Act's focus on preventive health and specialty practice has created a high demand for qualified health professionals in the United States. With the growing number of academic programs in the past decade, the occupational therapy profession is experiencing shortages in the number of qualified faculty and fieldwork placements available for high-quality experiential education. In response to these shortages, academic programs are developing creative opportunities using standardized patients in simulated contexts for prospective clerkships (see Figure 1). This research investigated the perceived academic rigor of the newly developing formats of fieldwork education by using best practices in brain-based education and applied cognitive neuroscience. A mixed methods study explored stakeholder perspectives about Level I, introductory, experiential training in a standardized patient program and compared those to fieldwork experiences in traditional and role-emerging practice settings. Twenty-seven occupational therapy assistant students completed Likert-scale surveys that were adapted with permission from the National League of Nursing. The quantitative data, analyzed using the non-parametric Friedman test and the Wilcoxon signed rank test, revealed that innovative training in the form of standardized patient programs and nontraditional fieldwork support independent problem-solving, peer collaboration, personalized training, and diverse learning methods among students. Qualitative data collected during interviews with six faculty, fieldwork educators, and potential employers shed light on the various viewpoints surrounding the benefits and challenges of embedding creative clerkships in the curriculum. Conscientious practice, neuroeducation principles, and user-centered approaches can help in designing job-embedded professional learning and facilitate greater understanding of educational innovation among stakeholders.

Figure 1. Students helping a standardized patient walk safely during a simulated lab training session.

Disclosures: S. Lala: A. Employment/Salary (full or part-time):; Nova Southeastern University.

Theme J Poster

TJP06: Teaching of Neuroscience: Graduate and Professional

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 1:00 PM

Program #/Poster #: TJP06.11SA/Y15

Topic: J.02. Teaching of Neuroscience

Title: A novel framework for teaching neuroscience: Using large language models, retrieval-augmented generation, and structured PDF parsing to enhance graduate students' interpretation of research articles

Authors: *M. GAJENDRAN, P. KOULEN;
Ophthalmology, Univ. of Missouri-Kansas City, Kansas City, MO

Abstract: This study presents a novel educational framework developed to enhance the interpretative skills of graduate students in neuroscience. The framework integrates advanced artificial intelligence technologies, including Large Language Models (LLMs) and Retrieval-Augmented Generation (RAG), aiming to improve students' engagement with and understanding of complex research articles.

The framework utilizes OpenAI's LLMs for in-depth semantic analysis and synthesis of article content, supported by the Mathpix API for transforming unstructured PDF documents into analyzable formats. RAG, anchored in a key neuroscience textbook, enhances the contextual accuracy of the LLM outputs. Additionally, OpenAI's vision capabilities are employed to analyze visual data within articles, such as images and plots. The learning experience is customized through a diagnostic interface that allows students to adjust their knowledge level, tailoring the complexity of the material accordingly.
The use of RAG led to noticeably improved comprehension of text-based content, significantly enhancing student engagement and understanding. The vision capabilities, while sometimes challenged by intricate non-textual details in plots, effectively provided a broad understanding of visual data when contextual cues were incorporated. These findings indicate the framework's strong potential in academic settings, though they also suggest areas for refinement to fully leverage all types of article data.
This framework represents a significant enhancement in teaching tools for neuroscience, leveraging AI to aid graduate students in mastering complex research articles. It demonstrates the powerful role of AI in educational innovation and highlights the need for ongoing development to maximize the technology's utility.

Disclosures: M. Gajendran: None. **P. Koulen:** None.

Theme J Poster

TJP06: Teaching of Neuroscience: Graduate and Professional

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 1:00 PM

Program #/Poster #: TJP06.12SA/Y16

Topic: J.02. Teaching of Neuroscience

Title: Increasing understanding, awareness, and acceptance of substance use disorder through enhanced neurobiology of addiction education

Authors: *L. C. NEWMAN, A. SWISSHELM;
Col. of Pharm., Ohio State Univ., Columbus, OH

Abstract: Substance use disorder (SUD) is a major public health concern requiring significant health care and attention. Despite the severity of the disease and its grip on society, gaps in substance use education have led to insufficiencies in practice. While SUD and the substances themselves get much attention in society and in the health care field, individuals with SUD are often disregarded and experience unnecessary stigma and judgement. This not only affects how individuals with SUD are regarded personally, but significantly impacts their medical treatment. The stigma associated with SUD in part arises from a lack of understanding of the disease nature of SUD which throws the individual into a survival mode and renders them unable to make rational decisions about substance use. Neuroscience education on SUD often involves discussing only the reward circuit of addiction which, without additional context, implies that individuals just want to “get high” and furthers the associated stigma. SUD is a captivating topic

for students, but the complex details of the neurobiology of addiction are less interesting and students generally do not give much thought to the experiences and emotions of the individual trapped in the addiction cycle. We have developed and implemented activities which convey the human element of addiction that consequently increase student interest and motivation in learning the complex mechanisms associated with addiction. The goals of these activities are to enhance the level of thinking about complex topics, help students consider multiple viewpoints, and let students self-evaluate their opinions of and attitudes towards SUD. Overall, enhanced understanding of the neurobiology of addiction gives students an appreciation for the devastating nature of this disease as well as for the emotional complexity of the individual. These aspects are vital to addressing the medical treatment of the individual with SUD as well as their emotional well-being, components that must be addressed together to better understand and prevent SUD.

Disclosures: L.C. Newman: None. **A. Swisshelm:** None.

Theme J Poster

TJP06: Teaching of Neuroscience: Graduate and Professional

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 1:00 PM

Program #/Poster #: TJP06.13SA/Y17

Topic: J.02. Teaching of Neuroscience

Support: NIH Grant U01NS103475
NIH Grant U01NS105509

Title: Systematic review of wet biomarkers to advance clinical trials in Huntington's disease: Methodological and training implications

Authors: *J. S. PAULSEN[1], A. PINTO[1], N. A. BOVIN[1], J. D. CLEMSEN[2], **A. M. KEY**[1], M. S. RUDRUD[1], M. L. JANZ[1], W. H. ADAMS[3], H. J. BOCKHOLT[2], D. K. BURKS[1], K. M. SHANNON[1];
[1]Univ. of Wisconsin, Madison, Madison, WI; [2]TReNDS Ctr., Georgia State Univ., Atlanta, GA; [3]Loyola Univ. Chicago, Chicago, IL

Abstract: Introduction: Clinical trials for Huntington's disease (HD) have been ongoing for almost 30 years. Recently, the burden and risk in HD clinical trials have significantly increased. Clinical trial success in medicine is remarkably low, with neurological trials among the lowest. The FDA, C-Path, and National Academies have issued strong guidelines for developing rigorous biomarkers (BM) and clinical outcome assessments (COA). However, there are no validated BMs or COAs for HD, and translational research training could better integrate these guidelines. Methods: A meta-analysis and systematic literature review using PubMed were performed from 02/18/2017 to 04/16/2024 using search terms from Silajdžić & Björkqvist's 2018 review. To meet review inclusion criteria, articles must have accessible data (either reported in the main article or the supplementary material) and compare persons with HD and healthy controls (HC). Only biomarkers with at least one validation/replication were included.

Any article serving as a replication of a single finding from Silajdžić & Björkqvist's 2018 review also met the inclusion criteria. The search yielded 697 results: 25 met inclusion criteria. Data were extracted by two independent reviewers. All 25 manuscripts underwent methodology ratings from Tang et al. 2021 by two independent raters. Results: Hedges' g was used to develop the standardized mean difference (SMD) between HD and HC. Random effects restricted maximum likelihood meta-analysis was used to pool estimates of the SMD when any biomarker was reported in ≥2 studies. Of 37 biomarkers analyzed, only neurofilament light chain (NfL) had consistently strong significance. When HD was divided into subgroups according to disease burden, cortisol, mHTT, NfL, and T-tau were of some significance. Ratings of methodological rigor varied widely, with a notable lack of inter-study consensus. Conclusions: BM development and validation for HD are paramount to effective and efficient clinical trials. Efficiency concerns are heightened for rare disorders since there are fewer participants for clinical trials. This review's findings may be critical to prepare the field for success in the development of new treatments for HD. Equally critical is considering what these findings suggest about the current practice of graduate and professional training. Two preliminary observations are that training could better anchor the role of systematic reviews in identifying current trends and persistent gaps in BM research and encourage public reporting of the key data and specific information required for effective BM systematic review and meta-analysis.

Disclosures: J.S. Paulsen: None. **A. Pinto:** None. **N.A. Bovin:** None. **J.D. Clemsen:** None. **A.M. Key:** None. **M.S. Rudrud:** None. **M.L. Janz:** None. **W.H. Adams:** None. **H.J. Bockholt:** None. **D.K. Burks:** None. **K.M. Shannon:** None.

Theme J Poster

TJP06: Teaching of Neuroscience: Graduate and Professional

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 1:00 PM

Program #/Poster #: TJP06.14SA/Y18

Topic: J.02. Teaching of Neuroscience

Title: Empowering neuroscience education: the role of student-led teaching

Authors: *G. N. WILSON, W. J. GELDENHUYS;
West Virginia Univ., Morgantown, WV

Abstract: Student-led teaching approaches empower learners to take an active role in their education by deepening their understanding of course material and fostering opportunities for both creativity and critical thinking. This technique shifts the traditional teacher-centered paradigm to one where students drive discussions, lead activities, and collaborate on projects. Through peer-to-peer teaching, students reinforce their knowledge and develop important communication and leadership skills. In the complex and growing field of neuroscience, student-led teaching can enhance learning outcomes by encouraging exploration, and problem-solving. As educators, we are aware of the benefits flipped classroom and peer-to-peer teaching can have on learning outcomes, but do students similarly value these educational approaches? Here, we

were interested in quantifying how students viewed flipped classroom activities, particularly student-led lectures on course material, in place of didactic, faculty-led sessions. Using basic survey data comparing perceptions and goals at the beginning of the course and following student-led activities, we summarized their views and perceived value of these activities within a first-year graduate neuroscience course, Fundamentals of Neuroscience, at West Virginia University. We show Likert data describing: (1) overall educational value of student-led vs. faculty-led sessions, (2) educational value of preparing teaching material, (3) educational value of learning from their peers, (4) views on social connectivity gained from working within a peer-group, (5) benefit of continuing student-led sessions, and more. While some students enjoy these approaches, others do not and it is important to continually ask questions, as we have here, to understand where these activities may fall short in students' eyes. Additionally, knowing the student-perceived strengths of these activities can help educators better implement and frame these exercises within the classroom in a way that softens student views and highlights the value of peer-to-peer learning and flipped classroom approaches. In addition to our Likert data, we describe here some of the benefits and challenges of implementing student-led teaching in neuroscience education from a faculty perspective. Overall, we assert that these educational approaches are worthwhile and full of potential to transform the learning experience and prepare students for future academic and professional endeavors.

Disclosures: G.N. Wilson: None. **W.J. Geldenhuys:** None.

Theme J Poster

TJP06: Teaching of Neuroscience: Graduate and Professional

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 1:00 PM

Program #/Poster #: TJP06.15SA/Y19

Topic: J.02. Teaching of Neuroscience

Title: Forging Tomorrow: The Interplay of Intellectual Property and Neuroscience in Modern Society

Authors: *R. BELTRAN-RAMIREZ[1], J. A. DOMINGUEZ-RAMIREZ[1], X. M. BECERRA-GONZÁLEZ[1], C. ROMAN[2], J. MARTINEZ-MENDOZA[3];
[1]Univ. de Guadalajara, Zapopan, Mexico; [2]Tecnology, Univ. de Guadalajara, Guadalajara, Mexico; [3]Periferico Norte, Ctr. Univericitario De Ciencias Economico Admin., Jalisco, Mexico

Abstract: In today's rapidly evolving landscape of technological innovation, neuroscience stands as a pivotal discipline at the intersection of scientific exploration, technological development, and intellectual property. The burgeoning field of neuroscience encompasses a multifaceted exploration of the brain and nervous system, offering profound insights. Within this context, the integration of cutting-edge technologies and the protection of intellectual property rights play crucial roles in driving progress and fostering innovation in neuroscience research and applications. Advancements in technology have revolutionized the field of neuroscience, enabling researchers to delve deeper into the complexities of the brain with unprecedented

precision and resolution. Techniques such as functional magnetic resonance imaging (fMRI), electroencephalography (EEG), and optogenetics have provided researchers with powerful tools to observe, manipulate, and understand neural activity in ways previously unimaginable. These technological breakthroughs have accelerated the pace of discovery in neuroscience, leading to groundbreaking insights into brain function, neural circuitry, and the mechanisms underlying neurological disorders. Moreover, the convergence of neuroscience with other fields such as artificial intelligence (AI), robotics, and biotechnology has sparked a new era of interdisciplinary collaboration and innovation. By leveraging insights from neuroscience, researchers are developing AI algorithms inspired by the structure and function of the brain, enhancing the capabilities of machine learning systems and autonomous technologies. Similarly, advancements in neuroprosthetics and brain-computer interfaces (BCIs) hold immense promise for revolutionizing healthcare, enabling individuals with disabilities to regain mobility and communication abilities through direct interaction with neural signals. However, amidst the rapid pace of innovation, the protection of intellectual property rights plays a critical role in incentivizing investment in neuroscience research and fostering a conducive environment for innovation. Patents, copyrights, and other forms of intellectual property protection are essential for safeguarding the fruits of scientific discovery, encouraging collaboration between academia and industry, and facilitating the commercialization of novel technologies and therapies. By granting inventors exclusive rights to their discoveries, intellectual property laws incentivize investment in research and development, driving continued innovation in the field of neuroscience.

Disclosures: R. Beltran-Ramirez: None. **J.A. Dominguez-Ramirez:** None. **X.M. Becerra-González:** None. **C. Roman:** None. **J. Martinez-Mendoza:** None.

Theme J Poster

TJP06: Teaching of Neuroscience: Graduate and Professional

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 1:00 PM

Program #/Poster #: TJP06.16SA/Y20

Topic: J.02. Teaching of Neuroscience

Title: “The sharing minute”: a strategy from neuroscience to humanize the learning environment in Higer Education

Authors: *Z. DUENAS[1], J. ROCA-LIZ[2];
[1]Ciencias Fisiológicas. Facultad de Medicina, Univ. Nacional de Colombia, Bogota DC, Colombia; [2]Facultad de Medicina, Univ. Nacional de Colombia, Bogota, Colombia

Abstract: During the COVID-19 pandemic, educational environments had to use different strategies that encouraged academic processes within the classroom. Besides the use of technological tools to facilitate contact with the class and pedagogical exercise within the learning conditions, the need to humanize the environment to allow the students to be more engaged and to provide them emotional support in the middle of the situation became evident.

Therefore, in my role as a professor at the Facultad de Medicina de la Universidad Nacional de Colombia, I decided to use a strategy I named: "The sharing minute", in which both the students and the professor have the chance at the beginning of the class talking in one minute with the rest of the group about any situation whether in the personal, academic and/or professional aspects. Actually, I continue using this strategy so in order to evaluate its impact on the students, a Google form was used with: 8 Likert-type questions about the characteristics of the strategy, 1 dichotomous question about whether the students recommend or not the strategy, and 3 open questions that were categorized to determine: A. Reasons why students recommend or do not recommend the strategy, B. Additional attributes that they consider that this strategy has, and C. Other comments. The results show that most of the students consider that this strategy: allows them to learn about other ways of professional practice when people share their projects and/or achievements (88.6%); facilitates the development of empathy between group members (85.7%), and facilitates the development of empathy between teacher and students (82.9%). Additionally, 97.1% recommend the use of this strategy and consider that it has additional attributes to those evaluated such as: it humanizes the classroom, strengthens interpersonal relationships and provides emotional support. These results are confirmatory with the latest findings on psychology and neuroscience about the influence od human emotions have in memory and learning (Barron et al., 2015; Halkiopoulos et al., 2022) Therefore these suggest the importance and need to generate more empathetic learning environments in higher education (Gayles, 2023), which has allowed students to perceive the classroom as humanized, thus establishing an environment conducive to self-development, motivation (Berberyan & Bashkireva, 2017) and the generation of positive emotions in the teacher-student relationship (Kim et al., 2023).

Disclosures: Z. Duenas: None. **J. Roca-Liz:** None.

Theme J Poster

TJP06: Teaching of Neuroscience: Graduate and Professional

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 1:00 PM

Program #/Poster #: TJP06.17SA/Y21

Topic: J.02. Teaching of Neuroscience

Title: Interoceptive experience inventory: content validation, an approach to the assessment of interoception in clinical environments

Authors: *R. LOPEZ BEJARANO[1,2], C. GALVEZ HERNANDEZ[6], V. NERI FLORES[6], O. A. ROJAS RAMOS[3], P. LUNA DAVILA[7], R. SOLIS-VIVANCO[8], M. RODRIGUEZ ORTIZ[4,5]; [1]Neurosciences, Facultad de Psicologia, UNAM, Mexico, Mexico; [2]Facultad de Psicologia, [3]Facultad de Psicología, Univ. Nacional Autónoma de México, Ciudad de México, Mexico; [4]Facultad de Psicologia, Univ. Nacional Autónoma de México, Mexico, Mexico; [5]Neurosciences, Univ. Nacional Autónoma de México, México, Mexico; [6]Breast Cancer, Inst. Nacional de Cancerologia, Mexico, Mexico; [7]Facultad de Psicologia, Univ. Nacional Autónoma de Mexico, Ciudad de México, Mexico; [8]Lab. of Cognitive and Clin. Neurophysiol., Inst. Nacional De Neurologia Y Neurocirugia Ma, Mexico City, Mexico

Abstract: Interoception refers to the internal representation of the organism's states, encompassing processes by which it senses, interprets, integrates, and regulates these signals within itself. Interoception is crucial for maintaining the balance of physiological states, both in restoring the basal state (homeostasis) and in anticipating future adjustments (allostasis), which is essential for overall bodily well-being. Various dimensions and concepts defining the interoceptive process have been reported: Interoceptive awareness, detection, discrimination, precision, sensitivity, etc. Interoceptive capacity has been measured by quantifying physiological variables using objective measurement devices (electrocardiogram, electromyogram, etc.) and subjective self-reports like inventories. Interoceptive processing plays a central role in the health-disease continuum. Recently, the transdiagnostic capacity of interoceptive measurement has been determined, as its decrease is concurrent with various medical and mental conditions, highlighting the need for a basic interoceptive self-reported assessment in patients.We propose the content validation of a self-report scale designed to assess interoceptive dimensions, guided by existing literature and intended as an indicator of the interoceptive capacity. Initially, a literature review was conducted, incorporating definitions of interoception, which formed the foundation for item development and concept classification. Following careful review and refinement by coordinators, the item bank underwent validation by six academic experts in neuroscience, psychology, and interoception. Among them, 66% held doctoral degrees, with an average of 10.8 years of experience in the field. Expert judgments were analyzed using the content validity coefficient, resulting in a value of CVCt = 0.83, indicating an acceptable level of validity.Suggestions and feedback provided were utilized to refine the constructed items. This instrument can be used as an indirect but rapid assessment of interoceptive capacity in clinical contexts, given its potential value as practical and resource optimization. In addition to objective measures, this inventory could complement them. Further research is warranted to bolster validity and reliability.

Disclosures: R. Lopez Bejarano: None. **C. Galvez Hernandez:** None. **V. Neri Flores:** None. **O.A. Rojas Ramos:** None. **P. Luna Davila:** None. **R. Solis-Vivanco:** None. **M. Rodriguez Ortiz:** None.

Theme J Poster

TJP06: Teaching of Neuroscience: Graduate and Professional

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 1:00 PM

Program #/Poster #: TJP06.18SA/Y22

Topic: J.02. Teaching of Neuroscience

Support: NSF grant for NeuroNex: C3NS #2015317

Title: Using AI tools to enhance the Sensory Afferent Database: a comparative study

Authors: *B. BOLEN, A. J. HUNT;
Mechanical & Materials Engin., Portland State Univ., Portland, OR

Abstract: The Sensory Afferent Database represents a learning resource for researchers interested in understanding sensory afferent feedback in locomotion motor control. This was outlined in our previous work, “Sensory Afferent Database: Advancing towards a comprehensive understanding of sensory afferents and motor control”. The ongoing challenge lies in efficiently and accurately expanding this database with relevant literature, including both model-specific papers and comprehensive literature reviews. The integration of Artificial Intelligence (AI) tools promises a potential solution to this challenge, offering rapid processing capabilities.
This study aims to evaluate the efficacy of current AI tools, such as Scispace and MirrorThink, in accurately and swiftly populating the Sensory Afferent Database. We investigate whether these tools can maintain a high standard of precision in identifying and summarizing pertinent research, thereby facilitating the database’s expansion. Our research questions focus on the reliability of AI-generated summaries and classifications compared to manual methods.
We employed a dual approach to populate and update the Sensory Afferent Database. Initially, we manually populated the database with a select number of models and conducted literature reviews to establish a benchmark. Subsequently, we utilized AI tools to process and summarize a broader list of papers, comparing these AI-generated summaries and classifications against our manual benchmarks. This comparative analysis aimed to identify the strengths and limitations of AI assistance in this context.
Our findings indicate that while AI tools exhibit the ability to process and summarize neuroscience papers, their reliability varies across different types of documents. For certain subsets of neuroscience literature, particularly those involving complex models or nuanced discussions, AI-generated outputs required significant human correction to ensure accuracy and relevance. However, for more straightforward literature reviews and model descriptions, AI tools performed adequately, reducing the time and effort needed for database population.
Integrating AI tools into the workflow of populating the Sensory Afferent Database offers a promising avenue for enhancing its growth. However, our study underscores the indispensable role of human oversight in ensuring the accuracy and relevance of AI-processed literature. The goal is to develop a hybrid model that leverages the speed and efficiency of AI while retaining the critical analytical depth that only human expertise can provide.

Disclosures: B. Bolen: None. **A.J. Hunt:** None.

Theme J Poster

TJP06: Teaching of Neuroscience: Graduate and Professional

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 1:00 PM

Program #/Poster #: TJP06.19SA/Y23

Topic: J.02. Teaching of Neuroscience

Support: STI2030-Major Projects2021ZD0203200-5
National Natural Science Foundation of China31930042
National Natural Science Foundation of China82130032
National Natural Science Foundation of China82021002

Title: Spinal astrocytes il-17a regulates bone cancer pain.

Authors: *Y. LANXING, Y. CHANG, Z. ZHOU;
fudan Univ., Shanghai, China

Abstract: In the realm of pain research, the intricate interplay between spinal microglia and astrocytes unveils intriguing dimensions, particularly in the contexts of neuropathic and inflammatory pain. Our investigation delves into the pivotal role of sustained activation of spinal astrocytes and the ensuing release of astrocyte-derived IL-17A in propelling the trajectory of mouse bone cancer pain, irrespective of sex disparities. Notably, interventions such as chemogenetic or pharmacological inhibition of spinal astrocytes exhibit promising efficacy in alleviating pain-like behaviors induced by bone cancer. Conversely, activation of spinal astrocytes through chemogenetic or optogenetic means precipitates pain hypersensitivity, implicating astrocytic activation in the genesis of bone cancer pain. Furthermore, our exploration reveals the predominance of IL-17A expression within spinal astrocytes, while its receptor, IL-17RA, primarily localizes in neurons expressing vGlut2 and vGat. Targeted knockdown of IL-17A in spinal astrocytes impedes and retards the onset of bone cancer pain, whereas selective knockdown of IL-17RA in spinal vGlut2+ or vGat+ neurons significantly attenuates bone cancer-induced hyperalgesia. Collectively, our findings underscore the indispensable involvement of sex-independent astrocytic signaling in the pathophysiology of bone cancer pain. By elucidating the mechanisms underlying spinal astrocyte and IL-17A/IL-17RA signaling, novel therapeutic avenues emerge, offering gender-inclusive strategies for the management of bone cancer pain.

Disclosures: Y. LanXing: None. **Y. Chang:** None. **Z. Zhou:** None.

Theme J Poster

TJP06: Teaching of Neuroscience: Graduate and Professional

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 1:00 PM

Program #/Poster #: TJP06.20SA/Y24

Topic: J.02. Teaching of Neuroscience

Title: A neuroanatomy digitization project to provide worldwide access to the educational and research resources at the National Museum of Health and Medicine

Authors: *J. MORRIS[1], D. L. DICKSTEIN[2,3], C. D. STIMPSON[2,3], C. C. SHERWOOD[4], D. J. MILLER[5,6], B. N. DUGGER[7], P. R. HOF[8], D. P. PERL[2];
[1]Mass Neuroanatomy, West Newbury, MA; [2]Pathology, Uniformed Services Univ. of the Hlth. Sci., Bethesda, MD; [3]The Henry M. Jackson Foundation for the Advancement of Military Health Inc., Bethesda, MD; [4]Anthrop., The George Washington Univ., Washington, DC; [5]Evolution, Ecology and Behavior, Univ. of Illinois, Urbana, IL; [6]Beckman Institute for Advanced Science and Technology, University of Illinois, Urbana, IL; [7]Pathology and Lab. Med., Univ. of

California-Davis-Health, Sacramento, CA; [8]Nash Family Dept. of Neurosci. and Friedman Brain Inst., Icahn Sch. of Med. at Mount Sinai, New York, NY

Abstract: With an enormous amount of well-preserved neuroanatomical material for research, education, and clinical investigation, the National Museum of Health and Medicine (NMHM) maintains one of the most comprehensive neuroanatomical collections in the world, carefully amassed for decades yet currently limited to physical access. Over 20 different repositories make up the Neuroanatomical Collections Division, including the immense Yakovlev-Haleem collection consisting of ~1200 human brain specimens, ranging in age from preterm to 100+ years with alternating Nissl and myelin whole brain serial sections representing normal and a variety of neuropathology cases. In addition to the human series, similarly prepared comparative specimens (Welker and Johnson collections) across 175 species and 30 orders (e.g. Primates, Chiroptera, Monotremata, Carnivora, Cetecea) provide context of evolutionary changes in the cellular structure of neural systems, revealing the fundamental anatomical substrate of brain function. Moreover, normal cases and rare pathologies across ages, an immense range of morphological cell types, and vast comparative animal examples provide the raw materials needed to understand brain development, allowing insight into the neural architecture of underlying vulnerabilities and specialization.
To bring these resources into the digital age, cellular level resolution scans (10X) of these collections are being created along with an online database to access and analyze the images. Our immediate goal is to obtain scholarly input from the neuroscience community and to raise awareness of the proof-of-concept phase of this project using images from the NMHM. This project will increase traffic to the NMHM brain collections from dozens of in-person annual visits to tens of thousands of virtual visits. Posting high quality scans on the internet will allow others to measure and compare the specimens, facilitating teaching, publications and training data to characterize neuroanatomical elements. Such interactive resources enliven and streamline training of medical students and researchers at all levels. Teaching programs spanning professional to scholastic endeavors, digital pathology to Brain Awareness Week, become possible year-round while collaborative efforts may be customized to remain public or private. While The NMHM will continue to provide higher resolution scans on request, worldwide access to these rare collections will enable anyone to explore human, bat, platypus, tiger, dolphin brains etc. and to take part in discovering shared similarities and differences.

Disclosures: J. Morris: None. **D.L. Dickstein:** None. **C.D. Stimpson:** None. **C.C. Sherwood:** None. **D.J. Miller:** None. **B.N. Dugger:** None. **P.R. Hof:** None. **D.P. Perl:** None.

Theme J Poster

TJP06: Teaching of Neuroscience: Graduate and Professional

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 1:00 PM

Program #/Poster #: TJP06.21SA/Y25

Topic: J.02. Teaching of Neuroscience

Support: NSF Grant FAIN-2309541

Title: Implementation of Use-Inspired research principles to Clinical Neuroscience to develop effective solutions for perinatal behavioral health disorders

Authors: *S. OZEN IRMAK;
TIBI Hlth. INC, San Francisco, CA

Abstract: One in 5 expecting and new mothers suffer from perinatal depression, anxiety, panic disorder, obsessive compulsive disorder, bipolar disorder, psychosis or post-traumatic stress disorder.[1,2] Suboptimal treatment of PMHDs lead to serious problems ranging from health comorbidities to suicides and infanticides.[3,4] Although perinatal behavioral health disorders (PBHDs) are extremely common, they are poorly addressed. Despite the existence of screening recommendations and mandates; only 50% of women are diagnosed on time. Despite the existence of a vast array of therapeutics, only 50% of those diagnosed receive appropriate treatment. And despite the validated clinical efficacy of these therapeutics, only a small fraction of treated women (less than 10%) reach complete symptom resolution. There is a considerable disconnect between the existing solutions vs the burning needs experienced in the field. Implementation of Use-inspired research into clinical neuroscience can address this unmet need.Use-inspired research (UiR) is an emerging principle that has increasingly been adopted by researchers and funding agencies, including the National Science Foundation.[5] UiR means that the research being conducted not only reflects the burning needs experienced in the field but also the end users' conditions and preferences around the "use" of solutions to address those needs. It is an effort to ensure resources, especially in academic research settings, are being utilized for creating the most crucial answers that will lead to impactful benefits to the end-users. To initiate UiR in clinical neuroscience, we have started a collaborative capacity-building effort under The Building Bridges to Use Inspired Research and Science Informed Practices project funded by NSF Grant # FAIN-2309541.[6] Our project aims to develop an example framework to create a connected regional ecosystem that builds an inclusive research community and fosters use-inspired research (UiR) in perinatal behavioral health sciences. One of the key deliverables we are working on is the development of a training curriculum that could be implemented to facilitate research efforts that can translate into desirable and implementable solutions in the field.
[1] Earls, 2010. [2] Wisner et al., 2013. [3] Creanga, et al, 2014. [4] Glazer & Howell, 2021. [5] NSF News, 2022. [6] England, 2023.

Disclosures: S. Ozen Irmak: A. Employment/Salary (full or part-time):; Tibi Health Inc. E. Ownership Interest (stock, stock options, royalty, receipt of intellectual property rights/patent holder, excluding diversified mutual funds); Tibi Health Inc.

Theme J Poster

TJP06: Teaching of Neuroscience: Graduate and Professional

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 1:00 PM

Program #/Poster #: TJP06.22SA/Web Only

Topic: J.02. Teaching of Neuroscience

Title: The use of crossword puzzles as teaching material in neuropharmacology

Authors: *A. VAZQUEZ-ALVAREZ;
Univ. Nacional Autonoma de Mexico, Mexico D.F., Mexico

Abstract: Crossword puzzles are a fun material that presents challenges for memory about a topic. In the Faculty of Chemistry in the Pharmacology I and Pharmacology II classes, we have used this material, after carrying out the academic activities corresponding to each topic. We begin each session with a short introduction with the historical background and the basic concepts of the topic to be covered, we give the foundations of the experimental sessions, we carry out practice with laboratory animals (zebrafish, mouse, rat). We obtain the results, we discuss them, the students prepare a report and additionally complete a crossword puzzle, in which we address the points that we consider basic for the corresponding topic. We carried out a study where we asked students: What do they think of the use of crossword puzzles at the end of each topic to reinforce concepts? The students considered crossword puzzles as good teaching material, which posed riddles, which they had to reason with to reinforce the knowledge acquired, others mentioned that it motivated them to investigate some concepts that they had not understood correctly, which required time, since they had to go to various sources of information to find the appropriate answers, limited by the number of letters raised in the crossword puzzle and their spelling. In this way we created crossword puzzles for the sessions of "Neuropharmacological profile"

Disclosures: A. Vazquez-Alvarez: None.

Theme J Poster

TJP06: Teaching of Neuroscience: Graduate and Professional

Location: MCP Hall A

Time: Saturday, October 5, 2024, 1:00 PM - 1:00 PM

Program #/Poster #: TJP06.23SA/Y26

Topic: J.02. Teaching of Neuroscience

Title: An educational review of traumatic brain injury: Understanding pathophysiological stages and treatment strategies

Authors: *K. D. VU, J. M. VASU, R. E. HARTMAN;
Dept. of Psychology, Loma Linda Univ., Loma Linda, CA

Abstract: Traumatic Brain Injury (TBI) is one of the most prevalent injuries, as it affects all people across the lifespan. Despite being one of the most commonly occurring injuries and one of the leading causes of mortality and disability, research on the pathophysiology and treatments of TBI are still limited. The aim of this poster is to educate researchers and clinicians on the complex pathophysiological process of TBI and possible treatments to increase recovery and health outcomes. Understanding the pathophysiological process of TBI can help practitioners determine the most appropriate treatments tailored to the specific stage of the injury. We conducted a literature review to evaluate the pathophysiological changes after a TBI and what

interventions may prevent or decrease the pathophysiological effects and symptoms. By looking at the progression of symptoms in the early, intermediate, and late stages of pathology, we can better define the appropriate times that certain treatments and interventions are prescribed and employed. The early stage of TBI typically consists of mechanical cell death and volatile fluctuations of physiological functions. The intermediate phase is primarily characterized by neuroinflammation, cerebral edema, and activation of apoptotic pathways. The late stage consists of chronic issues that persist from the earlier stages, reparative processes, and ultimately the occurrence of seizures and epileptogenesis. Current and possible treatments and interventions for TBI span a multidimensional approach, encompassing medical, pharmacological, lifestyle, and dietary modalities. In the early phase, medical treatments such as hyperbaric oxygen therapy and therapeutic hypothermia can decrease oxidative stress and inflammation. Similarly, nutritional fruits like pomegranates have antioxidants that may help reduce harmful physiological changes. The inhibition and stimulation of glutamate receptors, depending on the specific stage, have been shown to mitigate the damage done by TBI and enhance neuronal repair and recovery. Some behavioral interventions such as returning to school, shortly after a TBI, can also improve outcomes. Additional treatments such as phenytoin and antiepileptic treatments have been indicated due to their ability to reduce the risk of seizures. By integrating treatments consistent with the stages of TBI, practitioners can discern optimal timing and intervention modalities, thus optimizing patient care for TBI and ultimately improving functional outcomes.

Disclosures: K.D. Vu: None. **J.M. Vasu:** None. **R.E. Hartman:** None.

Theme J Poster

TJP07: Outreach Activities

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP07.01SU/Y27

Topic: J.03. Public Awareness of Neuroscience

Support: Dana Foundation

Title: Brain health learning network: a neuroscience education resource for older adults

Authors: *E. H. CHUDLER[1], N. LECHER[2];
[1]Bioengineering; Anesthesiol. & Pain Medicine; Ctr. for Neurotechnology, [2]Osher Lifelong Learning Inst., Univ. of Washington, Seattle, WA

Abstract: Neurological and mental illnesses are among the leading causes of death and disability worldwide. Neurological disorders such as Alzheimer's disease, Parkinson's disease, and stroke are particularly common among older adults. Despite ongoing research efforts to better understand the causes and develop effective treatments for these disorders, there remains a general lack of knowledge about neuroscience in older adults. An improved understanding of the brain and brain health may aid older adults as they manage symptoms and discuss their treatment options with healthcare providers and family members. This knowledge may also help older

adults analyze information about neuroscience in books, magazines, social media, and television. The Brain Health Learning Network first conducted five focus groups to determine what issues in neuroscience and brain health were of most interest and concern to older adults. Based on the results of these focus groups, the program developed a lecture series focused on the following topics: 1) Anatomy of the Brain; 2) Sleep and the Aging Brain; 3) Dementia and Memory Loss; 4) Alzheimer's disease; 5) Memory and Learning 6) Concussion and Head Injury; 7) Medical Misinformation; 8) Drug Interactions; 9) Weight Loss in Aging; 10) Diet and the Brain; 11) Parkinson's Disease and 12) Stroke. Brain Health Learning Network lectures (~60 minutes each) were free and open to the public and took place in community centers around Washington State (Seattle, Methow, Redmond, Mukilteo) and via Zoom. Prior to each lecture, participants completed a short pre-lecture survey to gather audience demographics and determine attendees' knowledge about the featured topic. Attendees were asked to complete a survey with the same pre-lecture questions immediately after each lecture to determine if there was a gain in knowledge. All lectures were recorded and placed on a website (https://www.osher.uw.edu/brain-health) for later viewing. Preliminary data show that lecture attendees ranged in age from 59 to 89 years old (mean age = 73.0 years) with a greater number of female attendees (75.2%) than male attendees (24.8%). After each lecture, attendees showed improved knowledge as evidenced by a greater number of correct responses on the post-lecture survey compared to the number of correct responses on the pre-lecture survey. Future Brain Health Learning Network activities include online forums and book and film (e.g., Still Alice) discussions to create a community of older adults interested in the brain and brain health.

Disclosures: E.H. Chudler: None. **N. Lecher:** None.

Theme J Poster

TJP07: Outreach Activities

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP07.02SU/Y28

Topic: J.03. Public Awareness of Neuroscience

Support: NIH Grant U24NS133077

Title: Scientific and Public Outreach of Allen Institute Cell Type Taxonomy Tools

Authors: *R. E. HOSTETLER[1], **L. ALFILER**[2], E. FIABANE[1], J. K. NYHUS[1], S. MUFTI[1], M. J. HAWRYLYCZ[1], K. CASIMO[2], J. A. MILLER[1];
[1]Allen Inst. for Brain Sci., Seattle, WA; [2]Allen Inst., Seattle, WA

Abstract: The Allen Institute is a non-profit research institute that generates large-scale brain cell taxonomy datasets and tools to help answer foundational questions of basic science, such as "How many cell types are in the mammalian brain?" These data and resources are made freely available to the greater scientific community for others to use to tackle complex scientific questions, but there is often a learning curve. To increase awareness, accessibility, and usage of

our datasets and tools, we created multiple webinars, workshops, tutorials, user guides, student lesson plans, presentations, and other resources geared towards both new and existing users. The three scientific tools featured are: the Allen Brain Cell Atlas (ABC Atlas), MapMyCells, and Cell Type Knowledge Explorer (CTKE). These tools allow neuroscience researchers to sort through, visualize, and analyze different taxonomy datasets directly from their browser. The ABC Atlas is an interactive brain cell atlas featuring sc/snRNA-seq cell type taxonomies of the whole mouse brain, whole human brain, and cortical samples from brains with Alzheimer's. MapMyCells is a tool for mapping a user's own transcriptomic data onto the cell type taxonomies featured in the ABC Atlas. The CTKE features sc/snRNA-seq cell type taxonomies of the primary motor cortex of mouse, human, and marmoset, multi-modal patch-seq data, and cross-species cell type homologies. Our scientific outreach efforts introduce users to the underlying science and techniques used to generate the data in these taxonomies, demonstrate how users can use these tools to guide their own research questions, and provide an opportunity for questions and user feedback that is then shared with Allen Institute scientific and technology teams. In addition, we also targeted non-scientific audiences in our outreach; public education and engagement include building and hosting a cell type taxonomy game at a local science museum, creating educational content for social media, and hosting a public seminar to introduce our local Seattle community to neuroscience research and cell type taxonomies. Overall, our scientific and public outreach efforts have reached 3000+ webinar viewers, 130+ in-person workshop attendees, 100+ in-person presentation attendees across multiple universities, 50+ local museum attendees, and 20+ local community college instructors during the first year of our initiative; we expect these numbers to only increase with our continued efforts in year two. All of the scientific tools described in this abstract, as well as a catalog of our training resources, can be freely accessed at brain-map.org.

Disclosures: R.E. Hostetler: None. **L. Alfiler:** None. **E. Fiabane:** None. **J.K. Nyhus:** None. **S. Mufti:** None. **M.J. Hawrylycz:** None. **K. Casimo:** None. **J.A. Miller:** None.

Theme J Poster

TJP07: Outreach Activities

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP07.03SU/Y29

Topic: J.03. Public Awareness of Neuroscience

Support: NIH P60-AA011605

Title: Memory and brain health: simple and engaging activities for all ages

Authors: G. E. KIRKPATRICK[1], *S. FACCIDOMO[2], D. L. ROBINSON[3];
[1]Bowles Ctr. for Alcohol Studies, Univ. of North Carolina-Chapel Hill, Chapel Hill, NC;
[2]Bowles Ctr. for Alcohol Studies, Univ. of North Carolina - Chapel Hill, Chapel Hill, NC;
[3]Bowles Ctr. for Alcohol Studies, Univ. of North Carolina Chapel Hill, Chapel Hill, NC

Abstract: ***Background*****:** The continued success of our neuroscience outreach activities relies on local partnerships. For Brain Awareness Week and for the North Carolina Science Festival, our local partners include the NC Museum of Life and Science (NC MLS) and the Morehead Planetarium and Science Center. This is an annual event and each year we strive to add or modify additional content to our recurring activities. ***Goals:*** Our goals were to restore the frequency and variety of our outreach activities to post-pandemic levels. We modified and added to our existing successful prior activities to promote enthusiasm about neuroscience to local students in NC. We use these events to teach our trainees how to disseminate effective science communication to lay audiences. ***Event: This year, we led learning labs at the NC MLS for 4 full days and had a double booth at the NC Science Expo, the flagship event for the NC Science Festival occurring throughout April. Approach:*** One of our most popular in-person activities is "Touch a Brain" and it has become a signature station for all our outreach events. We are fortunate to have human brain specimens that we share with the public. Our specimens are great conversation starters to share scientific knowledge about the brain in an accessible and interactive manner. New this year, we had access to plasticized transverse sections to share a novel orientation of the human brain. For the NC MLS, our theme was "Types of Memory". Our second station was the Mirror-Tracing Activity which involves learning a new motor skill, illustrating both visual and proprioceptive memory. Our third station was Memory Trays where we illustrated short-term recall. For the NC Science Expo, our theme was "Brain Health". We used concussion goggles (kids) and blood alcohol content goggles (adults) to illustrate and to reinforce healthy habits to keep our brains healthy. ***Observations:*** We had 1145 visitors to the museum with the demographic skewed toward elementary school populations. The Mirror Tracing Activity was fun, interactive and popular among both kids and adults. In this lab, we were able to train 17 new scientists and it was useful to use these stations to compare and contrast strategies for visual and short-term memory. The NC Science Expo had over 6,000 visitors and we trained 6 new volunteers. Our brain health module is well-suited to outdoors and was a draw to our booth. ***Conclusions:*** We will continue to explore new iterations of outreach activities that are engaging and interactive. We continue to have an overarching goal to make science accessible and fun for all, especially to current and future K-12 generations.

Disclosures: G.E. Kirkpatrick: None. **S. Faccidomo:** None. **D.L. Robinson:** None.

Theme J Poster

TJP07: Outreach Activities

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP07.04SU/Y30

Topic: J.03. Public Awareness of Neuroscience

Title: The science of science communication

Authors: *M. TAVARES[1], B. REIN[2];
[1]Univ. of California San Diego, La Jolla, CA; [2]Mind Sci. Fndn., San Antonio, TX

Abstract: Social media has dramatically transformed the dissemination of scientific content, providing rapid and widespread access to complex topics for a global audience. Video platforms like TikTok and Instagram, with their advanced recommendation algorithms, have become crucial in science communication, leveraging user interests to suggest personalized content. This study presents an analysis of video metrics for 150 educational science videos uploaded to TikTok and 227 videos from the same educational channel on Instagram, which collectively garnered over 55 million views and 8.5 million likes. We present survey data from users indicating that 84% felt more trustful of science and scientists after engaging with the videos, highlighting the potential of social media as a tool for enhancing science literacy. The analysis on TikTok revealed that videos summarizing research papers received the highest levels of engagement, suggesting a strong demand among lay audiences for digestible scientific literature. We also found that likes, shares, and viewer retention predicted video virality. Of note, we observe some distinct trends between Instagram and TikTok, despite the same content being shared on both channels. On Instagram, likes were not predictive of video performance, while shares had a pronounced impact on video views. Also unlike TikTok, the number of hashtags used on Instagram was correlated with video views. The contrasting algorithmic patterns between channels underscores the need for content creators to tailor their strategies according to the specific dynamics of each platform. Our findings not only illuminate the factors driving video performance and user engagement online but also suggest differences in how scientific content is disseminated across social media platforms. Such insights are invaluable for science communicators aiming to effectively reach and influence diverse audiences, promoting scientific understanding in innovative ways.

Disclosures: M. Tavares: None. **B. Rein:** None.

Theme J Poster

TJP07: Outreach Activities

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP07.05SU/Y31

Topic: J.03. Public Awareness of Neuroscience

Title: Evolution of the visual discourse of the infographic material from the online outreach project @theneurosc and its impact on public interaction

Authors: *G. HERRERA-LÓPEZ;
KAUST, Thuwal, Saudi Arabia

Abstract: Social media has emerged as a significant platform for various content creators, offering science communicators an avenue to engage a broader audience through visual mediums. Among these, infographics stand out as a popular tool for conveying scientific information briefly through a blend of text and images. This study examines the evolutionary trajectory of visual elements utilized by the neuroscience outreach initiative, @theneurosc, and their impact on audience engagement. The project, initiated on Facebook in 2020, initially

employed a restrained color palette with a gray background, predominantly using primary colors for emphasis. This aesthetic choice conveyed a sense of scientific rigor while incorporating elements of visual appeal to enhance audience connection with scientific concepts. However, by 2022, the project transitioned to a more vibrant color scheme, abandoning the subdued background in favor of increased visual stimulation. This shift correlated with a notable increase in public interaction, highlighting the significance of aesthetics in enhancing the effectiveness of scientific communication and fostering public interest in science. Nonetheless, maintaining a consistent posting frequency is crucial on social media platforms. The initial austere design facilitated more frequent posting compared to the more elaborate colorful scheme, albeit at the expense of reduced audience engagement. Thus, striking a balance between aesthetic design and content frequency is imperative to sustain optimal audience engagement and interaction.

Disclosures: G. Herrera-López: None.

Theme J Poster

TJP07: Outreach Activities

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP07.06SU/Y32

Topic: J.03. Public Awareness of Neuroscience

Support: Dialogue Fonds de recherche du Québec
Brain Canada

Title: Merging art and science : the Neuro-Show experience

Authors: *J. COTE[1], P. SARRET[2];
[1]Neurosciences Sherbrooke, Univ. de Sherbrooke (FMSS), Sherbrooke, QC, Canada;
[2]Pharmacol. & Physiol., Univ. of Sherbrooke, Sherbrooke, QC, Canada

Abstract: The human brain is certainly the most complex known object in the universe. It is the control center of our whole being, the seat of our consciousness, and yet we do not fully understand how it works. These mysteries are the essence of neuroscience: how does the human brain work?
The Neuro-Show was born from the somewhat crazy idea of letting "neuroscience" invade a theatre, for the pleasure of all audiences. The goal was to create a unique experience: the integration of scientific content with a playful theatrical performance around the vast subject of the brain. In order to create an original, funny and emotional show, not just an educational conference, we joined forces with professionals of the performing arts as well as citizens, researchers, and patients from the research center (patient-partner committee). Together, they were the source of the story told in the play, and they proved to be a winning formula to fuel curiosity, to be relevant, but also to entertain and inform the public. To engage our audience, we invite them to discuss with researchers, on the stage in the second half of the event, which allowed to create a direct connexion with scientists, to deepen the research themes and to

emphasize the scientific method. Moreover, we offer an information booklet to everyone, which they can take home to further explore certain topics, and allow people to continue their reflection after the event and share it with their family and friends. We may not know everything about the brain, but at least we are sharing and discussing what we know. The rest remains mystery and fascination... for now!

Disclosures: J. Cote: None. **P. Sarret:** None.

Theme J Poster

TJP07: Outreach Activities

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP07.07SU/Z1

Topic: J.03. Public Awareness of Neuroscience

Support: IBRO Brain Awareness Week 2024
SUNY Empire Student Activities Fund

Title: Art and the Brain: Using STEAM events to promote Brain Awareness

Authors: M. PERO[1], A. COMINCINI[2], ***J. PARATO**[3,4];
[1]Pathology and Cell Biol., CUMC, Columbia Univ., New York, NY; [2]Columbia Univ., New York, NY; [3]SUNY Empire, Brooklyn, NY; [4]Columbia University, New York, NY

Abstract: Brain Awareness Week is a worldwide movement to raise public interest in neuroscience. SUNY Empire hosts public neuroscience lectures for Brain Awareness Week (BAW), and more recently, art exhibitions. The 2024 exhibition, *Intrinsic Connections*, explored the aesthetic beauty of the brain while providing basic information on neuroanatomy, cellular biology and imaging techniques. Scientists from SUNY Empire, Columbia University and SUNY Downstate submitted pieces and narratives to the show. STEAM artists and art students were also invited to submit work. In particular, the art students were given a prompt to create a piece that encompassed their view of the brain or brain health. A community piece, *Fiber Hippocampus*, was created by students and faculty from SUNY Empire and City Tech (CUNY). During the weeks leading up to the show, participants crafted yarn neurons, which were assembled into two sets of interlocking C's to represent the rodent hippocampus. During the opening night, many scientists whose works of art were on display were able to attend, giving students, their family and their friends an opportunity to talk to neuroscientists about their work, as well as their career paths, in a fun, casual setting. The event was also designed to be kid-friendly, and attendees were encouraged to bring their families. There were multiple stations set up for children, but attendees of all ages ended up enjoying the crafts and games. The two most popular stations were *Make your own neuron*, where attendees made pipe cleaner and yarn neurons that could be added to the community *Fiber Hippocampus* piece or taken home as souvenirs, and *Trick your brain*, a visual distortion game where attendees could record how long it took their brain to adapt to vision-skewing goggles.

Because *Intrinsic Connections* was an interdisciplinary art and science experience, BAW facilitators were able to draw in a larger group of students, faculty and the public. By focusing on engagement, entertainment and simple but meaningful learning experiences, *Intrinsic Connections* was able to become a valuable addition to SUNY Empire's Brain Awareness Week.

Disclosures: M. Pero: None. **A. Comincini:** None. **J. Parato:** None.

Theme J Poster

TJP07: Outreach Activities

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP07.08SU/Z2

Topic: J.03. Public Awareness of Neuroscience

Title: The power of brain awareness week

Authors: *V. MUOIO[1,2], A. SILVA[3], N. AMARAL[4,5], A. MUOIO[6];
[1]Univ. of Sao Paulo, Sao Paulo, Brazil; [2]Univ. Nove de julho, Sao paulo, Brazil; [3]universidade nove de julho, sao paulo, Brazil; [4]Univ. Nove de Julho, sao paulo, Brazil; [5]Univ. nove de julho, Sao paulo, Brazil; [6]universidade Nove de Julho, Sao Paulo, Brazil

Abstract: Our first Brain Awareness Week at Universidade Nove de Julho in São Paulo, Brazil, was a blast! The events included in-person and online activities, and from day one, it was evident that we were about to experience something special.On the first day, we introduced the week to the students, and the reaction was beyond our expectations. They were incredibly excited at the prospect of exploring the wonders of the mind and immersing themselves in the various activities planned.On the second day, we had an extraordinary workshop with the theme, "How language shapes the way we think and act," combined with mental health practices. This workshop was enriched by the presence of the kung fu champion, who is fluent in Mandarin Chinese. Not only did he share his reflections on how language connects us to other cultures, but he also treated us to an exciting tai chi and kung fu class. It was a time of celebration of multicultural tolerance and peace, while acknowledging the unifying power of language and physical practice to promote mental well-being.On the third day, we immersed ourselves in a fascinating conversation about the integration between the enteric nervous system, the microbiota and the central nervous system, with the valuable contribution of a trauma surgeon and a neurologist. We explore the intricate links between gut health and brain health, broadening our understanding of how the human body works.On the fourth day, students had the unique opportunity to interact directly with neurosurgeons, neurologists, and neuroscientists in a professional panel. After the stimulating discussion, we held a quiz about neuromyths, which challenged and entertained all participants.On the last day, we had a fascinating discussion about the brain-machine interface and the future of neuroscience. We conclude with a reflection on the representation of neuroscience in Hollywood highlighting how brain science permeates various aspects of culture and society.It was inspiring to witness the enthusiasm of the students throughout the week. Many of them have already signed up for research projects and are connecting with potential mentors

they met during the workshops. Brain Awareness Week has the incredible power to unite and engage people around a topic as fascinating as neuroscience.
By the end of the week, we received a flood of suggestions for the coming year. It is gratifying to see so many people with ideas and suggestions, eager to actively participate in the upcoming sessions. It's an incredible opportunity to disseminate knowledge, inspire students, faculty, and researchers, and create a close-knit community around the fascinating journey of the human brain.

Disclosures: V. muoio: None. **A. Silva:** None. **N. Amaral:** None. **A. muoio:** None.

Theme J Poster

TJP07: Outreach Activities

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP07.09SU/Z3

Topic: J.03. Public Awareness of Neuroscience

Support: Support for this work was made possible by a Community Engagement Small Project Grant (CESPG) Award from the Institute for the Integration of Medicine & Science (IIMS) at UT Health San Antonio.

Title: Collective minds: a community-based approach to democratize neuroscience education

Authors: *B. SOTEROS[1], A. GRENIER[2];
[1]UT Hlth. San Antonio, San Antonio, TX; [2]Univ. of Texas at San Antonio, San Antonio, TX

Abstract: Brain education is a powerful tool for promoting brain health, self-awareness, growth mentality and emotional regulation. Yet, despite the expansive wealth of knowledge about the brain, public understanding of neuroscience remains limited and stagnant. In the United States, unfortunately, most public schools lack brain-focused curricula. The resulting lack of brain awareness among the general public stifles necessary conversation around brain health, perpetuates inequities in mental health care and fails to challenge mental health stigmas. We believe that all people, including children, deserve to understand the brain and champion their own brain health and emotional wellbeing. To this end, we are driven to establish meaningful, long-term academic-community partnerships to bring sustained neuroscience education to classrooms. This mission grew from our collaboration with S.M.A.R.T., a local non-profit founded by artists Andy and Yvette Benavides. Our partnership is founded on the principle that connection, creativity and curiosity are potent tools to nurture emotional wellbeing and build resilience. Central to our approach is the active involvement of our local schools and our neuroscience community, including students, trainees, professors and healthcare and industry professionals. Together, we will curate a growing compilation of neuroscience facts and tailor this information to different education levels. This collaborative effort creates an enriching opportunity to nurture science communication skills and expand valuable connections between academia and the broader local community. Our engagement strategy involves weekly brain

exchanges with teachers and classrooms, where we exchange fun facts, questions and curiosities, allowing the students to lead the discussion and drive topic exploration. Workshops feature real human and sheep brains, along with a variety of microscopes, providing students with tangible hands-on experiences that spark curiosity and deepen their understanding of neuroscience. Throughout the school year, we will use various measures to assess curiosity, growth mindset and resilience. With continued engagement throughout the school year, we aim to build students' confidence in discussing the brain, so they may become young ambassadors for neuroscience. Our ultimate goal is to empower people with the knowledge of their brain and provide meaningful opportunities for neuroscience professionals to engage with their community. As this initiative continues to grow and evolve, we welcome your input on how to expand and improve our program.

Disclosures: B. Soteros: None. **A. Grenier:** None.

Theme J Poster

TJP07: Outreach Activities

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP07.10SU/Z4

Topic: J.03. Public Awareness of Neuroscience

Support: IBRO/Dana Foundation Brain Awareness Week 2024 grant

Title: Enhancing community impact: A year-round approach based on brain awareness week success

Authors: A. GRYSHYNA[1], ***A. COACHMAN**[2], D. K. GREY[3], E. JONES[4], G. SAMSON[5], M.-M. B. COOPER[6], C. MUNOZ-BALLESTER[7], C. SANDERS[8], A. GWINN[9], J. ROTH[10], K. M. VISSCHER[11];
[1]Univ. of Alabama at Birmingham Chapter, Gradendale, AL; [2]UAB Comprehensive Neurosci. Ctr., Birmingham, AL; [3]Psychology, The Univ. of Alabama at Birmingham, Birmingham, AL; [4]Neurobio., Univ. of Alabama At Birmingham, Birmingham, AL; [5]Univ. of Alabama at Birmingham, Birmingham, AL; [6]Psychology, Univ. of Alabama at Birmingham, Irondale, AL; [7]Cell, Develop. and Integrative Biol., Univ. of Alabama at Birmingham, Birmingham, AL; [8]UAB, Birmingham, AL; [9]McWane Sci. Ctr., Birmingham, AL; [10]Neurobio., The Univ. of Alabama At Birmingham, Birmingham, AL; [11]Neurobio., Univ. of Alabama, Birmigham, Birmingham, AL

Abstract: Building upon a successful 15-year collaboration with the McWane Science Center in Birmingham, Alabama, during Brain Awareness Week (BAW), this initiative aims to expand the impact of neuroscience education and engagement throughout the year. Leveraging insights gained from BAW experiences, we have developed three components—Brain Snacks, Brain Chats, and Brain Bites—that offer diverse opportunities for community involvement and education.Brain Snacks provide short, hands-on lessons in neuroscience designed for easy

digestion and valuable take home messages about the brain. Developed and play-tested during BAW, these lessons utilize simple materials and are made available year-round. Members of the University of Alabama at Birmingham (UAB) community can borrow materials, access online resources, or participate in events to learn about neuroscience. Neuroscience community members at UAB and beyond are encouraged to integrate Brain Snacks into their own outreach activities, extending neuroscience education beyond traditional settings. The following project is also integrated as part of the ECPA projects curriculum by the 2024 ECPA co-author (Gryshyna). Brain Chats facilitate monthly discussions between local neuroscientists and the public at a local library. These discussions cover topical issues such as Alzheimer's Disease during Alzheimer's Awareness Month and incorporate both lectures and hands-on demonstrations. Importantly, Brain Chats foster direct interactions between neuroscientists and the community, fostering understanding and engagement.Brain Bites serve as thrice-annual gatherings for UAB neuroscientists to convene over tea and cookies. These meetings provide an opportunity to discuss current issues in public science outreach and brainstorm new collaborative ideas for enhancing community engagement in Birmingham. By fostering collaboration and knowledge-sharing among neuroscientists, Brain Bites aim to generate innovative approaches to public science outreach.In conclusion, these initiatives represent a comprehensive strategy to extend the impact of neuroscience education and engagement beyond Brain Awareness Week. By integrating hands-on learning, direct interactions with neuroscientists, and collaborative brainstorming sessions, we anticipate a broader and more sustained impact on the Birmingham community. This presentation will discuss our experiences and lessons from developing these programs. We are excited about the potential of these initiatives and look forward to their implementation in the future.

Disclosures: A. Gryshyna: None. **A. Coachman:** None. **D.K. Grey:** None. **E. Jones:** None. **G. Samson:** None. **M.B. Cooper:** None. **C. Munoz-Ballester:** None. **C. Sanders:** None. **A. Gwinn:** None. **J. Roth:** None. **K.M. Visscher:** None.

Theme J Poster

TJP07: Outreach Activities

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP07.11SU/Z5

Topic: J.03. Public Awareness of Neuroscience

Support: BAW-3828071075
ICTI-PICIR23-058
CIC UMSNH 18096
CIC UMSNH 18099
CIC UMSNH 18146
ICTI/DA/CTI/053/2023

Title: Brain Awareness Week at UMSNH. Divulgation activities could improve students' knowledge, avoiding routine.

Authors: C. J. GUTIERREZ-GARCIA[1], L. M. VAZQUEZ RANGEL, Sr.[2], M. FERREIRA RODRIGUEZ[2], A. RODRIGUEZ MEDINA[2], E. GONZÁLEZ[2], M. Y. GAUTHEREAU-TORRES[3], *L. ORTEGA-VARELA[4];
[1]Ingeniería Química y Bioquímica, TecNM/Campus Morelia, Morelia, Mexico; [3]Facultad de Ciencias Medicas y Biologicas Dr Ignacio Chavez, [2]Univ. Michoacana de San Nicolas de Hidalgo, Morelia, Mexico; [4]Salud Publica. Univ. Michoacana Sn Nicolas De H ., Morelia, Mexico

Abstract: Brain Awareness Week (BAW) is a global campaign to foster public enthusiasm and support brain science. Last March 11th-17th, a group of professors hosted a set of divulgation activities in the UMSNH, in Morelia, Michoacán, México. These BAW activities were carry out in 3 different locations of high school level (Preparatoria "Melchor Ocampo", Colegio de San Nicolás y Escuela Técnica de Enfermería). With the purpose of assessing the impact of our program and get a feedback of the activities, we conducted a brief exit survey to 15% of the 1246 assistants (n=187), with a confidence level of 95% and an interval confidence estimated of 6.61. Responses were from people between 15-45 years old (32% were 15 years old), the highest number of respondents were women (62%). The general impression of the tasks programmed was very positive for 99.5% of people interviewed (71.7% excellent and 27.8% good). Participants stand out that the activities were helpful to understand difficult things like brain functions (57.8%), and allow them to avoid school routine (19.3%). The most wanted activity was related to virtual reality and third dimension (46.1%), Biochemistry of love (21.6%), brain functions (16.8%) and the scrambled word game (15.1%). Respondents indicate as weakness of the sessions that they were too crowded (62%) or it was difficult to hear the instructions (12.6%), among others. These divulgation activities were carried out in three high schools, but we could register participants of at least 9 different schools and around a thrid part of the sample was conformed by bachelor degree students (35%), broading the reach of the campaign. 96.2% of the survey indicates that it is important to address scientific topics in extracurricular activities and 41.7% of students found attractive a scientific career, mostly related to health sciences. BAW campaign is successful over the world, and our data confirm that this kind of divulgation agenda could address scientific topics in high school population and improve student knowledge, avoiding routine.

Disclosures: C.J. Gutierrez-Garcia: None. **L.M. Vazquez Rangel:** None. **M. Ferreira Rodriguez:** None. **A. Rodriguez Medina:** None. **E. González:** None. **M.Y. Gauthereau-Torres:** None. **L. Ortega-Varela:** None.

Theme J Poster

TJP07: Outreach Activities

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP07.12SU/Z6

Topic: J.03. Public Awareness of Neuroscience

Support: INB-UNAM
CONCYTEC
CAPITULO DE LA CDMX DE LA SOCIETY FOR NEUROSCIENCE
COORDINACION DE LA INVESTIGACION CIENTIFICA

Title: 2024 brain awareness week in the institute of neurobiology in queretaro

Authors: R. OLIVARES-MORENO[1], D. GASCA-MARTINEZ[2], S. PECH-POOL[3], *C. PEREZ-DIAZ[4], B. GARCIA[6], E. BOLAÑOS-AQUINO[6], A. CASTILLA[6], C. GUTIÉRREZ HERNÁNDEZ[6], S. A. CASTRO-CHAVIRA[5], M. LUNA[7], T. MORALES[8];
[1]Neurobiología del desarrollo y neurofisiología, Lab. A-13, Univ. Nacional Autonoma De Mexico, QUERETARO, Mexico; [2]Behavioral Analysis Unit, Neurobio. Institute, UNAM Campus Juriquilla, Queretaro, Mexico; [3]Neurobio. and cellular department, INb, UNAM, QUERETARO, Mexico; [4]Univ. Nacional Autonoma de Mexico, Querétaro, Mexico; [5]Inst. de Neurobiologia, Univ. Nacional Autonoma de Mexico, Queretaro, Mexico; [6]Neurobio. Institute, UNAM, Queretaro, Mexico; [7]Neurobiología Celular y Mol., Inst. de Neurobiologia, UNAM, Queretaro, Mexico; [8]Inst. de Neurobiología UNAM, Inst. de Neurobiología, UNAM, Querétaro, Mexico

Abstract: The 2024 edition of our Brain Awareness Week was entitled "NEUROEMOCIONATE, El Cerebro y sus Secuaces." The main objective of our event was to generate enthusiasm and interest around how the brain works and how it is studied at our Institute of Neurobiology (INB, Instituto de Neurobiología, UNAM) to make our scientific work accessible to the public. The topics covered the research effectuated by the Department of Developmental Neurobiology and Neurophysiology. We achieved these goals with the support of students and academics at INB. Our event consisted of five activities: 1) Caravan of the Brain, which involved taking scientific recreational activities to schools away from the Institute. At the Institute facilities, 2) a total of 15 exhibitions, demonstrations, and recreational and interactive workshops, 3) a series of three science dissemination talks, and 4) a play about the function of neurotransmitters. On the internet, 5) digital content, including live streaming of the main activities and a website with digital resources, which were promoted in social media, i.e., Facebook and X - @unaminb, Instagram - @inb_unam, and the microsite https: //inb.unam.mx/semanadelcerebro/, hosted at the Institute's website: https://inb.unam.mx/. In this edition, around 4000 people were reached out, including children and young people from elementary, high school, and undergraduate educational levels from public and private schools in the city of Querétaro.

Disclosures: R. Olivares-Moreno: None. **D. Gasca-martinez:** None. **S. Pech-Pool:** None. **C. Perez-Diaz:** None. **B. Garcia:** None. **E. Bolaños-Aquino:** None. **A. Castilla:** None. **C. Gutiérrez Hernández:** None. **S.A. Castro-Chavira:** None. **M. Luna:** None. **T. Morales:** None.

Theme J Poster

TJP07: Outreach Activities

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP07.13SU/Z7

Topic: J.03. Public Awareness of Neuroscience

Support: Peru Chapter of Society for Neuroscience
Society for Neuroscience
International Brain Research Organization
Dana Foundation
Universidad Continental

Title: Promotion of Neuroscience in Peru: Experiences and Perspectives

Authors: *L. BAQUEDANO SANTANA[1], M. UTRILLA[2], R. E. LOVATON[3];
[1]Univ. Continental, Huancayo, Peru; [2]CHAPTER PERU, Lima, Peru; [3]Clinica San Pablo, Lima, Peru

Abstract: In recent years, there has been growing interest in promoting neuroscience in Peru through various educational activities, mentoring programs, networking opportunities, and the creation of research hotbeds. In this work, we present a compilation of experiences and results obtained from these initiatives, highlighting their impact on the development of neuroscience in the country. In the educational field, conferences, courses and workshops have been organized for students, professionals and the general public. These activities have allowed the establishment of collaboration networks between national and international researchers, facilitating the exchange of ideas and the generation of new research projects. On the other hand, mentoring has been a key component in the development of young neuroscience researchers, providing them with guidance and support to develop their scientific skills and advance their academic careers. Additionally, the creation of research hotbeds has provided a space for undergraduate and graduate students to participate in research projects led by experts in the field, thus promoting the development of new lines of research in neuroscience. Likewise, networking has also played a fundamental role in the promotion of neuroscience in Peru, allowing collaboration between academic institutions, research centers and governmental and non-governmental organizations. Here we present the educational activities, mentoring, networking and research incubators carried out to promote neuroscience in Peru, with tangible results such as the organization of scientific conferences that have brought together national and international experts, and the support for research through scholarships and financial projects. These initiatives have begun to strengthen the Peruvian scientific community in neuroscience. However, it is necessary to continue working to consolidate and expand neuroscience in the country, facing challenges such as the lack of resources and the need for greater international visibility.

Disclosures: L. Baquedano Santana: None. **M. Utrilla:** None. **R.E. Lovaton:** None.

Theme J Poster

TJP07: Outreach Activities

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP07.14SU/Z8

Topic: J.03. Public Awareness of Neuroscience

Title: Neurolatam a neuroscientist network

Authors: *L. HERNÁNDEZ[1], D. HERNÁNDEZ ESPINOSA[2], G. MEDINA RUIZ[3]; [1]Fisiología celular, UNAM, Mexico city, Mexico; [2]Neurobio., Univ. of Pittsburgh, Pittsburgh, PA; [3]Dept. of Otolaryngology, Univ. of Pittsburgh, PITTSBURGH, PA

Abstract: In recent years, strategic initiatives for promoting equity, diversity, and inclusion in neuroscience have increased globally. Those programs have been supported by a massive international commitment to expanding science. However, imbalances persist, especially in countries with limited resources, such as Latin American countries. The limited funding, infrastructure, and access to innovative research in Latin America pose unique challenges for neuroscientists, requiring collective solutions through collaboration. As part of these solutions, we generated www.neurolatam.net (NeuroLATAM). NeuroLATAM is an online community that aims to visualize, disseminate, and facilitate collaboration among Latin American neuroscientists worldwide. Using our website as a starting point, we utilize social media to connect with individuals through groups where academic and scientific outreach job opportunities are shared. This approach lets interested parties quickly contact each other and express their interest in collaborative projects. We offer two free ways to join our initiative: as ambassadors or community members. Ambassadors are professionals trained in neuroscience who promote the NeuroLATAM network and gain access to tools for global networking. On the other hand, community members benefit from the knowledge exchange and collaborative opportunities within our community. Members of NeuroLATAM also have the opportunity to request a general audience summary of their published scientific work. This service provides a valuable opportunity for researchers to increase the impact of their findings and to engage with a wider audience. Since its conception in 2022, NeuroLATAM has substantially increased its active members, and the number of new members keeps growing. Our strategy has successfully established collaborations with four organizations: The Mexican Society of Biochemistry, SfN Chapter Peru, SfN Chapter Mexico, and the International Association for Zinc Biology. Furthermore, we have participated as speakers in the SfN 2023 annual meeting and the V Neurobiology Meeting of the Mexican Society for Biochemistry held in Mexico. NeuroLATAM has served as a platform for Latin American neuroscientists to collaborate and network with others located around the world. As a result, articles have been published to promote the scientific works of young scientists. Moving forward, this platform will continue to expand and help bridge the gap between the Latin American neuroscience community.

Disclosures: L. Hernández: None. **D. Hernández Espinosa:** None. **G. Medina Ruiz:** None.

Theme J Poster

TJP07: Outreach Activities

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP07.15SU/Z9

Topic: J.03. Public Awareness of Neuroscience

Title: Empowering Minds: Neuroscience Education and Community Engagement

Authors: *H. THOMAS[1], A. TAYLOR[2], B. CREIGHTON[1], A. KIM[3];
[1]Neurosci., [2]Biol., Johns Hopkins Univ., Baltimore, MD; [3]Neurosci., John Hopkins Univ., Baltimore, MD

Abstract: Praxis in Neuroscience Education and Community ConnectionPraxis, or education in action, provides opportunities for people to learn about neuroscience andits practical applications. Johns Hopkins University sponsors BrainFest, a community outreachinitiative in Baltimore, Maryland. BrainFest aims to enhance education, promote brain sciencecommunication, and foster connections within underrepresented communities. This movementchallenges social norms and encourages positive change.BrainFest encourages people from all ages to embrace brain science by fostering curiositythrough hands-on activities and dialogue with scientists to learn, reflect on what they know, andthen apply it to their lives so lives feel a sense of agency and inspiration through this experience.Maxine Greene's idea of inspiring awe in students is a top goal in encouraging learning, especiallyfor students from underrepresented backgrounds facing societal biases (Greene, 1973).In Figure 1, a student interacts with a scientist at a nose or smell station. The student smellsvarious disguised scents and guesses what they are. Later, the scientist reveals the true scentusing pictures (e.g., orange, grape, cinnamon). This interaction promotes knowledge transfer,open dialogue, learning, reflection, and application.Hands-on aesthetic experiences incorporating the senses are essential for scientists to exchangeinformation with the public. To improve science communication and connection through praxis,scientists and the public partner together to advance the field of neuroscience, make it accessible,and promote social justice.ReferencesGreene, Maxine (1973). The Matter of Justice. Wadsworth Publishing Company. December1973, Vol. 75, No. 2.Project Bridge (2024). Johns Hopkins - PROJECT BRIDGE (projbridge.org)

Disclosures: H. Thomas: None. **A. Taylor:** None. **B. Creighton:** None. **A. Kim:** None.

Theme J Poster

TJP07: Outreach Activities

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP07.16SU/Z10

Topic: J.03. Public Awareness of Neuroscience

Title: Building Bridges in Neuroscience: From Los Angeles to Madrid, an International Collaboration for Outreach and Education of Neuroscience.

Authors: *A. PERIS-YAGUE[1], B. MARTÍN-GASCÓN[2], R. BARTOLOME[1], G. ROJAS-BOWE[3], C. SUHR[3], R. ROMERO[3];
[1]Univ. Autónoma de Madrid, Madrid, Spain; [2]Univ. Complutense de Madrid, Madrid, Spain; [3]Univ. of California Los Angeles, Los Angeles, CA

Abstract: Over the past 30 years, there has been increasing emphasis in establishing neuroscience outreach and educational programs with the goal of bringing knowledge about the intricacies of the brain to the general public. While many neuroscience outreach initiatives have been launched, most resources generated are solely available in English. We have previously provided a framework for the creation and translation of Spanish neuroscience content within an undergraduate community-engaged learning program. While our previous efforts resulted in increased readership of neuroscience-related content in the Spanish site of the Knowing Neurons platform (https://knowingneurons.com/es), the impact of our project on student perceptions and interest on neuroscience as well as the importance of multilingual science outreach remained to be elucidated. This research was carried out within the context of an established partnership between the University of California, Los Angeles (UCLA), Universidad Autónoma de Madrid and Universidad Complutense de Madrid, in collaboration with the online platform Knowing Neurons. Briefly, undergraduate students at UCLA enrolled in a community service Spanish course conducted translations of neuroscience outreach articles from English to Spanish. Translations were then checked for language accuracy by students in Madrid, with biweekly online feedback sessions between the students in UCLA and Madrid. Furthermore, students at UCLA developed a lesson plan, in Spanish, under the supervision of two neuroscience graduate students which was taught at a local bilingual high school. Participation in both the university courses and outreach activity increased undergraduate student perceptions on how easy it is to understand the field of neuroscience. Similarly, for high school students, attending the outreach activity significantly improved knowledge in neuroscience, access to scientific resources in Spanish as well as increased perception on the importance of science communication. Through our project, we aim not only at increasing interest in neuroscience to Spanish speakers but also provide a novel educational framework where the sciences and the humanities intersect.

Disclosures: A. Peris-Yague: None. **B. Martín-Gascón:** None. **R. Bartolome:** None. **G. Rojas-Bowe:** None. **C. Suhr:** None. **R. Romero:** None.

Theme J Poster

TJP07: Outreach Activities

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP07.17SU/Z11

Topic: J.03. Public Awareness of Neuroscience

Title: Creation and implementation of a neuroanatomy interactive game for brain awareness outreach events

Authors: M. HAZEL[1], *B. PUDER[2];
[1]Touro Univ.; Vallejo, CA, Vallejo, CA; [2]Touro Univ., Vallejo, CA

Abstract: An interactive neuroanatomy game was created for Brain Awareness outreach events. The neuroanatomy game is part of a neuroscience interactive learning station for high school aged students attending a Brain Awareness outreach event. The station includes a neuroanatomy poster used for a brief presentation on neuroanatomical structures and function, followed by the interactive neuroanatomy game. High school students interacted with the game board which represented the lateral side view of the left cerebrum, brainstem, and cerebellum. The game was designed to reinforce the neuroanatomical structures and functions learned during the station. Qualitative and quantitative data was collected through surveys, and pre/post testing (TUC IRB M-21022) to assess the effectiveness of the neuroanatomy station and the game. High school student participants (N= 110) rated the poster, presentation, interactive game between 4.3- 4.6 on a 5-point Likert scale. Participants commented that the station and game was fun and made learning the neuroanatomical structures easy to understand. Participants also commented that they liked the program and would attend the program again next year. Data collected from participants indicate that the neuroanatomy game was an engaging and effective method for teaching neuroanatomical structures and function to high school aged students.

Disclosures: M. Hazel: None. **B. Puder:** None.

Theme J Poster

TJP07: Outreach Activities

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP07.18SU/Web Only

Topic: J.03. Public Awareness of Neuroscience

Support: 2nd IndiaBioscience Outreach grant

Title: The Mind Gala science writing mentorship program: Time-constrained online matched group mentoring approach to writing a popular science book

Authors: *P. GARG[1], J. TRISAL[2], A. KRISHNAMURTHY[4], R. CHUNDURI[3], D. SATAV[5], S. MUTHIAH[6], H. J. ANAND[7], P. THAKUR[8];
[1]All India Inst. of Med. Sciences, Rishikesh, Rishikesh, India; [2]Biotech., [3]Shoolini Univ., Solan, India; [4]Nuclear Med. and PET, Aarhus Univ., Aarhus, Denmark; [5]Dept. of Mol. Med., Univ. of South Florida, Tampa, FL; [6]Sri Muthukumaran Med. Col. Hosp. & Res. Inst., Chennai, India; [7]Humanities, Natl. Inst. of Advanced Studies, Delhi, India; [8]Indian Inst. of Sci. Educ. and Research, Thiruvananthapuram, Thiruvananthapuram, India

Abstract: Writing scientifically coherent articles for a wide audience, from middle school students to senior scientists, is a skill that comes with experience and training. Acquiring such skills mandates socioeconomic privilege and prior exposure to science writing, posing significant hurdles for uninitiated students to develop the same. To empower students from resource-limited settings to navigate this process, we designed a science writing mentorship program under the purview of The Mind Gala initiative. 'The Mind Gala' was a joint venture between Project Encephalon and Thakur Neurodegeneration Lab (IISER-Thiruvananthapuram) and comprised a science writing mentorship program, a science communication workshop and the 'Bheja Fry' webinar series. The mentorship program began with a science communication workshop introducing participants to the nuances of communicating science. For the main program, 10 senior PhD students and post-doctoral fellows with demonstrable writing skills from diverse scientific areas were selected as mentors, to accommodate the interdisciplinarity of neuroscience. This initiative incorporated the top-down learning approach, consequently, 80 students with little to no experience were chosen as mentees. Each mentor was matched with 8 mentees based on common interests, and they were further subdivided into teams of 2-3 to foster peer learning. Following six weeks of this intensive summer program, 41 articles written by 69 mentees were compiled into a popular neuroscience book 'Tales of Neuroscience'. The articles branched into 5 themes- Basic Neurosciences, Diseases, Encounters of Daily Life, Mental Health and, Neuroscience and Technology. To account for India's linguistic diversity, 5 articles were translated into three common Indian languages, Hindi, Malayalam and Bengali; irrespective of limited resources. Limited edition printed copies were made available for free in several premier Indian institutes to further student outreach in an academic setting. A voluntary post-event survey was conducted to evaluate the participants' views of the program. Out of N=61 respondents, 98% (n=60) learnt new skills such as collaboration, communication, storytelling, creative writing, and comprehension of scientific literature. 83% (n = 51) rated the program 4 or higher on the Likert scale. Overall the program successfully accomplished all its goals. To ensure broad accessibility, all activities were conducted online, free of charge and all tangible outcomes- the popular neuroscience book, webinar recordings and workshop material were made available as free online resources.

Disclosures: P. Garg: None. **J. Trisal:** None. **A. Krishnamurthy:** None. **R. Chunduri:** None. **D. Satav:** None. **S. Muthiah:** None. **H.J. Anand:** None. **P. Thakur:** A. Employment/Salary (full or part-time):; Indian Institute of Science Education and Research, Thiruvananthapuram.

Theme J Poster

TJP07: Outreach Activities

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP07.19SU/Z12

Topic: J.03. Public Awareness of Neuroscience

Title: Knowing Neurons: a global nonprofit organization dedicated to science communication and outreach

Authors: *S. M. CHATURVEDI[1], L. RADER[2], L. E. WAGNER[3], C. AMIR[3], Z. DOBLER[3], A. HOGAN[3], M. HALL[4], A. GRYSHYNA[5], K. Y. LIM[3];
[1]Washington Univ. in St. Louis, St. Louis, MO; [2]Univ. of Colorado Boulder Dept. of Psychology and Neurosci., Boulder, CO; [3]UCLA, Los Angeles, CA; [4]Translational Genomics Res. Inst., Phoenix, AZ; [5]Univ. of Alabama at Birmingham Chapter, Gradendale, AL

Abstract: Knowing Neurons (KN) is a trainee-led neuroscience education and outreach non-profit founded in 2012 by graduate students. The organization has two goals: (1) To give a platform for early-career scientists to practice science communication and (2) To provide accurate, engaging, and easily accessible educational content for those interested in science. Consisting of over 60 early-career scientists who represent 15 different countries and 40 institutions, Knowing Neurons has created a wide range of content including articles, science illustrations, lesson plans, science policy briefs, podcasts, social media content and more. The groundbreaking KN translation team increases the availability of neuroscience content in Spanish, German, and Turkish, with full Spanish and German versions of the KN website. Beginning in 2023, Knowing Neurons team members collaborated with local communities to bring neuroscience education into K-12 education. These initiatives have included community workshop guides that are publicly available for neuroscience students interested in community-partnered science communication. In addition, Knowing Neurons facilitates young scientists to engage in science policy and advocacy efforts related to neuroscience. KN piloted a neuroscience policy paper competition to give early-career neuroscientists the opportunity to submit a policy paper that advocated for a neuroscience-related issue. With the success of our first policy paper competition, we aim to continue the event annually. Ultimately, Knowing Neurons provides early-career scientists with the tools necessary to communicate and disseminate neuroscience to a wide audience.

Disclosures: S.M. Chaturvedi: None. **L. Rader:** None. **L.E. Wagner:** None. **C. Amir:** None. **Z. Dobler:** None. **A. Hogan:** None. **M. Hall:** None. **A. Gryshyna:** None. **K.Y. Lim:** None.

Theme J Poster

TJP07: Outreach Activities

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP07.20SU/Z13

Topic: J.03. Public Awareness of Neuroscience

Title: The neurobiological effects of early childhood emotional maltreatment on amygdala structure, connectivity, and functioning: a systematic review of the literature

Authors: *S. GERAMI;
Biobehavioral Sci., Teachers Col., Columbia Univ., Lawrence, KS

Abstract: Despite the current emphasis on recognizing and understanding the impacts of childhood maltreatment, few studies specifically explore emotional maltreatment. This gap in the research is concerning, as emotional maltreatment is the most prominent form of childhood maltreatment. Considering the amygdala's role as the emotional center of the brain, the lack of attention given to how emotional maltreatment may relate to its structure and function is a crucial shortcoming within this area of research.
The current study addressed this gap in the research by reviewing the current literature on how emotional maltreatment in childhood influences amygdala development, analyzing studies published between 2010 and 2024. The aim was to explore the association between emotional maltreatment and changes in amygdala volume, functioning, and connectivity to other brain structures.
Findings indicated inconsistent results. For example, studies which focus on the effects of emotional maltreatment on amygdala volume show increases, decreases, and no differences in amygdala size compared to healthy controls. In contrast, studies on the effects of emotional maltreatment on amygdala functioning consistently present evidence of hyperactivity in the amygdala when maltreated individuals are presented with threatening or neutral stimuli, positively scaling with the severity of the maltreatment. There is also inconsistent evidence regarding the effects of emotional maltreatment on amygdala connectivity. Some findings indicate reductions in connectivity between the amygdala and the anterior cingulate cortex (ACC), medial prefrontal cortex (mPFC), insula, and a cluster from the orbitofrontal cortex and insula to the hippocampus and putamen. Others, in contrast, provide evidence of increased amygdala-hippocampus and amygdala-ACC connections. The alterations in functioning and connectivity detailed in the findings also resemble those seen in individuals with depression, anxiety, and post-traumatic stress disorder (PTSD), unlike those of healthy controls.
The varying impacts of emotional maltreatment on the amygdala signify the many developmental trajectories characterized by those who experience this early adversity. These findings highlight emotional maltreatment as deserving of greater professional and public attention, if only to gain a clearer understanding of its effects on brain development, and thusly, identify effective means of prevention and treatment for future generations.

Disclosures: S. Gerami: None.

Theme J Poster

TJP07: Outreach Activities

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP07.21SU/Z14

Topic: J.03. Public Awareness of Neuroscience

Title: Oxidative stress inbalance in the neurons of dopaminergic system generated by the addition of toluene

Authors: *M. MATA, Jr[1], O. R. GALICIA, Mr[2], M. H. BUENROSTRO-JAUREGUI, Mr[2]; [1]Psychology, Univ. Iberoamericana, Lomas de Santa Fe, Mexico; [2]Dept. of Psychology, Univ. Iberoamericana, Mexico City, Mexico

Abstract: We aim to review the scientific evidence reported in recent years about oxidative stress in the dopaminergic mesolimbic system and its relationship with the addictive use of inhalants. The abuse of inhalants, including toluene, is a disorder with neurobehavioural and neurotoxic conditions that can affect the dopaminergic mesolimbic system. One of the most used inhalants for recreational purposes is toluene. This compound, also called methylbenzene, is a colorless, water-insoluble liquid with an odor associated with paint thinners, mainly used as an industrial solvent. Among the neurotoxic effects are oxidative stress arising from an increase in reactive oxygen/nitrogen species [ROS/RNS] and a decrease in antioxidant protection capacity, characterized by a reduction in the ability of the endogenous system to combat attacks of oxidation of biomolecular targets. Although the toluene mechanism of action to produce such neurotoxic effects on the brain is unknown, there are a series of “in vitro” and ¨in vivo¨ studies that have shown that toluene affects cellular activities critical for neuronal survival as ATPase activity, Ca^{2+} levels and membrane fluidity in brain areas such as the ventral and dorsal striatum, the prefrontal cortex and hippocampus. These studies indicate that exposure to organic solvents causes oxidative damage to the dopaminergic mesolimbic system vulnerable to additional loads. Our aim is to collect information to promote research on the abuse of solvents and the dopaminergic system damage by ROS. As also to generate alternatives that help restore the damage produced by oxidative stress. Method: In the present work, a systematic review organized by various topics was carried out starting from basic word concepts, taken from the literature found in the PubMed and Web of Science databases. The main words searching are oxidative stress, species oxygen/nitrogen reactive agents, free radicals, toluene, dopaminergic mesolimbic system, and antioxidants.
Keywords: Oxidative stress, reactive oxygen species, antioxidants, dopaminergic system, addiction of inhalants and toluene.

Disclosures: M. Mata: None. **O.R. Galicia:** None. **M.H. Buenrostro-jauregui:** None.

Theme J Poster

TJP08: Teaching of Neuroscience: College IV

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP08.01SU/Z15

Topic: J.03. Public Awareness of Neuroscience

Title: Neuroscience in society: reimaging academic responsibility to include collective impact

Authors: *N. MICHAEL;
Univ. of Notre Dame, Notre Dame, IN

Abstract: The academy has generated hundreds of thousands of volumes of knowledge detailing the fundamentals and obligations of nervous system function, and yet the general public still has little literacy or skill-base regarding how to apply this knowledge in support of individual and community wellness. This poster will detail the multifaceted engagement strategies of the Neuroscience and Behavior major at the University of Notre Dame, including undergraduate curricular core competencies and student development, examples of course design in support of science communication and community engagement, as well as pivots in SfN Chapter activities and conference practices that highlight sustainable engagement methods and successful community-centered research practices. Taken together, these approaches offer a reimagining of how the academy can "narrow the gap" between what the academy knows and how individuals and communities practice. The academy can, and has the responsibility to, mobilize the evidence base of neuroscience, which can make significant contributions to general community capacity and collective impact; urgently needed strategies that stand to go a long way towards re-building public trust in science.

Disclosures: N. Michael: None.

Theme J Poster

TJP08: Teaching of Neuroscience: College IV

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP08.02SU/Z16

Topic: J.03. Public Awareness of Neuroscience

Title: Neuroscience students nurture community resilience

Authors: *K. DUFFY[1], N. MICHAEL[2];
[2]Biol. Sci., [1]Univ. of Notre Dame, South Bend, IN

Abstract: A critical piece of building resilience is through strengthening individual's knowledge and skills. University of Notre Dame neuroscience students and faculty have worked together with community partners to disseminate neuroscience information within the Greater Michiana community. Leveraging the brilliance and creativity of students has yielded great impact. The internship program supports the mobilization of academic knowledge in support of building community capacity and student interns gain significant opportunities to grow in their science communication skills and contribute to community knowledge and practice. Some resources that have been developed are conversation playing cards, manuals, booklets, children's activity books, and handouts. The partnership between the Notre Dame's Neuroscience and Behavior major and Self-Healing Communities of Greater Michiana has facilitated innovative and engaging methods of science communication, benefiting everyday community members. The community-university collaboration allows for sustained engagement within the community and opportunities for all involved to grow in personal and professional development.

Disclosures: K. Duffy: None. **N. Michael:** None.

Theme J Poster

TJP08: Teaching of Neuroscience: College IV

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP08.03SU/Z17

Topic: J.03. Public Awareness of Neuroscience

Title: Grey Matters Journal: A nonprofit advancing neuroscience education through accessible scientific literature, diversity-oriented outreach, and inclusive community events

Authors: *E. C. D'CESSARE[1], A. L. SCIOCCHETTI[13], E. B. SHIU[14], J. N. BHATEJA[2], B. C. WU[3], D. MAO[3], M. LI[4], B. G. ARNOLD[5], S. E. D'SOUZA[6], N. MATVEEVA[7], K. QIU[8], E. IVANOVA[7], S. BANSAL[9], P. SRINIVASAN[10], Z. THOMAS[11], S. A. GOLDEN[12]; [1]Neurosci., [2]Biol. Structure, Univ. of Washington, Seattle, WA; [3]Univ. of Washington, Sammamish, WA; [4]Univ. of Washington, Kirkland, WA; [5]Univ. of Washington, SEATTLE, WA; [6]Univ. of Washington, Portland, OR; [7]Univ. of Washington, Seattle, WA; [8]Univ. of Washington, Bellevue, WA; [9]Univ. of Washington, Duluth, GA, ; [10]Univ. of Washington, Redmond, WA; [11]Univ. of Washington, Mercer Island, WA; [12]Dept. of Biol. Structure, Univ. of Washington, Seattle, WA; [13]Univ. of Washington, Seattle, Seattle, WA; [14]Univ. of Washington, Seattle, Sammamish, WA

Abstract: Effective public communication of neuroscience is hindered by an increasing divide between scientific jargon and general comprehension. This gap is further exacerbated by a lack of diversity among field leaders and socioeconomic barriers such as the cost of accessing accurate scientific literature. Grey Matters Journal at the University of Washington is an undergraduate neuroscience organization dedicated to addressing these obstacles by providing free and high-quality neuroscience education for all. We aim to mentor and inspire the next generation of neuroscience learners and educators, and in service of this mission, to expand our

collaborations and partnerships around the globe.
Each quarter, Grey Matters Journal mentors students through writing, editing, illustrating, and designing a freely disseminated journal that comprehensively and accurately communicates complicated neuroscience topics. Furthermore, we host events across the Seattle area, where our outreach team of over 100 undergraduate and physician volunteers has provided over 5,000 PreK-12th grade students the opportunity to dissect sheep brains, interact with neurotechnology, and ask questions about higher education. We also engage the general public through An Evening with Neuroscience, a free annual event hosted on-campus and virtually. At this event, over 300 participants connect with interdisciplinary faculty, observe a human brain dissection, and celebrate neuroscience art and technology.
As our organization grows, we commit ourselves to broadening our impact culturally and geographically with equity in mind. We currently develop and host cultural and festive events that highlight the interdisciplinary nature of neuroscience and engage a larger, more diverse audience. Our outreach is focusing on under-resourced school districts and underrepresented student groups. In addition, we are in the process of developing an accessibility committee focused on improving our inclusivity efforts and fulfilling disability accommodations. Finally, to streamline the formation of new chapters across the country, our leadership team is creating a comprehensive guide. These improvements are essential for furthering our mission of making neuroscience accessible for all.

Disclosures: E.C. D'cessare: None. **A.L. Sciocchetti:** None. **E.B. Shiu:** None. **J.N. Bhateja:** None. **B.C. Wu:** None. **D. Mao:** None. **M. Li:** None. **B.G. Arnold:** None. **S.E. D'Souza:** None. **N. Matveeva:** None. **K. Qiu:** None. **E. Ivanova:** None. **S. Bansal:** None. **P. Srinivasan:** None. **Z. Thomas:** None. **S.A. Golden:** None.

Theme J Poster

TJP08: Teaching of Neuroscience: College IV

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP08.04SU/Z18

Topic: J.03. Public Awareness of Neuroscience

Title: Grey Matters Journal VC: An undergraduate operation to bring the public closer to the world of neuroscience

Authors: *S. BABITSKY[1], E. ANDERSEN[1], S. SKLAR[1], D. LORMAN[2];
[1]Vassar Col., Poughkeepsie, NY; [2]The Taub Inst. for Res. on Alzheimer's Dis. and the Aging Brain, Columbia Univ. Irving Med. Ctr., Brooklyn, NY.

Abstract: Now more than ever, it is crucial to deconstruct the barriers between the scientific community and the general public. The public’s understanding of neuroscience is limited by the abundance of scientific jargon and the existence of socioeconomic barriers, such as the cost of accessing scientific research. Grey Matters Journal at Vassar College (GMJvc) is a chapter of the neuroscience outreach publication Grey Matters established at the University of Washington in

2013. As a whole, our mission is to develop effective scientific communicators while providing an accessible and free platform that explores recent topics in neuroscience for Vassar students and the Poughkeepsie community alike. The Vassar College chapter of Grey Matters Journal is a semesterly publication entirely written, illustrated, and edited by Vassar students. Unlike other GMJ chapters, GMJvc is entirely run by undergraduates as Vassar does not have graduate students.
Each semester, we invite Vassar students to submit outlines summarizing their proposed articles. Each accepted author is then paired with a team of undergraduate editors to help them research their topics and refine their writing. Unlike the founding chapter, Vassar Grey Matters has three divisions of editors—Scientific Review, Lay Review, and General Editing—that each focus on one aspect of accessible writing. The Scientific Review focuses on refining the science behind the topic, the Lay Review ensures the article is understandable by someone without a scientific background, and finally, General Editing helps the author improve their flow and writing style. Each article team is also assigned an artist who designs illustrations that complement the article by elucidating relevant neurological mechanisms. This model allows us to ensure the articles remain engaging, accurate, and accessible without the assistance of graduate students. It also provides us the ability to mentor students who contribute to the journal, helping them develop their skills to become better editors, writers, artists, and scientific communicators.
Since our founding, we have engaged with the public through the annual "Grey Matters Art Show" at the Frances Lehman Loeb Art Center on Vassar's campus. This event provides an opportunity for community members to appreciate art from the journal and participate in Q&A sessions with faculty and alumni. Moving forward, while continuing to publish each semester and mentoring its members, GMJvc remains committed to broadening its engagement with the local community. We plan to focus our outreach efforts on schools in the Hudson Valley to promote STEM education in underserved communities.

Disclosures: S. Babitsky: None. **E. Andersen:** None. **S. Sklar:** None. **D. Lorman:** None.

Theme J Poster

TJP08: Teaching of Neuroscience: College IV

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP08.05SU/Z19

Topic: J.03. Public Awareness of Neuroscience

Title: Neuroscience policy in Florida and public outreach

Authors: *K. M. GONZALEZ[1,2,3];
[1]Neurosci., Univ. of Florida, Gainesville, FL; [2]Psychiatry, University of Florida, Gainesville, FL; [3]ECPA Program, Society for Neuroscience, Washington, DC

Abstract: The intersection of neuroscience and policy is quite expansive, ranging from appropriations for government institutions that fund research, such as NIH, to changes in pre-clinical animal use requirements. However, not all policy initiatives stem from the federal

government, with numerous state bills being proposed each legislative session. Florida currently has over 20 proposed bills related to neuroscience research or healthcare. This includes changes to the use of electronic health records in research and training requirements for employees at memory care units, which are typically home to those with neurodegenerative diseases. As an Early Career Policy Ambassador for SfN, I strive to advocate for neuroscience research while also building connections with local communities and policymakers. To accomplish this, I am creating a newsletter for the public and my colleagues on recent research findings in neuroscience and any related legislation, including the bills mentioned above. The newsletter will include a call-to-action section, additional advocacy resources, such as how to become a NeuroAdvocate, and tips on contacting their representatives. Additionally, I am partnering with various Florida Bar divisions, such as the Health, Public Interest, and Elder Law Sections, to host advocacy seminars for their members. The goal is to educate them on the importance of supporting neuroscience funding in the state and provide language to the Florida legislature on related bills. This poster will describe the outcome of these initiatives and their impact on Florida's neuroscience policy.

Disclosures: K.M. Gonzalez: None.

Theme J Poster

TJP08: Teaching of Neuroscience: College IV

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP08.06SU/Z20

Topic: J.03. Public Awareness of Neuroscience

Title: Outreach to, and with Mental Health Professionals: stakeholders, collaborators, and allies in envisioning the future of neuroscience and addressing mental health in the classroom

Authors: *D. DONLEY;
Harding Univ., Searcy, AR

Abstract: As the mental health crisis continues to grow, particularly among college students, increased collaboration between neuroscience faculty and mental health professionals is needed. Clinical mental health professionals are stakeholders in neuroscience but sometimes do not feel as though they belong as professionals in clinical medicine (e.g. neurology; psychiatry) or in research (e.g. academic neuroscience). As outreach efforts expand to support mental health within and beyond the classroom, an increased awareness is needed of how clinical mental health and academic neuroscience can provide mutual benefit. The goal of the current project is to explore the self-efficacy of clinical mental health professionals as stakeholders in neuroscience. We report on the ways in which clinical mental health professionals perceive their involvement in the progress of neuroscience and their view of the scope of the neurosciences. Additionally, we report how clinical mental health professionals respond to the ways that mental health terminology and concepts are used in the classroom. These data provide a framework for building outreach and co-curricular projects that increase collaboration among stakeholders in

the neurosciences. This project reports early pilot data characterizing the relationship of clinical mental health professionals with the neurosciences in academia. The long-term goal is to develop tools and strategies to increase authentic collaborations between mental health professionals and neuroscience faculty.

Disclosures: D. Donley: None.

Theme J Poster

TJP08: Teaching of Neuroscience: College IV

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP08.07SU/Z21

Topic: J.03. Public Awareness of Neuroscience

Support: Sharron and Joseph Ashyby Hubert Fund of the Community Foundation of Broward
Heidenreich Family Foundation
Stiles-Nicholson Foundation
Palm Health Foundation

Title: Not to stress: A coordinated approach to enhance brain resilience in South Florida through research, education, and community engagement

Authors: *N. L. BAGANZ[1,2], D. A. CINALLI, Jr.[1], A. M. PAZ[1], R. D. BLAKELY[1,2]; [1]Stiles-Nicholson Brain Inst., Florida Atlantic Univ., Jupiter, FL; [2]College of Medicine, Florida Atlantic University, Jupiter, FL

Abstract: Mental health conditions pose a significant burden on individuals, families, and communities, with alarming statistics in Florida, including high suicide rates among veterans and adults (2.6 times higher than the general population) and an above-average rate of suicide attempts among students. To address this crisis, we have developed a multi-tiered approach integrating research, education, and community engagement that builds on our existing brain science community programs, including “ASCEND”, a neuroscience education program for middle school students; “MobileMinds”, a transportable neuroscience outreach program; and “Brainy Days”, a monthlong celebration of neuroscience research held annually in March featuring public lectures by invited neuroscientists. In response to the alarming mental health statistics in Broward County, FL, and with the generous support of $400,000 from the Sharron and Joseph Ashby Hubert Fund of the Broward Community Foundation for this multi-year project, we are expanding our reach across South Florida. Through a university-community partnership, we are extending the geographical reach of our the “MobileMinds” program, including lessons related to brain stress resiliency, establishing an annual symposium focused on toxic stress-related brain disorders and supporting research into stress-related disorders through human and animal studies. Our 3-pronged approach enables us to address stress and brain health from multiple angles and for multiple age groups, spurring biomedical advances and increased

awareness of brain health and disorders to address the mental health crisis. By linking our research back to the community, we can educate thousands of eager learners each year and promote inclusive, evidence-based solutions. Our presentation will highlight our multi-tiered approach, demonstrating how research, education, and community engagement can combine to drive meaningful change. Visibility and impact assessments will be featured to measure success and steadily improve the program each year.

Disclosures: N.L. Baganz: None. **D.A. Cinalli:** None. **A.M. Paz:** None. **R.D. Blakely:** None.

Theme J Poster

TJP08: Teaching of Neuroscience: College IV

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP08.08SU/Z22

Topic: J.03. Public Awareness of Neuroscience

Support: William R. Kenan, Jr. Charitable Trust sponsored Whole Community Connection (WCC)

Title: Reducing stigma, saving lives: A community-based program to build awareness and treatment for those with opioid use disorder

Authors: *S. D. GARRISON[1], R. JORDAN[2];
[1]Dept. of Pharmacol., Univ. of North Carolina Chapel Hill, Chapel Hill, NC; [2]Univ. of North Carolina Sch. of Med., Chapel Hill, NC

Abstract: Opioid use disorder is a pressing concern affecting numerous Americans, with ~2.5 million adults in America meeting criteria for opioid use disorder in 2021. According to the North Carolina Department of Health and Human Services, there has been a recent annual increase in the number of North Carolinians losing their lives to fatal opioid-related overdoses. Robeson County, NC, where the two largest racial/ethnic groups are African-American (24%) and Native-American (42%), has a drug overdose rate that is nearly double the overall state rate. Moreover, in African-American and Native-American populations, the number of those impacted by opioid use disorder and opioid-related deaths has seen a larger increase than in other racial groups. However, while it is imperative to address and treat opioid use disorder in Robeson County, we must concurrently address opioid use-related stigma, since stigma is a prominent barrier to receiving treatment. Our initiative "Reducing stigma, saving lives," is a collaborative effort between clinicians and researchers from the University of North Carolina at Chapel Hill, and members of the Robeson County community. Our primary goal is to mitigate the harm caused by opioids within the community. To tackle this issue, we conduct training sessions aimed at destigmatizing opioid use and educating individuals on naloxone administration. These sessions begin with a pre-survey to gauge participants' baseline knowledge, followed by presentations and testimonies from individuals with lived experiences of opioid use disorder. Finally, a post-survey helps assess participants' learning outcomes and the training's overall

impact. To date, our surveys have provided insights across diverse age groups, gender identities, and racial backgrounds. Many participants shared this training was their first exposure to education on naloxone or recognizing signs of opioid overdose. While pre-survey responses often reflected uncertainty regarding the use of naloxone (how to administer naloxone and the timing and duration of its effect), post-survey results revealed a significant increase in correct answers and participant confidence. Additionally, over 90% of participants stated that they would change their behaviors involving naloxone due to what they learned in the training — a testament to the effectiveness of our efforts. Our team is currently working to identify shifts in community attitudes to opioid use and naloxone. Encouragingly, feedback on the training has been largely positive, motivating our team to strategize next steps.

Disclosures: S.D. Garrison: None. **R. Jordan:** None.

Theme J Poster

TJP08: Teaching of Neuroscience: College IV

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP08.09SU/Z23

Topic: J.03. Public Awareness of Neuroscience

Title: Comprehensive Needs Assessment tool for planning Mental Health and Substance Use Programming for Youth

Authors: R. MERRIER[1], D. BALANGOY[1], J. LEHMAN[2], K. ANDERSON[1], ***A. RANDOLPH**[2];
[1]Masonic Inst. for the Developing Brain, Univ. of Minnesota, Minneapolis, MN; [2]Univ. of Minnesota, Minneapolis, MN

Abstract: It is widely agreed that health inequities exist and persist in our society. Health inequities based on race are well-documented in access to care, maternal and infant health outcomes, disease burden, and life expectancy, amounting to a serious public health issue. Contrary to its common perception as a Scandinavian monoculture, Minnesota is a state that is very culturally diverse, with some of the largest Somali, Hmong, and Karen refugee populations in the U.S.; large Mexican, Ethiopian, Liberian, Vietnamese, Taiwanese, and Indian communities; and significant Indigenous populations from eleven sovereign tribal nations. This has positioned the Community Engagement and Education (CEEd) Hub to amplify voices from several underrepresented communities using a “Community First” listening model, integrating community feedback into the design and implementation of facilities, research questions, and clinical care. Community partners requested that the CEEd Hub play a key role in supporting community-engaged efforts to address mental health and substance use. In collaboration with the Advancing Community Empowerment and Social Justice (ACES) Laboratory at Michigan State University, the CEEd Hub developed a community-driven, culturally relevant, comprehensive needs assessment to understand the needs, opportunities, and future aspirations of youth with mental health and substance use challenges. This poster will discuss 1) needs assessment design,

2) social validation processes and assessment findings, and 3) best practices for conducting youth-centered, comprehensive needs assessments.

Disclosures: R. Merrier: None. **D. Balangoy:** None. **J. Lehman:** None. **K. Anderson:** None. **A. Randolph:** None.

Theme J Poster

TJP08: Teaching of Neuroscience: College IV

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP08.10SU/Z24

Topic: J.03. Public Awareness of Neuroscience

Support: Wellcome Research Enrichment – Public Engagement Fund

Title: OCD & the Brain: Bridging the gap between research and lived experience through a co-produced digital hub to disseminate accessible OCD neurobiology information

Authors: *U. R. CHATTERJEE[1,2], T. U. HAUSER[3,4];
[1]Neurosci. Training Program, Univ. of Wisconsin Sch. of Med. & Publ. Hlth., Madison, WI; [2]Intl. OCD Fndn., Boston, MA; [3]Dept. of Psychiatry and Psychotherapy, Eberhard Karls Univ. of Tübingen, Tübingen, Germany; [4]Max Planck UCL Ctr. for Computat. Psychiatry and Ageing Res., Univ. Col. London, London, United Kingdom

Abstract: Obsessive-compulsive disorder (OCD) is a prevalent yet incredibly misunderstood psychiatric illness. Recognizing the existing public knowledge gap about how OCD works in the brain and the pervasive public stigma surrounding OCD, the “OCD and the Brain” project was initiated by a collaboration between UCL, the International OCD Foundation (IOCDF), OCD Action, and people with lived experience of OCD. The project aimed to transform our understanding of the brain's role in OCD by co-creating resources to more effectively communicate what we know about OCD and the brain, understand how OCD research is conducted, and better align research with the needs of the OCD community. One of the project's key challenges was addressing the disconnect that exists between the experiences of people living with OCD and the accessible and accurate dissemination of neuroscience research.
The primary outcome of the OCD and the Brain project is a freely accessible digital hub, available at https://ocdandthebrain.com/. It features a comprehensive animation, a toolkit with engaging visuals and evidence-based information about the brain's role in OCD, educational resources, and information about the conduction of OCD research across various relevant disciplines. The collaborative approach of this project has not only resulted in an invaluable resource for the OCD community but has also successfully bridged the gap between lived experience and scientific research. Insights gained from the community have shaped and influenced not only the creation of this digital hub, but the future work of research programs, aligning science communication tools and research questions more closely with participants' interests and needs. The project sets a precedent for future research initiatives, emphasizing the

importance of integrating the lived experience perspectives of patients and family members to create meaningful and impactful outcomes. This poster will discuss the creation, execution, and dissemination of the OCD and the Brain project, providing valuable insights into working with and leveraging the insights of community members with lived experience. Ultimately, this poster works to inform a novel science communication framework for attendees to integrate into their respective research programs.

Disclosures: U.R. Chatterjee: None. **T.U. Hauser:** None.

Theme J Poster

TJP08: Teaching of Neuroscience: College IV

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP08.11SU/Z25

Topic: J.03. Public Awareness of Neuroscience

Support: A*STAR-HPP 1/23 AAR

Title: Empowering primary caregivers through neuroeducation about early childhood brain development

Authors: *A. SCHMIED, N. AZMAN, S. TEH;
Nanyang Technological Univ., Natl. Inst. of Educ., Singapore, Singapore

Abstract: The first six years of human development mark the prime of brain plasticity, where neural structure and function are especially malleable to life experiences. During these years, primary caregivers play critical roles in shaping children's brain development and subsequent behaviors throughout all stages of life. However, are they entirely aware of their influential role on children's growth? Neuroeducation refers to educating untrained individuals on neuroscience-related content. Studies on the impact of neuroeducation have largely focused on incorporating neuroscience principles into educators' training programs to improve teaching and learning. While research findings indicate positive effects of neuroeducation on educators and their students, it remains unknown whether primary caregivers and children could benefit similarly from infusing neuroscience principles. By providing fundamental knowledge on early childhood brain development, neuroeducation may also assist primary caregivers to better understand children's growth and to help them become more aware of the critical roles they can exert. "NeuroEducation for Parents" constitutes a unique research translation program to educate primary caregivers of children between ages 2-5 years about the relationship between early brain development, cognitive performance, and behavior across the lifespan. A secondary goal includes exploring its potential to raise awareness of sensitive caregiving. The program comprises a core, 7-session educational package based on neuropsychology and inquiry-based pedagogy and adopts an online-learning, self-paced format inclusive of lectures, active learning activities, and readings. "NeuroEducation for Parents" also serves as an active control arm of a larger 5-year research project titled "Learning about Our behavior is Valuable for Increasing

Nurturing relationships and healthy Growth, LOVING." The program is currently under development and will be evaluated on a 25 caregiver-child dyads pilot through a series of formative assessments and interviews. Following the pilot phase, this active control arm will take part in a randomized controlled trial with two other training programs under LOVING, which main objective is to improve sensitive caregiving. A total of 636 primary caregiver-child dyads will be enrolled and asked to complete a neurobiological battery to uncover the mechanisms and effects of the different programs. Thus, "NeuroEducation for Parents" not only comprises a standalone program to educate primary caregivers on early childhood brain development, but also has potential to raise awareness of sensitive caregiving.

Disclosures: A. Schmied: None. **N. Azman:** None. **S. Teh:** None.

Theme J Poster

TJP08: Teaching of Neuroscience: College IV

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP08.12SU/Z26

Topic: J.03. Public Awareness of Neuroscience

Support: CHFS
Morehead State University

Title: Characteristics of caregivers and effectiveness of caregiver training in Eastern Kentucky

Authors: *I. WHITE[1], W. WHITE[2];
[2]Psychology, [1]Morehead State Univ., Morehead, KY

Abstract: In Kentucky, one of every two adults has at least one chronic disease (CHFS, 2022), which often requires long-term care by unpaid family members. The burden of caregiving impacts a caregiver's quality of life significantly, posing a risk factor for mental and physical health and decreasing the quality of care. The present study examined the characteristics of family caregivers in Eastern Kentucky with a survey and interviews. We also assessed the effectiveness of a six-week caregiver training course attended primarily by caregivers. Caregiver participants were predominantly females, most provided caregiving alone under moderate to high stress and lacked financial support, and many of them reported emotional burden, burn out, and mental health problems. Participants had limited local resources for emotional and social support. Most care-receivers were cognitively impaired (62%) due to neurological disorders and aging, a condition that is particularly challenging to manage. The impact of long-term care on caregivers' emotional and psychosocial vulnerability can be a significant risk factor for mental health, particularly for female caregivers. Participants who completed caregiver training reported that the program provided useful strategies and resources for the challenges of caregiving, as well as helpful scientific background specific to their care-receivers. The present findings emphasize the importance of caregiver education and training that enables caregivers to better cope with the challenges of long-term caregiving in Eastern Kentucky.

Disclosures: I. White: None. **W. White:** None.

Theme J Poster

TJP08: Teaching of Neuroscience: College IV

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP08.13SU/Z27

Topic: J.03. Public Awareness of Neuroscience

Title: Neural Technology Development and Translation: Portfolio Analysis & Funding Opportunities from NINDS, the HEAL Initiative®, the BRAIN Initiative®, and the Blueprint MedTech Program

Authors: P. MOGHIMI, S. E. ROBINSON SCHWARTZ, E. ATKINSON, N. W. VAHIDI, M. FRANKOWSKI, B. GROSS, E. M. HUDAK, E. S. KEMMERER WHITE, G. K. WU, ***N. B. LANGHALS**;
Natl. Inst. of Neurolog. Disorders and Stroke, NIH, Bethesda, MD

Abstract: Objective: The National Institute of Neurological Disorders and Stroke (NINDS), HEAL Initiative, BRAIN Initiative, and Blueprint MedTech program provide numerous funding opportunities to academic and industry researchers to advance early-stage neurological technologies, devices, and therapeutic programs to industry adoption. Our goal in the Translational Neural Devices (TND) program is to support early feasibility studies required to finalize device design and facilitate their transition to phase II clinical trials.
Background: The mission of the Brain Research Through Advancing Innovative Neurotechnologies (BRAIN) Initiative is to revolutionize our understanding of the human brain by accelerating the development and application of innovative technologies. The Helping to End Addiction Long-term (HEAL) Initiative is a trans-NIH effort to accelerate development of scientific solutions to curb the national opioid crisis. The Blueprint MedTech program is an NIH incubator that supports development and translation of cutting-edge medical devices and technologies. Within the NINDS Division of Translational Research, TND provides support for the development, optimization, translation, and first-in-human testing of therapeutic and diagnostic devices for disorders that affect the nervous or neuromuscular systems.
Methods: A systematic review of our current device portfolio will be presented, including a detailed analysis of the success rate of our awarded projects including rate of gaining FDA approval for conducting small early feasibility clinical trials. We will also provide a breakdown by program, location, and indication. Lastly, an overview of the currently available funding opportunities and available resources from the NINDS TND Program, the BRAIN Initiative, the HEAL Initiative, and the Blueprint MedTech Program will be presented.
Results: TND funding opportunities and resources are actively supporting translational research in discovery and development of new therapeutic interventions for neurological disorders including neuropsychiatric disorders, movement disorders, neurotraumatic injuries, and pain. Since 2014 a total of 99 grants totaling nearly $430 million have been awarded which have resulted in 617 publications and 22 patents.

Conclusions: Through the funding opportunities that support late-stage device development and subsequent small clinical trials, TND programs have provided significant funding to a wide range of projects including projects involving new invasive and noninvasive devices for the treatment of disorders that affect the nervous or neuromuscular systems.

Disclosures: P. Moghimi: None. **S.E. Robinson Schwartz:** None. **E. Atkinson:** None. **N.W. Vahidi:** None. **M. Frankowski:** None. **B. Gross:** None. **E.M. Hudak:** None. **E.S. Kemmerer White:** None. **G.K. Wu:** None. **N.B. Langhals:** None.

Theme J Poster

TJP08: Teaching of Neuroscience: College IV

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP08.14SU/Z28

Topic: J.03. Public Awareness of Neuroscience

Title: Accelerating neuroscience innovation: How the NINDS small business program drives cutting-edge research and technologies

Authors: E. CAPORELLO[1], ***J. FORBES**[2];
[1]NIH, Natl. Inst. of Neurolog. Disorders & Stroke (NINDS), Rockville, MD; [2]Small Business Program, Natl. Inst. of Neurolog. Disorders and Stroke, Gainesville, FL

Abstract: NINDS Small Business Program Abstract
The National Institute of Neurological Disorders and Stroke (NINDS) Small Business Program aims to promote innovative neurological research by providing essential support to small businesses and fostering the commercialization of cutting-edge technologies. This poster presents a comprehensive overview of the program, highlighting its strategic initiatives, transformative technologies funded through its grants, and outreach activities that amplify the impact of neuroscience research.
The NINDS Small Business Program has a strong history of identifying and supporting promising technological innovations that address critical gaps in neuroscience. Through advanced diagnostic tools, novel therapeutic agents, and cutting-edge neuroimaging techniques, these funded projects have the potential to redefine standards of care in the field. The program empowers high-risk, high-reward research, enabling the development of groundbreaking treatments for a wide range of neurological diseases. By promoting collaborations with academic institutions and offering targeted funding opportunities, the program aims to accelerate the translation of innovations from lab to clinical application.
In addition to funding support, the NINDS Small Business Program also plays an integral role in outreach activities designed to broaden the program's impact within the neuroscience community. These activities include hosting workshops, networking events, and educational initiatives to foster a collaborative environment among researchers, innovators, and stakeholders. These outreach events serve as platforms for sharing insights, developing partnerships, and promoting the seamless translation of research findings into practical treatments.

Moreover, the poster will emphasize the disease spaces of interest to NINDS, including neurodegenerative disorders (e.g., Alzheimer's and Parkinson's diseases), conditions like multiple sclerosis and epilepsy, and rare neurological diseases. The program’s dedication to a broad spectrum of unmet medical needs illustrates its commitment to addressing some of the most challenging medical issues in neuroscience.
Through this poster, we invite researchers, innovators, and stakeholders to learn more about the NINDS Small Business Program’s dedication to advancing neurological research, its support for high-impact outreach activities, and its pivotal role in fostering a dynamic landscape of novel technologies.

Disclosures: E. Caporello: None. **J. Forbes:** None.

Theme J Poster

TJP08: Teaching of Neuroscience: College IV

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP08.15SU/Z29

Topic: J.03. Public Awareness of Neuroscience

Title: NINDS funding opportunities for Alzheimer's disease-related dementias

Authors: A. K. SHUKLA[1], H. R. ASTACIO[1], R. A. CORRIVEAU[1], *A. MCCARTNEY[2]; [1]NIH, Natl. Inst. of Neurolog. Disorders & Stroke (NINDS), Rockville, MD; [2]NIH, Natl. Inst. of Neurolog. Disorders & Stroke (NINDS), Milford, CT

Abstract: Goal 1 of the National Plan to Address Alzheimer's Disease (AD) is to prevent and effectively treat AD and AD-related dementias (ADRD). In the National Plan, ADRDs include Frontotemporal dementia (FTD), Vascular Contributions to Cognitive Impairment and Dementia (VCID), Lewy Body Dementias (LBD) and Multiple Etiology Dementias (MED) based on similarities in clinical symptoms and brain pathologies between these and pathological AD and/or clinical AD. Since 2012, the National Institute on Aging and NINDS have held research summits to assess needs and set AD/ADRD research implementation milestones. The NINDS ADRD Summit in 2022 resulted in ADRD research priorities for advancing the state-of-the-science toward meeting Goal 1 of the National Plan. NINDS led ADRD programs and initiatives (for current funding announcement see here) are responsive to these milestones, including in collaboration with and support from the NIA. Examples include MarkVCID, DISCOVERY, Diverse VCID, DetectCID, NAPS Consortium for LBD, ALLFTD, REGARDS, FTD Center Without Walls, and CONNECT-TBI. Through these initiatives, and investigator-initiated ADRD research, NINDS aims to provide a wide-ranging approach that could potentially revolutionize our understanding and treatment of AD and ADRD. This approach includes developing a trained workforce, understanding disease mechanisms, and applying research findings to translation and clinical research including clinical trials. AD/ADRD researchers can also apply to parent initiatives including the NIH Parent R01 and the NINDS R21. Finally, the NIA, with collaboration from the NINDS, provides detailed reporting on NIH responsiveness to all

implementation milestones in the National Plan, including from NINDS-led ADRD summits, in the AD and ADRD Research Implementation Milestones database.
See: https://www.ninds.nih.gov/current-research/focus-disorders/focus-alzheimers-disease-and-related-dementias | https://www.nia.nih.gov/research/milestones | https://aspe.hhs.gov/reports/national-plan-2023-update

Disclosures: A.K. Shukla: None. **H.R. Astacio:** None. **R.A. Corriveau:** None. **A. McCartney:** None.

Theme J Poster

TJP08: Teaching of Neuroscience: College IV

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP08.16SU/Z30

Topic: J.03. Public Awareness of Neuroscience

Support: Dana Foundation, Career Network in Neuroscience and Society grant

Title: Expanding neuroscience and society impact through the Dana Foundation Career Network in Neuroscience & Society

Authors: *E. RODRIGUEZ[1], C. MCFARLAND[3], I. RAMIREZ[4], M. LAW[2], C. BALUSU[5], I. STEVENS[6], A. P. STEINER[7], F. X. SHEN[8];
[1]MGH, Minneapolis, MN; [2]MGH, Boston, MA; [3]Harvard Univ., Cambridge, MA; [4]Johns Hopkins, Baltimore, MD; [5]Simply Neurosci., Fremont, CA, ; [6]Harvard Med. Sch., Boston, MA; [7]Minnesota State Univ., Mankato, MN, ; [8]Law School, MGH Psychiatry, Univ. of Minnesota, MGH & HMS, Minneapolis, MN

Abstract: Neuroscience is now being applied in many fields outside of science and medicine. Neuroscience and Society (“NeuroX”) fields such as neuromarketing, neurolaw, neuromusic, neuroethics, neuroeconomics, neuroscience and public policy, neuroarchitecture, neurophilosophy, neuroanthropology, and many more are now emerging. NeuroX fields offer

new collaborative and career opportunities for neuroscientists and trainees, and NeuroX fields are pathways by which neuroscience can make a broader impact across society.
Yet, to date, most neuroscientists remain unaware of NeuroX opportunities.
Against the backdrop of growing interest for pursuing opportunities in neuroscience and society, there exists a clear need for a platform that can expand and diversify the students and professionals working in these fields.
Drawing on the work of the newly formed Dana Foundation Career Network in Neuroscience & Society, this poster will introduce SfN attendees to NeuroX fields, promote critical discussion of neuroscience's potential societal impact, and provide career resources to neuroscientists interested in working in NeuroX fields.
The poster will discuss successful past and ongoing mechanisms for NeuroX engagement hosted by the Dana Foundation Career Network in Neuroscience & Society: the first Virtual Career Fair in Neuroscience & Society, which drew 1795 registrants fall 2023; outreach to 306 schools, many of which were Minority Serving Institutions; 21 regional and international NeuroX events, which brought people around the world to discuss emerging NeuroX fields and contemporary issues; and the NeuroX Job bank.
The poster will also provide suggestions for how to empower others to launch their own campus NeuroX initiatives, creating platforms that connect talent with opportunity and drive collaborative innovation at the frontiers of neuroscience and society.
The first year of the Career Network in Neuroscience & Society has taught us many lessons, which we will share with SfN attendees. Lessons include that there is increasing demand, especially from students, for cross-disciplinary NeuroX dialogue, yet there remains great uncertainty about what a NeuroX career looks like; communication strategies that reach underrepresented schools and individuals should be a priority; and quantified metrics of success remain difficult to develop but should be pursued with rigor.

Disclosures: E. Rodriguez: None. **C. McFarland:** None. **I. Ramirez:** None. **M. Law:** None. **C. Balusu:** None. **I. Stevens:** None. **A.P. Steiner:** None. **F.X. Shen:** None.

Theme J Poster

TJP08: Teaching of Neuroscience: College IV

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP08.17SU/Z31

Topic: J.03. Public Awareness of Neuroscience

Support: Dana Foundation, Neuroscience & Society Grant

Title: Innovating judicial education in neuroscience: Lessons from a co-created pilot program

Authors: *C. MCFARLAND[1], K. WILLIAMS[2], I. RAMIREZ[3], E. RODRIGUEZ[4], F. X. SHEN[5];
[1]Harvard Univ., Cambridge, MA; [2]Harvard Col., Cambridge, MA; [3]Johns Hopkins, Baltimore,

MD; [4]MGH, Cambridge, MA, ; [5]Law School, MGH Psychiatry, Univ. of Minnesota, MGH & HMS, Minneapolis, MN

Abstract: Neuroscientific evidence is increasingly appearing in courtrooms. Thus, there is a need to improve understanding of neuroscience by judges who act as the gatekeepers for the admissibility of expert witness opinion testimony and scientific evidence.To date, most judicial neuroscience education programs have been (1) one-off, and (2) created by scientific and legal experts, but not by judges themselves. One-off judicial education programs are important in providing a basic introduction to pressing neuroscience and law issues. But it remains unclear if these programs, where speakers present information to judges with limited or no follow-up, will be effective in changing real world practice.

In this study we present an innovative approach to judicial neuroscience education: working intensively with a single jurisdiction (Massachusetts) on a focused set of issues over the course of multiple deep engagements over a year.

In 2023, the Flaschner Judicial Institute and Center for Law, Brain & Behavior (CLBB) at MGH collaborated to co-create a program for 20 state judges in Massachusetts. Judges came from a wide number of courts, including criminal, civil, juvenile, appellate and trial-court level. The Flaschner Judicial Institute assists both new and experienced Massachusetts judges throughout their judicial careers in their continuing education and professional development. CLBB's mission is to transform law and public policy with accurate and actionable neuroscience.

The primary goals of this pilot program were to: (1) co-create a model of judicial neuroscience education that is aligned with real-world judicial practice; (2) implement the pilot program, which involved 4 sessions (including 2 overnight retreats) over a 12-month period; and (3) complete an evaluation component. Topics included: trauma, memory, mental health, cannabis, the developing brain, and more.

We report here on several evaluative metrics, including: mixed methods assessment of knowledge gained from the program-by both judge participants and faculty members, qualitative assessment of changes in judicial practice, identification of potential methods of supporting judicial acquisition of knowledge and its application in fostering positive practice changes, and identification of additional gaps that future programs can address.

Notably, our pre- and post-surveys found that judges reported significantly higher comfort with utilizing neuroscience in their practice, and that judges anticipated many practical, real-world use of the knowledge they gained in the program.

Disclosures: C. McFarland: None. **K. Williams:** None. **I. Ramirez:** None. **E. Rodriguez:** None. **F.X. Shen:** None.

Theme J Poster

TJP08: Teaching of Neuroscience: College IV

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP08.18SU/Z32

Topic: J.03. Public Awareness of Neuroscience

Support: NIH SEPA R25 GM146300

Title: The Ambassador Program: a Framework for Engaging Community in Neuroscience and Trainees in Outreach

Authors: *M. A. COBURN[1], A. Y. FLORES[1], R. E. HOKENSON[1], D. I. JAVONILLO[2], A. MOREHOUSE[1], W. NING[3], L. TANIGUCHI[4], A. TU[5], K. I. TSOURMAS[6], M. SANDOVAL[7], M. O. YASSA[8];
[1]Univ. of California, Irvine, Irvine, CA; [2]UCI Inst. for Memory Impairments and Neurolog. Disorders, Univ. of California, Irvine, Irvine, CA; [3]Neurobio. and Behavior, Univ. of California, Irvine, Irvine, CA; [4]Anat. & Neurobio., Univ. of California, Irvine, Irvine, CA; [5]UC Irvine, Irvine, CA; [6]Univ. of California Irvine, Irvine, CA; [7]Anat. & Neurobio., UC Irvine, Irvine, CA; [8]Ctr. for the Neurobio. of Learning and Memory, Univ. of California, Irvine, Irvine, CA

Abstract: The Center for the Neurobiology of Learning and Memory (CNLM) at University of California (UCI) was the first research institution in the world dedicated exclusively to understanding the mechanisms of learning and memory in the brain when it was founded in 1983. The CNLM has had a long history of engaging the community in the ongoing research conducted in the center, starting in 1995, regular and free lectures have been held for the community through the Distinguished Lecture Series on Brain, Learning and Memory, started by James L. McGaugh, Founding Director of the CNLM. Today we uphold the tradition of educating and engaging the local community through thoughtful, multi-leveled, outcomes driven, education and outreach initiatives. These efforts are conducted and organized in large part by the Ambassador Program, founded by the CNLM's Director of Outreach and Education, Dr. Manuella Oliveira Yassa, which trains and engages neuroscientists of all levels including undergraduate and graduate students, postdoctoral scholars, research staff, and affiliated faculty. Key to the success of the program is committees which run and organize different facets of community outreach lead by deeply committed and passionate neuroscience graduate students, who serve as chairs. The committees include the K-12 Committee, co-chaired by Lara Taniguchi, Alina Tu, and Matt Sandoval; the Adult Outreach Committee, co-chaired by Kate Inman Tsourmas and Sarvia Aquino; the Communications Committee co-chaired by Abigail Flores, Dominic Javonillo, and Jazmine Moore; the Brain Bee Committee, co-chaired by Rachael Hokenson, Wing (Winny) Ning, and Allison Morehouse; and the Brain Explorer Academy Committee co-chaired by Morgan Coburn and Jorge Miguel Mendoza.The Ambassador Program not only serves the community, but also enriches the trainees that participate in a multitude of ways, including training in pedagogy and project management, providing opportunities to teach and communicate their science to all levels, broadening their connections in the field of neuroscience, nurturing community and outlets outside of the lab, experience in leadership, and much more. This poster will describe the events and activities the Ambassadors organize and run as well as the structure of the program itself, some highlights include on-site visits for 50+ high school students, working groups to create curriculum for adult outreach, NIH-SEPA funded research on outreach and education, and the Brain Bee!

Disclosures: M.A. Coburn: None. **A.Y. Flores:** None. **R.E. Hokenson:** None. **D.I. Javonillo:** None. **A. Morehouse:** None. **W. Ning:** None. **L. Taniguchi:** None. **A. Tu:** None. **K.I. Tsourmas:** None. **M. Sandoval:** None. **M.O. Yassa:** None.

Theme J Poster

TJP09: Ethical and Policy Issues in Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP09.01SU/Z33

Topic: J.04. Ethical and Policy Issues in Neuroscience

Support: NIH Grant 7R01MH134144-02

Title: Addressing ethical and legal challenges in utilization of race and ethnicity population descriptors in human neuroscience research

Authors: *F. SHEN[1], L. LANG[2], E. LITTLE[3], C. MCFARLAND[4], R. JAIN[3], B. TAWE[5], E. RODRIGUEZ[6], J. GEROLD[7], S. HUANG[8], J. JACKSON[9];
[1]Univ. of Minnesota, MGH & HMS, Minneapolis, MN; [2]Emory Univ., Atlanta, GA; [3]Harvard Col., Cambridge, MA; [4]Harvard Univ., Cambridge, MA; [5]Brown Univ., Providence, RI; [6]MGH, Boston, MA; [7]Massachusetts Gen. Hosp., Medford, MA, ; [8]Massachusetts Gen. Hosp., Charlestown, MA, ; [9]CRESCENT Advising, LLC, Belmont, MA

Abstract: The neuroscience research community has recognized the need for more racial and ethnic diversity in those who participate in human neuroscience studies (Dotson & Duarte 2020). But improving engagement and recruitment with underrepresented groups first requires (1) determining which population descriptors to use to define those groups, and (2) consistent operationalizing of those descriptors across research teams, funders, and publication outlets. With support from an NIH BRAIN Neuroethics grant, in this study we are developing new guidelines for the use of population descriptors in human neuroscience research. We use as our touchpoints the 2024 U.S. Office of Management and Budget (OMB) Revisions to Statistical Policy Directive No. 15: Standards for Maintaining, Collecting, and Presenting Federal Data on Race and Ethnicity, and the National Academy of Sciences Engineering and Medicine (NASEM) committee's 2023 report titled "Using Population Descriptors in Genetics and Genomics Research: A New Framework for an Evolving Field".
OMB's new policy fundamentally changes the way that federal agencies collect race and ethnicity data. This study is the first to explore the implications of these changes for neuroscience research.
The NASEM report raises foundational questions about defining, measuring, and using race variables in research. In particular, the NASEM recommendations encourage researchers to move away from using racial identity as a proxy or as a monolith for appropriate consideration of population diversity. Ours is the first study to explore how the NASEM study applies in the neuroscience research context.
Our study includes an examination of current reporting requirements and practices in leading neuroscience journals, and a scoping review of the literature on emerging debates concerning measurement and reporting of race and ethnicity in neuroscience research. The work to be presented lays a foundation for future exploration and development of Common Data Elements (CDEs) of sociodemographic identity.

Based on consultation with an expert working group and community stakeholders, we offer recommendations aimed at neuroscience researchers, funders, journal editors, and institutions that facilitate neuroscience research.

Disclosures: F. Shen: None. **L. Lang:** None. **E. Little:** None. **C. McFarland:** None. **R. Jain:** None. **B. Tawe:** None. **E. Rodriguez:** None. **J. Gerold:** None. **S. Huang:** None. **J. Jackson:** None.

Theme J Poster

TJP09: Ethical and Policy Issues in Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP09.02SU/Z34

Topic: J.04. Ethical and Policy Issues in Neuroscience

Title: Clinical trials in neurology registered 2007-2018 demonstrate room for improvement in reporting and representation of race and ethnicity

Authors: *M. RAKOCZY[1], C. J. MAGNANI[1], J. R. STEINBERG[2], A. FROLOV[3], B. T. WEEKS[1], A. HARMANGE[4], N. HUDA[5], L. M. SHAH[6], L. ZUROFF[7], B. J. GU[7], H. RASMUSSEN[8], J. G. EDWARDS[9], M. SHEN[3], M. REN[6], B. BRYANT[6], Q. MA[3], A. Y. FENG[10], A. C. LIANG[11], V. E. SANTINI[12], M. CULLEN[8], B. E. TURNER[13];
[1]Brigham and Women's Hosp., Boston, MA; [2]Northwestern Univ. Feinberg Sch. of Med., Chicago, IL; [3]Columbia Univ. Med. Ctr., New York City, NY; [4]Boston Univ., Boston, MA; [5]Univ. of California San Francisco Benioff Children's Hosp., San Francisco, CA; [6]Johns Hopkins Univ. Sch. of Med., Baltimore, MD; [7]Perelman Sch. of Med., Philadelphia, PA; [8]Stanford Univ. Sch. of Med., San Francisco, CA; [9]Boston Children's Hosp., Boston, MA; [10]NYU Langone Hlth., New York City, NY; [11]Adventist Hlth. Lodi Mem., Oakland, CA; [12]Yale Sch. of Med., New Haven, CT; [13]Dana-Farber Cancer Inst., Boston, MA

Abstract: Introduction: Clinical trials form the basis for advancing medical best practices, yet lack of diverse representation perpetuates healthcare disparities. We aimed to characterize trends in reporting and representation of race and ethnicity in neurology clinical trials.
Methods: In a cross-sectional study of United States (US) based trials (2007-2018) with results reported to the ClinicalTrials.gov registry, we assessed whether race/ethnicity data were reported and evaluated trial diversity by comparing race and ethnicity representation (proportion of enrolled participants reported as White, Black, Hispanic, Asian, or Native American) to 2010 US Census data. We studied the role of trial funding sponsor (Industry, US Government, Academic) and 19 neurologic disease foci: Malignancy, Neurovascular, Peripheral Nervous System/Spine, Movement, Trauma, Neurodegenerative, Pain, Headache, Malformation, Inflammation, Seizure, Sleep, Systemic Disorders, Muscle and Neuromuscular Junction, Infection, Cutaneous, Autonomic, Otology, Other.
Results: Of 16,953 neurologic trials, 37.5% (6,361) were US-based of which 2,514 (39.5%) reported results to the registry. 1,444 (57.4%) reported any race/ethnicity data involving 151,263

participants. Reporting was significantly associated with sponsor (p<0.001) and disease category (p<0.001). Racial and ethnic minorities (17.6%) were underrepresented relative to US Census data (27.6%) most notably with Hispanic (6.2% vs 15.4%) and Asian (0.8% vs 5.0%) patients. Trials regarding Autonomic, Otology, Systemic, and Movement Disorders were least diverse (all <10%) while Infection (56.1%), Neurovascular (33.4%), and Trauma (32.4%) were most diverse. Conclusions: We found that clinical trials in neurology inadequately report race/ethnicity data and when doing so are not representative of the US population, which perpetuates systemic healthcare inequalities. This presents an opportunity for the field to further investigate the barriers to trial enrollment and improve access in future efforts to reduce existing disparities.

Figure: Comparing Representation in Neurology Clinical Trials to US Census by Category

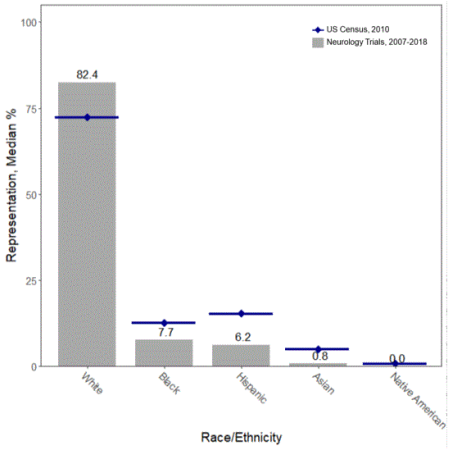


Table: Race Reporting and Representation in U.S. Neurology Clinical Trials 2007-2018

	Total Trials N N (%)	Reports Race N (%)	Representation[ab], Median % [IQR] White	Black	Hispanic	Asian
All	2514 (100.0)	1444 (57.4)***	82.4 [66.7, 92.7]***	7.7 [0.0,19.5]***	6.2 [0.0, 14.3]***	0.8 [0.0, 4.2]***
Sponsor						
Industry	931 (37.0)	514 (55.2)***	85.8 [74.4, 93.3]***	6.5 [1.2, 16.7]***	7.2 [1.9, 14.6]***	1.3 [0.0, 4.0]***
US Government	620 (24.7)	410 (66.1)***	73.8 [59.5, 88.1]***	11.2 [4.0, 25.7]***	6.4 [0.0, 14.7]***	1.1 [0.0, 4.8]***
Academic	963 (38.3)	520 (54.0)***	84.2 [64.8, 94.7]***	5.0 [0.0, 17.4]***	5.0 [0.0, 13.3]***	0.0 [0.0, 4.2]***
Disease Category						
Malignancy	353 (14.0)	226 (64.0)**	87.9 [75.0, 93.5]***	2.7 [0.0, 8.6]***	4.5 [0.0, 11.8]*	1.4 [0.0, 4.7]
Neurovascular	316 (12.5)	184 (58.2)	66.6 [50.0, 83.3]***	18.8 [8.7, 38.2]***	5.4 [0.0, 13.3]	1.6 [0.0, 6.5]*
Peripheral Nervous System/ Spine	247 (9.8)	138 (55.9)	85.4 [69.2, 94.8]	8.5 [1.5, 2.14]	5.0 [0.0, 14.8]	0.0 [0.0, 2.7]**
Movement	230 (9.1)	120 (52.2)	92.9 [88.9, 97.8]***	1.2 [0.0, 5.2]***	4.3 [0.0, 10.1]	0.2 [0.0, 4.6]
Trauma	230 (9.1)	122 (53.0)	67.6 [52.6, 87.8]***	14.7 [4.6, 26.1]***	12.0 [1.7, 21.1]***	1.6 [0.0, 5.5]
Neurodegenerative	220 (8.8)	138 (62.7)	88.2 [75.8, 95.7]***	6.1 [1.8, 16.9]	2.6 [0.0, 10.8]**	0.0 [0.0, 2.8]
Pain	182 (7.2)	91 (50.0)*	76.3 [62.2, 87.7]*	15.6 [7.0, 24.7]***	11.7 [1.8, 20.2]*	0.2 [0.0, 2.3]
Headache	164 (6.5)	91 (55.5)	78.7 [66.7, 83.5]**	13.4 [7.5, 20.3]**	12.5 [7.5, 17.9]***	1.7 [0.0, 3.3]*
Malformation	154 (6.1)	95 (61.7)	75.5 [64.3, 85.7]**	6.1 [0.0, 18.0]	8.1 [2.4, 13.5]	2.8 [0.0, 6.6]*
Inflammation	133 (5.3)	69 (51.9)	84.7 [75.8, 90.5]	11.5 [4.7, 20.0]*	4.2 [0.8, 10.0]	0.0 [0.0, 0.8]***
Seizure	117 (4.7)	68 (58.1)	80.4 [67.5, 92.2]	9.0 [0.0, 16.7]	9.6 [0.0, 18.1]	0.0 [0.0, 3.7]
Sleep	85 (3.4)	38 (44.7)*	75.2 [67.3, 92.0]	9.1 [4.2, 27.9]	9.0 [0.4, 14.9]	0.9 [0.0, 2.4]
Systemic Disorders	79 (3.1)	44 (55.7)	92.3 [72.2, 99.5]*	0.0 [0.0, 14.1]**	3.1 [0.0, 10.6]	0.0 [0.0, 2.5]
Muscle and Neuromuscular Junction	51 (2.0)	33 (64.7)	90.0 [84.1, 94.3]*	2.5 [0.0, 6.0]**	7.6 [0.0, 13.2]	1.7 [0.0, 5.4]
Infection	41 (1.6)	22 (53.7)	43.9 [29.8, 78.8]***	26.4 [7.5, 68.9]**	6.7 [3.1, 12.6]	0.8 [0.0, 3.6]
Cutaneous	32 (1.3)	22 (68.8)	80.0 [68.2, 91.3]	0.0 [0.0, 10.0]**	0.0 [0.0, 7.1]*	0.0 [0.0, 6.5]
Autonomic	29 (1.2)	17 (58.6)	100 [66.7, 100]*	1.1 [0.0, 13.2]	2.2 [0.0, 22.3]	0.0 [0.0, 9.3]
Otology	28 (1.1)	13 (46.4)	93.3 [78.6, 95.8]	0.0 [0.0, 4.2]**	0.6 [0.0, 7.9]	0.6 [0.0, 1.6]
Other	120 (4.8)	79 (65.8)	80.2 [54.3, 90.9]	9.7 [2.4, 26.5]	5.0 [1.3, 11.1]	0.0 [0.0, 2.8]

a. Race categories are treated as separate binary variables as they as not mutually exclusive
b. 2010 US Census: White 72.4%, Black 12.6%, Hispanic 15.4%, Asian 5.0 %, Native American 0.9%
c. Native American not shown given low enrollment with 0.0% median representation in every category.
d. * p < 0.05; ** p < 0.01; *** p < 0.001

Disclosures: M. Rakoczy: None. **C.J. Magnani:** None. **J.R. Steinberg:** None. **A. Frolov:** None. **B.T. Weeks:** None. **A. Harmange:** None. **N. Huda:** None. **L.M. Shah:** None. **L. Zuroff:** None. **B.J. Gu:** None. **H. Rasmussen:** None. **J.G. Edwards:** None. **M. Shen:** None. **M. Ren:** None. **B. Bryant:** None. **Q. Ma:** None. **A.Y. Feng:** None. **A.C. Liang:** None. **V.E. Santini:** None. **M. Cullen:** None. **B.E. Turner:** None.

Theme J Poster

TJP09: Ethical and Policy Issues in Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP09.03SU/Z35

Topic: J.04. Ethical and Policy Issues in Neuroscience

Support: NIH Grant U24MH130918-01
NIH Grant UM1MH130966-01
NIH Grant UM1MH130981-01
NIH Grant U01MH117023-01

Title: Fostering inclusive research environments in the NIH BICAN consortium

Authors: *J. GARCIA[1], K. ICHIHARA[2], S. MOHAMEDNUR[3], N. ROCKWEILER[4], A. SCHANTZ[5], T. E. BROWN[6], E. GARCIA PALLARES[7];
[1]Office of Diversity, Equity, Inclusion and Belonging (DEI&B), Allen Inst., Seattle, WA; [2]Broad Inst., Cambridge, MA; [3]Broad Inst. of MIT & Harvard, Cambridge, MA; [4]Broad Inst. of MIT & Harvard, Harvard Univ., Cambridge, MA; [5]Univ. of Washington, Seattle, WA; [6]Bioethics & Humanities, Univ. of Washington, Seattle, WA; [7]Massachusetts Gen. Hosp., Schenectady, NY

Abstract: Scientific innovation and excellence is best accomplished in an inclusive environment where a diversity of perspectives are valued and all team members feel a sense of belonging. Several groups, however, are far too often underrepresented and marginalized along the lines of gender, race, ethnicity, cultural background, and/or other identities. Recognizing the crucial need for representation and diversity within biomedical research, the NIH took a significant step forward by introducing a new component to grant applications: the Plan for Enhancing Diverse Perspectives (PEDP). Pioneered by the BRAIN Initiative in Spring 2021, the PEDP policy leverages the benefits of diverse perspectives to increase the scientific impact of research funded by the NIH. This policy reflects the BRAIN Initiative's firm commitment to fostering diversity, inclusivity, and accessibility in the research community.
In 2023, the BRAIN Initiative Cell Atlas Network (BICAN) consortium created a working group to coordinate PEDP efforts across the consortium, as well as provide guidance on diversity, equity, inclusion, and belonging (DEI&B) principles. These principles reflect our commitment to include and leverage diverse perspectives, as well as foster inclusive research environments that drive equitable development and distribution of scientific innovation and advancements. The PEDP working group supports collaborative activities that can only be accomplished through coordinated, synergistic efforts between consortium members. Highlights of our work together

include: hosting an annual career panel for high school and undergraduate students showcasing diverse career paths and speakers in neuroscience; writing BICAN DEI&B guidance; and developing an annual survey to assess the consortium's culture. Future activities and goals of the working group include: career panel for postdocs; coordinating summer activities for trainees; developing additional DEI&B guidance on best practices; and creating more opportunities for trainee visibility within the consortium.
We are committed to being leaders in advancing DEI&B in neuroscience research, and to improving science culture in general. We hope that through this coordinated work, we can recruit and retain a diverse scientific workforce, foster scientific innovation, and improve equitable access to and quality of research.

Disclosures: J. Garcia: None. **K. Ichihara:** None. **S. Mohamednur:** None. **N. Rockweiler:** None. **A. Schantz:** None. **T.E. Brown:** None. **E. Garcia Pallares:** None.

Theme J Poster

TJP09: Ethical and Policy Issues in Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP09.04SU/Z36

Topic: J.04. Ethical and Policy Issues in Neuroscience

Support: Dana Foundation grant to Loyola University Chicago

Title: On well-being as the neuropsychiatry end goal, and the case for brain manipulation on account of authenticity

Authors: *S. HOU, L. RAMIREZ, E. J. GLOVER;
Psychiatry, Univ. of Illinois, Chicago, Chicago, IL

Abstract: Who is sick? What is normal? The line demarcating normality from abnormality, health from disease, appears uniquely blurred in neuropsychiatry. The resulting high rates of both false positives and negatives in issuing diagnoses and care seem unusual, if not outright concerning, for a subdiscipline of empirical biomedicine. In part one, I aim to demonstrate that the subjective experience of inauthenticity, which arises from the misalignment between the undesirable yet intractable elements of one's psychophysiology and their authentic true self, manifests universally across diagnostic categories and thresholds. Serving as a common denominator for mental dis-eases, the torment of misalignment alone becomes both necessary and sufficient to warrant neuropsychiatric care. I conclude by proposing that an authenticity-based well-being should be the finish line of neuropsychiatry, instead of mere diagnostic thresholds themselves. Part two begins by challenging the distinction among treatment, enhancement, and recreation, which stems from the flawed binary conception of mental illness and wellness. I then proceed to make the neuroethical case for voluntary brain manipulation as a means to alleviate misalignment and foster authenticity, notwithstanding possible harms and stigma involved. Consequently, what naturally follows is the neuroethical imperative to develop

pharmaceuticals and biotechnologies for brain manipulation that are safe, effective, and accessible to both patients and non-patients alike, for use beyond mere therapeutics.

Disclosures: S. Hou: None. **L. Ramirez:** None. **E.J. Glover:** None.

Theme J Poster

TJP09: Ethical and Policy Issues in Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP09.05SU/Z37

Topic: J.04. Ethical and Policy Issues in Neuroscience

Title: Attaining brain health and mental wellbeing despite socioeconomic and political constraints

Authors: *J. RAJI KUBBA;
Alrafidain Civic Educ., Baghdad, Iraq

Abstract: Many societies are facing economic and security challenges. These livelihood matters are stressing people everywhere. It seems that the whole world needs help in their mental health and psychological wellbeing.As conflicts rage in the Middle East and North African region, there is a heavy toll on populations. Mental illness, mental crises and even suicide were unheard before. Over the past several years many young people in the Middle East and North Africa region (MENA) experienced the burden of poor mental health. One in six young people (22.5 million) are estimated to be living with a mental disorder.[1]Ironically, the current policy in many countries in the region is to diminish services delivered to the population. This means that health services have declined, less resources are available to families, and mental health services or even education are virtually non-existent. International aid organizations dictate to governments to frame policies restricting health and educational services that have been free of charge -or delivered with minimum cost to the end user- for over a century.[2]To circumvent these challenges, collaborations among willing partners and stakeholders and social leaders facilitated some knowledge delivery, staff training, and curricula changes that could be used as a pretext to provide mental health support not as a medical service but more integrated with the school curricula and educational and cultural programs[3].These activities enabled concerned parties and stakeholders to transcend restrictions due to government policy, geographical separation, and the COVID-19 pandemic. Knowledge to teachers and parents, and mental health awareness to children and families can be delivered and can help people who are experiencing incredible levels of stress and anxiety and their educators and caregivers.
Footnotes[1] UNICEF and Burnet Institute (2023) Young people's health and wellbeing in the Middle East and North Africa region. p 42.[2] Kubba, J. (2018) Iraq must now take the path of healing and recovery. *International Journal of Contemporary Iraqi Studies* 12-3 pp 269-287.[3] Raji Kubba, J. (2017) Developing a national program to promote cognitive and mental wellbeing in conflict afflicted Iraq. *Society for Neuroscience Annual Meeting*. Washington DC, USA.

Disclosures: J. Raji Kubba: None.

Theme J Poster

TJP09: Ethical and Policy Issues in Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP09.06SU/Z38

Topic: J.04. Ethical and Policy Issues in Neuroscience

Title: Applications of AI in Neuroscience - New Challenges from the Perspective of Neuroethics

Authors: S. VALIZADEH[1], ***M. RAZA**[2];
[1]Biomed. Engin., Shahid Beheshti Univ., Tehran, Iran, Islamic Republic of; [2]Baqiyatallah Univ. of Med. Sci., Tehran, Iran, Islamic Republic of

Abstract: Artificial Intelligence and its rapid use in various fields has rapidly opened new world with flooding of data leading to new applications as well as challenges. The knowledge of minute details of human brain structure and function in health and its alteration in disease, behavior and normal and abnormal genetics together with data gathered from modern technologies used for the diagnosis, treatment and prevention of various disorders is expanding exponentially. Considering ethical and legal aspects in the field of Neuroscience this situation poses additional challenges with the application of this vast and detailed knowledge. AI-based technologies such as ChatGPT, Google Bard, Microsoft Copilot, etc. and use of specialized technologies using the AI algorithms such as these Large Language Models (LLMs) raise new legal concerns for data privacy, individual rights, personal ethics, unlawful use of data and other aspects related to ethics of AI-based information technologies. By analyzing a massive amount of data—such as social media activity, online shopping and browsing history, etc., AI algorithms can create a detailed psychological and behavioral profile of anyone using smart phone, laptop and other gadgets. This profile can reveal vulnerabilities, fears, and desires, giving malicious individuals a roadmap to exploit weaknesses for their own gain and possibly leading to crimes. This enormous and in depth information can create problems related employment and workplace. We hereby present our argument as well as suggest possible solutions to new ethical and legal issues of AI-based technologies from the perspective of Neuroscience.

Disclosures: S. Valizadeh: None. **M. Raza:** None.

Theme J Poster

TJP09: Ethical and Policy Issues in Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP09.07SU/AA1

Topic: J.04. Ethical and Policy Issues in Neuroscience

Title: Neuroscience and the ethics of conceiving artificial intelligence (AI): Lessons and responsibilities

Authors: *E. OHAYON[1,2];
[1]Neurolinx Res. Inst., The Green Neurosci. Lab., La Jolla, CA; [2]The Inst. for Green and Open Sci. (igos.ca), Toronto, ON, Canada

Abstract: There is considerable interest in applying new AI models to neuroscience research including the capture and analysis of brain activity and imaging data. Ironically, such AI models draw heavily on a long history of neural network modeling going back decades. Here we review some of the history and ethical implications. Recognition of this history and comparisons is important in that it invites a reconsideration of neuroscientific successes, limitations and ethical responsibilities. In particular, the recent ability of current generative AI models to transcend modalities (text, image, video, etc.) demonstrates that these AI models are more than statistical text predictors. Although there are significant differences between silicon-based models and organic brains, the achievement of recent AI models suggests that network principles are more germane than the molecular features in understanding the brain, cognition and possibly even sentience. This recognition further indicates a need to reconsider efforts in neuroscience. Examples include the proclivities of both human-animal and artificial systems to hallucinate and discriminatory bias. As such, neuroscientists need to look beyond the excitement of new technologies and consider how their contributions may be unwittingly fueling harmful applications. These responsibilities extend to the ever-closing gap between silicon-based and complex organic networks such as brain organoids.

Disclosures: E. Ohayon: None.

Theme J Poster

TJP09: Ethical and Policy Issues in Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP09.08SU/AA2

Topic: J.04. Ethical and Policy Issues in Neuroscience

Title: Convergent Neuroscience and Anticipatory Governance: Artificial Intelligence, Synthetic Biology, and CRISPR

Authors: *M. NESTOR[1], R. WILSON[2];
[1]Autica Bio, Baltimore, MD; [2]Towson Univ., Towson, MD

Abstract: Exponential increases in computing power over the past 20 years have enabled a renaissance in the speed of adoption of artificial intelligence (AI)-enabled technologies. In parallel, the use of AI in neuroscience R&D has rapidly expanded with minimal regulatory oversight. This has enabled a permissive environment that allows for the convergence of AI with

two other highly disruptive technologies in the context of neuroscience research: clustered regularly interspaced short palindromic repeats (CRISPR) and synthetic biology (SB). The combination of these technologies can currently be observed in the context of gene drive research. The disruption that will be caused by this convergence of technologies has yet to be fully appreciated by both the scientific and lay communities. This puts neuroscientists in a unique ethical conundrum, balancing rapid innovation with the need for trust from the lay public. The application of AI to SB and CRISPR in humans opens the ability to supersede Mendelian restraints when used with gene drive technology. This potential supra-Mendelian AI-driven editing enabled by an increase in speed and computing power, when applied to research involving cognition or cognitive states, may suggest a redefinition of personhood. This is particularly acute when considering how SB, AI, and CRISPR are currently being used to study genes affecting cognitive states. Cognition is closely aligned with the lived experience of stakeholders, and that phenomenology is used to define personhood. Neuroscience research policy must track closely with AI policy and should be used as a framework within anticipatory ethics. It should enable anticipatory governance to set guardrails to guide the adoption of convergence. To build this framework, principles from the European Commission's Artificial Intelligence Act can be combined with a neuroscience-based phenomenological analysis. Centered on a definition of cognition developed by researchers in the neuroscience community, a regulatory framework for an ethical convergence can be built considering the most diverse set of future stakeholders. This framework provides a pathway for conducting convergent research in neuroscience and increasing the engagement of scientific and non-scientific stakeholders alike.

Disclosures: M. Nestor: None. **R. Wilson:** None.

Theme J Poster

TJP09: Ethical and Policy Issues in Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP09.09SU/AA3

Topic: J.04. Ethical and Policy Issues in Neuroscience

Title: Discourse, disability, and intentionality: the language of brain computer interfaces through technological development

Authors: *S. M. SCOTT;
Media Communication, Colorado State Univ., Fort Collins, CO

Abstract: Despite research efforts aimed towards further expanding the communicative and restorative potential of neuroadaptive devices, there are still challenges for widespread acknowledgement and adoption of these tools as important scientific health and meaningful social technologies. Some scholars argue that growing private interest can result in reframing the functionality and purpose of these tools in ways that deviate from their original intended use, thus shifting the intended original goal of building these systems for individuals who experience communication challenges and who rely on these tools for external and social interaction.

Research that integrates alternative approaches towards assessing developing technologies and their emergence within various social and scientific research contexts, enables exploration of complex topics through both, critical, as well as cultural considerations.This study examines intentionality in the development of neuroadaptive communication technologies, asking, how do individuals and organizations communicate the intentions and purpose of these technologies in public settings? Intentional communication is characterized by:(a) the determination to persist in communication efforts and (b) the expansion or elaboration ofcommunication methods in response to initial failures. What industry leaders say, about these tools communicates intentions, purposes, goals, rationales. These messages contribute to the public construction and understanding of these technologies for users, as well as among the broader population.Using a posthuman and postphenomenological approach to evaluate the ways in which we position both human and non-human actors within conceptions of technological production and decision-making regarding intended uses, beliefs, and understandings, this work analyses public messages about neuroadaptive technologies on social media and in the press along with a series of 20-30 interviews with developers and scientists. It aims to map their inception and growth, from initiative conceptualizations to contemporary commercialization, in order to identify how neural research and subsequent technological developments are shaped by value-laded laden processes in relation to dominant narratives in society. This study will help scholars and practitioners better understand the complex relationship between scientific research development and decision-making processes with the goal of learning, how social and scientific collectives can be engaged to more effectively examine the consequences that values may have within neuroscience endeavors and outcomes.

Disclosures: S.M. Scott: None.

Theme J Poster

TJP09: Ethical and Policy Issues in Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP09.10SU/AA4

Topic: J.04. Ethical and Policy Issues in Neuroscience

Title: Eeg-based bcis: what are the risks that should be addressed in non-invasive neurotechnology?

Authors: *J. MOONGA;
King's Col. London, London, United Kingdom

Abstract: Brain computer interfaces (BCIs) are revolutionary cutting-edge neurotechnology for neurostimulation, neuromodulation and neurofeedback. Electroencephalogram (EEG), transcranial-direct current stimulation (tDCS) and transcranial magnetic stimulation (TMS)-EEG are non-invasive BCIs, expanded from brain recording to wellbeing-monitoring and gaming. While EEG measures neural activity and evoked response, TMS−EEG measures cortical activity at high spatiotemporal resolution. However, research is lacking on neurodata integrity, accuracy

and risk association with non-invasive devices. Presently, artificial intelligence (AI), machine learning and algorithm create data-aggregation tools to decode and analyse highly sensitive information from neurotechnology. Yet, continuous expansion of neural devices brings new threats to device users- from personal safety, data privacy to social, ethical and legal concerns. Over the past decade, BCIs gained many stripes through the Brain Research Through Advancing Innovative Neurotechnologies (BRAIN). The goal is to foster and accelerate human neuroscience research advancement through novel tools and neural correlates. Furthermore, core values embedded in neuroethics principles raised important ethical questions that sparked global debates on various risks, security and policy gaps. Most recent EU regulations for medical devices and software suggest urgent need for better policy and governance of neurotechnology. Considering the dynamic expansion of BCIs, few studies exist on neurodata privacy, and their associated risks. We present a systematic review with comprehensive electronic search, adopted through a five-stages screening using PRISMA. EEG-based BCIs outputs are assessed for risks, accuracy and fidelity. In addition, policy and regulatory voids are outlined. The results show EEG-based BCIs often generate sensitive health data, with potential risks to identity, and vulnerabilities. Based on the findings drawn from this research, we conclude brain-derived data should be treated as highly sensitive health data. Yet, neurodata is noisy with various inaccuracies. Insufficient policy around BCIs poses privacy issues and cybersecurity risks, in addition to existing ethical and legal concerns. Evidently, neurotechnology offer many promising as innovative tools for various brain disorders and debilitating diseases. However, in response to the growing domain of neurotechnology regulatory frames are necessary to delineate specific measure for the risks associated with EEG-based BCIs. Policy and regulation are as important as the clinical effectiveness of neurotechnology.

Disclosures: J. Moonga: None.

Theme J Poster

TJP09: Ethical and Policy Issues in Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP09.11SU/AA5

Topic: J.04. Ethical and Policy Issues in Neuroscience

Support: the development of technologies for electroceuticals, funded by the Ministry of Healch&Welfare and Ministry of Science and ICT, Republic of Korea(grant number: HI22C019900, 2022M3E5E9082303)

Title: A case study on the medical technology evaluation of Bioelectronic Medicines: A Perspective on Clinical Usefulness and Effectiveness

Authors: *Y. KANG, W. CHOI, J. CHOI;
NECA, Seoul, Korea, Republic of

Abstract: Background Biobioelectronic medicine or electroceutical is an interventional technique that aims to obtain drug-like therapeutic effects on various diseases, including neurological diseases, by selectively using physical stimulation in the treatment area to influence biological functions or pathological processes. Recently, with the rapid development of neural interface technology, the research, development, and commercialization of bioelectronic medicine has become the focus of treatment for patients who are resistant to treatment or have difficulty receiving drug treatment. Although the scope of bioelectronic medicine-related R&D is expanding, it is pointed out that there is a lack of linkage between technical competitiveness and market performance. Therefore, through a case study of bioelectronic medicine, we aim to derive and analyze issues to be considered in medical technology evaluation and use them as effective evidence to reduce the gap between R&D and commercialization. **Methods** This study focused on eight bioelectronic medicine-related technologies developed in the Republic of Korea. We conducted quantitative analysis based on eight cases of R&D clinical trial protocol consultation and 14 cases of an in-person consultation. **Results** To summarize the analysis results, although they focus on stimulation sites or methods, it is necessary to clearly identify the mechanism of action that induces the treatment effect and standardize the treatment considering the patient's acceptability. In this process, a study design that can confirm symptom improvement and control bias is important, and various studies, including the available range of electrical stimulation (appropriate frequency, wavelength, etc.), must be conducted in advance. In addition, it is suggested that clinical usefulness will be further enhanced if a monitoring method considers patient compliance. **Discussion** Through this study, it is suggested that the future development of bioelectronic medicine should focus on issues of clinical usefulness and effectiveness that are derived to strengthen the treatment effect of bioelectronic medicine and complement its limitations. This suggests a direction for broadly applying electronic medicines beyond the current situation and can be used as evidence in the future commercialization stage of bioelectronic medicine. In addition, the need for continuous prior consultation during the R&D stage is raised.

Disclosures: Y. Kang: None. **W. Choi:** None. **J. Choi:** None.

Theme J Poster

TJP09: Ethical and Policy Issues in Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP09.12SU/AA6

Topic: J.04. Ethical and Policy Issues in Neuroscience

Support: Ministry of Health & Welfare(MoHW)/HI22C019900
Ministry of Science and ICT(MSIT)2022M3E5E9082303

Title: Korea HTA fast track and Analysis of interview results about Electroceuticals

Authors: *M. PARK[1], W. CHOI[2], C. SHIN[2], S. MIN[3];
[1]Devision of New Hlth. Technol. Assessment, Natl. Evidence based Collaborating Agency,

SEOUL, Korea, Republic of; [2]Natl. Evidence based Healthcare Collaborating Agency, SEOUL, Korea, Republic of; [3]Natl. Evidence based Healthcare Collaborating Agency, Seoul, Korea, Republic of

Abstract: Abstract: Background Aims to analyze the HTA(Health technology assessment) fast track of 'Electroceuticals', a scientific technology in the field of neuroscience, And to investigate the needs for entering the medical field and development trends through semi-structured interviews. In Korea, In order to quickly use ‘Innovative new health technologies’ are under process in the HTA fast track and pre-entry system. Methods A review of Korea's nHTA fast track system(pre-entry system), and Semi-structured interviews were conducted with Experts(n=18, experts participating in Industry:6, Goverment:6, Health Academia:6) who are developing(researching or review) or using Electroceuticals. Results Overall interview participatients are answered that based on Korea's infrastructure, the level of research in the electroceutical field is evaluated as not lagging behind the rest of the world. But social needs and values are high is a need for a policy to establish a developeing the safety and effectiveness of technology for the use of Electroceuticals. Industry participants answered that there were difficulties in developing evidence and thay also view the fast track already implemented by the government as positive. The Goverment and Health Academia experts are answered that clarification of standards for the interaction between nerves and organs and standardization of treatment should be established, and that neuro-ethical considerations from the perspective of neurology patients are also necessary. Conclusion electroceuticals are emerging technology that has been developed in various areas such as obesity, sleep, and burns in addition to vagus nerve stimulation. Not only ‘new health technologies’ lack clinical evidence for safety and effectiveness, support for evidence developement is needed. but also Korea's fast track(Pre-entry system) is used to promote health It has become possible to create evidence through fast track of new health technologies and accumulation of real world data within the public health insurance area, and Korea's HTA fast track is the policy that can be access into clinical practice.

Disclosures: M. Park: None. **W. Choi:** None. **C. Shin:** None. **S. Min:** None.

Theme J Poster

TJP09: Ethical and Policy Issues in Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP09.13SU/AA7

Topic: J.04. Ethical and Policy Issues in Neuroscience

Title: Prosthesis users' perspectives and concerns on neuroprostheses and research

Authors: *J. FAROOQUI[1], L. E. FISHER[2], T. BROWN[3];
[1]Carnegie Mellon Univ., PITTSBURGH, PA; [2]Physical Med. and Rehabil., Univ. of Pittsburgh, Pittsburgh, PA; [3]Univ. of Washington, Seattle, WA

Abstract: Much of neural engineering research aims to improve assistive technology for disabled populations. An ongoing study in our lab explores spinal cord stimulation (SCS)-evoked sensation to develop prosthetic devices capable of delivering sensory feedback to the missing limb for people with lower-limb amputation, aiming to improve the usability and functionality of prosthetic limbs. However, studies like ours, focused on evaluating novel neurotechnologies, often overlook marginalized populations. For example, although Black patients in the United States are four times more likely to receive amputations than White patients with the same disease indications, participants in our studies have been overwhelmingly White. Moreover, although rurality and low income are strong predictors of amputation, studies frequently do not collect data about these factors or how they influence research participation and neurotechnology adoption. This means that research priorities and findings are informed by homogenous samples that are not representative of the intended user base, potentially undermining the field's ability to develop devices that effectively serve the needs of marginalized users.
While prior work has explored research participation among marginalized groups, understanding the specific perspectives and needs of prosthetic users can better inform the ongoing work of developing effective neuroprostheses. In this study, five participants with amputations, from a diverse set of backgrounds, completed a short survey based on the Research Attitudes Questionnaire (RAQ) and participated in a semi-structured phenomenological interview to explore the priorities, concerns, and perspectives that influence their willingness to participate in neuroprosthesis research and utilize future neurotechnologies. The interviews were designed to assess: (1) participants' experiences and familiarity with prosthetic devices; (2) their perceptions of research, researchers, and medical technologies; and (3) their reactions to a trial technology of the SCS-based neuroprosthetic device. Our results suggest that major barriers to participation in neurotechnology research include invasiveness of the devices and access to research centers and/or information about research. Participants display a range of attitudes toward research and researchers, and these attitudes are strongly influenced by personal interactions and experiences. Findings from this study are now being synthesized to inform future research priorities and participant engagement practices in our lab to better serve the needs of underserved prosthetic users.

Disclosures: J. Farooqui: None. **L.E. Fisher:** None. **T. Brown:** None.

Theme J Poster

TJP09: Ethical and Policy Issues in Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP09.14SU/AA8

Topic: J.04. Ethical and Policy Issues in Neuroscience

Support: integrated Translational Health Research Institute of Virginia (iTHRIV). The iTHRIV Scholars Program is supported in part by the National Center for Advancing Translational Sciences of the NIH under Award Numbers UL1TR003015 and KL2TR003016.

Title: Evaluating Infant MRI Study Recruitment Efforts: A thematic analysis of Mother's feedback to improve study, recruitment, and retention strategies.

Authors: *O. CHINAKA[1], B. HOWELL[2];
[1]Translational Biology, Medicine, & Hlth., [2]Fralin Biomed. Res. Inst. at VTC, Virginia Tech., Roanoke, VA

Abstract: Pregnant and birthing individuals are not often the focus of recruitment for neuroscience studies. The purpose of the present investigation was to understand the perspective of mothers in an infant non-invasive brain imaging study to aid in improving recruitment efforts within this vulnerable population. A mixed method study approach was taken that utilized questionnaires and demographic interviews. Questionnaires were administered at various time points; prenatally (n=13), up to 3 months (n=19), 4 months (n=18), 12 months (n=21), and 24 months (n=6) postpartum. Questionnaires were completed by 43 out of 44 birthing people. A thematic analysis was conducted where survey responses were encoded using inductive coding in an iterative process to identify themes and subthemes. The analysis provided four main domain themes: recruitment, the study, personal, and other. Each theme provided additional information on the perspective of the mother as it relates to these domains. Results indicate that in the recruitment domain, mothers suggested various improvements such as engaging community organizations and utilizing peer-to-peer referral. In the study domain, mothers provided their perceptions of study expectations and research team support. The other domain allowed mothers to discuss others' perceptions of them participating in the research study, and the effects of these perceptions. Lastly, mothers reflected on personal participation and voiced barriers that could arise with participation and perceived benefits of the study while primarily emphasizing how stress impacted the experience. Overall, these results suggest that continual feedback surveys and analysis throughout a neuroscience study can help with recruitment and retention by implementing suggestions from parents during the study instead of after. Without analysis of the feedback data from participants, neuroscience projects will continue to ineffectively recruit and retain participants. There is need for more research to aid neuroscientists in understanding how to recruit vulnerable populations, and also systems to implement resulting recruitment and retention strategies.

Disclosures: O. Chinaka: None. **B. Howell:** None.

Theme J Poster

TJP09: Ethical and Policy Issues in Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP09.15SU/AA9

Topic: J.04. Ethical and Policy Issues in Neuroscience

Title: Navigating the intersection of science and society: Real-world ethical reflections on human cerebral organoids

Authors: *A. MOVAHED[1], F. MOVAHED[1], J. S. ROBERT[2];
[2]Sch. of Life Sci., [1]Arizona State Univ., Tempe, AZ

Abstract: The development of human pluripotent stem cell-derived cerebral organoids (hCOs) has provided unprecedented opportunities for studying neurological disorders and cancers. These organoids, with their resemblance to the human brain in terms of cell type diversity, structural organization, and functional connectivity, offer a promising platform for modeling complex brain diseases. The utilization of brain organoids in neuroscience research represents a helpful approach to understanding and potentially treating neurodegenerative diseases such as Alzheimer's and Parkinson's. These three-dimensional in vitro structures from adult stem cells, which mirrored the anatomy and molecular behavior of their original organs, enabled more accurate study of disease progression and drug responsiveness. Thus, the use of hCOs in neuroscience offer models that closely resemble human brain development and pathology. However, hCOs raise additional ethical questions regarding the potential for the moral status of these entities, including concerns about the potential consciousness of organoids, the use of human genetic material, and implications for patient consent. Often, discussions on ethics are more focused on hypothetical scenarios than on actual facts. In this presentation, we address real-world ethical and scientific dimensions of hCO research on neurodegenerative disease.

Disclosures: A. Movahed: None. **F. Movahed:** None. **J.S. Robert:** None.

Theme J Poster

TJP09: Ethical and Policy Issues in Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP09.16SU/AA10

Topic: J.04. Ethical and Policy Issues in Neuroscience

Title: Human cerebral organoids in neurodegenerative disease: Promise, prospects, problems

Authors: *J. S. ROBERT, O. POOLE, A. MOVAHED;
Sch. of Life Sci., Arizona State Univ., Tempe, AZ

Abstract: Human cerebral organoids (hCOs) are three-dimensional cell-culture based simulacra of the human brain, derived from human induced pluripotent stem cells. While initially useful for studying early brain development, there are now at least four promising types of applications of hCOs in neurodegenerative disease research. In reviewing the ethical and scientific prospects for hCOs in this domain, we base our analysis in the mundanity of scientific practice, avoiding esoteric sensationalism about these models. 1. They may be useful as models of neurodegeneration and neurodegenerative disorders such as Parkinson Disease (PD) and Alzheimer's Disease (AD). *To what extent do hCOs faithfully replicate these processes and disorders as compared with native tissues?* 2. As potential therapeutics for transplantation. *How could hCOs help solve outstanding challenges with cell-based transplants?* 3. As assay systems for potential therapeutics. *Do hCOs improve upon other novel approaches, such as clinical-*

trials-on-a-chip? 4. As models of human brain evolution, especially regarding the apparent uniqueness of PD and AD amongst humans. *Could hCOs shed light on these key issues while moving us beyond ethical concerns in research with non-human primates?* In this presentation, we outline these applications and the various methodological and ethical problems they pose - and help to resolve.

Disclosures: J.S. Robert: None. **O. Poole:** None. **A. Movahed:** None.

Theme J Poster

TJP09: Ethical and Policy Issues in Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP09.17SU/AA11

Topic: J.04. Ethical and Policy Issues in Neuroscience

Title: Neuroprotective Effects of Turmeric Extract Against Rotenone-Induced Neurodegeneration: Histopathological and Functional Insights

Authors: K. SIMONYAN[1], L. DARBINYAN[2], ***V. SARKISIAN**[3], L. MANUKYAN[2], N. SARGSYAN[2], L. HAMBARDZUMYAN[2];
[1]Neuroendocrine Relationships, Orbeli Inst. of Physiol. NAS RA, Yerevan, Armenia; [2]Sensorimotor Integration, Orbeli Inst. of Physiol., Yerevan, Armenia; [3]Orbeli Inst. Physiol, Yerevan, Armenia

Abstract: Curcuma longa, commonly known as turmeric, has been esteemed for centuries for its medicinal properties, particularly its potent antioxidant effects. In this study, we investigated the neuroprotective potential of turmeric extract against rotenone-induced Parkinson's disease (PD) in rats. Rats were orally administered turmeric extract at a dose of 1100 mg/kg body weight for 21 days following exposure to rotenone (2.5 mg/kg). Histopathological examinations revealed a notable preservation of neuronal integrity in the turmeric extract-treated group compared to the rotenone-exposed group. This was evidenced by reduced neuronal degeneration and lessened inflammatory responses in brain tissue sections. In vivo electrophysiological recordings further supported these findings, demonstrating sustained neuronal activity in the turmeric extract-treated rats, indicative of a protective effect against rotenone-induced neurotoxicity. Functional assessments using the cylinder test showed improved motor performance in the turmeric extract-treated rats, highlighting potential benefits in mitigating motor deficits associated with PD. Additionally, biochemical analysis revealed decreased oxidative stress markers and enhanced antioxidant enzyme activity in the turmeric extract-treated group, indicating a potential mechanism underlying its neuroprotective effects. These findings collectively suggest that turmeric extract possesses robust neuroprotective properties against rotenone-induced PD pathology. Further exploration of the molecular mechanisms involved and long-term studies are warranted to elucidate its full therapeutic potential. **Keywords:** Parkinson’s disease, Curcuma longa, hippocampus, rotenone, cylinder test

Disclosures: K. Simonyan: None. **L. Darbinyan:** None. **V. Sarkisian:** None. **L. Manukyan:** None. **N. Sargsyan:** None. **L. Hambardzumyan:** None.

Theme J Poster

TJP09: Ethical and Policy Issues in Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP09.18SU/AA12

Topic: J.04. Ethical and Policy Issues in Neuroscience

Title: The rise and fall of Relyvrio: Lessons learned about how a promising drug for ALS failed

Authors: *O. POOLE, J. S. ROBERT;
Sch. of Life Sci., Arizona State Univ., Tempe, AZ

Abstract: The approval, release, and subsequent retraction of Relyvrio, produced by Amylyx Pharmaceuticals, highlights several critical issues within the neurodegenerative disease treatment research and development enterprise. A drug for Amyotrophic Lateral Sclerosis (ALS), Relyvrio was initially granted accelerated approval by the FDA in 2022 after a small Phase II study. Earlier this year, the drug failed to meet its primary endpoints in a Phase III study. Despite promising early results and high hopes amongst patients, advocacy groups, and clinicians, and despite $380 million in sales last year, the Phase III study revealed Relyvrio's failure to improve function, communication, and independence in ALS patients. Amylyx has since pulled Relyvrio off the market, and is currently attempting to reposition the active ingredients in Relyvrio - sodium phenylbutyrate and taurursodiol - as a treatment for other, much rarer neurodegenerative diseases: Wolfram Syndrome and Supranuclear Palsy. We explore the nature and ramifications of federal regulatory leniency in drug approval along with the notion of repurposing drugs ineffective for a primary indication as potentially useful for other neurodegenerative diseases as a means of failing to acknowledge that a promising hypothesis could be wrong while at the same time acting to retain profitability.

Disclosures: O. Poole: None. **J.S. Robert:** None.

Theme J Poster

TJP09: Ethical and Policy Issues in Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP09.19SU/AA13

Topic: J.04. Ethical and Policy Issues in Neuroscience

Support: Dana Foundation

Title: Hormonal Behavior and Embodied Brains: Neuroendocrinology and Behavioral Neuroethics

Authors: E. RODRIGUEZ[1], R. NADLER[2], A. SHARAFKHODJAEVA[3], C. ANDERSON[4], *A. P. STEINER[5];
[1]Massachusetts Gen. Hosp., Boston, MA; [2]Univ. of British Columbia, Vancouver, BC, Canada; [3]Minnesota State Univ., Mankanto, MN; [4]Minnesota State Univ., North Mankato, MN; [5]Psychology and Cognitive Sci., Minnesota State Univ., Mankato, MN

Abstract: The last few decades have seen the rapid proliferation of discourse about the ethical implications of neuroscientific advancements in academic, clinical, and technological contexts. This growing field of discourse, aptly named 'Neuroethics,' has become a critical stage upon which ethicists, scientists, and practitioners discuss medical frameworks and interventions on human behavior and cognition. This stage has only grown in importance with the exponential increase of novel therapeutics, hormonal therapies, neurotechnologies such as Brain-Computer Interfaces and Deep Brain Stimulation devices, and contemporary paradigm shifts in mental health and neurodiversity.

The significant socioeconomic and cultural impacts on human psychology have rightly complicated academic conversations about the brain's involvement in human behavior. However, conversations *within* persons still assume that brain structure and activity are the sole intervention points, driving the conceptualizations about medical influences on human behavior. This neurocentrism occurs despite the brain's inextricable situation within the context of various humoral and organ-based physiological systems.

In this presentation, we seek to elaborate upon medical interventions on human hormonal equilibria, linking the existing discussions on neuroenhancement and psychiatric treatment. We specifically advocate for access to hormone replacement therapy (HRT) for transgender individuals through the lens of neuroenhancement and psychotherapeutic treatment. We will elaborate on the psychological and ethical impacts of endocrine influences on human behavior, the intersection of neuroscience and neuroendocrinology, and how these should contribute to neuroethical discourse as mediators of human behavior and personal choice for medical treatments.

We hope for this to be a stepping-off point for the further development of a neuroendocrinological and wholistic persona perspective on neuroethics, one which would initiate bioethical conversations between neuroscientists, endocrinologists, and practitioners, beneficially complementing our notion of the body, brain, and behavior. We should consider neurological, psychological, and endocrinological conditions and interventions when discussing human behavior, especially in clinical and biotechnological settings.

Disclosures: E. Rodriguez: None. **R. Nadler:** None. **A. Sharafkhodjaeva:** None. **C. Anderson:** None. **A.P. Steiner:** None.

Theme J Poster

TJP09: Ethical and Policy Issues in Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP09.20SU/AA14

Topic: J.04. Ethical and Policy Issues in Neuroscience

Support: We thank the Zuckerman Institute for financial support to ZIGI activities and the research presented here.

Title: Expecting Better in Neuroscience: Understanding Reproductive Hazards in Neuroscience Laboratories

Authors: *E. M. PARKER[1], A. ZAVITSANOU[2], C. LIFF[3], D. JEURISSEN[4], N. MIMOUNI[4], E. ROGERS[1], I. SUCCI[5], C. ENVIRONMENTAL HEALTH & SAFETY[1], C. U. ZUCKERMAN INSTITUTE GENDER INCLUSION GROUP[1];
[1]Zuckerman Inst. for Mind, Brain and Behavior, [3]Zuckerman Inst., [4]Neurosci., [2]Columbia Univ., New York, NY; [5]Biol. Sci., Zuckerman Inst. at Columbia Univ., New York, NY

Abstract: Neuroscientists undergo rigorous training to navigate laboratory hazards. However, there is no training to navigate the specific risks related to fertility, pregnancy, and breastfeeding. Pregnancy and parenting advice is ubiquitous for risks outside the laboratory but there is a notable absence of consolidated resources for reproductive risks within laboratory settings. This lack poses a significant hurdle for individuals considering extending their family. To address this gap, we aimed to develop a tool that is easy to use, which is particularly important for trainees and employees who are choosing to not yet disclose information about a future or current pregnancy. We collaborated with Environmental Health & Safety (EH&S) at Columbia University to comprehensively identify hazards at the Zuckerman Institute for Mind, Brain and Behavior. Combining manual searches of peer-reviewed literature with programmatic queries from PubChem and government databases, we compiled detailed information on hazard characteristics: adverse effects, exposure, timing, and safety measures. The outcome of our collaboration is a publicly accessible resource specifically tailored for aspiring parents in neuroscience, including individuals of all genders planning to have a baby, pregnant women, breastfeeding mothers, and those undergoing fertility treatments. Our findings reveal the presence of chemical, biological, and radiological hazards in neuroscience laboratories, with chemical hazards posing the predominant risk. For each hazard, we provide comprehensive details as well as synonyms and infographics to increase ease of use. Furthermore, our user-friendly search tool is categorized by reproductive stage and will soon be publicly accessible on our website. This tool will help individuals identify which hazards pose the greatest risk and those that pose no known reproductive risk. By making resources like these readily available, we support the retention of prospective parents in neuroscience and foster diversity within STEM fields.

Disclosures: E.M. Parker: None. **A. Zavitsanou:** None. **C. Liff:** None. **D. Jeurissen:** None. **N. Mimouni:** None. **E. Rogers:** None. **I. Succi:** None. **C. Environmental Health & Safety:** None. **C.U. Zuckerman Institute Gender Inclusion group:** None.

Theme J Poster

TJP09: Ethical and Policy Issues in Neuroscience

Location: MCP Hall A

Time: Sunday, October 6, 2024, 8:00 AM - 12:00 PM

Program #/Poster #: TJP09.21SU/AA15

Topic: J.03. Public Awareness of Neuroscience

Support: NIH Grant F32MH133274
Research!America - Civic Engagement Microgrant
National Science Policy Network (NSPN) - Microgrant Award
Michigan Chapter Society for Neuroscience Outreach Award
Union of Concerned Scientists - Science for Public Good Fund

Title: From Research to Action: The Importance of Science Policy and Advocacy in Environmental Neuroscience

Authors: *C. G. ZUNDEL[1], B. FRIDAY[2], E. FIDLER[2], S. DESAI[3], V. KELLEY[3], M. MCFARLANE[3], N. SNIDER[3], C. JOHNSON[3], V. FASAKIN[3], E. SAKO[3], L. GOWATCH[4], M. SHAMPINE[4], T. HASTERT[5], L. PILE[2], R. CHAPMAN[6], C. LEACH[7], T. M. FISCHER[8], H. MARUSAK[4];
[1]Psychiatry & Behavioral Neurosciences, Wayne State Univ., Detroit, MI; [2]Biol. Sci., Wayne State Univ., Detroit, MI; [3]Wayne State Univ., Detroit, MI; [4]Psychiatry and Behavioral Neurosciences, Wayne State Univ., Detroit, MI; [5]Oncology, Wayne State Univ., Detroit, MI; [6]Inst. of Envrn. Hlth. Sci., Wayne State Univ., Detroit, MI; [7]Inst. of Gerontology, Wayne State Univ., Detroit, MI; [8]Psychology, Wayne State Univ., Detroit, MI

Abstract: Environmental neuroscience is an interdisciplinary fieldthat investigates how various environmental factors, such as air pollution,climate change, and urbanization, impact brain and behavior. As this fieldcontinues to grow, it is crucial to incorporate science policy, advocacy, andcommunity outreach as foundational elements to ensure the effective translationof scientific findings into societal benefits. Science policy and advocacy play pivotal roles in guidingresearch priorities, funding allocations, and regulatory frameworks.Environmental neuroscientists can incorporate these elements into their careersby partnering with science policy-based organizations. For example, SciencePolicy Network-Detroit (SciPol-Detroit) is a student-led group at Wayne StateUniversity that advocates for science and evidence-based policies, aiming tobridge the gap between scientists, lawmakers, and the public. Its members spanall career stages including undergraduates, graduate students, postdoctoralfellows, and professors. This organization has conducted action groups toincrease public awareness of salient environmental toxicants and has ledadvocacy days on Capitol Hill to promote science-backed policies. An overviewof these science policy and advocacy activities, their formats, and impactswill be presented. Community outreach is another essential pillar toincorporate into environmental neuroscience, as it translates scientificfindings into public awareness and action and inspires future generations ofneuroscientists. The THINK lab, a developmental neuroscience lab based inDetroit, MI, has integrated community outreach as a core component. Eventsinclude “brain

days” at local elementary, middle, and high schools, showcasinghuman brain specimens, conducting demonstrations with air pollution monitors,and presenting research findings in age-appropriate language. The THINK lab hasalso attended several career fairs discussing the day-to-day life of aneuroscientist and the importance of neuroscience research. An overview ofthese community outreach activities, their formats, and impacts will bepresented. Theintegration of science policy, advocacy, and community outreach intoenvironmental neuroscience is crucial for addressing the multifacetedchallenges posed by environmental factors on brain health. By advocating forscience-based policies and engaging with the public, environmentalneuroscientists can enhance the impact of their research. These efforts willnot only advance the scientific knowledge and grow the field but alsocontribute to the development of a healthier environment and community.

Disclosures: C.G. Zundel: None. **B. Friday:** None. **E. Fidler:** None. **S. Desai:** None. **V. Kelley:** None. **M. McFarlane:** None. **N. Snider:** None. **C. Johnson:** None. **V. Fasakin:** None. **E. Sako:** None. **L. Gowatch:** None. **M. Shampine:** None. **T. Hastert:** None. **L. Pile:** None. **R. Chapman:** None. **C. Leach:** None. **T.M. Fischer:** None. **H. Marusak:** None.