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Theme K Poster

TKP01: Historical Perspectives on Neuroscience Concepts, Models, and Clinical Translation

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP01.01SA/LL28

Topic: K.01. History of Neuroscience

Support: NSF Grant 2440400

Title: When the Brain Went Mainstream: Neuroscience's Transformative Decade

Authors: *L. YETNIKOFF[1], D. P. MCCLOSKEY[2];
[1]City Univ. of New York, Brooklyn College, CUNY Neurosci. Collaborative, Brooklyn, NY;
[2]Dept of Psychology and Program in Developmental Neurosci., Col. of Staten Island, City Univ. of New York, Staten Island, NY

Abstract: The 1960s was a ground-breaking era for the study of the brain. This decade began with the coining of the term ‘neuroscience’ by the biophysicist Francis Schmitt, it saw the first neuroscience/neurobiology departments appear in universities across the US, and it culminated with the formation of the Society for Neuroscience in 1969. These developments represented a coming of age for a new interdisciplinary field which captured public imagination. This period was marked by key technological and innovational advances, such as the widespread emergence of electroencephalography (EEG), the development of the Falck-Hillarp method to visualize monaminergic neurons, and single-cell recording and electrophoretic injections to visualize neuron morphology. These innovations, in turn, led to advances in the understanding of epilepsy and sleep, the discovery of dopamine as a neurotransmitter, the dopamine-basis of Parkinson’s disease, and the first report of long-term potentiation, which were all reported to the public in the lay media. This poster will summarize major advances in the field of neuroscience during the decade of the 1960s with a focus on how those advances were conveyed to the public.

Disclosures: L. Yetnikoff: None. **D.P. McCloskey:** None.

Theme K Poster

TKP01: Historical Perspectives on Neuroscience Concepts, Models, and Clinical Translation

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP01.02SA/LL29

Topic: K.01. History of Neuroscience

Title: From Clarke to Cajal, Bruce, Rexed, and Grant: historical foundations of spinal cord anatomy

Authors: *G. SENGUL[1], I. DEMIRCUBUK[2], E. CANDAR[3];
[1]Ege Univ, Sch. Med., Izmir, Turkey; [3]Neurosci., [2]Ege Univ., Izmir, Turkey

Abstract: The history of spinal cord anatomy illustrates the transformation of neuroanatomy from gross description to cellular, tract-based, functional, and molecular interpretation. Early studies established the spinal cord as a segmented continuation of the central nervous system, linked to spinal nerves and dorsal and ventral roots. The Bell-Magendie distinction between sensory dorsal roots and motor ventral roots provided a fundamental framework for spinal cord function. In the nineteenth century, Luigi Rolando's description of the substantia gelatinosa, Benedikt Stilling's sectional studies, and Jacob Augustus Lockhart Clarke's identification of the nucleus dorsalis, later known as Clarke's column, helped define the organization of spinal gray matter. The mapping of spinal pathways was advanced by Karl Friedrich Burdach, Friedrich Goll, Heinrich Lissauer, Paul Flechsig, William Richard Gowers, Joseph Jules Dejerine, Augusta Dejerine-Klumpke, and Charles-Edouard Brown-Sequard. Alexander Bruce's topographical atlas of the human spinal cord provided an early segmental reference for human spinal cord anatomy. These anatomical and clinico-pathological studies contributed to the definition of posterior column systems, the dorsal root entry zone, spinocerebellar and anterolateral pathways, and functional localization within the spinal cord. At the turn of the twentieth century, Santiago Ramon y Cajal transformed spinal cord anatomy through the neuron doctrine and detailed descriptions of neurons, axonal projections, dendritic organization, and local circuits. Later work linked spinal cord structure more directly to function. Bror Rexed's laminar classification provided a cytoarchitectonic framework that remains central to modern neuroscience, while Gunnar Grant and colleagues refined knowledge of primary afferent projections, dorsal horn circuitry, and sensory pathways. Broader cytoarchitectonic and systems-level concepts were also shaped by Alfons Maria Jakob, Constantin von Economo, Janos Szentagothai, and Sir John Eccles, who contributed to the understanding of interneuronal organization, reflex circuitry, and synaptic function. Patrick Wall and Ronald Melzack later integrated dorsal horn anatomy with pain mechanisms through the gate control theory. This overview highlights the major scientists and conceptual milestones that shaped spinal cord anatomy, from classical landmarks to contemporary studies of connectivity, neurochemistry, imaging, gene expression, spinal cord injury, and neuromodulation.

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

Theme K Poster

TKP01: Historical Perspectives on Neuroscience Concepts, Models, and Clinical Translation

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP01.03SA/LL30

Topic: K.01. History of Neuroscience

Support: NIH Grant from NLM (submitted).

Title: The Classical Contributions of Galen of Pergamon and Antonio Scarpa of Pavia to Inner Ear Neuroanatomy

Authors: *A. LYSAKOWSKI;
Anat. and Cell Biol., Univ. of Illinois at Chicago, Chicago, IL

Abstract: This study will present some translations and illustrations of excerpts of the works of Galen and untranslated works of Scarpa on the neuroanatomy of the inner ear. Both were pioneers in the neuroanatomy of the vestibular and cochlear portions of the inner ear. Aristotle believed that the inner ear was filled with air, so-called "aer implantus" and Galen also supported this idea. In his book "*De Usu Partium*" (170 CE), Galen, considered the "father of anatomy", made some fundamental anatomical descriptions of the external ear, but his dissections were based on primates, not humans, since human dissections were prohibited by Roman law. Galen's anatomical descriptions were later challenged by human cadaver dissections done in Padua by the surgeon/anatomist Andreas Vesalius, the "father of modern human anatomy", in his classic work "*De humani corporis fabrica* (*On the Fabric of the Human Body*)" (1543). It was not until the discovery of perilymph, a serous fluid in the labyrinth, in 1761 by Domenico Cotugno, in his thesis "*De aquaeductibus auris humane internae anatomica dissertatio*", who was the first to associate this fluid with sound transmission, that the cochlea was associated with sound perception. Antonio Scarpa's two classic works on inner ear anatomy, written in Latin, "*De structura fenestrae rotundae auris et de tympano secundario, anatomicae observationes*" (1772) and "*Anatomicae Disquisitiones de Auditu et Olfactu*" (1789), were the first to provide details on human inner ear anatomy. While Scarpa described the detailed anatomy of the inner ear, including both the cochlear and vestibular portions, and the eponymous Scarpa's (vestibular) ganglion, he failed to appreciate the gravity- and head motion-sensing function of the vestibular portion of the inner ear, instead attributing an auditory function to the semicircular canals and otolith organs. Later French physiologists worked out the function of the vestibular portion through experimentation.

Disclosures: A. Lysakowski: None.

Theme K Poster

TKP01: Historical Perspectives on Neuroscience Concepts, Models, and Clinical Translation

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP01.04SA/LL31

Topic: K.01. History of Neuroscience

Support: NIH/NEI grant EY30155

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

Authors: *C. W. TYLER;
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. 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 circular color space that has been widely adopted in recent years. 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, although MacAdam (1938) showed that this space was highly non-uniform perceptually, so it 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 generally 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 latest trichromatic mapping of the CIE, the LMS color space, has remained unclear, however, and cannot be satisfactorily resolved. For example, the typical color circle mapping lies well inside the spectrum locus, and cannot map the full color gamut. A re-evaluation of the analytic validity of this tetrahedral color space now provides an appropriate psycho-physical and neuro-physical basis to relate the geometry of color representation to the primary cone activation signals that define the concept of color.

Disclosures: C.W. Tyler: None.

Theme K Poster

TKP01: Historical Perspectives on Neuroscience Concepts, Models, and Clinical Translation

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP01.05SA/LL32

Topic: K.01. History of Neuroscience

Title: Pavlov and Beyond: A Historical Perspective on the Redefinition of the Conditioned Reflex.

Authors: *D. BEREZHNOI;
Dept. of Psychiatry, Univ. of Michigan, Ann Arbor, MI

Abstract: Conditioned reflex (CR) remains one of the fundamental terms in modern neuroscience, but its definition has changed significantly. The concept was introduced by I. Pavlov in his 1903 Madrid address as a "psychic salivary reaction," in which he emphasized the mechanistic determinism of a simple automatic reaction, linking new external stimulus to an innate visceral response. This model paid direct homage to Sechenov's 1863 "Reflexes of the Brain". However, even within his own school, the concept soon evolved. In Pavlov's 1927 lectures the definition shifted toward a more general framework. Yet, in his later polemics with Wolfgang Köhler over complex problem-solving in primates, Pavlov still emphasized the boundaries of the CR—demarcating what it is from what it is not. At the same time, the broader discipline of the Physiology of Higher Nervous Activity, established in the USSR as Pavlov's legacy, eroded the boundaries of the initial term in its attempts to prove its universal applicability across all domains of animal and human behavior. Consequently, by the 1950s, the CR had transformed into a fluid descriptor for vastly distinct phenomena—ranging from Bykov's "interoceptive conditioning" to Asratyan's "causal conditioning," Anokhin's "functional systems" and Beritashvili's "free behavior". This **semantic expansion** was further complicated by the highly politicized 1950 "Pavlovian Session" of the Soviet Academies, which abstracted the CR into a general biological principle, thereby obscuring its behavioral limits and possible mechanisms. At the same time, the conditioned reflex made its way across the ocean and was adopted by the American behaviorists, where it underwent a distinct **conceptual drift**. It shifted from Pavlovian conditioned secretion reflexes toward motor reflexes—increasingly viewed as a whole-body response—in line with a research field dominated by operant conditioning. In this form, it was inherited by modern neuroscience. Notably, the majority of original Soviet works on CRs were not translated into English, and the term was largely reshaped within American psychology through a process akin to a conceptual game of "telephone." Beyond the psychological reframing of the initial concept, this transformation also thinned the distinction between "conditioning" and "learning". The lack of a unified American scientific school further contributed to this **definitional variance**, with the CR sometimes being described in mutually exclusive terms and contexts by different groups, creating confusion. This talk will historically analyze the transformations of the initial concept, tracing how it mutated into a broad semantic umbrella term.

Disclosures: D. Berezhnoi: None.

Theme K Poster

TKP01: Historical Perspectives on Neuroscience Concepts, Models, and Clinical Translation

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP01.06SA/Web Only

Topic: K.01. History of Neuroscience

Title: Lange's theory of emotion as a pioneer work in affective neuroscience (1): Lange's perspective as evident from the first part of "The emotions"

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

Abstract: In the latter half of the 19th century, two prominent figures historically known for their peripheral theories of emotion emerged: William James and Carl Lange. In their respective papers, they described how peripheral organs are deeply involved in the mechanism by which emotions arise, and their theories are collectively referred to as the James-Lange theory, named after the two of them. While James's theory is well known—and his famous statement that "the bodily changes follow directly the perception of the exciting fact, and that our feeling of the same changes as they occur is the emotion" is widely cited—Lange's theory, at least in America and in Japan where I live, seems to be less familiar. Therefore, based on Lange's paper "The emotions: A psychophysiological study," I would like to clarify what Lange's ideas were. In this presentation, drawing on the first half of "The emotions"—specifically the section preceding the discussion of specific emotions such as sorrow, joy, fright, and anger-rage—I will discuss Lange's assertion that the functioning of the peripheral organs is crucial to the emotions.

Disclosures: T. Sato: None.

Theme K Poster

TKP01: Historical Perspectives on Neuroscience Concepts, Models, and Clinical Translation

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP01.08SA/LL33

Topic: K.01. History of Neuroscience

Title: From counterculture to clinic: The evolution of psychedelic pharmacotherapy

Authors: *I. M. MONTGOMERY, R. E. HARTMAN;
Psychology, Loma Linda Univ., Loma Linda, CA

Abstract: Over half a century before the modern revival of psychedelic research, the first clinical study of lysergic acid diethylamide (LSD) was published in 1947. By the mid-1960s, LSD had been administered to tens of thousands of patients, and psychedelic research had generated many clinical and scientific publications. However, early methodological limitations, countercultural association, public perception, and increasingly restrictive drug policy contributed to the abrupt decline of psychedelic research after the passage of the 1970 Controlled Substances Act. This review examines the historical evolution of psychedelic pharmacotherapy as a study in how science policy is ultimately shaped by scientific evidence, cultural context, regulatory classification, and public trust. Early studies suggested therapeutic potential, but were

often limited by poor experimental design, such as a lack of proper controls, inconsistent dosing, variable therapeutic settings, and a lack of long-term follow-up. Contemporary studies have renewed interest in psychedelic-assisted therapy for psychopathologies such as depression, anxiety, substance use disorders, and post-traumatic stress disorder, with some studies reporting rapid and sustained symptom improvement after a small number of treatments. Serotonergic psychedelics, in particular, appear to act in part through 5-HT2A-mediated signaling pathways that are often associated with cortical plasticity, synaptogenesis, and altered functional connectivity. However, the recent "psychedelic renaissance" also raises neuroethical and societal concerns, including exaggerated claims, commercialization, equitable access, clinician training, informed consent, psychiatric screening, and maintaining scientific rigor. The history of psychedelic pharmacotherapy illustrates how promising neuroscience-based treatments can be advanced, interrupted, and revived. Future research should combine rigorous randomized controlled trials, mechanistic neuroscience, long-term safety monitoring, and ethically grounded implementation models to evaluate the role of psychedelics in psychiatric and neurological care.

Disclosures: I.M. Montgomery: None. **R.E. Hartman:** None.

Theme K Poster

TKP01: Historical Perspectives on Neuroscience Concepts, Models, and Clinical Translation

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP01.09SA/LL34

Topic: K.01. History of Neuroscience

Title: Shifting Paradigms: A Historical Review of Fibromyalgia, Small Fiber Neuropathy, and CIDP as a Pathological Spectrum

Authors: S. PRAKASH[1], O. BUCKHORN[2], S. PRAKASH[1], X. CARO[3], J. SHIVELY[4], *N. PRAKASH[5];
[1]Glendora High Sch., Glendora, CA; [2]Kaiser Permanente Bernard J. Tyson Sch. of Med., Los Angeles, CA; [3]Southern California Fibromyalgia Res. & Treatment Ctr., Northridge, CA; [4]City of Hope, Duarte, CA; [5]City of Hope Natl. Med. Ctr., Duarte, CA

Abstract: OBJECTIVE This review traces the conceptual history of Fibromyalgia (FM), Small Fiber Neuropathy (SFN), and Chronic Inflammatory Demyelinating Polyradiculoneuropathy (CIDP) to examine how advancements have shifted their classification from isolated diagnostic silos toward an overlapping neuroinflammatory spectrum and understanding the physiology of peripheral nerves. Peripheral nerves can be divided into categories such as, myelinated and unmyelinated; large and small. However historically, the ability to distinguish dysfunction in these different subtypes has clinically been asymmetric. BACKGROUND Historically, centralized pain and peripheral neuropathies were segregated. FM was long dismissed as psychosomatic or muscular ("fibrositis"), CIDP was classified as an autoimmune large fiber demyelinating polyneuropathy, and SFN remained unrecognized due to normal conventional

nerve conduction studies. Modern neuroscience increasingly reveals shared pathophysiological boundaries between these conditions. HISTORY *The Diagnostic Blind Spot (Pre-1990s):* Lacking objective tools to evaluate unmyelinated C and thinly myelinated Aδ; fibers, clinical neurology forced a binary classification: patients either fit large-fiber neuropathies or were relegated to non-structural central pain syndromes (FM). *The SFN Bridge (1990s-2000s):* The introduction of intraepidermal nerve fiber density (IENFD) assessment via skin biopsy revealed objective peripheral neurodegeneration in up to 50% of FM patients. This historical pivot demonstrated that "central" pain syndromes can possess distinct peripheral neuropathic substrates.The *Neuroinflammatory Continuum:* Over the last two decades, discoveries of nodal/paranodal autoantibodies in CIDP variants, alongside shared elevated cytokine profiles and small-fiber involvement in atypical CIDP, have blurred the lines between classic autoimmune neuropathies and chronic widespread pain syndromes. DISCUSSION Viewed retrospectively, the boundaries separating these entities are more historical than biological. Peripheral small-fiber damage may act as a chronic afferent trigger driving central sensitization in FM, while phenotypic overlaps with early-stage CIDP highlight a shared spectrum of immune-mediated neural injury ranging from unmyelinated nociceptors to large myelinated fibers. CONCLUSION The history of these conditions demonstrates a paradigm shift from symptom-based categorization to a mechanism-based continuum, illustrating that centralized pain and peripheral nerve pathology are fluid expressions of a singular neuroinflammatory spectrum.

Disclosures: S. Prakash: None. **O. Buckhorn:** None. **S. Prakash:** None. **X. Caro:** None. **J. Shively:** A. Employment/Salary (full or part-time):; City of Hope, Department of Immunology & Theranostics. **N. Prakash:** A. Employment/Salary (full or part-time):; City of Hope, Chief of Neurology, Clinical Professor.

Theme K Poster

TKP01: Historical Perspectives on Neuroscience Concepts, Models, and Clinical Translation

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP01.10SA/LL35

Topic: K.01. History of Neuroscience

Support: USU HU00012320101
CDMRP W81XWH-22-20037
JPC-5 HU00012520003

Title: Convergent Neural Signatures of Human Sleep States: A Systematic Review of Simultaneous EEG-Neuroimaging Studies

Authors: *A. POLLATOU[1], G. TAYS[3], N. ABAD[4], L. MARINELLI[4], C. A. SCHOLL[5], W. COON[6], P.-H. YEH[7], E. METZGER[8], T. DOTY[3], R. SHIH[2], L. SKEIKY[9], V. CAPALDI[10], A. LEE[1], S. KIM[11], J. WERNER, Jr.[12];
[1]Uniformed Services Univ. of the Hlth. Sci., Bethesda, MD; [2]Uniformed Services Univ. of the

Hlth. Sci., Washington, DC; [3]WRAIR, Silver Spring, MD; [4]GE HEALTHCARE, Niskayuna, NY; [5]Johns Hopkins Univ. Applied Physics Lab., Washington, DC, ; [6]Johns Hopkins Univ. Applied Physics Lab., Laurel, MD, ; [7]NICOE, Silver Spring, MD; [8]Injury Prevention Center, Univ. of Michigan, Virginia Beach, VA, ; [9]USUHS, Bethesda, MD; [10]Uniformed Services Univ. of Hlth. Sci., Bethesda, MD; [11]Uniformed Services Univ. of Hlth. Sci. Grad. Program In Neurosci., Bethesda, CA, ; [12]Uniformed Services Univ., Baltimore, MD.

Abstract: Sleep involves complex, stage-specific changes in brain activity, yet the neurobiology of these transitions remains incompletely understood. Simultaneous EEG and neuroimaging uniquely combines the temporal precision of EEG with the spatial resolution of fMRI, PET, or NIRS, enabling direct mapping of sleep-state brain function. Beginning with early PET studies in the 1990s and expanding through the EEG-fMRI revolution of the 2000s, this field has grown substantially yet remained fragmented across modalities and populations, with no prior systematic synthesis despite growing recognition of sleep's role in memory consolidation, emotional regulation, and neural restoration. Following PRISMA guidelines, we searched five databases and identified 205 eligible studies recording simultaneous EEG and fMRI, PET, or NIRS during human sleep with EEG-based staging; sequential acquisition and awake-only studies were excluded. The majority employed EEG-fMRI (n=141), with smaller contributions from EEG-PET (n=34), EEG-NIRS (n=26), and multimodal combinations (n=4). Studies varied in design (49% overnight, 20% nap-only), population (74% healthy adults), and staging approach (61% using 30-second epochs), with a median sample size of 18 participants. Despite substantial methodological heterogeneity, convergent findings emerged across modalities. NREM sleep showed robust thalamic, precuneus, and posterior cingulate involvement, with PET studies additionally identifying medial orbitofrontal and frontal cortex deactivation. EEG-fMRI studies revealed that slow waves and sleep spindles engage distinct yet overlapping thalamocortical networks, with spindle-related BOLD responses concentrated in sensorimotor and frontal regions and slow wave activity linked to widespread default mode deactivation. REM sleep was characterized by increased limbic and paralimbic activity alongside reduced prefrontal engagement. EEG-NIRS extended these findings to developmental and clinical populations where MRI is less feasible. Clinical studies, though underrepresented (n=31), revealed disorder-specific patterns including heightened limbic activation in depression and PTSD, thalamic abnormalities in epilepsy, and disrupted hypothalamic connectivity in narcolepsy. This review provides the first unified synthesis of simultaneous EEG-neuroimaging sleep research, maps convergent neural signatures across sleep states and modalities, and offers evidence-based recommendations for artifact correction, study design, and cross-modal integration — laying the groundwork for translational applications in sleep medicine and neuroscience.

Disclosures: A. Pollatou: None.

Theme K Poster

TKP01: Historical Perspectives on Neuroscience Concepts, Models, and Clinical Translation

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP01.11SA/Web Only

Topic: K.01. History of Neuroscience

Title: Evolution and Impact of Mediterranean-DASH Intervention for Neurodegenerative Delay Diet (MIND) on Alzheimer's and related neurodegenerative disorders

Authors: *M. F. KIRMANI[1], R. KIRMANI[3], A. WALLER[1], R. T. SLATER, III[2];
[2]Associate Professor, Family & Integrative Med., [1]Univ. of Incarnate Word Sch. of Osteo. Med., San Antonio, TX; [3]Texas A&M University, Dept. of Behavioral and Cognitive Neurosci., College Station, TX

Abstract: The relationship between diet and health goes back centuries. In the modern era, several diets have been developed to address chronic diseases, including diabetes and heart-healthy diets for patients with coronary artery disease and hypertension. However, relatively less research has been done from a dietary perspective on neurodegenerative diseases. The MIND diet, or Mediterranean-DASH Intervention for Neurodegenerative Delay, was first developed by Dr. Martha Clare Morris and her colleagues at Rush University Medical Center in 2015. This diet focuses on the nutrients needed for brain health. The first paper was published in 2015. The diet was tested in a controlled setting on 994 people over a period of 10 years to see if it prevents cognitive delay and reduces the risk of Alzheimer's disease. The study concluded that the MIND diet significantly lowers the risk of Alzheimer's by 53%. This diet was based on the studies showing that foods like berries and leafy greens were linked with improvement of brain health. Dr. Morris also discussed the importance of the MIND diet in reducing cognitive decline, which was a breakthrough, and the findings were discussed at the Wisconsin Alzheimer's Disease Research Center 2017 Annual Fall Lecture. However, more research and multicenter randomized controlled trials are needed to further evaluate the benefits of this diet in neurodegenerative disorders.

Disclosures: M.F. Kirmani: None. **R. Kirmani:** None. **A. Waller:** None. **R.T. Slater:** None.

Theme K Poster

TKP02: Graduate and Professional Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP02.01SA/LL36

Topic: K.02. Teaching of Neuroscience

Title: Outcomes for Trainees Supported by Individual and Institutional Training Grants from the National Institute on Drug Abuse

Authors: *W. COMPTON[1], A. L. HOLMES[2], L. N. FRIEND[3], E. FALCON[4];
[1]NIH/National Inst. On Drug Abuse, Washington, DC; [2]NIH, Natl. Inst. on Drug Abuse (NIDA), North Bethesda, MD; [3]NIDA, NIH, Natl. Inst. On Drug Abuse, North Bethesda, MD; [4]NIDA/NIH, Natl. Inst. on Drug Abuse, Silver Spring, MD

Abstract: INTRODUCTION: The National Institute on Drug Abuse (NIDA) offers a strategic set of funding mechanisms and programs to support the development of research scientists through multiple stages of their careers. These awards are designed to ensure that qualified scientists can meet the country's need for substance use and addiction research. Our goal is to examine whether the different types of training grants have similar or dissimilar outcomes. BACKGROUND: NIDA supports both institutional (Ruth L. Kirschstein National Research Service Award (NRSA) Institutional Research Training Grant T32) and individual predoctoral NRSA grants for MD/Ph.D. students, graduate students, and postdoctoral fellows (F30, F31, and F32, respectively). METHODS: One possible measure for success of these programs is measuring rates of subsequent NIH grant applications and awards. NIDA Fellowship and T32 awardees between 2010 and 2020 were used in this analysis. RESULTS: Upon examining grant applications from predoctoral awardees, we found that 65% (n=251) of F31 awardees subsequently applied to one or more NIH grants, and 39.3% (n=173) subsequently received NIH funding. T32 predoctoral appointees demonstrated lower rates of applications (53.5%, n=528) and awards (31.2%, n=308). We observed a similar trend among postdoctoral fellows. 64% (130) of F32 awardees later applied to NIH, and 49.3% (n=100) were later funded; while 60.6% (n=657) of T32 postdoctoral appointees later applied to NIH, and 40.8% (n=443) were awarded. CONCLUSION: These results suggest that recipients of individual fellowships in early career stages are more likely to apply and receive successive NIH grants. Based on this data, NIDA has been emphasizing and promoting individual fellowships as part of an overall expansion of research training. Mentoring and training in grantsmanship is essential at early career stages and pivotal for the success of the next generation of substance use and addiction researchers. Additional analysis on Career Development (K) awardees applying for and receiving subsequent NIH grants is planned to examine outcomes of later career stages.

Disclosures: W. Compton: A. Employment/Salary (full or part-time):; NIH. **A.L. Holmes:** A. Employment/Salary (full or part-time):; NIH. **L.N. Friend:** A. Employment/Salary (full or part-time):; NIH. **E. Falcon:** A. Employment/Salary (full or part-time):; NIH.

Theme K Poster

TKP02: Graduate and Professional Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP02.02SA/LL37

Topic: K.02. Teaching of Neuroscience

Support: R25NS124530

Title: Advancing Research Careers of Postdocs in Brain Science

Authors: *K. M. WEBSTER[1], J. T. RITT[1], A. M. VAN WART[2], J. KIMBERLY[3], C. D. AIZENMAN[4], D. LIPSCOMBE[1];
[1]Carney Inst. for Brain Sci., [2]Office of Univ. Postdoctoral Affairs, [4]Dept. of Neurosci., [3]Brown Univ., Providence, RI

Abstract: Time spent in a postdoctoral research position is a critical stage in the biomedical career path to becoming an independent researcher. However, in recent years, fewer U.S. Ph.D. graduates in the life sciences are pursuing postdocs than ever before. Even if trainees pursue postdoctoral training, many do not continue in academia despite strong track records in research and publishing. There are few academic faculty positions for the number of qualified postdocs. In addition, barriers to career advancement do exist and vary depending on career stage and discipline; these are evident in biomedical and STEM fields contributing to attrition of talented individuals from research careers. Actions can be taken to mitigate attrition but structured cohort programs that include mentorship and career development for postdoctoral scholars are limited, particularly when compared to programs that target predoctoral trainees. To address this gap, we designed the Advancing Research Careers (ARC) Program for postdoctoral scholars at Brown University to respond to training and mentoring needs of individual participants. The ARC program incorporates three foundational pillars: the establishment of peer cohorts, a strong mentor network, and opportunities to excel in research. These pillars are critical elements for retention and advancement in neuroscience research. This two-year program recruits mid-level postdoctoral trainees to cultivate annual cohorts. ARC Scholars are highly competitive and successful excelling in neuroscience research and having successful career outcomes. Program resources for participants include a mentoring team, quantitative research methods consultations, seed funds for participants' own research projects, and funds for conference travel and scientific training. We leverage Brown's commitment to the success of our talented trainees and the commitment of our faculty, including brain and quantitative scientists, to increase the number of highly qualified neuroscientists contributing to neuroscience research. In this presentation, we share insights from summative assessment, program evaluation and participant feedback in shaping programmatic offerings, and cumulative lessons learned during the first four years of the ARC program.

Disclosures: K.M. Webster: None. **J.T. Ritt:** None. **A.M. Van Wart:** None. **J. Kimberly:** None. **C.D. Aizenman:** None. **D. Lipscombe:** None.

Theme K Poster

TKP02: Graduate and Professional Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP02.03SA/LL38

Topic: K.02. Teaching of Neuroscience

Support: NINDS 5UC2NS128361

Title: Community for Rigor: Better Science Every Day

Authors: *E. A. SNEDDON, A. GOVJIAN, A. HUNTEMER-SILVEIRA, K. RUSCH, K. WORD, H. YE, T. MCDONALD, Z. PARKER, C. GARCIA, K. KORDING;
Univ. of Pennsylvania, C4R, Philadelphia, PA

Abstract: Community for Rigor (C4R) is an initiative funded by the National Institute of Neurological Disorders and Stroke (NINDS) led by Dr. Konrad Kording. Our goal is simple, to increase and promote scientific rigor by not only encouraging rigorous practices but, also, by providing resources to scientists and institutions on a wide-range of topics. We work together with partner institutions to create materials and strategies to encourage rigorous practices - essentially our content is for scientists by scientists.
So what is scientific rigor? Scientific rigor produces insights that are reliable and properly contextualized. In turn, rigorous science asks meaningful questions which leads to the design of informative studies.This results in transparent reporting of findings that contribute to theory and progress. Despite well-intentioned science, rigor is challenged through honest mistakes, haphazard practices, and everyday pressures. We aim to provide a solution to these challenges, by sharing open-source content to help scientists create more credible, collaborative scientific research.
The materials we create encompass topics that all address real challenges that researchers face every day. From understanding why data sharing is often skipped, to identifying confirmation bias before it can influence our findings, to untangling the nuances of causality, we offer practical, actionable solutions and resources.
How can we support you throughout your rigor journey? We provide everything you need to teach and practice rigor for free. For each unit, we provide ready-made slide decks and online books for any setting. Want to introduce your lab to a topic but you only see them all together for one hour at lab meeting? No problem! Each unit has an one- or three-hour version that can be adapted for your needs. With each unit, we also have interactive activities to engage learners so that they can apply the research practices introduced in the units. Do you think C4R might support your training program at a larger scale and want to know how to implement it? We can visit your institution and work with you on implementing our materials into your program.
At the end of the day, C4R is here to provide you with resources, training, and a community of scientists who are committed to doing science right. Conducting rigorous science should never feel impossible, and with C4R, it isn't.

Disclosures: E.A. Sneddon: None. **A. Govjian:** None. **A. Huntemer-Silveira:** None. **K. Rusch:** None. **K. Word:** None. **H. Ye:** None. **T. McDonald:** None. **Z. Parker:** None. **C. Garcia:** None. **K. Kording:** None.

Theme K Poster

TKP02: Graduate and Professional Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP02.04SA/LL39

Topic: K.02. Teaching of Neuroscience

Title: Training Cross-Functional Teams to Deploy Digital Measure Technology in Neuroscience

Authors: *J. ZYUZIN[1,2], K. GILLAND[2], N. DITTO[2];
[1]The Jackson Lab., Los Angeles, CA; [2]The Jackson Lab., Bar Harbor, ME

Abstract: Traditional in vivo research, even at leading research institutions, has often relied on small, PI-led teams operating in silos, reflecting limited cross-functional coordination rather than an integrated research ecosystem. Workflows center on episodic, manual measurements, with vivarium and IT treated as support roles, low-temporal-resolution data capture, and analysis deferred to a single statistician at study completion. These constraints limit data quality, scalability, reproducibility, and detection of subtle phenotypic signals, while reducing effectiveness of animal welfare monitoring. Emerging digital technologies, including continuous home-cage monitoring platforms that generate high-dimensional behavioral and physiological data, are transforming not only data acquisition but also the organizational structures required to support preclinical research. These systems enable 24/7 automated collection, AI-driven signal detection, standardized protocols, and real-time welfare assessment, shifting research toward a high-resolution and reproducible framework. At The Jackson Laboratory, we have observed through onboarding of Envision platform users that successful adoption of digital measure technologies depends on coordinated, multidisciplinary teams spanning study operations, veterinary and vivarium staff, data science, and IT and training roles. Clearly defined responsibilities and cross-functional collaboration are critical. Veterinary teams ensure welfare standards during data collection, operations maintain facility readiness, and IT enables secure infrastructure, while data scientists link digital endpoints to clinical relevance and training programs anchor consistency. We find that structured cross-team onboarding, role clarity with backups, and coordinated training establish the organizational foundation for successful study execution. Early IT engagement reduces deployment delays, veterinary integration improves interpretation of health signals, and standardized training accelerates adoption and reduces variability. This integrated approach maximizes data usability, supports longitudinal re-analysis, and improves cross-study comparability. These findings highlight that digital transformation in preclinical research is both a technological and organizational shift. Coordinated roles, shared workflows, and cross-functional alignment are essential to enable reproducible, scalable, and translationally relevant neuroscience research.

Disclosures: J. Zyuzin: A. Employment/Salary (full or part-time):; The Jackson Laboratory. **K. Gilland:** A. Employment/Salary (full or part-time):; The Jackson Laboratory. **N. Ditto:** A. Employment/Salary (full or part-time):; The Jackson Laboratory.

Theme K Poster

TKP02: Graduate and Professional Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP02.05SA/LL40

Topic: K.02. Teaching of Neuroscience

Title: Neural Data Science: A masters level course on the final boss of data science

Authors: *P. WALLISCH[1], S. SPIVACK[2];
[1]New York Univ., New York, Afghanistan; [2]New York Univ., New York, NY

Abstract: Here, we report on the results of offering a "Neural Data Science" course at the master's level for several semesters. About half of the students are data scientists without relevant domain knowledge in neuroscience. The other half are neuroscientists without relevant domain knowledge in data science. This course brings both groups to the very edge of their respective fields and perhaps beyond. In neural data, many of the typical assumptions of data science methods are grossly violated: Nothing is normal, nothing is independent, nothing is ergodic, nothing is linear. Conversely, the sheer amount of data now available overwhelms the classically trained neuroscientist: Principles of distributed storage and computing, even cloud-based computing and storage, become necessary to handle the volume and nature of contemporary neural data effectively. This presentation is about best practices for handling these challenges, the experiences of the students taking the course (via surveys), the clash of cultures and how to best mediate it, as well as historical learning outcomes. Moreover, unifying common-ground frameworks such as high-dimensional geometry are introduced and discussed. As challenging as teaching (and taking) such a class can be, we also outline why it is necessary to offer it, given the current environment. Training a cadre of confident and competent practitioners of neural data science, fluent in both cultures, does more than bridge a gap between existing fields. It effectively creates an emergent third culture, one equipped to confront contemporary neural data on their own terms. This - in turn - might be the key to unlocking future developments in artificial intelligence, namely those informed by NeuroAI.

Disclosures: P. Wallisch: None. **S. Spivack:** None.

Theme K Poster

TKP02: Graduate and Professional Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP02.06SA/LL41

Topic: K.02. Teaching of Neuroscience

Title: Building a Community-Based Framework for Hands-On Advanced Skills Training

Authors: E. MCMAINS, C. FAULDS, A. A R TEIXEIRA, C. WALTON, T. GURA, *R. MEIJERS;
Inst. for Protein Innovation, Boston, MA

Abstract: As neuroscience research continues to evolve, neuroscientists will need strong foundations in core concepts and methodologies, along with greater access to advanced technical, scientific, and graduate-level training opportunities. The Institute for Protein Innovation (IPI) is a nonprofit protein research institute in Boston with a focus on neuroscience. To expand avenues for ongoing education and community engagement, IPI is building an educational framework to provide resources, courses and community-oriented workshops to active neuroscientists and researchers-in-training.
IPI has engaged with neuroscientists to understand which target families suffer notable shortfalls in available high-quality antibody products. We leveraged our industrial-scale platform, capable

of discovering hundreds of antibodies annually, to create highly specific antibodies to key targets of interest. We then collaborated with external partners through target-focused community workshops designed to improve our offerings based on their in-lab experience and experimental data. Successful workshops have thus far engaged scientists from more than two dozen labs and incorporated more than 246 lab results related to antibodies targeting Neurexins, Neuroligins, Adhesion GPCRs, and Glial cells.
In addition, IPI launched an Education Program to offer intensive hands-on courses, taught by our in-house technical domain experts. Our current programming focuses on yeast display technology for antibody discovery and automated liquid handling, equipping neuroscientists with the skills necessary to approach antibody discovery and production at scale. Our programming has so far engaged more than 75 academic and industrial researchers, from graduate students to principal investigators, in experiential training in advanced lab techniques. Post-course surveys have shown marked learning gains and improved confidence in implementing new techniques, fruitful cross-disciplinary connections, and emerging research collaborations, leading to the establishment of a nascent community of practice in IPI's technical domain. We intend to expand this programming and further develop this community of practice to meet the needs of neuroscientists, as the academic and industrial landscapes of bioscience shift.

Disclosures: E. McMains: None. **C. Faulds:** None. **A. A R Teixeira:** None. **C. Walton:** None. **T. Gura:** None. **R. Meijers:** None.

Theme K Poster

TKP02: Graduate and Professional Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP02.07SA/LL42

Topic: K.02. Teaching of Neuroscience

Title: From Evidence to Argument Using Storyboards to Teach Scientific Writing

Authors: *J. A. MCQUAIL;
Univ. of South Carolina, Columbia, SC

Abstract: Scientific writing is often taught as a product-centered activity focused on drafting prose, despite the fact that many students struggle earlier in the process with organizing evidence, developing arguments, and synthesizing findings across studies. These challenges are particularly pronounced in neuroscience, where students must integrate complex experimental designs, diverse methodologies, and large bodies of primary literature. To address this gap, we developed a storyboard-based framework that treats scientific writing as a process of evidence organization and scientific reasoning before sentence-level composition begins. The approach adapts principles from visual storyboarding to neuroscience education by decomposing scholarly writing into hierarchical components. Individual research findings are represented as "frames" that capture specific data, methodological considerations, and interpretive constraints. Related frames are organized into paragraph-level arguments, which are subsequently assembled into

larger thematic sections and complete manuscripts. Structured prompts require students to identify what evidence supports a claim, what evidence does not support a claim, and what limitations or contextual factors must be considered when interpreting findings. This process makes reasoning visible and encourages explicit engagement with uncertainty, alternative interpretations, and scientific rigor. The framework has been incorporated into undergraduate research training and directed-study coursework focused on neurobiology and cognition. Storyboards are integrated with literature curation, annotated bibliographies, scientific writing, and collaborative mentoring using commonly available academic tools. By shifting emphasis from writing sentences to organizing evidence, students develop clearer conceptual frameworks before drafting prose and engage more directly with primary research articles as sources of data rather than conclusions. Storyboarding provides a practical and scalable approach for teaching scientific synthesis, argument development, and evidence-based reasoning. This framework may be particularly valuable in neuroscience education, where students must navigate complex datasets and integrate findings across multiple levels of biological organization.

Disclosures: J.A. McQuail: None.

Theme K Poster

TKP02: Graduate and Professional Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP02.08SA/LL43

Topic: K.02. Teaching of Neuroscience

Support: Border Biomedical Research Center
Department of Computer Science (IAA)
Research Incentive Funds (AMK)

Title: The Ship of Theseus: Continued software development, across semesters and students, of Community Brain Maps, an open-access rat brain atlas based on the Brain Maps 4.0 reference space

Authors: *I. ACEDO AGUILAR[1], B. AVALOS[1], R. AYALA[1], A. FLORES[1], J. JASSO[1], A. G. ROBLES[1], D. LOYA[1], G. MALDONADO[1], N. MESTA VALENZUELA[1], K. OKWUNWANNE[1], L. PORRAS[1], E. ROJERO RODRIGUEZ[1], A. TORRES[1], A. VILLAGOMEZ[1], E. WILCHER[1], D. M. MEJIA[1], A. M. KHAN[2];
[1]Dept. of Computer Sci., [2]Dept. of Biol. Sci., Univ. of Texas at El Paso, El Paso, TX

Abstract: For two different semesters, cohorts of MS-level graduate students have completed a graduate software engineering practicum here at UTEP as part of their capstone project before graduation. For this last cohort, we had 15 students from both the Master's in Software Engineering, and the Master's in Artificial Intelligence programs. In this second iteration of a digital Community Brain Maps project, which digitizes Brain Maps 4.0; a rat brain atlas (LW Swanson, 2018) several new features were implemented, such as a sandbox to parcellate over

images, better features for a personalized academic literature library, an AI model trained with the atlas information, a split screen to visualize different atlas levels alongside previously uploaded images at the same time, sharing parcelated images to other users, and other new features; all intended to aid researchers in their use of the atlas as a community tool. These students faced some common roadblocks during their start of inheriting a project and continuing the development, making this software engineering project also evolve into a more distinct paradigm of software maintenance. The projects developed in this class were successful in completing some of the user stories delineated by the customer by the end of the semester. This process of continuing development of the project made a compelling case for the creation of a new class, which will focus in its entirety on teaching students Software Maintenance, with lessons on the best way to take on working with legacy systems. This newly evolved development for our original course provides a different lens through which we approach brain mapping software, and will greatly benefit the learning curve of the students, improving their understanding of what to expect from the class.

Disclosures: I. Acedo Aguilar: None. **R. Ayala:** None. **A. Flores:** None. **J. Jasso:** None. **A.G. Robles:** None. **D. Loya:** None. **G. Maldonado:** None. **N. Mesta Valenzuela:** None. **K. Okwunwanne:** None. **L. Porras:** None. **E. Rojero Rodriguez:** None. **A. Torres:** None. **A. Villagomez:** None. **E. Wilcher:** None. **D.M. Mejia:** None. **A.M. Khan:** None.

Theme K Poster

TKP02: Graduate and Professional Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP02.09SA/LL44

Topic: K.02. Teaching of Neuroscience

Title: Integrating Mental Health Promotion into Medical Education: A Reflective Seminar Model for Psychological Safety and Professional Identity Formation

Authors: *D. P. GUÍZAR;
Univ. Nacional Autónoma De México, Ciudad de México, Mexico

Abstract: Background: Medical students experience elevated rates of psychological distress, including depression, anxiety, burnout, and suicidal ideation. Despite growing recognition of these challenges, mental health promotion remains largely peripheral to formal medical curricula, particularly in Latin American settings. Educational approaches that explicitly address well-being may contribute to healthier learning environments and support professional identity formation. This study examined a curriculum-integrated reflective seminar designed to promote mental health among preclinical medical students.Methods: A qualitative interpretive study was conducted at a large public medical school in Mexico. The intervention consisted of a Reflective Seminar on Mental Health embedded within the second-year physiology curriculum. Four focus groups were conducted with 26 participants, including 14 students and faculty facilitators. Data were analyzed using thematic analysis with inductive and deductive coding, triangulation of

sources, and collaborative interpretation.Results: Three interconnected themes emerged. First, students perceived the seminar as a meaningful expression of institutional care, legitimizing mental health and well-being as relevant components of medical education. Second, psychological safety emerged as a key mechanism facilitating open dialogue, peer support, and reflection about academic stress and personal challenges. Third, faculty members served as emotional facilitators and role models by sharing experiences of vulnerability, resilience, and professional growth. Students reported increased feelings of belonging, normalization of emotional difficulties, and greater willingness to seek support. Faculty participants described changes in their educational role, moving beyond content delivery toward mentorship and relational teaching. Together, these themes formed a conceptual model in which institutional commitment, safe learning environments, and faculty engagement mutually reinforce student well-being and professional development.Conclusions: Reflective seminars may serve as a feasible curricular strategy for integrating mental health promotion into medical education. The findings suggest that structured opportunities for reflection can foster psychological safety, strengthen professional identity formation, and support the development of more humanistic educational cultures. This model may be transferable to other medical schools seeking to address student well-being through curriculum-based interventions.

Disclosures: D.P. Guízar: None.

Theme K Poster

TKP02: Graduate and Professional Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP02.10SA/LL45

Topic: K.02. Teaching of Neuroscience

Title: Neuroscience Competency and Curriculum Assessment in Pharmacy Education

Authors: *G. M. KHAN, A. MOMEN;
Appalachian Col. of Pharm., Oakwood, VA

Abstract: Objective: To evaluate the perceptions and self-reported competencies of first-year (P1) pharmacy students regarding neuroscience education within a 3-year accelerated PharmD curriculum. **Methods:** A survey was administered to P1 students (n=40) to assess their confidence in neurobiological principles, clinical application of Central Nervous System (CNS) pharmacology, and their views on current instructional methods and curriculum depth. Responses were collected using Likert scales and multiple-choice selections covering topics from drug mechanisms to patient counseling. **Results:** Competency and Confidence: Students reported varying levels of confidence in applying neuroscience principles. While some felt competent in explaining complex mechanisms of action for drugs like atypical antipsychotics and anticonvulsants, others remained neutral or less confident. Similarly, confidence in identifying significant drug-drug interactions and providing patient counseling for antidepressants or anti-epileptic drugs showed a broad distribution among the cohort. Clinical

Application: Lower confidence levels were observed regarding the recognition of clinical side effects, such as tardive dyskinesia or extrapyramidal symptoms, and the ability to discuss specific treatment guidelines (e.g., Migraine or Parkinson's) within a multidisciplinary team. Curriculum Assessment: Regarding the curriculum's depth, 20 students felt the time allotted for neuroscience related course(s) was "just right," though a significant minority (13 students) felt there was "too little" emphasis on neuroscience. A vast majority of students viewed neuroscience knowledge as "somewhat" or "very" important for their future roles in community or hospital settings. Case-based learning was identified as the most effective teaching method by 25 students, significantly outperforming traditional lectures (8 students) and 3D brain models (7 students). **Conclusion:** P1 pharmacy students recognize the critical importance of neuroscience in pharmacy practice but exhibit inconsistent confidence in clinical application and complex neuropharmacology. The findings suggest that while the curriculum is generally well-received, there is a strong student preference for case-based learning to bridge the gap between theoretical neurobiology and clinical pharmacy practice.

Disclosures: G.M. Khan: None. **A. Momen:** None.

Theme K Poster

TKP02: Graduate and Professional Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP02.11SA/LL46

Topic: K.02. Teaching of Neuroscience

Title: Neuroscience for poets (and lawyers, philosophers, sociologists etc).

Authors: *M. J. FARAH[1], H. GERSTEIN[2];
[1]Univ. Pennsylvania, Philadelphia, PA; [2]Ctr. for Neurosci. & Society, Univ. of Pennsylvania, Philadelphia, PA

Abstract: Neuroscience (NS) is of growing interest within a broad range of other fields because of its increasing ability to explain, predict, and even control human thought and action. We developed a 2-course sequence to educate a cohort of graduate and professional students to be "informed consumers" of NS in their fields. The goal of this presentation is to transmit concrete know-how, acquired by teaching graduate students from 21 different departments, to SfN colleagues interested in teaching NS to students who want to incorporate NS into their graduate training. Here we focus on problems we encountered and related workarounds. 1) Reaching and recruiting students in far-flung departments and establishing a degree of integration with their main doctoral studies is not simple in a large, busy university. We found recruitment to be a "high touch" process, requiring free lunches and shmoozing in department lounges. Advisors should be looped in so they understand what their grad students are trying to do and can advise them appropriately. Word of mouth eventually supplements these efforts. 2) The selection of NS subject matter to teach students from widely varying fields was less problematic than expected. Core topics in cognition and emotion are pertinent to the psychology of virtually all professions

and social science disciplines, and students had no problem identifying how the material relates to their graduate work. Eg, hippocampal learning is central to education, law (eyewitness testimony), business (memorable jingles), philosophy (epistemology), etc. 3) One is always torn between carefully laying the methodological groundwork versus getting to the "good stuff" (human behavior), but the students in question here are particularly naïve about NS methodology so at least a bare minimum of instruction is needed at the outset. What worked well was an initial few weeks on nuts-and-bolts physiology and methods, then proceeding to studies of brain and behavior. By prefacing these studies with nuts and bolts, the subsequent NS results seem more grounded and less like commandments from the mountain top. It also prepares students to understand some of the more nuanced methodological controversies covered in the second semester. 4) To avoid "NS cheerleading" rather than a critical appreciation of insights from NS, students enroll in a second course on methodological and inferential controversies in NS, where they read about different types of validity, common statistical misunderstandings, replicability and reverse inference. They also present an NS journal article to the class (journal club style) and then act as a reviewer for NS papers that have appeared in a Frontiers journal.

Disclosures: M.J. Farah: None. **H. Gerstein:** None.

Theme K Poster

TKP02: Graduate and Professional Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP02.12SA/LL47

Topic: K.02. Teaching of Neuroscience

Title: Impacto de una intervención educativa de enfermería para recién nacidos sobre la CPAP nasal en la UCIN, basada en la teoría de Patricia Benner.

Authors: *R. BALTAZAR TELLEZ[1], A. GARRIDO LOZADA[2], E. MOLINA TRINIDAD[3], D. MOLINA AVILEZ[4], G. A. ANGELES OCHOA[5], O. FLORES CHAVEZ[3], J. ARIAS-RICO[6]; [1]Inst. de Ciencias de la Salud, Univ. Autónoma Del Estado De Hidalgo, Pachuca, Mexico; [2]Nursing pediatric, Univ. Autónoma del Estado de Hidalgo, Mineral de la Reforma, Mexico; [3]Inst. de Ciencias de la Salud, Univ. Autónoma del Estado de Hidalgo, San Agustin Tlaxiaca, Mexico; [4]Inst. de Ciencias de la Salud, Univ. Autónoma del Estado de Hidalgo, Pachuca de Soto, Mexico; [5]Univ. Autonoma del Estado de Hidalgo, Zempoala, Mexico; [6]Inst. de Ciencias de la Salud, Univ. Autonoma Del Estado De Hidalgo, Pachuca, Mexico

Abstract: Impact of a Nursing Educational Intervention for Newborns on Nasal CPAP in the NICU, Based on Patricia Benner's Theory.The care of newborns (NBs) presents a challenge for healthcare professionals; high-level interventions such as the use of nasal CPAP are key strategies for managing respiratory failure in preterm newborns, Inappropriate use of this device can lead to complications such as hypoxic-ischemic encephalopathy (HIE), altered primitive reflexes, and increased intracranial pressure; therefore, ongoing training of nursing staff is essential. Consistent clinical practice reinforces the formation of synaptic networks, allowing

knowledge to be transferred to long-term memory. The objective of this study was to evaluate the impact of an educational intervention aimed at nursing staff regarding the care of newborns with nasal CPAP in the NICU of a secondary-level hospital, based on Patricia Benner's theory. A longitudinal, observational study with a mixed-methods approach and a quasi-experimental design was conducted, involving the administration of a pretest and a posttest to a sample of 13 nurses. The educational intervention consisted of four sessions, each lasting half an hour, focused on the rationale for nasal CPAP, its correct installation, securing the device, skin care, and the prevention of associated injuries. The following instrument was used for data collection: Evaluation of Nursing Interventions for Newborns with Continuous Positive Airway Pressure (EIERNPPCVA). Statistical analysis was performed using descriptive and inferential statistics, employing Student's t-test for paired samples.The results showed a statistically significant increase ($p < 0.05$) in the nursing staff's level of knowledge following the educational intervention, particularly regarding the identification of nasal CPAP components, selection of the appropriate size, correct fitting, and skin care for the newborn.This research is significant because it provides a broader perspective on how knowledge and the reflection of short- to long-term memory through educational intervention contribute to improving the quality of nursing care.The study was conducted without conflicts of interest or external funding.

Disclosures: R. Baltazar Tellez: None. **A. Garrido Lozada:** None. **E. Molina Trinidad:** None. **D. Molina Avilez:** None. **G.A. Angeles Ochoa:** None. **O. Flores Chavez:** None. **J. Arias-Rico:** None.

Theme K Poster

TKP02: Graduate and Professional Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP02.13SA/LL48

Topic: K.02. Teaching of Neuroscience

Support: Guarantors of Brain Award - INNC 2025

Title: A Novel Hands-On Neurosurgical Tumour Resection Simulation Workshop Using an Egg Model

Authors: *F. DEEN[1], G. NG[1], L. WANG[2];
[1]Univ. Col. London, London, United Kingdom; [2]Imperial Col. London, London, United Kingdom

Abstract: Neurosurgery demands manual dexterity, spatial awareness, and meticulous tissue handling, yet reduced operative exposure and the cost, scarcity, and ethical burden of cadaveric, animal, and virtual-reality models constrain practical opportunities. Egg-based simulators are inexpensive and accessible, but published protocols validate isolated tasks rather than an integrated operative approach. Here, we developed and evaluated a comprehensive, low-cost neuro-oncological workshop in which a single boiled chicken egg is used to perform sequential

tasks mapped to core operative phases: high-speed drilling of the shell (approach), membrane incision & foramen creation (exposure), yolk removal as a simulated deep-seated tumour (resection & debulking), and microsurgical membrane suturing (closure). All four tasks were derived from the published list of neurosurgical-oncology competencies. Senior neurosurgery trainees in the United Kingdom delivered the workshop to 103 medical students and doctors from 20+ international institutions across 3 independent cohorts. In 2 pilot cohorts (n=72; 35 female, 37 male), anonymous post-workshop 5-point Likert ratings were uniformly high (mean ± SD: enjoyment 4.81 ± 0.60, equipment quality 4.69 ± 0.72, usefulness 4.69 ± 0.57, facilitator knowledge/helpfulness 4.75 ± 0.60, and perceived broadening of neurosurgical exposure 4.58 ± 0.61; all out of 5). A definitive third cohort (n=31; 17 female, 14 male) included pre- and post-measures and objective measures; overall satisfaction remained high (4.26 ± 0.75/5). On an 8-item confidence scale, confidence rose from 2.24 ± 0.93 to 2.96 ± 0.88 (paired t-test and Wilcoxon $p<0.001$; Cohen's $dz=0.83$) and self-efficacy from 2.78 ± 0.83 to 3.20 ± 0.76 ($p=0.02$); 92% reported improved skill across domains ($p<0.001$). On blinded faculty assessment, technical performance across completed operative stages averaged 17.4 ± 3.1 (~70%) out of 25. Participants rated the model realistic (face validity 3.93 ± 0.41/5) and cost-effective (4.32/5). Overall, an integrated egg-model tumour-resection workshop is therefore feasible, consistently well received, and associated with significant gains in learner confidence and credible objective performance at negligible cost, supporting wider use to broaden early neurosurgical exposure for medical students and doctors.

Disclosures: F. Deen: None. **G. Ng:** None. **L. Wang:** None.

Theme K Poster

TKP02: Graduate and Professional Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP02.14SA/LL49

Topic: K.02. Teaching of Neuroscience

Title: Implementation of Automated Histological Technologies in Neuroscience Education and Biomedical Engineering Training

Authors: *R. BELTRAN-RAMIREZ[1], C. JIMÉNEZ-ROMÁN[1], J. MARTINEZ-MENDOZA[2], X. M. BECERRA-GONZÁLEZ[3], J. A. DOMINGUEZ-RAMIREZ[4];
[1]Univ. de Guadalajara, Guadalajara, Mexico; [2]Periferico Norte, Ctr. Univericitario De Ciencias Economico Admin., Jalisco, Mexico; [3]Univ. De Guadalajara, Zapopan, Mexico; [4]Knowledge Mgmt. Innovation, Univ. De Guadalajara, Zapopán, Mexico

Abstract: Histological techniques are essential for understanding neural structure, neurodegeneration, and experimental neuroscience. However, traditional tissue processing and sectioning methods require specialized equipment, extensive training, and substantial instructor supervision, limiting their accessibility in educational settings. This project evaluated the implementation of an automated histological processing platform as an educational tool for

neuroscience and biomedical engineering training.The platform integrates automated paraffin embedding, tissue sectioning, temperature regulation, microcontroller-based control, and remote monitoring capabilities. These features were incorporated into laboratory activities designed to support student learning in histology, neuroanatomy, neuroscience, and biomedical technology development. The system was developed to reduce technical barriers while providing standardized exposure to tissue preparation workflows commonly used in research laboratories.Implementation focused on facilitating hands-on learning experiences, improving reproducibility of laboratory procedures, and promoting interdisciplinary training. The automated workflow reduced the complexity of tissue preparation tasks and allowed students to concentrate on understanding biological principles, experimental design, and interpretation of histological findings. In addition, the modular architecture enabled demonstrations of automation, instrumentation, and digital technologies relevant to modern biomedical research.The incorporation of automated histological technologies into neuroscience education may contribute to improved student engagement, increased accessibility to laboratory-based learning, and enhanced development of technical competencies. These findings support the use of innovative educational technologies as a strategy to strengthen neuroscience and biomedical engineering training while promoting broader access to research methodologies and emerging neurotechnologies.

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

Theme K Poster

TKP02: Graduate and Professional Teaching of Neuroscience

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Program #/Poster #: TKP02.15SA/LL50

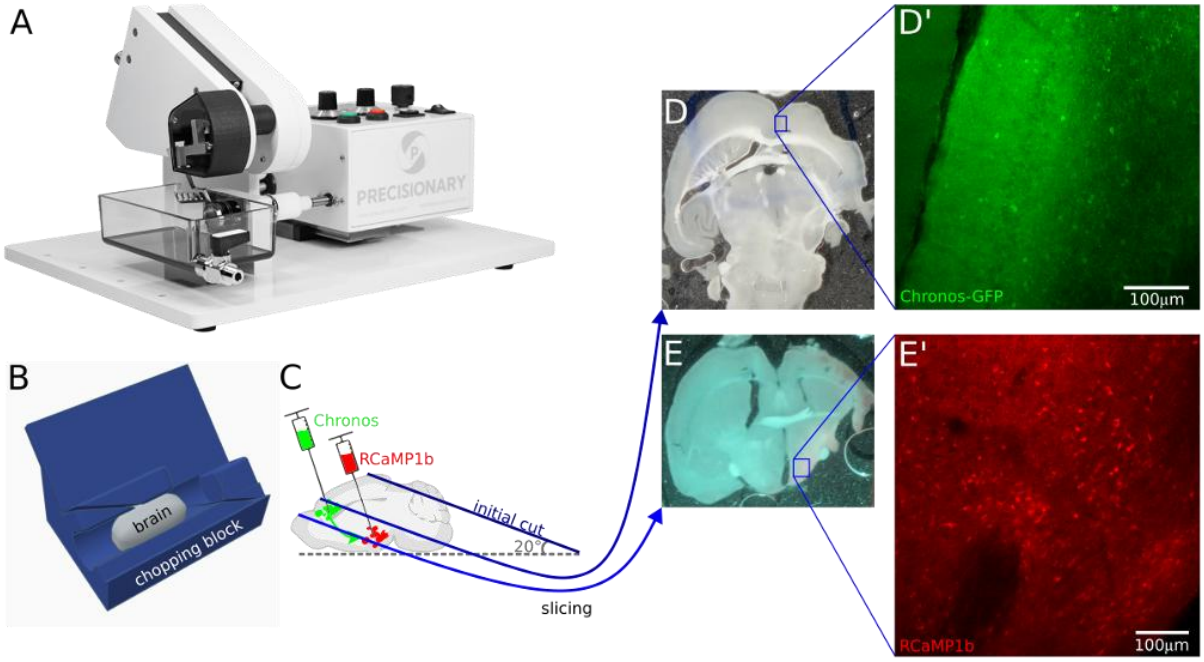
Topic: K.02. Teaching of Neuroscience

Title: Teaching Long-Range Circuit Preservation Using Compresstome-Prepared Prefrontal-Hypothalamic Brain Slices

Authors: *A. CHU[1], M. M. KARNANI[2];
[1]Precisionary Instruments, Ashland, MA; [2]Ctr. for Discovery Brain Sci., Univ. of Edinburgh, Edinburgh, United Kingdom

Abstract: Understanding long-range neural circuitry is an educational objective in modern neuroscience training, yet many acute brain slice preparations fail to preserve long axonal projections required for circuit-level investigation. We developed a training framework centered on preservation of medial prefrontal cortex (mPFC) to lateral hypothalamus (LH) connectivity using Compresstome vibratome-based acute brain slice preparation, allowing students to directly visualize and functionally interrogate an intact long-range circuit ex vivo. The workflow combines targeted neonatal viral transduction, para-horizontal brain slice preparation using a Compresstome VF-510-0Z vibrating microtome, and single-photon optogenetic stimulation and

calcium imaging. A 20° trimming angle preserves rostrocaudal axonal trajectories within the medial forebrain bundle while maintaining optical access to LH neurons. The protocol emphasizes how tissue orientation, sectioning strategy, and tissue stabilization influence preservation of long-range connectivity and experimental success. Trainees can observe intact prefrontal-hypothalamic projections, evaluate neuronal viability, and perform all-optical experiments that distinguish responsive from non-responsive neuronal populations. The workflow provides hands-on instruction in neuroanatomy, acute slice preparation, circuit preservation, optical experimental design, and functional data interpretation. This framework is designed to reduce barriers to participation in circuit neuroscience by leveraging affordable, reproducible methodologies that laboratories with limited access to specialized imaging platforms can adopt. By integrating tissue preparation, optical interrogation, and open dissemination of experimental workflows, this approach promotes broader access to modern neuroscience techniques while supporting workforce development, methodological transparency, and community-driven scientific education.



Disclosures: A. Chu: A. Employment/Salary (full or part-time):; Precisionary Instruments. **M.M. Karnani:** None.

Theme K Poster

TKP03: K-12 Teaching and Outreach of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP03.01SU/LL51

Topic: K.02. Teaching of Neuroscience

Title: Implementation of SlugAtlas and Limaco-SlugScience as a bridge for teaching neuroscience in elementary and intermediate schools

Authors: *C. L. FLORES[1], A. VARELA-ECHAVARRIA[2];
[1]INSTITUTO DE NEUROBIOLOGIA, UNAM, Queretaro, Mexico; [2]Inst. de Neurobiologia, UNAM, Queretaro, Mexico

Abstract: Implementation of SlugAtlas and Limaco-SlugScience as a bridge for teaching neuroscience in elementary and intermediate schools
Carlos Lozano-Flores[1], Ramón Martínez-Olvera[1], Luis A. Aguilar-Bautista[2], Alejandro de León-Cuevas[2], Alejandro Ávalos-Fernández[2], Alfredo Varela-Echavarría[1,2].
[1]Instituto de Neurobiología, Universidad Nacional Autónoma de México (UNAM), Querétaro, México.[2]Laboratorio Nacional de Visualización Científica Avanzada (LAVIS-SECIHTI-UNAM), Querétaro, México.
Neuroscience education must transcend the typical confines of academic and scientific settings and should be engaging, visually appealing, and dynamic for children and teenagers. Here we present online resources that could be used to guide their learning process, creating a window of opportunity for inquisitive questions and fostering a solid understanding of neuroscience.Due to their distinctive characteristics, land slugs are attractive research subjects from various perspectives, including neuroscience, stem cell biology, regeneration, and embryonic development. As a tool for research and teaching we built SlugAtlas, an anatomical and histological reference of the land slugs *Deroceras laeve* and *Ambigolimax valentianus* (*https://slugatlas.lavis.unam.mx*). The atlas is freely availabe and comprises a series of histological sections in the horizontal, sagittal, and transverse planes for both species, with 3D visualization tools of the main components of the central nervous system and main organs. This resource was used to perform a comparative analysis of organs and tissues of the two species, providing detailed histological descriptions and novel findings of unique features of their anatomy. For *D. laeve*, we additionally studied its capacity for degrowth and regrowth, a characteristic of animals with high regenerative potential. SlugAtlas is also designed to adapt to future growth and, together with the experimental techniques we have developed, provides a solid foundation for research and teaching in a wide variety of biological areas. A companion to SlugAtlas, Limaco-SlugScience is a website containing information, numerous videos, and high-resolution photographs of slugs in their natural habitats (*https://limaco.lavis.unam.mx*). It also contains laboratory exercises that could be implemented for inquiry-based science education in elementary, middle, or high schools.
Acknowledgements: Gema Martínez Cabrera, Nidia Hernández Ríos, Erika de los Ríos Arellano, María Eugenia Rosas Alatorre, Omar González Hernández, and Laura González Dávalos.
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Disclosures: C.L. Flores: None. **A. Varela-Echavarria:** None.

Theme K Poster

TKP03: K-12 Teaching and Outreach of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP03.02SU/LL52

Topic: K.02. Teaching of Neuroscience

Support: Stiles-Nicholson Foundation
FAU Tech Fee
Heidenreich Foundation
Broward County Community Foundation

Title: With a little help from our tech: Advancing neuroscience outreach through emerging educational tools

Authors: *N. L. BAGANZ[1,2], A. M. PAZ[1], **D. A. CINALLI, Jr.**[1], R. D. BLAKELY[1,2]; [1]Stiles-Nicholson Brain Inst., Florida Atlantic Univ., Jupiter, FL; [2]Col. of Med., Florida Atlantic Univ., Boca Raton, FL

Abstract: The rapid evolution of neuroscience research and educational technologies presents new opportunities to engage learners with authentic scientific experiences. However, many advanced tools used in medical, research, and higher education settings remain inaccessible to K-12 students and community audiences. Through ASCEND (Advancing STEM-Community Engagement through Neuroscience Discovery), the FAU Stiles-Nicholson Brain Institute has developed innovative approaches that adapt advanced neuroscience technologies and laboratory techniques for community engagement programs, including MobileMinds, AAUW Tech Trek summer camp, Brain Sparks, and neuroscience field-trip experiences that have collectively engaged more than 30,000 learners. Recent program enhancements include the integration of Medivis Anatomy X mixed-reality anatomy software, acquired through a university technology grant supporting 30 mixed-reality headsets and enabling deployment across summer camps, field trips, undergraduate courses, and community outreach programs. Originally developed for medical and health-professions education, this platform enables immersive exploration of neuroanatomy and human physiology for middle school, high school, undergraduate, and community learners. Additional activities introduce participants to authentic neuroscience research methodologies through brain dissection and slicing demonstrations, brain slice slide mounting and pilot histological staining activities, electrophysiological investigations using EEG and EMG technologies, and molecular biology exercises in which students investigate the genetic basis of disease and behavior through hypothesis development, PCR-based genotyping, gel electrophoresis, data analysis, and scientific interpretation. These experiences provide learners with opportunities to engage directly with concepts, technologies, and research methods rarely encountered in traditional K-12 science settings while emphasizing scientific inquiry, critical thinking, and STEM career exploration. This presentation describes the development, implementation, and educational rationale of these emerging outreach strategies and offers a framework for adapting technologies traditionally reserved for professional and higher education settings to community neuroscience education. The model demonstrates how authentic scientific experiences can expand neuroscience literacy, increase access to STEM learning opportunities, and strengthen pathways into neuroscience and health-related careers.

Disclosures: N.L. Baganz: None. **A.M. Paz:** None. **D.A. Cinalli:** None. **R.D. Blakely:** None.

Theme K Poster

TKP03: K-12 Teaching and Outreach of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP03.03SU/LL53

Topic: K.02. Teaching of Neuroscience

Title: Engaged Learning in Neuroscience: Creating Modules for Rural K-12 Outreach

Authors: D. MUNDS, B. GREEN, N. NYE, K. CARTER, *J. O. TAYLOR;
Utah Valley Univ., Orem, UT

Abstract: This project combines content creation by Utah Valley University students and neuroscience outreach to rural K-12 schools in Utah. It is well documented that inequities in access to advanced STEM education begin well before high school, especially in rural areas of the United States. STEM awareness and engagement are broadly limited in rural areas for reasons including financial burdens, social attitudes, and access to expertise. This is true not only in the classroom, but also in out-of-school and co-curricular learning opportunities, like STEM fairs. These inequities reduce access to higher education, well-paying careers, and community health for rural communities. Pilot testing at elementary schools near UVU has demonstrated a great deal of engagement and interest in this project, and we anticipate similar results as we reach out further. Although the completion of each outreach event is an important goal in themselves, the events are bookended by research related to input and outcome of the events: (1) To determine whether the structured engaged learning associated with undergraduate content creation improve content knowledge and perceived comfort in being a science communicator, and (2) whether attendance at the outreach events actually increases awareness, excitement and knowledge among community participants.

Disclosures: D. Munds: None. **B. Green:** None. **N. Nye:** None. **K. Carter:** None. **J.O. Taylor:** None.

Theme K Poster

TKP03: K-12 Teaching and Outreach of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP03.04SU/LL54

Topic: K.02. Teaching of Neuroscience

Title: Tools for Communicating Neuroscience: Voice, Body, and Creativity at the Universidad Veracruzana

Authors: *P. B. PENSADO GUEVARA[1], J. CORTÉS CORTINA[2], G. VARELA CASTILLO[3], L. ZAVALA-FLORES[4], M. J. ROVIROSA[5], A. A. BARRIENTOS BONILLA[3];

[1]Inst. de Neuroetología, Univ. Veracruzana, xalapa, Mexico; [2]Inst. de Neuroetología, Xalapa, Mexico; [3]Univ. Veracruzana, Xalapa, Mexico; [4]Ctr. de Investigación Biomédica del Noreste, IMSS, Monterrey, Nuevo león, Mexico; [5]Inst. Neurothology UV, Xalapa, Mexico

Abstract: Introduction. Communicating neuroscience requires mastering voice, body language, and creativity to engage diverse audiences. Socializing science and making it understandable is essential for fostering critical thinking and social appropriation of knowledge. Attracting people to scientific events remains a challenge; effective tools are key to promoting active participation. **Objective.** Our working group, Neuroteam DHB (Instituto de Neuroetología, Universidad Veracruzana), aims to highlight body and voice-related tools as a didactic strategy to convey concepts in cellular and molecular neurobiology. We employ artistic activities such as music, literature, drawing, painting, and theater. **Method.** We´re using empirical and retrospective learning to identify and systematize useful tools over ten years of outreach. Empirical learning emerges from direct practice, while retrospective learning enables critical reflection on experiences, allowing continuous improvement of communication processes. **Results.** Neuroteam has participated in more than 20 workshops, talks, and events, ensuring at least one participation per semester. Notable events include “Sabados en la Ciencia”, “Feria Internacional del Libro Universitario” and “Semana del cerebro” (Mexico and Colombia). Training in national and local forums has allowed us to integrate tools ranging from intention, volume, and diction to identifying analogies, limitations, avoiding scientifically inaccurate information. **Perspectives.** Horizontal dialogue and active participation are fundamental for learning neuroscientific concepts. Effective connection with non-specialist audiences requires: 1) voice control, 2) body language control, and 3) creativity for neuroscience teaching. We aim to consolidate a community of practice integrating performing arts and narrative into scientific communication.
Financial disclosure: PG-PB and CC-JJ received a fellowship from SECIHTI for postgraduate studies in neuroethology (# 912883 and #1317215 respectively).



Disclosures: P.B. Pensado guevara: None. **J. Cortés Cortina:** None. **G. Varela Castillo:** None. **L. Zavala-Flores:** None. **M.J. Rovirosa:** None. **A.A. Barrientos Bonilla:** None.

Theme K Poster

TKP03: K-12 Teaching and Outreach of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP03.05SU/LL55

Topic: K.02. Teaching of Neuroscience

Support: City of Minneapolis, Opioid Settlement Funds

Title: Developing a Middle-School Neuroscience Curriculum: Closing the Knowledge Gap in Youth Requires Closing the Knowledge Gap in Education Professionals

Authors: *J. LEHMAN[1], J. RUSSO[3], J. CABLE[3], R. RUTHIG[1], A. BALTACI[3], N. BYINGTON[1], B. D. CLARK[2], D. NTABA[1], J. A. SKUZA[3], D. A. FAIR[1];
[1]Masonic Inst. for the Developing Brain, [2]Med. Discovery Team on Addiction, Univ. of Minnesota, Minneapolis, MN; [3]Dept. of Youth Develop., Univ. of Minnesota Extension, Minneapolis, MN

Abstract: Neuroscience is rarely a dedicated focus in K-12 education in the United States; instead, neuroscience learning and curricula are typically reserved for higher education. Yet the value of teaching young people about neuroscience is clear: it can spark interest in neuroscience careers; promote greater empathy for individuals facing mental, behavioral, and developmental health challenges; and help youth better understand themselves. However, the problem isn't just that youth aren't being taught neuroscience—if we look upstream, neuroscience literacy is limited across professionals who support youth learning and development. At best, this can result in the creation of educational materials that are thematically aligned with the intended science but cite imprecise or inaccurate neurobiology; at worst, it can produce content that draws incorrect conclusions and perpetuates misconceptions such as viewing dopamine as a "pleasure chemical". This leaves educators in a bind: either selecting from a limited pool of content that may be understandable but inaccurate, or not teaching neuroscience at all because they feel unequipped. Recognition of this knowledge gap in professionals across the education ecosystem helped inform the development and implementation of the *Catalyst: BrainWaves* curriculum—a middle school neuroscience curriculum designed for non-formal and formal education settings. This curriculum contains twenty-six 30-45-minute learning experiences that have youth exploring neuroscience concepts from the following domains: "Neuroscience Fundamentals" (brain structure, function, and adolescent brain development); "Healthy Brains & Healthy Minds" (physical brain safety, mental health, and emotional wellbeing); and "Substance Use & Addiction" (mechanisms, stigma, and the neurobiology of addiction). To create engaging, pedagogically grounded materials, this curriculum was developed through a collaboration between neuroscientists and youth development professionals, with ongoing didactic instruction providing the team with a common neuroscience foundation. A similar approach guided the creation of curricular support materials, where external vendors received neuroscience briefings that shaped and refined instructional figures and videos. Each lesson was also designed with a brief, lay-friendly neuroscience background section, in an effort to help educators and facilitators feel confident teaching neuroscience. While this approach is resource-intensive in time and effort, its potential to close early neuroscience knowledge gaps underscores its value as a strategy for curricular design.

Disclosures: J. Lehman: None. **J. Russo:** None. **J. Cable:** None. **R. Ruthig:** None. **A. Baltaci:** None. **N. Byington:** None. **B.D. Clark:** None. **D. Ntaba:** None. **J.A. Skuza:** None. **D.A. Fair:** None.

Theme K Poster

TKP03: K-12 Teaching and Outreach of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP03.06SU/LL56

Topic: K.02. Teaching of Neuroscience

Support: NSF Grant 2342866
NIH Grant 1R21AG101586

Title: AI-enabled support for teaching high school geometry using neuroscience-inspired approaches: use of very large spatial scales

Authors: *J.-M. FELLOUS, O. CARRIOLI;
UCSD, La Jolla, CA

Abstract: AI tools such as large language models (LLMs) are becoming increasingly pervasive. Can they be used to support the teaching and learning of biology or mathematics in high school? Can they be tuned to the specific needs of each classroom, small study groups of 3-4 students, or even individual students? We report on an attempt to use AI-enabled note-taking devices (Plaud) to help teach geometry to 9th and 10th graders.
We focus on recent findings suggesting that hippocampal circuits may encode very large spatial scales differently from "regular" spatial scales, such as those traditionally taught in geometry. These very large scales have been hypothesized to involve all antero-posterior levels of the hippocampus rather than posterior regions alone. This increased global involvement of the hippocampus may be more conducive to learning and may generally improve memory.
Geometry instruction and problems were designed using both traditional and very-large-scale examples. Note-taking devices were distributed to student volunteers and used to capture their in-class discussions. Selected, anonymized transcripts were incorporated into a NotebookLM workflow alongside relevant instructional materials from the class textbook. Gemini was used to support prompt design and quality control, while NotebookLM was used to generate study summaries containing deliberate errors for students to detect, as well as problem sets targeting common misunderstandings. These materials were later distributed to students in small groups as pen-and-paper exercises, and their subsequent deliberations and problem-solving discussions were again recorded.
We report on these methods and interventions and speculate on ways in which they may be used and improved to support STEM and neuroscience education in high school.

Disclosures: J. Fellous: None. **O. Carrioli:** None.

Theme K Poster

TKP03: K-12 Teaching and Outreach of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP03.07SU/LL57

Topic: K.02. Teaching of Neuroscience

Title: Immersive Virtual Reality Assessment to Support Educational Planning for Neurodiverse Learners in a Simulated Classroom Environment

Authors: *L. AZAMBUJA[1], J. LIMA DO ESPIRITO SANTO[2];
[1]Private Practice, Porto Alegre, Brazil; [2]Private Practice, Estrela, Brazil

Abstract: Educational systems increasingly face the challenge of identifying and supporting diverse learning profiles in inclusive classroom settings. Traditional neuropsychological assessments provide important information regarding cognitive abilities but may not fully capture how students engage with real-world educational environments. Immersive virtual reality (VR) technologies offer an innovative approach for evaluating attention, self-regulation, and classroom-related behaviors under ecologically relevant conditions while maintaining standardized assessment procedures.

This study explored whether performance patterns obtained in a simulated virtual classroom could characterize educationally relevant cognitive and behavioral profiles across neurodevelopmental conditions. Twenty children (mean age = 7.48 years; mean IQ = 107.2) were assessed using a VR platform. Participants were distributed across five groups: Autism Spectrum Disorder (ASD; n = 4), Attention-Deficit/Hyperactivity Disorder with hyperactivity (ADHD-H; n = 4), Attention-Deficit/Hyperactivity Disorder without hyperactivity (ADHD; n = 4), Dyslexia (n = 4), and Giftedness (G; n = 4). The immersive assessment measured sustained attention, vigilance, processing speed, motor activity, and inhibitory control within a standardized virtual classroom environment.

Distinct learning-related performance patterns emerged across groups. Children with dyslexia demonstrated lower attentional efficiency, suggesting greater vulnerability to classroom demands requiring sustained focus. Participants with ADHD-H exhibited greater inhibitory-control difficulties, whereas children with ASD showed elevated motor activity within the classroom simulation. In contrast, the G group demonstrated consistently strong performance across executive-function measures, including attentional efficiency and processing speed.

These findings suggest that immersive classroom-based assessment can provide meaningful information regarding how different neurodevelopmental profiles interact with educational environments. Beyond traditional cognitive scores, VR-based tools may identify functional patterns directly relevant to student engagement, classroom participation, and learning support needs.

The results highlight the potential of immersive technologies as objective and scalable resources for educational assessment, contributing to individualized educational planning, evidence-informed school decision-making, and more inclusive learning environments for neurodiverse students.

Disclosures: L. Azambuja: None. **J. Lima do Espirito Santo:** None.

Theme K Poster

TKP03: K-12 Teaching and Outreach of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP03.08SU/LL58

Topic: K.02. Teaching of Neuroscience

Support: NIH-SEPA R25 GM146300-01

Title: Evaluating the Impact of a Hands-On Neuroscience After-School Program on STEM Identity and Science Self-Efficacy

Authors: *M. A. COBURN[1], E. M. PURVIS CONWAY[2], M. O. YASSA[2];
[1]Ctr. for the Neurobio. of Learning and Memory, UC Irvine, Irvine, CA; [2]Ctr. for the Neurobio. of Learning and Memory, Univ. of California, Irvine, Irvine, CA

Abstract: Hands-on neuroscience experiences have the potential to transform how youth see science, scientists, and themselves within science pathways. However, neuroscience is seldom included as part of the K-12 curriculum. Informal, out-of-school opportunities are often the only meaningful exposure that youth have to neuroscience. While these experiences provide hands-on learning and mentorship from scientists, their short duration may limit their ability to influence science identity formation. To address this, we designed a twenty-session after-school program that engages high school students over ten weeks. We predicted that sustained neuroscience engagement would increase participants' knowledge and positively influence attitudes and behaviors related to science and science careers.
Here, we share evaluation findings from the Brain Explorer Academy, an NIH Science Education Partnership Award (SEPA)-funded immersive after-school program at the University of California Irvine Center for the Neurobiology of Learning and Memory. The program aims to introduce high schoolers to neuroscience and expose them to scientific content, authentic and hands-on science activities, collaborative learning, and neuroscience careers. An independent external evaluation team employed a mixed-methods approach, including pre-post surveys and focus groups, to examine changes in students' knowledge, attitudes, and practices around science and careers in science. Findings revealed increases in students' confidence explaining neuroscience concepts, understanding how scientists conduct research, and imagining themselves in science careers. Qualitative findings highlighted the importance of supportive instructors, hands-on learning, and opportunities for students to view science as attainable and accessible. We also share lessons learned from designing and implementing a university-based after school neuroscience program. These findings suggest that neuroscience can serve as a powerful entry point for engaging high school students in science and that university-based after-school programs can serve as effective mechanisms to broaden participation in neuroscience.

Disclosures: M.A. Coburn: None. **E.M. Purvis Conway:** None. **M.O. Yassa:** None.

Theme K Poster

TKP03: K-12 Teaching and Outreach of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP03.09SU/LL59

Topic: K.02. Teaching of Neuroscience

Support: Friends of the CNLM fund

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, W. NING, J. LORITSCH, A. MOREHOUSE, M. A. COBURN, E. M. PURVIS CONWAY, M. O. YASSA;
Ctr. for the Neurobio. of Learning and Memory, Univ. of California, Irvine, Irvine, CA

Abstract: As neuroscience continues to reshape how we understand society, the need for a neuroscience-literate workforce increases. However, neuroscience is rarely included in the K-12 curriculum. Informal, out-of-school opportunities are often the only exposure youth have to neuroscience. Early exposure to science increases knowledge, shapes attitudes, and promotes persistence in STEM fields. The Brain Bee is a global competition that introduces adolescents to neuroscience. While local competitions can expose students to neuroscience, science mentors, and institutions of higher education, their structure and impact vary widely. Here, we present the Irvine Brain Bee as a case study to demonstrate how a logic model can guide the development, implementation, and evaluation of neuroscience outreach programs. Data was collected from participant registration forms and a post-program evaluation. We developed a program-specific logic model outlining inputs, activities, outputs, and outcomes. Participants reported perceived increases in knowledge, attitudes, and practices related to neuroscience and neuroscience careers, as well as motivation for participating, perceived impact, and changes in participants' thinking about neuroscience. The logic model is a replicable framework that can be adapted by other Brain Bee chapters and outreach initiatives, serving as a planning roadmap and an evaluation tool to support stakeholder alignment and strengthen sustainability planning.

Disclosures: R.E. Hokenson: None. **W. Ning:** None. **J. Loritsch:** None. **A. Morehouse:** None. **M.A. Coburn:** None. **E.M. Purvis Conway:** None. **M.O. Yassa:** None.

Theme K Poster

TKP03: K-12 Teaching and Outreach of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP03.10SU/Web Only

Topic: K.02. Teaching of Neuroscience

Title: Design and Evaluation of An Interactive Learning Activity For Teaching the Brain Stress Response Pathway

Authors: *H. GILL[1], B. A. PUDER[2];
[2]Basic Sci. Dept., [1]Touro Univ., Vallejo, CA

Abstract: Educational outreach programs with interactive hands-on learning activities have been proven to be effective forms of increasing student engagement and retention in STEM related topics. This project evaluated the effectiveness of an interactive neuroscience outreach activity to teach students about the amygdala, hypothalamus, and sympathetic nervous system specifically through hands-on learning strategies. Over the course of two days, high school students from four surrounding schools participated in an educational outreach station which included a poster presentation and interactive game board activity about the stress response pathway. Students were administered pre- and post- tests to measure the effectiveness of the station. Qualitative data was collected through Likert scale surveys to measure student experience while participating in the station. Results revealed that the post-test mean scores were significantly higher than pre-test scores, indicating improved student understanding following the poster presentation and activity ($p<0.001$). Additionally, the Likert scale surveys revealed above average student ratings across all categories. These findings support the use of interactive outreach activities as effective tools for improving student understanding of the stress response pathway.

Disclosures: H. Gill: None. **B.A. Puder:** None.

Theme K Poster

TKP03: K-12 Teaching and Outreach of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP03.11SU/Web Only

Topic: K.02. Teaching of Neuroscience

Title: Neurobehavioral Insights from Project B.E.H.A.V.E: Autoethnographic Reflections on Classroom Management and Student Regulation in a Behavior-Focused School

Authors: *A. A. BANTOC;
Sci. Dept. - Sunrise Mountain High Sch., Clark County Sch. District, Las Vegas, NV

Abstract: Students in behavior-focused classrooms often experience significant neurodevelopmental and behavioral challenges, resulting in disrupted learning and poor self-regulation. Despite the success of behavioral interventions in general settings, little is known about how neuroscience-informed management practices impact student regulation and classroom climate in these specialized environments. This autoethnographic study systematically documented the implementation of Project B.E.H.A.V.E.—a structured classroom management framework integrating Positive Behavioral Interventions and Supports (PBIS), social learning, and culturally responsive practices—in a U.S. middle school mathematics classroom (grades 6-7, n=5-25 students, ages 11-13, mixed gender). Data comprised weekly reflective journals, classroom artifacts (behavior tracking, routines, “MATHrigold” chip logs), and anonymized student/parent feedback. Thematic analysis was used to identify emergent patterns in student engagement, self-regulation, and classroom adaptation. Scientific rigor was maintained through triangulation of data sources, ongoing reflexivity, and anonymization of all identifying details.

Implementation of structured routines and positive reinforcement (token economy) enhanced predictability and reduced behavioral incidents, especially for students with histories of trauma or emotional disturbance. Students demonstrated improvements in self-regulation, motivation, and classroom participation. Consistent teacher-parent communication reinforced behavioral gains and increased family engagement. Teacher reflection and adaptation proved essential for meeting diverse neurobehavioral needs. No adverse events were reported. Aligning classroom management with neuroscience-informed practices—such as structured routines, positive reinforcement, and reflective adaptation—supports self-regulation and engagement in behavior-focused settings. These findings suggest that proactive, relationship-centered strategies can facilitate neurodevelopmental growth and foster inclusive, resilient learning environments. This work offers actionable insights for educators and policymakers designing management systems for students with complex behavioral needs.

Disclosures: A.A. Bantoc: None.

Theme K Poster

TKP03: K-12 Teaching and Outreach of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP03.12SU/Web Only

Topic: K.02. Teaching of Neuroscience

Title: Stem outreach for high school students on the benefits of neurotrophic brain foods

Authors: *A. LEE[1], B. A. PUDER[2];
[2]Basic Sci. Dept., [1]Touro Univ., Vallejo, CA

Abstract: A neuroscience education outreach station regarding brain nutrition was created to educate high school students (grades 9 - 12) from underserved communities in the California Northern Bay area. The purpose of the station was to educate and inspire curiosity regarding neuroscience in the participants. The station included an educational poster presentation, a hands-on activity testing students' knowledge on brain nutrition and an educational worksheet to review key concepts from the station. To assess the effectiveness of the station, a multiple choice 10 question pre- and post-test was administered to evaluate the efficacy of the educational experience (TUC IRB 26-010). Additionally, a survey was given at the end of the program to obtain student participants' experience and opinions. The station was presented to a total of 105 high school students over a 2-day brain program event period.Quantitative data from the pre- and post-test revealed that the students who participated in the station showed highly statistically significant increases in their knowledge on brain nutrition after participating in the station ($p < .01$). Qualitative data from the student experience survey administered at the end of the brain outreach program revealed that the participating students found the brain nutrition station fun, enjoyable, and easy to understand (average Likert scale ratings of 4.3 out of 5). Therefore, educational outreach programs such as the one executed are effective in engaging students and increasing interest in neuroscience.

Disclosures: A. Lee: None. **B.A. Puder:** None.

Theme K Poster

TKP03: K-12 Teaching and Outreach of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP03.13SU/LL60

Topic: K.02. Teaching of Neuroscience

Title: Partners in Education: 4H and SfN Chapters

Authors: S. YAKOVENKO[1], B. FINT-CLARK[2], *V. GRITSENKO[2];
[1]Suncrest Middle Sch., Morgantown, WV; [2]West Virginia Univ., Morgantown, WV

Abstract: Children in West Virginia, especially young children, have very limited access to STEM education. Our West Virginia Chapter of the Society for Neuroscience aims to increase access to science education, and motivate WV youth to pursue STEM careers. 4-H is a youth organization run by a community of universities that works to increase opportunities for young people to identify and pursue fulfilling careers. Our motivation was to educate 4-H Cloverbuds (kids ages 5-7) about how their brains work to get them interested in neuroscience. We partnered with 4-H to deliver hands-on activities to club members at one of their regular meetings. The activity was led by the primary author, who is a 4-H member and attends Suncrest Middle School in Morgantown, WV. We first gave a short talk on the hemispheres of the brain, explaining what they do. Children were asked to repeat the functions of the lobes and point on their heads to their locations. We then split the children into two groups, one group sculpting model brains out of play-dough, and the others making neurons out of pipecleaners. Groups switched tasks after 5-7 min. We had a 4-H volunteer help lead the play-dough activity, and the primary author co-led the pipe cleaner activity with another teen 4-H member. The activities lasted, in total, about fifteen minutes after which new groups came in. Three groups of 24 children (eight in each group) took part in our station. Children were extremely interested in learning about their brains. They asked multiple questions throughout the explanations, and participated in activities with gusto. Some children donated their pipecleaner neurons to our small neural network, and all learned about how neurons communicated with each other. Big success! Children walked away with playdough creations and huge smiles, swordfighting with neurons. Kids learned about main functions of the brain lobes and the main components of the neuron. We plan to continue these activities and build upon them on an annual basis.

Disclosures: S. Yakovenko: None. **B. Fint-Clark:** None. **V. Gritsenko:** None.

Theme K Poster

TKP03: K-12 Teaching and Outreach of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP03.14SU/LL61

Topic: K.02. Teaching of Neuroscience

Title: Duke University Neuroscience Experience (DUNE) immerses local high school students in mentored summer research

Authors: *A. M. BRIGANDE[1], O. TRAUBERT[2], E. LANG[1], T. SCOTTON[3], L. E. WHITE[3]; [1]Neurobio., [2]Biomed. Engin., [3]Duke Inst. for Brain Sci., Duke Univ., Durham, NC

Abstract: Durham public high school students may grow up minutes from Duke University, yet still not view themselves as belonging in STEM careers or at institutions like Duke. Many come from communities with limited experience navigating higher education and STEM careers, and they often have fewer opportunities to develop skills in scientific inquiry and less access to STEM mentorship. The Duke University Neuroscience Experience (DUNE) program addresses this gap by inviting students into the daily practice of neuroscience research and connecting them with a network of mentors and STEM professionals. DUNE scholars join neuroscience labs at Duke as paid summer interns and conduct full-time, independent research over eight weeks, guided by trained mentors who are PhD students, postdoctoral fellows, and staff scientists. Mentors design projects across disciplines in neuroscience, from translational neurology to computational and systems neuroscience. Scholars generate hypotheses, perform experiments, analyze data, and present their findings as scientific posters at an end-of-program symposium. To build confidence in the lab, scholars learn fundamental neuroscience principles through lectures and hands-on activities. To support them beyond DUNE, scholars participate in college preparation workshops on applications, financial aid, and undergraduate life. Neuroscience professionals from academia, medicine, and industry share their work and career paths, exposing scholars to STEM careers and advising them on the steps to pursue them. After the summer, scholars receive ongoing support from mentors and the DUNE team in applying to college and seeking research opportunities as undergraduates. Since our first cohort in 2021, DUNE has served 32 rising juniors and seniors from local schools and will have served 40 after the 2026 program. Our assessments show that students who participate in DUNE are more confident in applying to college, more certain they want to pursue STEM majors and careers, more competent in research skills, and more knowledgeable about neuroscience topics. DUNE scholars have a 100% high school graduation rate, and 81% go on to pursue STEM majors in college. DUNE's mission is to provide students with the scientific skills, mentorship, and professional development opportunities that position them for success in STEM fields. By connecting scholars with mentors and STEM professionals, immersing them in scientific inquiry, training them to communicate their research, and exposing them to new career paths, DUNE instills in scholars confidence, efficacy, direction, and an authentic sense of belonging as they pursue higher education and STEM careers.

Disclosures: A.M. Brigande: None. **O. Traubert:** None. **E. Lang:** None. **T. Scotton:** None. **L.E. White:** None.

Theme K Poster

TKP03: K-12 Teaching and Outreach of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP03.15SU/LL62

Topic: K.02. Teaching of Neuroscience

Title: Teaching Neuroscience Through the Senses: A Multimodal Approach to Inclusive STEAM Education

Authors: *J. VISWANATHAN;
Baby Senses, Indianapolis, MD

Abstract: Communicating complex scientific concepts accurately to diverse audiences in an engaging manner is a challenge in STEM curriculum development, particularly in early education. Motivated by the lack of children's neuroscience content that is scientifically accurate and creatively engaging, I developed *Baby Senses: A Sensory Neuroscience Primer for All Ages*, a multimodal educational platform that integrates scientifically rigorous content with visual art, narrative storytelling, and emotional vignettes to support early engagement in neuroscience during early developmental critical learning periods during which foundational interest in STEAM is formed. Grounded in rigorous academic research on sensory neuroscience spanning the animal kingdom, *Baby Senses* presents both canonical and non-traditional sensory modalities to diverse audiences. Scientific concepts are conveyed through hand-drawn accurate neuroscientific illustrations. This approach translates cellular- and systems-level processes into visually compelling representations following principles of art such as color and composition, making technical knowledge and associated reference lists accessible to broad audiences. In addition, principles of creative storytelling, including poetry, are woven into the narrative. This approach emphasizes sparking curiosity by linking the "what" (sensory adaptation) and "how" (mechanisms), to the "why" (evolutionary drive/advantage). The approach de-emphasizes technical jargon without shying away from deconstructing the underlying science. Concepts are relatable to everyday experiences while emphasizing abilities that make an animal different marking them as "superpowers", fostering inclusivity. Importantly, it leverages multimodal learning—combining visual, linguistic, and experiential modalities—to engage diverse cognitive profiles, including neurotypical and neurodivergent learners. The integration of art and creative narrative methods further supports emotional engagement, through metaphor, analogy, and the universal parent-child conversation setting. By embedding neuroscience within artistic and narrative frameworks, this work demonstrates how STEAM-based approaches can foster curiosity, accessibility, and sustained engagement with scientific concepts across the lifespan. Since its publication, qualitative analysis of feedback, particularly from the neuroscience community (including SfN AoN audiences) have been positive, highlighting the success of this approach and the need for multi-modal educational resources like *Baby Senses* to inspire the next generation of scientists.

Disclosures: J. Viswanathan: E. Ownership Interest (stock, stock options, royalty, receipt of intellectual property rights/patent holder, excluding diversified mutual funds); Copyright owner for Baby Senses and receive royalties from book sales.

Theme K Poster

TKP03: K-12 Teaching and Outreach of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP03.16SU/LL63

Topic: K.02. Teaching of Neuroscience

Support: Associated Students of the University of Washington Special Appropriations Fund

Title: An undergraduate-led nonprofit advancing accessible neuroscience education through multimodal scientific communication, diversity-oriented outreach, and engaging community events

Authors: ***R. H. YIN**[1], L. TRAVIS[2], C.-Y. LIN[2], A. SCIOCCHETTI[2], E. B.-Y. SHIU[2], E. MCPEEK[2], J. BAI[2], M. BROGAN[2], G. AYER[2], A. NAVIAUX[2], K. DENG[2], A. ZHANG[3], S. COLALUCA[2], A. REEDER[4], C. JIN[5];
[1]Neurobio. & Biophysics, [2]Univ. of Washington, Seattle, WA; [3]Univ. of Washington, San Diego, CA, ; [4]Univ. of Washington, Bremerton, WA; [5]Univ. of Washington, SEATTLE, WA

Abstract: Complex jargon in neuroscience literature has long been a barrier that aspiring neuroscientists face within the field. As neuroscience advances, cost barriers to accessing scientific literature and a lack of diversity among field leaders further exacerbates this gap. Grey Matters Journal at the University of Washington is an undergraduate neuroscience non-profit organization dedicated to addressing these obstacles by creating accessible and high-quality neuroscience education for all. To serve this mission, we establish initiatives to mentor and inspire the next generation of neuroscience enthusiasts and educators within the Seattle area and beyond.

Grey Matters Journal guides undergraduate students through writing, reviewing, illustrating, and designing a free journal that communicates diverse neuroscience topics each academic quarter. To broaden access to our content, we produce it in various media formats and languages. On campus, we host a seminar series where experts from diverse backgrounds present on their contributions to the field and inspire engagement with the neuroscience community. Furthermore, we host events across Seattle, where our volunteers have provided over 14,700 PreK-12th grade students the opportunity to participate in hands-on sheep brain dissections, interact with neurotechnology, and learn about higher education. To involve the general public, we host an Evening with Neuroscience, a free annual event that is held at the University of Washington Seattle campus and livestreamed. Here, over 500 participants connect with a panel of interdisciplinary clinicians and researchers, observe a human brain demonstration, and celebrate neuroscience art and technology.

As our organization grows, we commit ourselves to educational equity by broadening our efforts geographically. Our outreach efforts focus on providing neuroscience demonstrations to under-resourced and underrepresented student groups in Washington state. To further engage high school students with foundational neuroscience topics, we are developing a tailored summer program curriculum, NeuroNet. The program pairs high school students with UW undergraduate mentors to explore current neuroscience research, culminating in a symposium poster

presentation. To encourage accessible neuroscience education throughout the nation, our leadership team facilitates chapter formation and helps support our 14 existing chapters at various institutions. In addition, we are collaborating on a collective journal issue with 6 other chapters. These improvements are essential for furthering our mission of making neuroscience accessible for all.

Disclosures: R.H. Yin: None. **L. Travis:** None. **C. Lin:** None. **A. Sciocchetti:** None. **E.B. Shiu:** None. **E. McPeek:** None. **J. Bai:** None. **M. Brogan:** None. **G. Ayer:** None. **A. Naviaux:** None. **K. Deng:** None. **A. Zhang:** None. **S. Colaluca:** None. **A. Reeder:** None. **C. Jin:** None.

Theme K Poster

TKP03: K-12 Teaching and Outreach of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP03.17SU/LL64

Topic: K.02. Teaching of Neuroscience

Title: Working Memory in Aging and Adult Neurogenic Disorders of Communication: A Review

Authors: *V. BALASUBRAMANIAN;
Seton Hall Univ., Piscataway, NJ

Abstract: This review provides a panoramic view of working memory (WM), focusing on its models, neural bases, role in language, aging, disorders, assessment, and treatment. As such, it will be of use to clinicians, researchers, and students in speech-language pathology and cognitive neuroscience. Overview of Working Memory (WM): WM is an active system language comprehension, and production. It interacts with attention, perception, long-term memory, and motor systems. Theoretical Models and Neural Bases: Baddeley's Multi-component Model, Cowan's Embedded Process Model, and Carpenter & Just's Capacity Theory of WM. Neural substrates: Different WM components are distributed across both hemispheres, involving frontal, parietal, and temporal regions. WM in Language Processing: WM capacity constrains language comprehension and production in adults, children, and individuals with language disorders. Studies show that higher WM span correlates with better performance in complex language tasks. WM Decline in Aging: WM performance declines steadily from young adulthood, affecting both verbal and visuospatial subsystems. Age-related decline is linked to reduced attentional resources, slower processing speed, and decreased inhibitory control. Older adults may compensate with bilateral brain activation during WM tasks. . WM Impairments in Neurogenic Disorders: WM deficits are common in aphasia, apraxia of speech, right hemisphere damage, traumatic brain injury, dementia, and Parkinson's disease. These deficits contribute to broader cognitive and communicative impairments. Details will be offered in the presentation. Assessment of WM: Common measures include span tasks (digit, letter-number sequencing), reading span, n-back tasks, and specialized cognitive tests (e.g., Swanson Cognitive Processing Test, California Verbal Learning Test). Assessment should consider both domain-specific and

domain-general aspects of WM. Treatment of WM: Strategy Training: Teaches encoding, maintenance, and retrieval strategies (e.g., rehearsal, chunking, elaborative encoding). Core Training: Involves intensive, repetitive WM tasks targeting general WM mechanisms (e.g., Cogmed program, n-back tasks). Other approaches include music training, mindfulness, and computerized interventions. Evidence suggests WM can be improved with training, though transfer to real-world tasks and long-term effects require further research. Clinical and Research Implications will be discussed. There is a need for ecologically valid assessment tools and tailored interventions for older adults and those with neurogenic disorders.

Disclosures: V. Balasubramanian: None.

Theme K Poster

TKP04: College Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP04.01SA/LL65

Topic: K.02. Teaching of Neuroscience

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

Authors: P. L. QUIRK[1], L. M. ALLEN[2], B. RICE[3], A. FRICKS-GLEASON[4], A. O'HARE[5], D. A. MITRANO[6], D. A. KOZLOWSKI[7], S. PAREKH[8], G. A. AIMALE[9], T. ELLIS-VAUGHN[10], ***R. J. CALIN-JAGEMAN**[11];
[1]Biomed. Sci., Colorado State Univ., Fort Collins, CO; [2]Psychology Dept, Florida Intl. Univ., Miami, FL; [3]Slippery Rock Univ., Slippery Rock, PA; [4]Creighton Univ., Omaha, NE; [5]Psychological Sci., Weber State Univ., Ogden, UT; [6]Mol. Biol. & Chem., Christopher Newport Univ., Newport News, VA; [7]Neurosci., DePaul Univ., Willow Springs, IL; [8]Psychology and Neurosci., Boston Col., Chestnut Hill, MA; [9]Psychology and Neurosci., Univ. of Colorado Boulder, Santa Fe, NM; [10]Nu Rho Psi, Nu Rho Psi, Newport News, VA; [11]Neurosci. Program, Dominican Univ., River Forest, IL

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 14,000 members, representing 120 chapters in 36 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 2026-27 theme is Neuroscience and AI. 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 Dominican University (exec@nurhopsi.org). Information regarding the charter application process may be found on our web page: https://nurhopsi.org.

Disclosures: P.L. Quirk: None. **L.M. Allen:** None. **B. Rice:** None. **A. Fricks-Gleason:** None. **A. O'Hare:** None. **D.A. Mitrano:** None. **D.A. Kozlowski:** None. **S. Parekh:** None. **G.A. Aimale:** None. **T. Ellis-Vaughn:** None. **R.J. Calin-Jageman:** None.

Theme K Poster

TKP04: College Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP04.02SA/LL66

Topic: K.02. Teaching of Neuroscience

Support: Bucci Fellows Fund

Title: From Classroom to Convention Center: An Experiential Seminar Bringing Undergraduates to the Society for Neuroscience Meeting

Authors: *K. M. NAUTIYAL;
Dartmouth Col., Hanover, NH

Abstract: Neuroscience is a broad and rapidly evolving field, often outpacing textbooks and challenging undergraduate educators hoping to convey the latest advances. To address this, we have expanded on the seminar model developed by Bucci and Falls (2007), which uses the Society for Neuroscience (SfN) annual meeting program as a living syllabus for an undergraduate seminar in neuroscience at Dartmouth College. The course integrates cutting edge topics in research, immersive conference attendance, and structured professional development for advanced neuroscience majors. Each student selects a focus topic drawn from the annual meeting program, finds background and primary literature, and identifies unanswered research questions. In class, students present background material on their topic, lead journal-club discussions on chosen papers, and delineate the known from the unknown. By the time of the conference, students are intimately familiar with their chosen topic and related conference content. They are equipped to engage in meaningful discussions with poster presenters and critically evaluate talks. Students also learn to navigate a major scientific conference - making sense of the Neuroscience Meeting Planner, understanding the various session types, learning to curate a personalized itinerary, participating in social functions, and identifying networking

opportunities. Professional development is another key goal of the course. Students complete the Individual Development Plan for career exploration across academic and non-academic paths. They subsequently plan out networking goals, for example forging connections with potential post-bac and graduate mentors or employers from industries outside of academia. Science communication is also a primary learning goal of the course. Students learn to tell scientific stories to diverse audiences, engage with science social media, and use generative AI responsibly and effectively. Overall, this course aims to develop transferable skills in critical evaluation, networking, communication, and scholarly writing. As higher education evolves, courses prioritizing experiential learning, career readiness, and engagement with the scientific community are increasingly essential. Embedding students directly within a national conference of professional neuroscientists, this model bridges the gap between classroom instruction and the realities of a career in science, and equips students to thrive in a rapidly changing academic and employment landscape.

Disclosures: K.M. Nautiyal: None.

Theme K Poster

TKP04: College Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP04.03SA/LL67

Topic: K.02. Teaching of Neuroscience

Title: The Faculty For Undergraduate Neuroscience (FUN): How our organization shapes future next-generation neuroscientists

Authors: *L. S. NEUWIRTH[1,2,3];
[1]Psychology & SUNY Neurosci. Res. Inst., SUNY Old Westbury, Old Westbury, NY; [2]SUNY Neurosci. Res. Inst., Old Westbury, NY; [3]Fac. For Undergraduate Neurosci., Mount Vernon, OH

Abstract: The Faculty for Undergraduate Neuroscience (FUN) 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 international, national, and regional networks that support undergraduate neuroscience education, research, and faculty development. To this end, FUN has facilitated numerous initiatives that include: the Journal for Undergraduate Neuroscience Education (JUNE), an equipment loan program, travel awards for undergraduates, undergraduate poster sessions, faculty summer workshops, faculty mentoring networks, and faculty social events. These activities are often conducted in collaboration with partners in the neuroscience industry and other organizations. Our community is comprised of 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 come meet us and explore what we have to offer. Please come to learn more about and to join our organization.

Disclosures: L.S. Neuwirth: A. Employment/Salary (full or part-time):; SUNY Old Westbury. Other; Faculty For Undergraduate Neuroscience, President.

Theme K Poster

TKP04: College Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP04.04SA/LL68

Topic: K.02. Teaching of Neuroscience

Title: Teaching neuroscience for the public: A framework for integrating popular science, primary literature, and science communication in the college classroom

Authors: *A. LEKANDER;
Univ. of Michigan, Ann Arbor, MI

Abstract: Neuroscience increasingly influences public discussions of health, education, technology, and behavior. Students and the broader public are more likely to encounter neuroscience through media such as books, podcasts, documentaries, and social media than through primary scientific literature. Many undergraduate neuroscience courses often emphasize content acquisition and technical skills and devote less attention to how these ideas are communicated to non-specialist audiences. To address this challenge, we developed and implemented an upper-level undergraduate neuroscience seminar designed to integrate interdisciplinary thinking, scientific literacy, and effective communication. The course used popular neuroscience literature as an accessible entry point for exploring and integrating topics of hemispheric specialization, cultural history, and the relationship between scientific ideas and society. Students critically evaluated claims presented in popular science texts through guided discussions of primary research articles, historical case studies, and philosophical perspectives. Course activities emphasized source evaluation, scientific discussion, interdisciplinary perspectives, and how to communicate these concepts to broad audiences.This framework positions popular science as a tool for students to engage with primary literature through critical examination of scientific claims and their broader societal implications. By integrating neuroscience, history, and philosophy with science communication, the course provides a model for educators to prepare students not only to understand neuroscience, but also to evaluate and communicate scientific knowledge in an increasingly complex public information environment.

Disclosures: A. Lekander: None.

Theme K Poster

TKP04: College Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP04.05SA/LL69

Topic: K.02. Teaching of Neuroscience

Title: Empowering non-majors to engage with primary research through a low-prep neuroscience course

Authors: *K. M. WIENS;
Sci., Bay Path Univ., Longmeadow, MA

Abstract: Courses for non-majors provide an opportunity to engage students in neuroscience topics while building their curiosity, creativity, motivation, and critical thinking skills. The main goal of this neuroscience-based Perception course was to provide students with practice finding and analyzing primary research related to neuroscience content while encouraging them to connect material to their own career goals, interests, and real-life issues. We used the book Perception: How Our Bodies Shape Our Minds as a text to introduce concepts that are approachable for all majors. We used Figma as a collaborative online workspace where students posted two general resources before the first discussion day and one primary research article before the second discussion day each week. Students came to the first discussion day prepared to discuss the book chapter (~25 pages) and resources posted by their peers. This method encouraged students to follow their interests and become more familiar with the topic using any information format that worked best for them. All class periods started with small group discussions with the prompt “What did you find interesting from your explorations?” Students could then add group questions to the collaboration board, followed by a full-class discussion of selected questions. The second discussion day focused on analyzing primary research articles posted by the students. Each small group chose one primary research article and then explained one figure within that article to the class. Evidence of student participation was recorded using a modified Cornell notes format. Students commented that this course was challenging but interesting and helped them build confidence in critical thinking and data analysis skills. Instructor preparation for this course was minimal, as students took the lead in determining topics to explore further and drove the discussion; review of the collaboration space prior to class provided enough background and topics to help guide the discussion if needed. This approach demonstrates how a low-prep, student-centered neuroscience course can make primary research more accessible and meaningful for non-major students.

Disclosures: K.M. Wiens: None.

Theme K Poster

TKP04: College Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP04.06SA/LL70

Topic: K.02. Teaching of Neuroscience

Title: Development and deployment of a tool to train students to critically evaluate research

Authors: *E. A. HAMMOCK;
Psychology and Program in Neurosci., Florida State Univ., Tallahassee, FL

Abstract: In modern neuroscience, it is standard practice to attempt to understand causal neural mechanisms regulating physiology and behavior. Students and researchers alike develop a reasonable heuristic to vertically integrate across levels of biological organization, such that lower levels support higher levels. This heuristic, while reasonable, likely interferes with critically evaluating research to distinguish causal vs correlational claims. There are numerous research tools available that allow researchers to investigate nervous systems. To the untrained observer, these methods appear as though they will reveal the biological causes of physiology and behavior (i.e., lower levels of biological organization supporting higher levels). However, this is only the case for some methods: some methods can be used to determine causal neural mechanisms because they can be used to manipulate brains (e.g., optogenetics), but other methods only permit observation of the neural correlates (e.g., fMRI). Thus, a fundamental cognitive skill that needs to be trained in learners is to discern when causal claims are permitted vs when they are not. Here, I describe the development and use of the Strategy for Evaluating Empirical Research (SEER), a tool that explicates how to critically read scientific papers, to facilitate cognitive skill development of undergraduate students in an upper-level elective course, Social Neuroscience. After a semester of practice reading 15 pre-selected primary research papers, students are assessed for their ability to evaluate causal claims in the scientific literature. The classroom use of the SEER is well-received by students: students endorse that this course encouraged them to think critically, students report that they wish they learned this method earlier in their college career, and students who later enrolled in graduate school continue to use the SEER in their graduate studies.

Disclosures: E.A. Hammock: None.

Theme K Poster

TKP04: College Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP04.07SA/LL71

Topic: K.02. Teaching of Neuroscience

Support: NSF Grant 2216386

Title: A for effort: Differential preparedness, but not fluency with subject matter, can be overcome by Instruction

Authors: A. GODBOUT-MOSER[1], M. PAQUETTE-SMITH[1], J. WONG[1], ***W. E. GRISHAM**[2];
[1]Psychology, [2]UCLA, Los Angeles, CA

Abstract: In advanced STEM courses, students vary widely in their background knowledge and level of preparedness. Correlational studies suggest that differential preparedness (or prior exposure to material) may influence their performance. We compared two groups of students who differed in their level of exposure to neuroanatomy: Neuroscience majors who had greater exposure and Psychobiology majors who had less. Accuracy in both cohorts were assessed at four time points: a pre-test, immediate post-test, delayed post-test, and on the final exam. Neuroscience majors scored higher on the pre-test. Yet the knowledge gap between Neuroscience and Psychobiology majors narrowed after instruction. These findings suggest that early assessment scores may over-represent the effect of prior exposure and should be interpreted cautiously in educational contexts. We postulated that Psychobiology majors may have closed the gap in knowledge due to having greater Grit (a psychological construct that measures interest and consistent efforts over time). However, in a different but similar cohort of students, we found no difference in Grit Scale Scores. In the first three assessments, we also tested two reaction time measures: latency (how long it took to select the correct answer) and fluency (the number of questions students answered correctly within the first 15 seconds after the question appeared). Neuroscience students took longer to respond on the pre-test, but both groups converged and were statistically indistinguishable in latency by the delayed post-test. Although fluency increased for both groups of students, Neuroscience majors were significantly more fluent at each time point. After instruction, differential preparedness seems to impact fluency to a greater degree than performance. Educational interventions designed to reduce the impact of differential preparedness may be more effective if they contain repeated practice that may decrease gaps in both knowledge and fluency.

Disclosures: A. Godbout-Moser: None. **M. Paquette-Smith:** None. **J. Wong:** None. **W.E. Grisham:** None.

Theme K Poster

TKP04: College Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP04.08SA/LL72

Topic: K.02. Teaching of Neuroscience

Title: An Asynchronous Module Connects Artificial Intelligence and Neural Networks in Undergraduate Neuroscience Education

Authors: ***S. PAREKH**[1], A. NATHAN[2];
[1]Psychology and Neurosci., Boston Col., Chestnut Hill, MA; [2]Dept. of Biomed. Informatics, Harvard Med. Sch., Boston, MA

Abstract: Large language models (LLMs) are rapidly transforming education, research, and healthcare, yet many undergraduate students have limited foundational understanding of how these systems work or how they relate to neuroscience. Understanding how these modules function improves students' ability to use them effectively and responsibly. To address this gap, we developed and implemented an asynchronous educational module introducing the basics of LLMs within the context of an introductory neuroscience course at Boston College. The goal of the module was to provide accessible, foundational AI literacy training while explicitly connecting computational concepts to neuroscience principles familiar to students. The module included sections on: (1) defining large language models, (2) how computers process and understand language, (3) deep learning and neural networks, (4) examples of LLMs and tools built around LLMs, (5) real-world applications of LLMs, and (6) responsible and ethical use of generative AI technologies. A key instructional component connected machine learning concepts to the biological inspiration of artificial neural networks, emphasizing parallels between neuronal connectivity in the brain and deep neural network architectures. This framing was designed to make AI concepts more relevant and approachable for neuroscience students. Students completed the module independently in an asynchronous format and submitted pre- and post-assessments aligned with the module learning objectives. Preliminary findings demonstrated measurable learning gains following module completion. Additionally, most students reported that approximately 50-75% of the material presented was new to them, suggesting that foundational knowledge how of LLMs and generative AI work remains limited even among digitally engaged undergraduate populations. These findings support the value of integrating foundational AI literacy into neuroscience education and demonstrate that neuroscience classrooms may provide a uniquely effective setting for introducing concepts in machine learning and deep neural networks. Given the growing role of artificial intelligence in neuroscience research and society, introducing foundational AI concepts in undergraduate neuroscience courses may help students develop the scientific literacy needed to critically engage with emerging technologies.

Disclosures: S. Parekh: None. **A. Nathan:** None.

Theme K Poster

TKP04: College Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP04.09SA/LL73

Topic: K.02. Teaching of Neuroscience

Title: Student-authored question generation as an active learning strategy improves academic performance in undergraduate neuropharmacology

Authors: T. JESSEN[1], L. WONG[2], ***J. C. G. SNG**[3];
[1]Pharmacol., [2]Physiol., [3]Dept. of Pharmacol., Natl. Univ. of Singapore, Singapore, Singapore

Abstract: Active learning processes such as retrieval practice, elaboration, and metacognitive monitoring are central to the neuroscience of learning yet remain underused in undergraduate science curricula that rely on passive instruction. While answering questions support retrieval and reinforcement, authoring question may more strongly encourage higher-order processing by requiring students to organize concepts, anticipate misconceptions and identify gaps in their own understanding. We tested whether a student-authored question generation activity improves academic performance.In an undergraduate neuropharmacology course at the National University of Singapore. Students generated multiple-choice questions (MCQs) from lecture content using an online peer-learning platform (PeerWise). The activity was voluntary n 2018 and compulsory in 2019 and 2020. We compared end-of-course continuous assessment (CA) scores between cohorts that completed the activity (2018-2020) and historical cohorts that did not (2016-2017). Data were analyzed by unpaired t-test on Microsoft Excel.Across 2018-2020, students authored 156 MCQs and submitted 540 answers. Mean CA scores pre-implementation cohorts were 69.8 ± 14.5% (2016) and 77.7 ± 12.1% (2017), rising to 86.1 ± 10.2% (2018) when the activity was introduced as voluntary and remained elevated when it became compulsory at, 88.0 ± 11.1% (2019) and 83.2 ± 13.7% (2020). CA scores were significantly higher in participating cohorts than in non-participating cohorts ($p = 0.0002$). We also observed a difference of 12% points corresponding to a large standardised effect (Cohen's d ~0.99). These results indicate that student-authored questioning is associated with improved academic performance, consistent with the recruitment of neurocognitive processes underlying retrieval, elaboration, and metacognitive regulation. Question generation may therefore be a low-cost scalable strategy for translating neuroscience-of-learning principles into curricular design, with the emerging influence of generative AI on these processes. A priority for future study.

Disclosures: T. Jessen: None. **L. Wong:** None. **J.C.G. Sng:** None.

Theme K Poster

TKP04: College Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP04.10SA/LL74

Topic: K.02. Teaching of Neuroscience

Title: Organizing exams by Bloom's Taxonomy to assist preparation and reflection

Authors: *T. J. SCHOENFELD, J. PARK;
Belmont Univ., Nashville, TN

Abstract: Bloom's Taxonomy classifies cognitive learning objectives across six domains (remembering, understanding, applying, analyzing, evaluating, creating) and is widely used by educators to design learning outcomes, instruction, and assessments. However, even with instruction on Bloom's Taxonomy and how to use it, students struggle to discern the Bloom's level of exam items and create effective study strategies to prepare for exams. Thus, I scaffolded the structure of courses, exams, and study supports in a Learning & Conditioning course for

psychology and neuroscience majors to intentionally align with Bloom's Taxonomy with a purpose of developing increased awareness, improved study habits, and enhanced exam performance in students. At the start of the course, I provided students with an interactive lecture on Bloom's Taxonomy and a Bloom-centered study guide. Rather than listing specific topics to study, the study guide outlined concrete learning strategies aligned with each Bloom's level, applicable to learning content from any course. Students also completed exam wrappers to document their preparation strategies and reflect on their performance with each exam. Critically, exams were intentionally structured around Bloom's Taxonomy and organized by cognitive domain, with students progressing from questions on remembering and understanding to applying, analyzing, and finally evaluating questions, regardless of question format. This structure helped students become more aware of the level of thinking required for each question and better reflect which Bloom's domains they prepared effectively or ineffectively for. Combined with the study guide, students could more strategically adjust their study behaviors across the semester. On the first exam, students naturally did well on remembering and understanding-level questions, but had poor performance on questions at the higher levels of Bloom's. After multiple exams, students' performance on all levels improved and student feedback suggested that the exam wrappers and question structure helped them recognize how to better prepare for future exams.

Disclosures: T.J. Schoenfeld: None. **J. Park:** None.

Theme K Poster

TKP04: College Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP04.11SA/LL75

Topic: K.02. Teaching of Neuroscience

Title: A Novel Approach to using AI in a Student-centered Course to Promote Active Learning and Quantitative Reasoning

Authors: *A. C. NICHOLAS, **C. SINGH**;
Neurobio. & Behavior, Univ. of California, Irvine, Irvine, CA

Abstract: Students in active learning environments perform significantly better with studies showing improvements up to 20-30% in STEM courses (Freeman et al., 2014). Research suggests that active, student-centered learning approaches such as collaborative problem-solving and application-based activities can enhance cognitive skills and improve knowledge retention compared to traditional lecturing methods (Prince, 2004). In neuroscience education specifically, there is still limited research on how instructional design influences learning outcomes. In addition, AI has changed the rules of active instruction given that many traditional active learning approaches such as worksheets, paper analysis and written reflections can be offloaded to an AI assistant, rendering the student struggle ineffective. To counter this, our course implemented structured activities promoting intentional use of AI to facilitate students' ability to

analyze data. These quantitative reasoning activities were employed in a newly-developed undergraduate general education course, the Neuroscience of Wellbeing, at the University of California, Irvine. The activities required collecting raw data, analyzing, graphing and incorporating data findings into current literature and relating them to core course content, providing opportunity for application, synthesis, and evaluation. Activities include scenario-based questions, data collection surveys, and data analysis to connect neuroscience concepts to real-world contexts.
This course was uniquely supported by senior STEM undergraduate learning assistants who participated in both pedagogical training and education research. In this role, students assisted the instructor with activity implementation as well as contributing peer-informed perspectives to curriculum design. Enrolled student learning gains were assessed using pre/post-course tests to measure changes in comprehension and retention. In addition, students completed qualitative surveys regarding their course experience.
Expected outcomes include significantly increased depth of conceptual understanding, improved ability to apply knowledge across topics, and greater confidence in quantitative reasoning.
References:
Freeman S, Eddy SL, McDonough M, et al. Active learning increases student performance in science, engineering, and mathematics. Science. 2014;344(6189):841-844. Prince M. Does active learning work? A review of the research. Journal of Engineering Education. 2004;93(3):223-231.

Disclosures: A.C. Nicholas: None. **C. Singh:** None.

Theme K Poster

TKP04: College Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP04.12SA/LL76

Topic: K.02. Teaching of Neuroscience

Title: Exploring controversial science topics through structured, class-wide debate

Authors: *S. E. PICKERNELL;
Psychological and Brain Sci., Indiana Univ., Bloomington, IN

Abstract: While STEM students often prefer definitive answers, science often exists in “grey” areas requiring critical synthesis and developing your own thoughts on controversial topics through synthesis of contrasting evidence. To bridge this gap, structured class-wide debate is employed in my upper-level undergraduate Neuroscience of Mood Disorders (P457) course. The debate addresses the controversial use of non-human animal models to study innately human mood disorders. Students are divided into "for" and "against" groups and provided with foundational literature and lecture material to supplement their own independent research. The formal debate structure includes opening statements, rebuttals, and closing statements formulated as a team. Assessment utilizes a rubric evaluating respectful discourse, information quality, attendance/active listening, and a post-debate reflection. Results from student reflections and

evaluations indicate that the debate successfully encourages multifaceted thinking and deepens understanding of complex ethical issues. Furthermore, students reported increased confidence in reading and discussing primary scientific literature.

Disclosures: S.E. Pickernell: None.

Theme K Poster

TKP04: College Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP04.13SA/LL77

Topic: K.02. Teaching of Neuroscience

Support: NSF Grant 2315440

Title: Turning neuroscience research into instructor-authored lessons and assessments for undergraduates with Show Me the Brain!!

Authors: *N. C. HINDY[1], A. J. BISHARA[1], E. LOVELLETTE[2], I. A. HAAS[2], J. R. PANI[3,4]; [1]Psychology, [2]Computer Sci., Col. of Charleston, Charleston, SC; [3]Show Me the Brain!!, LLC, Portland, ME; [4]Psychological and Brain Sci., Univ. of Louisville, Louisville, KY

Abstract: Instructors increasingly need ways to teach neuroanatomy using multimodal brain representations, yet most digital resources offer fixed, generic content rather than tools for authoring course-specific materials. This creates a translation problem that Show Me the Brain!! (SMtB) addresses by combining research-derived multimodal neuroanatomy with instructor authoring tools (Hindy et al., *Anatomical Sciences Education*, 2026). SMtB integrates research-derived anatomical data, including Visible Human cryosections, MRI, 3D gray matter models, label maps, and coordinate tools, within a co-registered graphical environment. It also incorporates white-matter pathways reconstructed from diffusion MRI tractography, allowing instructors to relate brain structures to the anatomical pathways among them, a perspective increasingly central to contemporary neuroscience. Building on our prior classroom studies of SMtB learning effects (Hindy et al., *Anatomical Sciences Education*, 2025), we focus here on the authoring system that enables instructors to create course-specific instructional content. In SMtB Desktop, instructors build scenes, assemblies, narratives, and assessments that specify what students see, how they interact with it, and what feedback they receive. These tools generate portable files that define displays, options for student interaction, and feedback, so the same materials can be used for instruction and assessment in SMtB Web, the student-facing web reader. Assessment authoring produces course-aligned quizzes tied to specific anatomical scenes, with selected structures and orientations saved as reusable views, configurable answer lists and multiple-choice distractors, feedback options, timing, number of attempts, and testing modes such as open-book practice or formal testing. Using these tools, we authored chapter-by-chapter neuroanatomy lessons and quizzes aligned with assigned textbooks for two undergraduate courses, an introductory behavioral neuroscience course and an advanced systems and integrative

neuroscience course. This classroom use demonstrates that SMtB supports a complete instructional workflow, from research-derived anatomical representations to instructor-authored lessons and student-facing assessments. Because authored materials are portable, this model provides a foundation for future cross-institutional sharing, adaptation, and reuse of instructor-authored content.

Disclosures: N.C. Hindy: None. **A.J. Bishara:** None. **E. Lovellette:** None. **I.A. Haas:** None. **J.R. Pani:** None.

Theme K Poster

TKP04: College Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP04.14SA/LL78

Topic: K.02. Teaching of Neuroscience

Title: Practical Neuroscience, a course to introduce undergraduate students to research methods used in neuroscience

Authors: *N. J. POWELL;
Allegheny Col., Meadville, PA

Abstract: Practical neuroscience is a course designed to acquaint undergraduate students with the range of experimental techniques used in modern neuroscience. Due to the breadth of levels of investigation and the rapid progress of technology, there is a huge diversity of experimental techniques commonly used in neuroscience experiments. In order to really understand the research that supports our current state of knowledge, and to design future experiments, it is important for students to understand how these techniques work, when each is appropriate, and what they really tell us about the nervous system. However, fully introducing these techniques in other neuroscience classes, particularly in an undergraduate curriculum, can be challenging.
In the first 2 iterations of this course, I've used the Guide to Research Techniques in Neuroscience by Carter, Essner, Goldstein, and Iyer. I mix textbook readings and informational lectures with practical tours of labs available on campus and at nearby Universities. The goal of these lab visits and field trips is to further introduce students to the reality of conducting experiments (how much space is in a SEM chamber? How loud is it during an fMRI? What does a well isolated single unit sound like?) Additionally, I hope that meeting scientists and fellow students conducting research will normalize the experience for students who may not see themselves as researchers. For the second iteration, I also encouraged students to reach out to faculty on campus and beyond to set up class visits or field trips, which has the added benefit of encouraging students to contact scientists directly. In addition to experimental techniques, we also explore the different model species used in neuroscience, and the advantages and disadvantages of each. Each class also employed a scaffolded assignment encouraging students to develop an ideal "budget free" experiment to answer some question of interest in neuroscience with a focus on exploring the most appropriate experimental species, technique, and design to

answer it. These projects always include some aspect of peer review, as well as both a written project description and an in-class presentation so that all students can engage with each other in the project development process. Upon completion of the class, students should be able to describe multiple different experimental techniques used in neuroscience research and explain what they are actually measuring, describe multiple different species used in neuroscience research and explain the benefits and drawbacks of each, and evaluate the appropriate choice of both species and technique for evaluating a particular experimental question.

Disclosures: N.J. Powell: None.

Theme K Poster

TKP04: College Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP04.15SA/LL79

Topic: K.02. Teaching of Neuroscience

Support: NIH R25 NS130655

Title: Undergraduate research experience in computational brain science

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

Abstract: 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. We describe our ongoing development and implementation 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 computational neuroscience research, computational fluency, and professional skills development. We recruit participants through The Leadership Alliance (TLA), an organization devoted to training outstanding leaders and role models in academia, the public, and the private sector. Through TLA's Summer Research Program, undergraduates gain research experience and mentoring in the principles underlying the responsible conduct of rigorous 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 computationally focussed neuroscience 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 of the program, that provides hands-on experience with fundamentals of research computing. To learn about the broad range of neuroscience topics, participants participate in weekly meetings with rotating computational neuroscience 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. Now in our third year, we summarize our experience so far, ongoing challenges, and planned refinements.

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

Theme K Poster

TKP04: College Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP04.16SA/LL80

Topic: K.02. Teaching of Neuroscience

Title: Creating an Undergraduate Neuroscience Research Experience with Open, Big Data and Computational Tools

Authors: *S. RAMAKRISHNAN[1], K. CASIMO[2];
[1]Univ. of Puget Sound, Tacoma, WA; [2]Allen Inst., Seattle, WA

Abstract: While the field of neuroscience is rapidly advancing with moves towards large data sets from whole brains, undergraduate neuroscience experiences are still limited by access to these data resources, tools to analyze them, and opportunities for students to develop their data science and coding skills. In Fall 2025, the University of Puget Sound collaborated with the Allen Institute to create an Advanced Topics in Neuroscience course for senior neuroscience students that would facilitate student-designed research projects using open data, with the potential to generate novel findings. Students had at least one introductory neuroscience course, and some lab experiences, but no specific coding experience was required. The class size was small, at 7 students. Three teams of Allen Institute researchers presented tutorials on the open dataset(s), background on the science underlying the dataset, the online environments, Jupyter/Google CoLab notebooks to mine the data, and frameworks for analysis. Following the initial tutorials, students developed a mid-term proposal to use the dataset of their choice to ask hypothesis-driven questions. They then worked independently over the semester to implement their code, analyze the data, and produce results, with the opportunity to check in with the course instructor (Ramakrishnan) and Allen Institute scientists for guidance and questions as needed. Students presented their final work as posters at the Allen Institute. All 4 projects were successful with tangible results and progress. Student feedback indicated a high level of engagement with the material, an increased level of comfort in coding and understanding the nature of big data. Students also gained a tangible understanding of the imperfections and messiness involved in the data collection and annotation process and an appreciation of what

"real world" neuroscience research meant. We will offer the course again in fall 2026, implementing revisions to the tutorials and course structure in response to student feedback. This poster will elucidate the course structure, data sets used, assessment components, sample student proposals and presentations, as well as student feedback/comments from the course. We will also discuss the challenges and opportunities in creating a computational neuroscience course at the undergraduate level using open data.

Disclosures: S. Ramakrishnan: None. **K. Casimo:** None.

Theme K Poster

TKP04: College Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP04.17SA/LL81

Topic: K.02. Teaching of Neuroscience

Support: NSF Grant 2332375

Title: Giving students a "taste" for research: introducing connectomics through a course-based undergraduate research experience (CURE) lab module

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

Abstract: Course-based undergraduate research experiences (CUREs) are an effective way to provide experiential learning opportunities to large numbers of students. Even a single lab module conducted as a CURE within a large, introductory neuroscience course can allow students to participate in the scientific process. Connectomics represents an exciting and rapidly developing area of Neuroscience that can be used to teach students about the relationship between neuroanatomy and brain function. The whole-brain connectome in the fruit fly, *Drosophila melanogaster*, is easily accessible through FlyWire and the FlyWire team has created tutorials for incorporating this database into classrooms. Here, I describe my specific approach of using FlyWire connectomics as a CURE with participation from ~100 second-year undergraduate students over one academic year. This single-lab module is based on the research in my lab, focused on understanding the neural circuits that control taste sensation and feeding behavior. The lecture portion of the lab was designed to introduce students to the larger scientific question about amino acid taste, leading them to conclude that understanding the connectivity of specific neurons in the taste circuits would help to answer our research questions. Then, groups of 3 students were assigned 1 starting taste neuron and followed a series of steps compile information about all second-order neurons, visualizing how taste information flows anatomically in the fly brain. I created a worksheet to guide students to make hypothesis about taste information processing in the brain based on neuroanatomy (local neurons vs. projection neurons) and predicted neurotransmitters (excitatory vs. inhibitory). Students reported that they were able to apply concepts from across the semester to one specific question and felt motivation

by contributing to an ongoing research project. This single-module CURE can readily be adapted to other circuits and questions across levels in neuroscience education.

Disclosures: M. Stanley: None.

Theme K Poster

TKP04: College Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP04.18SA/LL82

Topic: K.02. Teaching of Neuroscience

Support: Unity x Meta Higher Ed Innovation Grant

Title: BrainVoyage XR: A Free Mixed Reality Game for Introductory Neuroanatomy

Authors: *L. PETLEY[1], A. LEE[2];
[1]Clarkson Univ., Potsdam, NY; [2]Arizona State Univ., Phoenix, AZ

Abstract: Learning neuroanatomy from verbal descriptions and textbook figures is a challenging task that relies on visuospatial skills to translate this knowledge into a 3D mental representation of the brain. Interactive 3D figures are a popular choice for overcoming this limitation, but the gold standard remains brain dissections. At the undergraduate level, such dissections typically involve sheep's brains. This long-standing pedagogical approach has many benefits, but sheep's brains differ considerably from human neuroanatomy. Furthermore, the formaldehyde that is used to fix such specimens is increasingly being recognized for its carcinogenic properties, making it impossible for instructors who lack access to ventilated lab spaces to use this approach. Mixed reality provides a mechanism for students to interact with brain models in a fashion that is similar to dissections without such risks. Further, the method allows direct access to human neuroanatomy, increasing its relevance for students who are pursuing careers in medicine, psychology, and cognitive neuroscience. Supported by a Higher Ed Innovation grant, we have developed a mixed-reality game that teaches neuroanatomy in this manner. The game's scope aligns with neuroanatomy as taught by open-source introductory psychology textbooks. It has several important advantages over other interactive 3D neuroanatomy tools, including true stereoscopic visualization via head-mounted display, natural coloration rather than colorized neuroanatomical landmarks, and the use of collaborative problem-solving. We present a literature review covering the rationale for the game's design and offer visitors an opportunity to try it. The game is freely available and requires relatively low-cost virtual reality hardware, making it an accessible option for instructors who lack the infrastructure to teach using biological specimens.

Disclosures: L. Petley: None. **A. Lee:** None.

Theme K Poster

TKP04: College Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP04.19SA/LL83

Topic: K.02. Teaching of Neuroscience

Support: NSF Grant EFRI BRAID-2223822
NSF Grant DGE-2241144

Title: Empowering the next generation of neural engineers: an open-sourced neural-decoding workshop for undergraduates

Authors: *O. G. LEE[1], H. TEMMAR[4], J. HUANG[8], S. NARASIMHA[9], L. M. OSTROWSKI[11], L. STANWICKS[12], R. SRISTI[8], R. PARSONS[1], J. T. COSTELLO[5], L. H. CUBILLOS[6], M. J. MENDER[2], M. M. KELBERMAN[7], A. L. PRITCHARD[13], D. M. MIFSUD[14], C. PANDARINATH[15], G. MISHNE[10], V. GILJA[16], C. A. CHESTEK[3];
[2]Biomed. Engin., [1]Univ. of Michigan, Ann Arbor, MI; [3]Biomed. Engin., Univ. of Michigan, ANN ARBOR, MI; [4]Biomed. Engin., [6]Robotics, [5]Univ. of Michigan, Ann Arbor, Ann Arbor, MI; [7]Univ. of Michigan, Ann Arbor, Glen Ellyn, IL; [8]Electrical and Computer Engin., Univ. of California San Diego, La Jolla, CA; [9]Neurosciences Grad. Program, UC San Diego, San Diego, CA; [10]UC San Diego, La Jolla, CA; [11]Neurosciences Grad. Program, UCSD MSTP, Neurosciences, La Jolla, CA; [12]Psychology - McGill Hall, Univ. Of California San Diego, SAN DIEGO, CA; [13]Biomed. Engin., Emory Univ., Atlanta, GA; [14]Biomed. Engin., Georgia Inst. of Technol., Atlanta, GA; [15]Biomed. Engin., Emory Univ. and GA Tech., Decatur, GA; [16]Electrical and Computer Engin., Paradromics, San Francisco, CA

Abstract: Brain-computer interfaces are emerging as a highly interdisciplinary field between neuroscience, machine learning, and engineering. However, educational pathways that introduce undergraduate students to neural decoding early-on remain scarce. To bridge this gap, we developed a two-day neural-decoding workshop for undergraduates through the NSF EFRI-BRAID program. We present this workshop under an open-sourced framework to equip educators with the resources to host their own hack-a-thon style, neural decoding workshop. Our team assembled a body of four neural datasets and comprehensive training materials for undergraduate students from diverse backgrounds. Student teams were formed and the groups developed their own neural-decoding projects which they completed over the two days. We gave feedback on the student projects throughout and ran mini-workshops covering data visualization, statistical analysis, machine learning methods, and latent neural dynamics. In addition to technical content, the workshop also included career talks and a graduate student panel. Improving iterations of these workshops were run over the duration of the EFRI-BRAID program in 2023, 2024, and 2025 at the University of California San Diego and at the University of Michigan. To evaluate and demonstrate the framework's multi-site extensibility, current expansion efforts focus on adapting and running the workshop at the Georgia Institute of Technology and Emory University, which introduces a new open-source dataset and undergraduate-focused tutorial module to the curriculum. An open-access GitHub repository is linked below which serves as a collection of the workshop materials and a guide for future

workshop organizers. The repository contains the workshop curriculum including a suite of slideshows, Python code and Jupyter notebooks that walks students from technical lectures and mini workshops into applying these skills with real-world neural datasets during their projects. The repository serves as a blueprint for organizers, with example workshop schedules, team rosters, outreach flyers, and a standardized rubric for project evaluations. Examples of forms used for student registration and gathering post-workshop feedback are available. A historical archive of the materials used for each of the workshop iterations serves as a case study for future adaptations. The repository is publicly available for download at this link: https://github.com/chesteklab/neural-decoding-workshop.

Disclosures: O.G. Lee: None. **H. Temmar:** None. **J. Huang:** None. **S. Narasimha:** None. **L.M. Ostrowski:** None. **L. Stanwicks:** None. **R. Sristi:** None. **R. Parsons:** None. **J.T. Costello:** None. **L.H. Cubillos:** None. **M.J. Mender:** None. **M.M. Kelberman:** None. **A.L. Pritchard:** None. **D.M. Mifsud:** None. **C. Pandarinath:** None. **G. Mishne:** None. **V. Gilja:** A. Employment/Salary (full or part-time):; VG holds shares in Neuralink Corp. and is Chief Scientific Officer and an options holder at Paradromics, Inc.. **C.A. Chestek:** None.

Theme K Poster

TKP04: College Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP04.20SA/LL84

Topic: K.02. Teaching of Neuroscience

Title: Assessing User Problem-Solving and Attention in a Neurophysiology Simulation Via Eye Tracking and Retrospective Think-Aloud Interviews

Authors: E. ALLAN[1], L. LOVEJOY[3,2], T. WILLIAMS[1], L. ASANTE[4,2], D. O'DONOGHUE[5,6], *E. C. LEININGER[1];
[2]Neurosci., [1]St. Mary's Col. of Maryland, St. Mary's City, MD; [3]Newburg, MD, ; [4]Waldorf, MD, ; [5]Silver Spring, MD, ; [6]Neurosci., St. Mary's Col. of Maryalnd, St. Mary's City, MD

Abstract: Digital simulations provide an opportunity to teach foundational concepts in neurophysiology in contexts where wet labs are not feasible. While the efficacy of simulations can often be measured through pre-post content surveys, less is known about how users interact with simulations as they engage in learning. Visual attention, paired with think-aloud interviews, allows us to know both what information a learner perceives through a visual modality, and how factors such as level of expertise and metacognition influence interaction. Here we report visual attention patterns and think-aloud themes from learners as they interact with the neuroscience simulation Crescent Loom, which can be used to teach concepts related to how small neural networks generate behaviors using a simulated organism and a schematic of its "in vitro" brain. We used eye-tracking to examine which parts of the game students visually attended to across 3 groups of students with varying levels of previous knowledge in neuroscience. After free exploration of Crescent Loom, participants completed a specific task within 5 minutes and

completed a retrospective interview regarding their thought process and a post survey to gather demographic and usability information. Overall, there was no significant effect of prior neuroscience experience on attention distribution across regions of interest in Crescent Loom. Across all participants, there was a significantly higher total fixation time and number of visits to the brain and creature, relative to other areas of the game. Participants had a significantly longer average fixation time on the brain, relative to other areas. Think-aloud interviews revealed themes related to usability, neuroscience knowledge, game mechanisms, and metacognition. This suggests easy adaptability of Crescent Loom across groups despite differences in neuroscience content knowledge, suggesting the potential for flexible use across course contexts.

Disclosures: E. Allan: None. **T. Williams:** None. **E.C. Leininger:** None.

Theme K Poster

TKP04: College Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP04.21SA/LL85

Topic: K.02. Teaching of Neuroscience

Title: Supporting Undergraduate Scientific Literacy Skills Using Custom Web Apps

Authors: *D. SCHNITZLER, M. STEFAN;
Med. Sch. Berlin, Berlin, Germany

Abstract: Undergraduates in science programmes often struggle to engage with foundational scientific literacy skills (SLS), including data analysis and the critical reading of primary scientific literature (PSL). The barriers to learning these skills include limited prior exposure, restricted access to appropriate tools, and a perception of high complexity, leading to anxiety and disengagement (Goudsouzian & Hsu, 2023; Paci et al., 2025). Moreover, as students readily adopt generative AI tools, educators are challenged to emphasise the intrinsic value of learning SLS. To address these issues, we developed BlinkR and Parsible using a Shiny framework: open-source web apps to support the learning of SLS through interactive, low-barrier approaches, taking a research-informed approach to teaching (Hagtvedt et al., 2007).
BlinkR and Parsible are device agnostic, interactive browser-based tools, providing accessible and scaffolded learning approaches, grounded in pedagogical evidence. BlinkR supports learning of scientific research processes through guided workflows, from hypothesis development to statistical analysis with R. Parsible demonstrates how to parse PSL, guiding learners through identifying relevant information, assessing methodological quality, and independently interpreting results.
BlinkR has been embedded in a course for medical students, demonstrating that targeted web apps can be successfully implemented within curricula. Parsible extends this approach by supporting independent development of SLS.
While formal evaluation is ongoing, there has been positive uptake of these tools, illustrating

how course-integrated digital resources aligned with specific learning objectives can enhance accessibility, student agency, and engagement in SLS.

Disclosures: D. Schnitzler: None. **M. Stefan:** None.

Theme K Poster

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Topic: K.02. Teaching of Neuroscience

Support: NIH Grant R25AG076406

Title: Promoting undergraduate student success through aging research: the UWM STAR program

Authors: *C. R. BOWMAN[1], K. M. ESGUERRA[2], T. MCKINNEY[2], G. NAGY[2], K. M. FRICK[3];
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Abstract: The U.S. population is aging rapidly, which is sure to strain current systems for supporting and caring for older adults, creating an urgent need to understand aging processes and find new and innovative ways to support older individuals. Issues of aging are particularly acute for those at increased risk for age-related health issues, like low-income older adults and older adults of color. Biomedical researchers trained in aging and health disparities are needed to make advances that will help keep older individuals healthy. The Success Through Aging Research (STAR) program at the University of Wisconsin-Milwaukee is an undergraduate training program that aims to increase the engagement of undergraduate students in aging and health disparities research, with the long-term goal of growing the pool of aging researchers available to promote health in older age. The program provides students with structured, multi-year research experiences with close faculty mentorship. Additional program elements include tailored learning opportunities and curriculum, professional development, cohort building, and preparation for graduate study. The first cohort of students was enrolled in Fall 2023, with two subsequent cohorts enrolled in Fall 2024 and Spring 2026. Of the 31 students enrolled in the program, 22 agreed to participate in program evaluation. Surveys were administered at program entry and at the end of each semester, for a total of 6 waves of data collection to date. Demographic questions revealed that groups typically negatively affected by health disparities (low-income individuals and individuals of color) are well represented within the STAR program (45% Black or Latino, 41% First generation college, 41% Pell eligible). The biggest factors driving students' decisions to join the program were interest in addressing health disparities and desire for research mentorship, and those motivations remained relatively stable throughout the time in the program. Students also rated their feelings of competence across four domains:

Research, Academics, Aging and Health Disparities Knowledge, and Career Development. All domains except Academics showed significant improvement throughout time in the program, with Aging and Health Disparities Knowledge and Career Development showing the greatest improvement. Together, results suggest that the STAR program effectively engages undergraduate students in aging and health disparities research and trains them for the next stage of their careers. If replicated elsewhere, this program holds promise for positively changing the gerontology workforce at a national scale.

Disclosures: C.R. Bowman: None. **K.M. Esguerra:** None. **T. McKinney:** None. **G. Nagy:** None. **K.M. Frick:** None.

Theme K Poster

TKP04: College Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP04.23SA/LL87

Topic: K.02. Teaching of Neuroscience

Support: NSF RCN-UBE #2217333
NIH 1UM1NS132253

Title: Connecting to Connectomes: Teaching Fundamental Neuroscience Principles Using Connectomics Datasets

Authors: K. J. COLODNER[1], D. SITARAMAN[2], ***A. C. BELLEMER**[3];
[1]Neurosci., Mount Holyoke Col., South Hadley, MA; [2]Psychology, California State Univ. East Bay, Hayward, CA; [3]Dept. of Biol., Appalachian State Univ., Boone, NC

Abstract: Laboratory activities based on authentic research data are broadly understood as a valuable supplement to classroom-based undergraduate education, but these opportunities may be limited at many institutions by laboratory infrastructure, instructor training, and budget constraints. The burgeoning neuroscience subfield of connectomics, which seeks to systematically reconstruct and analyze the neuroanatomy and connectivity of entire nervous systems or brain regions, provides a promising opportunity to incorporate authentic research into undergraduate coursework. To this end, we have developed, implemented, and assessed laboratory modules that address fundamental neuroscience concepts including neuroanatomy, neural ultrastructure, and synaptic connectivity and that incorporate connectomics datasets, analytical tools, and concepts. These modules incorporate data from two major connectomics datasets: the Female Adult Fly Brain (FAFB) dataset, a complete reconstruction of the *Drosophila* brain as a set of serial transmission electron microscopy sections, and the MICrONS dataset, a reconstruction of a cubic millimeter of mouse visual cortex. These modules have been implemented at several institutions ranging from private small liberal arts colleges to public R1 institutions. Our assessment of instruction using these modules suggests that they promote

learning of fundamental neuroscience concepts and create opportunities for students to perceive themselves as part of a community of scientists.

Disclosures: K.J. Colodner: None. **D. Sitaraman:** None. **A.C. Bellemer:** None.

Theme K Poster

TKP04: College Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP04.24SA/LL88

Topic: K.02. Teaching of Neuroscience

Support: NSF Grant 2416714

Title: Learn with Worms: StressCURE's Modular Approach to Innovative Laboratory Design for Integrating Research into Undergraduate Neuroscience Courses.

Authors: *S. CAITO[1], J. HALL[2], J. HARTMAN[3], J. NEWELL-CAITO[1], J. GRAY[4]; [1]Univ. of Maine, Orono, ME; [2]Biol. and Chem., Lincoln Mem. Univ., Harrogate, TN; [3]Med. Univ. of South Carolina, Charleston, SC; [4]US Coast Guard Acad., New London, CT

Abstract: Research has shown for undergraduates that earlier exposure to research leads to increased retention in STEM, self-identification as a scientist, and graduate school progression. Course-based Undergraduate Research Experiences (CUREs) are an effective way to expose undergraduates to research in the regular course of instruction throughout their curriculum. StressCURE is an NSF-funded program supporting six faculty members to develop a modular approach to CURE design focused on the concept of biological stress in the C. elegans model system. Biological stress is defined as anything that disrupts the homeostasis of an organism, including genetic alterations, alternative diets, and exposure to toxicants or temperature extremes. The first StressCURE modules developed focused on behavioral assessments and tested at the primary author's institution along with at least one other institution, refined, and then evaluated by the advisory board. Finalized protocols are published on the StressCURE website (www.stresscure.org) and communicated at scientific conferences to encourage adoption. Efficacy of the overall StressCURE model was assessed using validated survey instruments according to a pathway model approach to program assessment. Herein, we describe how StressCURE can be used to build a full length (15 week) neuroscience laboratory course. Students select their stressor of choice and proceed through a series of modules exploring dose-responses to the stressors, locomotion, simple and complex behaviors. StressCURE's first thirteen modules have produced significant interest, having been successfully adopted in the laboratories of investigators, with several other faculty members planning to adopt them. Use of the modules significantly reduced the workload required to adopt a new laboratory protocol for teaching laboratories. Future assessments will determine efficacy outside of the investigator group through surveys and ongoing mentoring. Upcoming modules will continue neuroscience topics as well as include biochemical, molecular, and genetic protocols. This material is based

upon work supported by the National Science Foundation under Grant Number 2416714 as part of the Improving Undergraduate STEM Education (IUSE EDU).

Disclosures: S. Caito: None. **J. Hall:** None. **J. Hartman:** None. **J. Newell-Caito:** None. **J. Gray:** None.

Theme K Poster

TKP04: College Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP04.25SA/LL89

Topic: K.02. Teaching of Neuroscience

Support: Border Biomedical Research Center
Department of Biological Sciences
Research Incentive Funds (AMK)

Title: A new curriculum for a decade-old Brain Mapping & Connectomics course-based undergraduate research experience: Integration of 3-D imaging, software engineering, and digital humanities into the existing pedagogical framework

Authors: A. M. KHAN[1], I. ACEDO AGUILAR[2], S. BALIVADA[3], ***M. N. MUNOZ**[1], C. E. D'ARCY[1];
[1]Biol. Sci., Univ. of Texas at El Paso, El Paso, TX; [2]Biol. Sci., Univ. of Texas at El Paso, Ciudad Juarez, Mexico; [3]Univ. of Texas at El Paso, El Paso, TX.

Abstract: For over ten years, we have deployed a two-semester freshman laboratory course-based undergraduate research experience called Brain Mapping & Connectomics (BMC). In BMC, freshman undergraduates learn basic biological lab skills while learning more about neuroscience, contributing to the mapping of novel chemoarchitecture in the rat brain and using a digital rat brain atlas to document their findings. With modern technologies, we are now seeking to revamp this course to better prepare our undergraduates for careers in science by integrating three new novel modules of instruction within our existing pedagogy: 1) 3-D imaging using light sheet microscopic equipment in a core facility on campus; 2) a learning module teaching the students about software engineering and giving them the opportunity to contribute design ideas for a new online version of Brain Maps 4.0, the well cited open access rat brain atlas (Swanson, 2018; J Comp Neurol); and 3) a new digital humanities archive for the course which students will contribute to help preserve their scientific authority over their mapped datasets. We describe these new modules and present an integrated and stepwise time-boxed series of activities for the planned course this Fall-Spring 2026/2027. We seek feedback from the neuroscience education community on aspects of this curriculum and best practices they may use that can help augment the planned course curriculum.

Disclosures: A.M. Khan: None. **I. Acedo Aguilar:** None. **S. Balivada:** None. **M.N. Munoz:** None. **C.E. D'Arcy:** None.

Theme K Poster

TKP04: College Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP04.26SA/LL90

Topic: K.02. Teaching of Neuroscience

Support: Border Biomedical Research Center
Department of Biological Sciences

Title: A newly formulated CURE for AI erasure: Adding a Digital Humanities component to the curriculum of a brain mapping course to preserve the craft and community of brain mapping

Authors: *K. BANUELOS[1], A. SINCERA[2], K. J. MORENO[3], E. TAKEHANA[4], A. M. KHAN[1];
[1]Biol. Sci., Univ. of Texas at El Paso, El Paso, TX; [2]Sociology and Anthrop., [3]Computer Sci., [4]English, The Univ. of Texas at El Paso, El Paso, TX

Abstract: PURPOSE. Brain mapping depends on the work of researchers and trainees, however their labor becomes invisible within the final product. As Artificial Intelligence (AI) emerges within the field of brain mapping, it intensifies the longstanding issues surrounding authorship, attribution, and personalization. The Brain Mapping and Connectomics (BMC) course at the University of Texas at El Paso allows freshman undergraduates to conduct research, gaining skills not only in data production, interdisciplinary thinking, and scientific judgement but also professional identity, academic endurance, and unity. These successes are particularly meaningful for students coming from underrepresented communities. Their digital atlas maps of neurochemical systems can be provided to the public using traditional or AI-based search interfaces, but this also risks erasing minority scientific labor, identity, and institutional recognition through a vicious cycle: training corpora underrepresent work from minority-serving institutions and student authors, then encode that exclusion into model weights to further scientific work. Here, we request attendee feedback on our plan to preserve student attribution, transparency, and scientific lineage within AI systems through digital humanities (DH) infrastructures.
METHODS. 18 college freshmen (typically 80% Hispanic, >60% female, 30% first-in-family in college) will voluntarily participate in an IRB-approved DH intervention. Alongside their data, the intervention will capture testimonials of their mapping experience and context of thought as science trainees within a new course DH archive. Persistent Identifiers will be assigned for student-generated atlas maps, with citable DOIs for course-derived datasets and archival snapshots indexed prior to commercial scraping windows. Omeka-based repositories will preserve contributor metadata at the schema level, and REST API endpoints will expose provenance chains for downstream verification.
RESULTS. We provide data on students' increased self-identification as scientists compared to their non-CURE counterparts and detail the planned DH intervention and its expected impact. We expect DH will augment student self-perceptions of their human scientific agency, its

relation to AI, and their willingness to stay in STEM majors in their second year. CONCLUSION. Our brain mapping CURE model inverts the extractive logic of AI annotation labor by attributing student work through co-authorship, preserving rather than overwriting lineage/ancestry. Our DH component, by centering human experience more holistically, will help retain students in STEM disciplines.

Disclosures: K. Banuelos: None. **A. Sincera:** None. **K.J. Moreno:** None. **E. Takehana:** None. **A.M. Khan:** None.

Theme K Poster

TKP04: College Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP04.27SA/LL91

Topic: K.02. Teaching of Neuroscience

Support: NIH Grant P50MH132642
NIH Grant R01EY036242
NIH Grant P30EY012576

Title: BrainMaps.org: Integrating Open Neuroscience Infrastructure with Undergraduate Research Training

Authors: C. A. USREY[1], H. A. SPENCE[1], H. BOERSMA[1], J. S. JOHNSON[1], *W. USREY[2]; [1]Ctr. for Neurosci., Univ. of California, Davis, Davis, CA; [2]Ctr. for Neurosci., Univ. of California, Davis, Davis, CA

Abstract: Introduction: BrainMaps.org is an open-access digital neuroanatomical resource that provides high-resolution histological datasets and brain atlases for multiple species. The platform enables researchers worldwide to examine neuroanatomical structure at cellular resolution through web-based access to large-scale microscopy data. In addition to supporting the neuroscience community, BrainMaps serves as a training environment for undergraduate students who participate directly in the creation, processing, and dissemination of scientific datasets.
Methods: Undergraduate researchers were integrated into the BrainMaps image-processing pipeline and received training in digital neuroanatomy, microscopy imaging, and data management. Student responsibilities included slide scanning, image quality assessment, section alignment, image enhancement, annotation, and database curation. These activities contributed directly to the preparation and dissemination of datasets hosted on the BrainMaps platform. Resource utilization was assessed through measures of dataset production and platform access, while educational outcomes were evaluated through student participation and skill development metrics.
Results: Undergraduate researchers contributed to the processing and curation of >3,000 histological sections across datasets representing 15 species. Flexible participation enabled

students to contribute to long-term data production efforts while accommodating diverse academic schedules. These efforts supported the generation and dissemination of openly accessible neuroanatomical resources used by investigators worldwide. During the study period, Brainmaps traffic included >10,000 page visits/month from >30 countries. Participating students acquired practical experience in image processing, neuroanatomical analysis, data stewardship, and open-science workflows. Conclusions: BrainMaps demonstrates how a large-scale neuroscience resource can simultaneously advance scientific discovery and undergraduate education. By integrating students into authentic research workflows that produce publicly available datasets, the platform provides hands-on training in neuroscience and data science while expanding resources available to the broader research community. This model illustrates the potential for open scientific infrastructure to serve both community research needs and workforce development in neuroscience.

Disclosures: C.A. Usrey: None. **H.A. Spence:** None. **H. Boersma:** None. **J.S. Johnson:** None. **W. Usrey:** None.

Theme K Poster

TKP04: College Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP04.28SA/LL92

Topic: K.02. Teaching of Neuroscience

Title: Principles of Inclusive Curriculum Design/Redesign for Undergraduate Neuroscience: Identifying Mechanisms of Exclusion at Disciplinary Boundaries

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

Abstract: Neuroscience, as an integrative discipline, holds great promise for advancing higher-order goals of undergraduate education, such as integrative thinking, while broadening participation in STEM. The realization of that promise will depend on the design of inclusive undergraduate neuroscience curricula that avoid the perpetuation, reinforcement, or construction of exclusionary structures. In undergraduate neuroscience curricula, such features are often preserved from antecedent curricula in biology and psychology, and may be maintained by patterns of resource allocation and cultural norms tied to those historical structures. Structural features of undergraduate curricula such as hierarchical course sequencing, tracking, demarcated disciplinary boundaries, and related enrollment policies can have profound implications for inclusion. Theory and research from the sociology of durable inequality and education identify common academic policies and practices that have adverse impacts on the effectiveness of neuroscience curricula, such as those that reflect the deficit thinking and opportunity hoarding pervasive in many STEM programs. Through examination of existing curricular structures, enrollment policies, advising language/messaging, and current institutional capacity for change, the design or redesign of neuroscience curricula should be conducted with an eye toward

dismantling such structures that operate as mechanisms of exclusion, particularly at disciplinary boundaries. The development of moral and instrumental rationales for necessary structural change and resource allocation at the institutional level can then be achieved by evidence-based alignment of proposed curricular directions with institutional and broader national strategic goals.

Disclosures: A.C. Basu: None.

Theme K Poster

TKP04: College Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP04.29SA/LL93

Topic: K.02. Teaching of Neuroscience

Support: NSF GRFP
Binghamton University FRI Program

Title: Impact of Graduate Mentor Led Neuroscientific Literature-Based Curriculum on Early-Stage Undergraduate Researchers

Authors: *M. SCROGER[1], F. P. VARODAYAN[1], D. S. KREISS[2];
[1]Binghamton Univ., Vestal, NY; [2]Binghamton University, First-Year Res. Immersion Program, Vestal, NY

Abstract: Public interest in neuroscience has increased in recent years, yet undergraduate education has struggled to keep pace with the evolving demands of the field. Many students have difficulty connecting foundational concepts in biology and psychology to neuroscience research, creating a gap between classroom learning and its relevance. Limited access to research experiences and mentorship both contribute to and stem from this gap. As a result, many graduating neuroscience students decide to pursue unrelated careers. Binghamton University's First-year Research Immersion (FRI) Neuroscience Stream addresses these challenges through a three-semester curriculum that combines hands-on behavioral and neurochemical rodent-based neuroscience research with verbal, visual, and written scientific skill advancement. Newly, we innovated and implemented a graduate student-led longitudinal mentorship model to enhance students' development in areas of identified weakness beyond the scope of the current curriculum, including understanding primary literature, critical thinking about research topics, and public speaking. The graduate mentor was in charge of leading team small group discussions and guiding students throughout the projects. The 30 undergraduate students organized into 5 thematic research teams learned how to read a primary neuroscience paper with the goal of understanding its core concepts and societal implications during the second semester. Individual team members were assigned specific roles to present this information from various perspectives, such as a health magazine writer. In the final semester, students participated in a team Journal Club that emphasized in-depth evaluation of the methodology and experimental design of an

empirical paper outside of their own experimental approaches, yet complementary to the teams' rodent research project. Pre- and post-assessment surveys collected quantitative and qualitative feedback regarding both activities, with students reporting increased confidence in science communication and literacy. Improvements were observed in public speaking, understanding the neuroscientific literature, and critically evaluating scientific evidence. Qualitative feedback further suggested greater engagement with the research process while enjoying the assignments and focused/personalized interactions with the graduate mentor. Overall, these findings indicate that integrating graduate-student mentorship with guided practice in reading and communicating research can strengthen scientific literacy, fostering skills that support student retention and success in neuroscience and STEM.

Disclosures: M. Scroger: None. **F.P. Varodayan:** None. **D.S. Kreiss:** None.

Theme K Poster

TKP04: College Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP04.30SA/LL94

Topic: K.02. Teaching of Neuroscience

Support: UNC Institute for the Arts and Humanities Fixed-Term Faculty Support Grant
UNC College of Arts and Science Faculty Travel Grant

Title: Mindset Across the Neuroscience Pipeline: Student Beliefs, Research Belonging, and Career Development

Authors: *S. D. ROBERTSON[1], W. ADAIR[2];
[1]Univ. of North Carolina Chapel Hill, Holly Springs, NC; [2]Univ. of North Carolina Chapel Hill, Greenville, NC

Abstract: Background: Student mindsets influence motivation, resilience, performance, and persistence in STEM, yet little is known about mindset development within undergraduate neuroscience. We present findings from a three-part mindset focused neuroscience education research program. (1) In our descriptive study, we investigate the mindsets of a large undergraduate neuroscience student population. (2) Using an intervention approach, we ask how a simple mindset reflection can impact student research skill development, scientific self-efficacy, and research community belonging. (3) A longitudinal study explores how structured reflection during career exploration can help students develop the mindset and metacognitive habits to persist in neuroscience and STEM careers.Methods: First, we characterized growth mindset beliefs among undergraduate neuroscience students using a mixed-methods survey approach. Second, we evaluated a scalable growth mindset intervention embedded within research article analysis assignments in an upper-level neuroscience course. Third, we describe an ongoing longitudinal study in a neuroscience career development course examining whether metacognitive and growth mindset reflections influence students' beliefs about learning,

intelligence, and their future in STEM.Results: Neuroscience students generally reported strong growth mindsets without intervention. Contrary to expectations from prior STEM literature, students from several historically excluded racial and ethnic groups demonstrated significantly higher growth mindset scores than their peers. In the intervention study, underrepresented minority and first-generation students demonstrated significantly greater gains in research community belonging than control students. First-generation students also reported greater gains in scholarly writing and presenting research. Ongoing longitudinal work is exploring whether repeated mindset reflection in a career course context can produce measurable changes in students' beliefs about intelligence, learning, and success in STEM.Conclusions: Together, these studies suggest that mindset may influence multiple dimensions of undergraduate neuroscience education, including academic beliefs, research community belonging, professional identity development, and STEM persistence. By examining mindset across classroom, research, and career-development contexts, this program of research seeks to identify scalable strategies that help students navigate challenge, develop a stronger sense of belonging, and envision themselves as future members of the neuroscience workforce.

Disclosures: S.D. Robertson: None. **W. Adair:** None.

Theme K Poster

TKP04: College Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP04.31SA/LL95

Topic: K.02. Teaching of Neuroscience

Title: The Neuro-Glial-Vascular Unit in Action: An Interactive Simulation of Neurophysiology

Authors: *S. FISCHBACH[1], S. JAMES[2];
[1]Neurosci., sacred heart university, fairfield, CT; [2]Psychology, Sacred Heart Univ., Fairfield, CT

Abstract: Brain activity emerges from the dynamic interplay between neural, glial, and vascular systems, yet these components are often taught in isolation due to their complexity and the difficulty of visualizing their interactions. This separation can limit students' ability to understand how integrated physiological processes give rise to brain function. To address this gap, we developed an interactive Neuro-Glial-Vascular Unit (NGVU) Simulation, a web-based, open-source educational tool designed to visualize and explore multiscale brain physiology in an integrated and intuitive manner. The NGVU Simulation models key features of neural signaling, including action potentials, synaptic transmission, and ion flux, alongside astrocytic processes such as ion buffering, metabolic coupling, and neurovascular signaling. These elements are further integrated with vascular dynamics, including blood-brain barrier regulation, hemodynamic flow, and oxygen and glucose delivery, all within a unified spatial and temporal framework. Rather than prioritizing strict biophysical accuracy, the simulation emphasizes mechanistic clarity, temporal sequencing, and causal relationships, allowing users to observe how activity propagates across systems and scales. Interactive visualizations—including

labeled molecular components, slow-timescale processes, and state-dependent transitions—are intentionally designed to reduce cognitive load and support conceptual understanding. The platform is implemented using a modular JavaScript architecture, enabling extensibility, parameter manipulation, and user-driven experimentation without the need for specialized hardware or proprietary software. This simulation has been integrated into undergraduate neuroscience curricula to promote active learning and interdisciplinary thinking. By enabling students to explore brain function through the lens of an interconnected functional unit, the NGVU Simulation enhances scientific literacy and provides a scalable, accessible framework for teaching complex neurophysiological concepts.

Disclosures: S. fischbach: None. **S. James:** None.

Theme K Poster

TKP04: College Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP04.32SA/LL96

Topic: K.02. Teaching of Neuroscience

Support: Barnard college faculty research grant

Title: "Why" questions matter: effects of prediction framing and curiosity on the acquisition of scientific knowledge.

Authors: *N. SINGLA[1], P. RISHI[2], A. ALEXANDRESCU[3];
[1]Neurosci. and psychology, New York Univ., New York, NY; [2]Neurosci., Univ. of California, Berkeley, Fremont, CA; [3]Neurosci. & Behavior, Barnard Col., Secaucus, NJ

Abstract: Curiosity, a form of intrinsic motivation, boosts learning through increased engagement with new information, while generating predictions can enhance memory through negative prediction errors and the production of surprise. This study investigates how the type of question used to prompt predictions influences curiosity and retention of scientific knowledge. In an online experiment, adult participants studied concepts drawn from the fields of biology, physics, and chemistry. During the study session, participants answered either mundane questions or generated predictions in response to "Why" (emphasizing the significance) or "What" (focusing on factual description) questions about each concept before receiving the answers. Participants also rated their levels of curiosity, confidence, and surprise related to their predictions and the provided answers. These metacognitive judgements will be used to assess the contributions of intrinsic motivation and prediction error to learning. Long-term memory will be tested immediately and one week later using surprise memory tests. We hypothesize that prediction-making will enhance the acquisition of scientific knowledge and specifically that predictions prompted by "Why" questions will elicit higher curiosity and greater surprise than predictions prompted by "What" questions. We further predict that memory benefits will be strongest following incorrect predictions during states of high curiosity and moderate confidence,

consistent with the information-gap theory. By isolating the effects of question framing in a controlled, yet ecologically valid environment, this study aims to clarify the cognitive mechanisms through which simple pedagogical prompts influence durable STEM learning.

Disclosures: N. Singla: None. **P. Rishi:** None. **A. Alexandrescu:** None.

Theme K Poster

TKP04: College Teaching of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP04.33SA/Web Only

Topic: K.02. Teaching of Neuroscience

Support: Scholarship No. 1317215 for JJC-C
Scholarship No. 912883 for PBP-G

Title: Bridging the gap: challenges in digital Image analysis training.

Authors: *J. CORTÉS CORTINA[1], P. B. PENSADO GUEVARA[2], A. A. BARRIENTOS BONILLA[3], Y. FLORES-MARTINEZ[4], J. RODRÍGUEZ-LANDA[1];
[1]Inst. de Neuroetología, Xalapa, Mexico; [2]Inst. de Neuroetología, Univ. Veracruzana, xalapa, Mexico; [3]Univ. Veracruzana, Xalapa, Mexico; [4]Inst. Politécnico Nacional, Ciudad de México, Mexico

Abstract: The increasing use of digital microscopy, immunofluorescence, and high-resolution imaging has transformed neuroscience research, making quantitative image analysis an essential skill for modern neuroscientists. Despite these advances, formal training in image analysis often lags behind training in traditional histological techniques. Many students and early-career researchers learn to acquire biological images but receive limited training on how to process, analyze, and interpret them using computational tools. This educational gap can affect data reproducibility, methodological transparency, and the development of quantitative reasoning skills.Through a narrative review of the literature and the author´s experience in training students involved in histological research, this work explores the main barriers encountered during the transition from conventional histology to computational image analysis in neuroscience education. We propose that integrating digital image analysis into neuroscience research curricula from the earliest stages of training could enhance students' ability to generate reproducible and objective measurements from biological images. Furthermore, interdisciplinary educational strategies that combine histology, data analysis, and computational thinking can facilitate the adoption of open-source tools and emerging artificial intelligence approaches. Addressing these challenges is essential for working effectively in more reliable, reproducible, and objective research environments.

Disclosures: J. Cortés Cortina: None. **P.B. Pensado guevara:** None. **A.A. Barrientos Bonilla:** None. **Y. Flores-Martinez:** None. **J. Rodríguez-Landa:** None.

Theme K Poster

TKP05: Outreach Activities of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP05.01SU/MM2

Topic: K.03. Public Awareness of Neuroscience

Title: CiviSense Lab: A Community-Engaged Model for Neuroscience Outreach and STEAM Pathway Development

Authors: *H. THOMAS;
Johns Hopkins Univ., Baltimore, MD

Abstract: CiviSense Lab: A Community-Engaged Model for Neuroscience Outreach and STEAM Pathway Development
Neuroscience research is often communicated through passive, non-interactive approaches that limit accessibility and public engagement. Concurrently, students from underrepresented backgrounds face persistent barriers across the STEM pathway, including limited early exposure, reduced sense of belonging, and lack of mentorship, which contribute to decreased persistence in STEM fields. Addressing both challenges requires innovative outreach models that actively engage diverse communities while supporting long-term STEM development. The CiviSense Lab is a community-engaged neuroscience outreach initiative designed to bridge these gaps through interactive, experiential learning. Integrating science, art (NeuroArts), and public engagement, the program delivers hands-on activities that allow participants to explore neuroscience concepts through sensory-based experiences. Outreach activities include interactive stations focused on visual perception, microbial science, and olfactory processing, where participants construct kaleidoscopes, model microbial environments, and engage in scent-based learning. These experiences are facilitated by undergraduate and graduate student leaders, who serve as near-peer mentors and science communicators. The CiviSense Lab operates within a multi-level STEM ecosystem that connects K-12 students, higher education trainees, and community members. By emphasizing sensory engagement, creativity, and accessibility, the program fosters active learning and promotes positive interactions with science. Preliminary observations indicate that participants exhibit increased curiosity, engagement, and confidence in interacting with scientific concepts, while student facilitators gain valuable experience in science communication and leadership. This model positions civic engagement as a mechanism for strengthening STEM pathways by fostering a sense of belonging, supporting STEM identity development, and expanding access to scientific learning opportunities for diverse populations. The CiviSense Lab represents a scalable framework for integrating neuroscience outreach, education, and community engagement to promote equity and persistence in STEM.

Disclosures: H. Thomas: None.

Theme K Poster

TKP05: Outreach Activities of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP05.02SU/MM3

Topic: K.03. Public Awareness of Neuroscience

Title: Student Led Interdisciplinary Outreach in STEM Education

Authors: N. MCWILLIAMS[1,2], ***L. SCHULBACH**[1,2], R. CALLOS[1,2], A. JENSEN[1,2], C. DUNCAN[1], N. RAHMANIAN[1], J. KIESEL[1], K. YOAKUM[1], C. LOVE[1,2], C. AUSTIN[1,2], K. SMITH[1,2];
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Abstract: The Interdisciplinary Neuroscience Association (INA) at Portland State University (PSU) is a student-led organization with the goal of providing neuroscience education for individuals across all majors at PSU. We are committed to supporting students during their academic careers by integrating interdisciplinary methods of learning such as tactile and art based teaching into our neuroscience programming, allowing students to engage with the learning material through a variety of modalities. This programming engages with cultural and STEM lenses to reduce the stigma often associated with STEM courses. We invited many student groups across various cultures and disciplines in addition to local speakers to create accessible neuro education. Using art and a variety of pedagogical approaches, we increased access to neuroscience education for our student body and the greater Portland State community. The INA works directly in collaboration with the local nonprofit NW Noggin, serving as the volunteer base for outreach events at local schools, correctional facilities, youth shelters, and more. This enables us to provide educational access to children and community members. In addition, the INA has fostered neuroscience outreach from Chile to Palestine, providing resources to communities who are historically underserved and underrepresented. Culturally informed and holistic neuroscience education supports equitable and inclusive learning by recognizing cognitive diversity and strengthening our teaching of how the brain learns, develops, and stores information. The Interdisciplinary Neuroscience Association has also participated in political advocacy, including local initiatives in STEM education reform. One of our guiding principles is centering interdisciplinary knowledge and collaborations. As one of PSU's largest student organizations, we offer support to our peers by fostering new student engagement, a sense of belonging, and leadership opportunities within our university. PSU does not have a neuroscience major, and INA was formed to subsidize neuroscience education at all academic levels. INA's interdisciplinary nature is essential as it enables students across all majors to learn about and participate in the field of neuroscience. It also provides a space for students interested in the interdisciplinary neuroscience minor at PSU to learn more about the minor, and to build community with others interested in neuroscience.
*All authors contributed to the creation of this abstract.

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Theme K Poster

TKP05: Outreach Activities of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP05.03SU/MM4

Topic: K.03. Public Awareness of Neuroscience

Support: Biomedical Research Center, UV
Institute of Neuroetology, UV
Science Communication Department, UV

Title: Harmonizing Minds: Scientists and Musicians Promoting Mental Health

Authors: *R. C. ZEPEDA[1], R. PÉREZ ALARCÓN[1], T. MOLINA-JIMENEZ[2], G. GUILLÉN-RUIZ[1], B. BERNAL-MORALES[7], T. CIBRIAN-LLANDERAL[3], L. L. CRUZ ZAVALETA[4], R. L. CASTILLO LÓPEZ[8], M. AGUILAR CUCURACHI[5], C. J. JUÁREZ-PORTILLA[6];
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Abstract: Mental disorders affect approximately one in eight people worldwide and remain among the most stigmatized health conditions, contributing to delayed diagnosis, reduced help-seeking behaviors, and limited treatment adherence. Although advances in neuroscience have demonstrated measurable alterations in brain connectivity and neural network functioning associated with psychiatric disorders, public perceptions of mental illness continue to be influenced by misconceptions and stigma. NeuroArts initiatives provide a unique opportunity to bridge scientific knowledge and lived experience through artistic engagement.
During Brain Awareness Week 2026, the Biomedical Research Center, the Institutes of Neuroetology and Health Sciences, the Faculty of Biology, and the Science Communication Department of Universidad Veracruzana organized “Harmonizing Minds,” a NeuroArts event designed to promote mental health literacy and foster dialogue among neuroscience, music, and society. The program combined brief neuroscience lectures with live musical performances inspired by renowned musicians whose lives were associated with documented experiences of depression, bipolar disorder, obsessive-compulsive disorder, substance-use disorders, and other psychiatric conditions.
The scientific presentations emphasized current evidence demonstrating that psychiatric disorders involve alterations in neural circuits and large-scale brain networks rather than personal weakness or moral failure. Topics included neuroimaging findings, brain plasticity, and evidence-based psychological and psychiatric interventions. Musical performances provided an emotional and cultural context that facilitated audience engagement and reflection on the relationship between creativity, vulnerability, and mental health.
The event brought together researchers, clinicians, science communicators, university artistic

groups, and professional musicians, including the Universidad Veracruzana Choir, Orbis Tertius Jazz Ensemble, Xalli Big Band, and violinist David Corzo. More than 400 attendees participated in the event, which created an accessible platform for discussing psychiatric disorders through both scientific and artistic perspectives.
This experience demonstrates the potential of NeuroArts-based science communication to increase mental health awareness, humanize psychiatric disorders, reduce stigma, and strengthen public engagement with neuroscience. Integrating music and neuroscience may contribute to transforming social narratives surrounding mental illness by promoting empathy, understanding, and informed dialogue.

Disclosures: R.C. Zepeda: None. **R. Pérez Alarcón:** None. **T. Molina-jimenez:** None. **G. Guillén-Ruiz:** None. **B. Bernal-Morales:** None. **T. Cibrian-Llanderal:** None. **L.L. Cruz Zavaleta:** None. **R.L. Castillo López:** None. **M. Aguilar Cucurachi:** None. **C.J. Juárez-Portilla:** None.

Theme K Poster

TKP05: Outreach Activities of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP05.04SU/MM5

Topic: K.03. Public Awareness of Neuroscience

Title: Youth-Led Peer Resources for Empathy Across Neurotypes: A Neuroscience-Informed Outreach Model

Authors: A. PARSA, *K. J. HORNING;
Youth for Neurodiversity, San Jose, CA

Abstract: Adolescence is a critical period of neurodevelopment in which peer influence strongly shapes empathy and social understanding. Research shows that positive peer experiences enhance prosocial decision-making by activating the reward system and brain regions involved in affective-motivational processes (Güroğlu, 2021; Li et al., 2025), and peers directly contribute to empathy development (Miklikowska et al., 2022). Emerging programs bringing neurodivergent and neurotypical high school students together have shown increased neurodiversity awareness, acceptance, and social understanding (Schuck et al., 2024). Several student-led neuroscience education and outreach initiatives now exist for high school students (Minen et al., 2023). However, student-led initiatives that combine yearlong peer collaboration among different neurotypes to promote neuroscience of empathy and strengths-based neurodiversity remain limited.Neurodivergent youth, including those with attention-deficit/hyperactivity, autism, and learning differences, represent roughly 15-20% of the adolescent population (Yang et al., 2022). Compared with their neurotypical peers, they disproportionately experience bullying, depression, and suicidal ideation (Accardo et al., 2024; Brown et al., 2024).Youth for Neurodiversity (YND), founded in August 2025, is a student- and volunteer-led organization in which neurotypical and neurodivergent adolescents collaboratively

develop educational resources, including a seven-module high school curriculum on the adolescent brain, neurodevelopment of empathy, social connections, identity, and emotional regulation, and strengths-framing of neurotypes (Youth for Neurodiversity Inc., 2026). Youth share personal stories, co-create interactive tools, compile school-to-college resources, and engage via communities, such as the San Francisco Bay Area Society for Neuroscience Chapter, Discord, and Instagram.YND also mobilizes adult allies at conferences, such as the California School Health & Behavioral Health Conference, Neurotech Frontiers Summit, and International Youth Conference. In eight months, it has engaged 36 student leaders and 40 adults from 11 U.S. states, 9 countries, and 16K+ Instagram impressions.YND offers a unique model of youth-led, neuroscience-informed outreach and collaboration among neurotypes to foster empathy, peer connections, and strengths-based understanding. With mental health clinicians, educators, social workers, and parents expressing interest in piloting its resources, YND plans to expand outreach and conduct systematic program evaluation of empathy-related outcomes.

Disclosures: A. Parsa: None. **K.J. Horning:** None.

Theme K Poster

TKP05: Outreach Activities of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP05.05SU/Web Only

Topic: K.03. Public Awareness of Neuroscience

Title: Psychophysiological criteria for predicting stress reactivity in war veterans and athletes in the context of global change and uncertainty: implementation in the educational process

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Abstract: The success, physical health, and mental health of war veterans and athletes during periods of global change and uncertainty are closely linked to their functional state. This state depends on numerous factors, including motivation, sensory workload, baseline nervous system activity, and individual characteristics of higher nervous activity. The authors demonstrate that specific combinations of nervous system properties facilitate certain types of activities, directly influencing their efficiency and reliability. Consequently, understanding prognostic criteria and evaluating indicators of neurodynamic functions are crucial tasks for students, athletes, educators, and coaches. Based on long-term research, the authors substantiate a system of dynamic properties comprising adaptive mechanisms to stressful conditions during times of global change and uncertainty, including stress resistance, stress vulnerability, cognitive abilities, and the functional state of the nervous system. Furthermore, criteria for their assessment in war veterans and athletes are developed. This system includes indicators such as simple visual-motor reaction time, choice reaction time (selecting one or two out of three signals), and reactions to a moving object. It also assesses the speed, quality, and volume of information processing under

two modes: "imposed rhythm" and "feedback". These modes determine the functional mobility and strength of nervous processes. These indicators are shaped by highly genetically determined properties of core nervous processes, alongside memory, thinking, perception, and attention. Conducting complex biological studies involving war veterans and athletes strictly requires adherence to bioethical principles. The research findings are integrated into the specialist training framework within the education system, enhancing the effectiveness of the educational process. The practical value of these research materials lies in their rapid integration into higher education. This is achieved through developing methodological materials for bachelor's and master's students in courses such as "Basics of Scientific Research in Physical Culture and Sports" and "Modern Methods of Scientific Research in Physical Rehabilitation", etc., as well as delivering lectures and webinars for coaches across various sports, specialists in physical culture and sports rehabilitation of war veterans and athletes.

Disclosures: S. Fedorchuk: None. **T. Kutsenko:** None. **O. Lysenko:** None.

Theme K Poster

TKP05: Outreach Activities of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP05.06SU/MM6

Topic: K.03. Public Awareness of Neuroscience

Support: NIA 1R25AG092311-01
R25AG092311

Title: Lean on Me: A Community-Based Participatory Research Approach to Developing Dementia Friendly Music and Neuroscience Outreach Programs

Authors: *S. M. TURNER, K. BOWDEN, J. REDDEN, N. VEBLEN, A. RESCHKE-HERNANDEZ;
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Abstract: Persons with dementia (PWD) due to Alzheimer’s disease and related disorders experience progressive cognitive and functional decline that limit opportunities for meaningful engagement and community participation. Responsiveness to musical rhythm, melody, and emotional tone often remains preserved. Community music-based interventions offer a promising, low-cost strategy to support social connection and well-being. Yet, there is limited evidence on how to design programs that are community-driven, accessible, and culturally responsive. This community-based participatory research addresses this gap by co-developing a dementia inclusive community music program. Our research is in an area of Lexington, KY characterized by high dementia prevalence and well-documented disparities in income and access to supportive resources. Phase 1 (ongoing; qualitative) engages community members (including PWD; teens) and local leaders through focus groups, interviews, and feedback sessions to identify needs and barriers. Data are audio recorded, transcribed, and analyzed using

reflexive thematic analysis, with iterative member checking to guide program development. Phase 2 will pilot the co-designed program. Preliminary findings suggest three community-defined priorities: (1) reduce barriers through relevance, clarity, and cultural alignment; (2) build trust, belonging, and meaningful social connection; and (3) address holistic accessibility to support sustained participation. Across analyses, participants emphasized limited access to clear, trustworthy information about dementia and expressed a strong desire for opportunities to learn about dementia signs and symptoms, and strategies to support individuals and families. They identified intergenerational and varied music activities (e.g., singing, movement, playing instruments, talking about music) as an approachable entry point for educational information. Participants favored programs that integrate music with informal, culturally responsive health education, social interaction, and practical resources delivered in concise, accessible formats at trusted locations. This project illustrates how neuroscience public awareness and outreach can extend beyond traditional education by partnering with communities to translate research on music, brain health, and well-being into accessible, community-driven programming. Through co-design and shared decision making, this work advances a community-informed approach to dementia inclusive public engagement and will inform future development of an implementation toolkit to support adaptation in other communities.

Disclosures: S.M. Turner: None. **K. Bowden:** None. **J. Redden:** None. **N. Veblen:** None. **A. Reschke-Hernandez:** None.

Theme K Poster

TKP05: Outreach Activities of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP05.07SU/MM7

Topic: K.03. Public Awareness of Neuroscience

Title: Effectiveness of cognitive behavioral intervention in the treatment of video game addiction in young adults: A systematic review of interventions

Authors: *E. RAMÍREZ MORENO[1], L. RIVERA-RAMIREZ[2], J. ARIAS-RICO[5], R. BALTAZAR TELLEZ[6], O. MARTÍNEZ[7], Z. OLGUÍN-HERNÁNDEZ[3], Z. CALDERÓN-RAMOS[4];
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Abstract: Video game addiction has been established as a current public health problem, recently recognized by the WHO. Despite its prevalence, evidence on effective interventions in early adulthood requires rigorous synthesis. This review aims to determine the efficacy of

cognitive behavioral therapy (CBT) in reducing video game addiction and its associated symptoms in adolescents and young adults aged 12 to 40 years. A systematic review was conducted following the PRISMA guidelines. The PubMed, Google Scholar, PsycINFO, Web of Science, Cochrane, and SciELO databases were searched, including studies published between January 2015 and October 2025. Methodological quality was assessed using the ROBINS-I V2 tool, selecting 20 studies that met the eligibility criteria. The findings indicate that CBT, in individual, group, and virtual formats, significantly reduces gaming time and the severity of the addiction. Furthermore, consistent improvements were observed in comorbidities such as depression, anxiety, and insomnia. Specific programs like PIPATIC stood out for their comprehensive approach, highlighting a significant lack of scientific literature on this topic in the Latin American context. However, this represents a watershed moment for research in this population, building upon studies found in other countries. Therefore, CBT is the intervention with the strongest empirical support for the treatment of gaming disorder. Its implementation combined with psychoeducation and family support is recommended, although further research with standardized diagnostic criteria and long-term follow-up is needed to strengthen the validity of the results.

Disclosures: E. Ramírez Moreno: None. **L. Rivera-Ramirez:** None. **J. Arias-Rico:** None. **R. Baltazar Tellez:** None. **O. Martínez:** None. **Z. Olguín-Hernández:** None. **Z. Calderón-Ramos:** None.

Theme K Poster

TKP05: Outreach Activities of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP05.08SU/MM8

Topic: K.03. Public Awareness of Neuroscience

Title: Awareness of Modifiable Brain Aging Risk Factors

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Abstract: This study reviews countries that make brain health awareness and highlighting the factors that worsen brain disease. There are 14 modifiable risk factors that have been identified, including diabetes, obesity, smoking, as well as low education levels, lack of social engagement, depression, vision and hearing loss, high cholesterol, head injury, physical inactivity, excessive alcohol consumption, and air pollution. This factors theoretically could prevent half of dementia cases (Lin et al, 2025) Evidence from the genome wide studies of the brain age gap (BAG), MAPT and APOE and the medical causal roles of hypertension, and diabetes in accelerating brain aging. (Jawinski et al, 2025) Other factor such as structural reduced in hippocampal and amygdala volumes, cortical thinning and enlarged ventricles. The Finnish cohort study that

shows Early Childhood Education and Care (ECEC) would protect the socio-emotional development. (Tervahartiala, K et al, 2025). There is study mentioned over three decades the disability adjusted life years (DALYs) of early onset dementia (EOD) from 1990-2021 is nearly doubled though age-standardized prevalence (ASPR) and DALY rates (ASDR) rose only slightly. The high middle (sociodemographic index) SDI countries had the highest ASPR compared to middle SDI countries that show highest ASDR. (Li, et al 2022). there's study shows the burden of EOD that rising in low- and middle-income countries increased due to significant demographic and lifestyle transitions that leads in metabolic risk factors. While in Finlandia, The Finnish Brain Association create National Brain Health Programmed with objectives, understanding brain health and diseases that could be prevented or treated, with 3 age groups such as children and young people, working age population and the elderly, there are also projects in brain ergonomics, and restorative sleep. This awareness could prevent the acceleration of brain aging pandemic.

Disclosures: H. pristiwa oktaviani: None. **R.B. mboe:** None.

Theme K Poster

TKP05: Outreach Activities of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP05.09SU/MM9

Topic: K.03. Public Awareness of Neuroscience

Title: Grey Matters Journal VC: An undergraduate effort to break barriers and democratize scientific communication

Authors: *J. FALLON[1], L. GAFFNEYBORO[1], R. NICOLAU[2], E. BAGADE[4], L. OBERMUELLER[5], A. EARP[3];
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Abstract: Today, scientists and laypeople are disconnected from each other, separated by political tension, mistrust, and scientific jargon. Historically, the public has been cut off from access to cutting-edge research due to a lack of open-access literature and rising socioeconomic barriers that bar entry into STEM fields. To bridge this divide, we must erode the systemic barriers by ensuring that scientific research is both accessible and digestible. 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. Our mission is to mentor effective scientific communicators while providing an accessible, free platform for Vassar students, the surrounding Poughkeepsie community, and anyone interested in exploring novel neuroscience content. GMJvc is a biannual publication written, illustrated, and edited entirely by Vassar students. Unlike other GMJ chapters, our chapter is completely run by undergraduates. Each semester, we invite Vassar students to submit outlines of their proposed articles. Every accepted

author is then paired with a team of editors to assist with researching their topic and refining their writing. Unlike the founding chapter, the Vassar chapter has three divisions of editors — Scientific Review, Lay Review, and General Editing — that each focus on one aspect of crafting accessible writing. Scientific Review focuses on refining the science behind the topic, Lay Review ensures the article is understandable to someone without a scientific background, and General Editing helps the author improve their writing style and flow of the article. Each article team is also assigned an artist who designs illustrations that complement the article by visualizing relevant neurological mechanisms, appealing to more forms of learning. Our model allows us to ensure that articles remain scientifically accurate, accessible, and engaging, while simultaneously guiding student editors in developing their skills and becoming 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 learn about GMJvc's mission. 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: J. Fallon: None. **L. Gaffneyboro:** None. **R. Nicolau:** None.

Theme K Poster

TKP05: Outreach Activities of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP05.10SU/MM10

Topic: K.03. Public Awareness of Neuroscience

Support: IBRO/DANA Grant BAW26-3322270635
Dirección del Instituto de Neurobiología, campus Juriquilla
Coordinación de la Investigación Científica, UNAM
Coordinación de Posgrado, UNAM
Academia de Investigación en Biología de la Reproducción
Sociedad de Ciencias Fisiológicas
Biasys

Title: Engaging Communities in Neuroscience: The Institute of Neurobiology's Brain Week 2026 Experience

Authors: *C. I. PEREZ-DIAZ[1,2], A. B. HERNÁNDEZ ABREGO[3], B. GARCIA[4], R. OLIVARES-MORENO[5], C. PÉREZ HERNÁNDEZ[6], J. A. GARCÍA MARTÍNEZ, Sr.[7], C. GUTIÉRREZ HERNÁNDEZ[8], M. LUNA[9], T. MORALES[10];
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Mexico; [5]Neurobiología del desarrollo y neurofisiología, Inst. de Neurobiología, Univ. Nacional Autonoma De Mexico, Queretaro, Mexico; [6]Inst. de Neurobiología, Univ. Nacional Autonoma De Mexico, Querétaro, Mexico; [7]Inst. de Neurobiología, Univ. Nacional Autonoma De Mexico, México, Mexico; [8]Inst. de Neurobiología, Univ. Nacional Autonoma De Mexico, QUERETARO, Mexico; [9]Inst. de Neurobiologia, UNAM, Queretaro, Mexico; [10]Inst. de Neurobiología, UNAM, Querétaro, Mexico

Abstract: Brain Week 2026, held from March 17 to 21, represented a comprehensive science outreach initiative organized by the Institute of Neurobiology (INb) at the National Autonomous University of Mexico (UNAM), Juriquilla campus. As part of a global effort established to promote neuroscience awareness, this annual program seeks to strengthen the interface between scientific research and society. Since joining this international initiative in 2005, the INb has developed a sustained and structured outreach strategy aimed at disseminating neuroscientific knowledge, fostering public engagement, and promoting brain health literacy through accessible, inclusive, and culturally relevant formats. The 2026 edition comprised a diverse portfolio of outreach activities targeting heterogeneous audiences. A total of 17 in-person events were conducted at the Academic Cultural Center (CAC) and the INb facilities, complemented by the theatrical production *"Neuro-Activate"*, which integrated artistic expression with science communication to enhance audience engagement. Additionally, four hybrid-format lectures were delivered, ensuring both onsite participation and remote accessibility; these sessions remain publicly available via the @UNAMINB YouTube channel, significantly extending their reach and impact. Beyond institutional venues, the *Brain Caravan* initiative expanded outreach into community settings by visiting three public schools on April 15, 22, and 29, 2026. These interventions, conducted through interactive and pedagogical activities between 9:00 a.m. and 12:00 p.m., facilitated early exposure to neuroscience concepts, stimulating curiosity and interest in scientific inquiry among young students. Collectively, these actions demonstrate an effective multi-modal dissemination strategy combining in-person, hybrid, and community-based engagement.
Brain Week 2026 underscores the sustained institutional commitment of UNAM and the INb to science communication, education, and social responsibility. The integration of interdisciplinary methodologies—including academic, digital, and cultural approaches—proved effective in broadening participation and enhancing public understanding of neuroscience. The initiative highlights the importance of decentralized and inclusive outreach models, reinforcing the role of scientific institutions in bridging the gap between research and society while fostering a scientifically informed citizenry.

Disclosures: C.I. Perez-Diaz: None. **A.B. Hernández Abrego:** None. **B. Garcia:** None. **R. Olivares-Moreno:** None. **C. Pérez Hernández:** None. **J.A. García Martínez:** None. **C. Gutiérrez Hernández:** None. **M. Luna:** None. **T. Morales:** None.

Theme K Poster

TKP05: Outreach Activities of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP05.11SU/MM11

Topic: K.03. Public Awareness of Neuroscience

Title: USA Brain Bee engages teens in neuroscience

Authors: *M. O. YASSA;
Ctr. for the Neurobio. of Learning and Memory, Univ. of California, Irvine, Irvine, CA

Abstract: The USA Brain Bee is the national arm of the International Brain Bee, a neuroscience education initiative founded by Dr. Norbert Myslinski in 1998 to inspire high school students to learn about the brain and pursue careers in neuroscience. Through a nationwide network of regional competitions, thousands of students engage annually in neuroscience learning, competition, and mentorship. Regional champions advance to the USA National Brain Bee Championship, and the national champion advances to the International Brain Bee World Championship, creating a pathway for sustained engagement with neuroscience during a critical stage of educational development.
In 2026, the USA National Brain Bee Championship was hosted by the Center for the Neurobiology of Learning and Memory at the University of California, Irvine. The competition brought together 54 regional champions representing 33 states, the largest participation in program history. Students completed multiple rounds of written assessments covering neuroscience knowledge and scientific methods, followed by a live elimination final round. Keynotes by Dr. Michael Yassa and Dr. Julianne McCall highlighted contemporary research on Alzheimer's disease and the role of neuroscience in public policy, exposing participants to both scientific discovery and diverse career pathways.
The championship was supported by faculty judges, educators, and more than 30 volunteer neuroscience ambassadors. Equally important is the nationwide network of chapter coordinators and volunteers who organize local competitions, recruit participants, and mentor students. Reports from 56 regional chapters indicated participation by nearly 2,000 high school students during the 2025-2026 competition cycle. Coordinators described impacts extending beyond competition day, including the formation of neuroscience clubs, participation in research experiences, mentorship opportunities, and increased interest in neuroscience careers. Several chapters highlighted the Brain Bee's role in fostering scientific identity, building community among students with shared interests, and connecting secondary education to university neuroscience programs.As neuroscience continues to grow as an interdisciplinary field, programs such as the Brain Bee provide scalable opportunities to engage students early, broaden participation, and strengthen the future neuroscience workforce. Ongoing efforts focus on expanding access to regional competitions, increasing geographic representation, and developing sustainable partnerships to support neuroscience education nationwide.

Disclosures: M.O. Yassa: None.

Theme K Poster

TKP05: Outreach Activities of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP05.12SU/MM12

Topic: K.03. Public Awareness of Neuroscience

Title: Community Neuroscience Engagement Through Partnerships with Public Libraries

Authors: *L. A. CZARNECKI[1], A. FONTANINI[2];
[1]Neurobio. and Behavior, SUNY Stony Brook, Stony Brook, NY; [2]Neurobio. and Behavior, Dept. of Neurobio. & Behavior, SUNY Stony Brook, Stony Brook, NY

Abstract: Community engagement is an important step in the scientific process. Public libraries have been invaluable partners for the Department of Neurobiology and Behavior's outreach efforts. By bringing free programming directly into the spaces people already trust, we train our students in safe contexts, extend the reach of our research and connect with community members in ways that feel relevant to their everyday lives.
Our activities have two interconnected goals. The first goal is to provide graduate students with training in outreach. Public programming is paired with a Department-sponsored outreach journal club in which graduate students read about and discuss published articles on science communication, public perception of science and scientists, and engagement strategies. The group meets monthly and applies insights to shape our program offerings. Students then get practical experience developing and delivering programming. The second goal is to reach community members through public library systems and present a variety of programs and activities targeting audiences of all ages.
We have presented activities on the neurobiology of sleep, emotions and mental health, neurodegenerative diseases, taste and smell, and the neuroscience of movement. Each topic reflects the expertise and interests of our faculty and students. Programs are lecture-based but aim to be interactive and many have active demonstration components. For example, in the taste and smell module, we use phenylthiocarbamide (PTC) paper strips to demonstrate individual variability in taste perception. This experience lends to a conversation about the genetic foundation of taste, and how taste receptors impact taste perception. Presenters avoid jargon and use accessible language to explain concepts. Concepts are paired with illustrative examples whenever possible. Since 2024, we have conducted 10 programs in public libraries and have expanded to include offerings to Girl Scout Troops, tabling at community events, and other public forums. Our programs have trained more than a dozen students and reached out to several hundred community members.
Through these efforts, we aim to make neuroscience accessible to everyone.

Disclosures: L.A. Czarnecki: None. **A. Fontanini:** None.

Theme K Poster

TKP05: Outreach Activities of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP05.13SU/MM13

Topic: K.03. Public Awareness of Neuroscience

Support: NIH Grant U24NS133077

Title: Exploration and dissemination of cell type resources with the Allen Institute

Authors: *R. E. HOSTETLER, L. ALFILER, E. FIABANE, J. NYHUS, S. MUFTI, M. HAWRYLYCZ, K. CASIMO, J. A. MILLER;
Allen Inst., Seattle, WA

Abstract: Over 20 years ago, the Allen Institute was founded with the goal sharing science openly with the rest of the world. Through this work, the central goal has been mapping out the cells of the mammalian brain. Initial work included the 2006 *in situ* hybridization Allen Mouse Brain Atlas, while more recent work includes single cell and spatial transcriptomic atlases in multiple species and states. With the ever-increasing number and size of datasets being produced, effort is needed for guidance and documentation. In the third year of the Scientific and Public Outreach of Cell Type Taxonomies (SPOCTT) Initiative, we continued to reach researchers, educators, and the public through our efforts. From September 2025-May 2026, we reached 50 researchers at in-person workshops, 80 students through university seminars, and ~2,500 viewers through our webinars. This work will continue through summer 2026, where we anticipate an additional 200 researchers at workshops in London (AAIC), Boston (MIT), Buenos Aires (Leloir Institute), and Barcelona (FENS). We have collected and analyzed feedback from our audiences; this feedback is crucial for assessing outcomes and influences how we plan future efforts. Overall, our audience can be grouped into “non-coders,” “interested coders,” and “experienced coders.” Those who do not have/need programmatic skills fall into the “non-coder” group, while those with limited to no coding skills but needing skills to access our data fall into the “interested coders” category. Lastly, our “experienced coders” group have significant programming experience and can access datasets programmatically with ease. Most of our previous outreach efforts were aimed at the “non-coder” category; lectures, webinars, and documentation were focused on GUI tools (e.g., Allen Brain Cell Atlas, MapMyCells, Cell Type Knowledge Explorer). As our audiences become more aware and comfortable using these tools, more technical support is needed in accessing the underlying datasets. Due to this shift, we have created more outreach aimed at the “interested coders” and “experienced coders.” To lower barriers of access to the “interested coders,” we have created 1) light-weight Google Colab notebook tutorials for quick data access and 2) installation guides for full access to our ABC Atlas Access Jupyter notebooks. For the “experienced coders,” we developed a new workshop focused on transcriptomic data analysis, where attendees worked in small teams to complete a hackathon project. Overall, we adapted our outreach efforts to better support the broad expertise of our audiences and will continue to adapt based on user feedback.

Disclosures: R.E. Hostetler: None. **L. Alfiler:** None. **E. Fiabane:** None. **J. Nyhus:** None. **S. Mufti:** None. **M. Hawrylycz:** None. **K. Casimo:** None. **J.A. Miller:** None.

Theme K Poster

TKP05: Outreach Activities of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP05.14SU/MM14

Topic: K.03. Public Awareness of Neuroscience

Support: Biomedical Research Center, UV

Title: Beyond the Bench: Multidisciplinary Neuroscience Outreach

Authors: *C. J. JUÁREZ-PORTILLA[1], T. MOLINA-JIMENEZ[2], G. GUILLÉN-RUIZ[1], B. BERNAL-MORALES[6], M. ALVARADO[7], T. CIBRIAN-LLANDERAL[3], R. VIVEROS CONTRERAS[1], A. CORTES-SOL[4], M. AGUILAR CUCURACHI[5], R. C. ZEPEDA[1]; [2]Ctr. de Investigaciones Biomédicas, [3]Inst. de Neuroetologia, [1]Univ. Veracruzana, Xalapa, Mexico; [4]Univ. Veracruzana, Xalapa, Veracruz, Mexico; [5]Univ. Veracruzana, XALAPA, Mexico; [6]Neuropharm. laboratory, Univ. Veracruzana, Inst. de Neuroetología, Xalapa, Mexico; [7]Neuroetology Inst., Xalapa, Veracruz, Mexico

Abstract: Neuroscience outreach has become an increasingly significant component of daily activities within the scientific community. Furthermore, the involvement of the university community from various disciplines significantly expands the reach of Brain Awareness Week at the Universidad Veracruzana. For more than a decade, the collaboration among the Biomedical Research Center, the Institutes of Neuroethology and Health Sciences, and the faculty of Biology has been a success in raising awareness of neuroscience. The 2026 BAW edition reached approximately 3.4K assistants aged 4 to 75. A wide range of activities were conducted, including workshops in kindergartens, elementary and middle schools, and lectures for high school students; informal talks at science cafes; and three scientific lecture series. Over a full week, around 300 people, including researchers, faculty members, health professionals, undergraduate and graduate students, addressed several topics related to neuroscience, including learning, stress, environmental relationships with the brain, neurotoxins, the microbiota, emotion regulation, and addiction, among others. The opening of these activities was a concert featuring music and short talks about mental health, merging the arts and neuroscience. This is a once-a-year opportunity to break down the barriers between science and society and, thus, contribute to our community by providing universal access to knowledge.

Disclosures: C.J. Juárez-Portilla: None. **T. Molina-jimenez:** None. **G. Guillén-Ruiz:** None. **B. Bernal-Morales:** None. **M. Alvarado:** None. **T. Cibrian-Llanderal:** None. **R. Viveros Contreras:** None. **A. Cortes-Sol:** None. **M. Aguilar Cucurachi:** None. **R.C. Zepeda:** None.

Theme K Poster

TKP05: Outreach Activities of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP05.15SU/MM15

Topic: K.03. Public Awareness of Neuroscience

Support: Schreiber Venture Fund, Loyola University Chicago.

Title: Neuroscience in the Neighborhood: Development, Implementation, and Evaluation of a Community-Engaged Neuroscience Outreach Program

Authors: *J. L. HOFFMAN;
Mol. Pharmacol. and Neurosci., Loyola Univ. Chicago, Maywood, IL

Abstract: Neuroscience concepts are highly relevant to everyday experiences including learning, stress, decision-making, mental health, and substance use, yet opportunities for neuroscience education and engagement with scientists remain limited in many communities. To address this gap, we developed *Neuroscience in the Neighborhood*, a community-engaged outreach program designed to increase neuroscience literacy, strengthen public engagement with science, and provide science communication training for neuroscience trainees.The program uses a partnership-based model involving schools, libraries, and community organizations in the Chicago area. Undergraduate, graduate, and postdoctoral trainees serve as Neuroscience Ambassadors and receive training in science communication, community engagement, and workshop facilitation. Ambassadors collaborate with faculty and community partners to develop and deliver modular, hands-on workshops focused on brain anatomy and function, learning and memory, stress and resilience, decision-making, perception, and brain health.Workshops incorporate active-learning strategies and portable demonstration tools including brain models, electrophysiological recording systems, reaction-time assessments, sensory illusion activities, and concussion-simulation exercises. Program implementation follows a phased approach consisting of curriculum development, ambassador training, pilot deployment, iterative refinement, and community dissemination.A mixed-methods evaluation framework assesses program impact. Community outcomes include measures of neuroscience knowledge, interest in science, perceived relevance of neuroscience, participant engagement, and satisfaction. Trainee outcomes include science communication confidence, community engagement skills, and professional development. Programmatic outcomes include partnership growth, workshop reach, and curriculum utilization.At the time of presentation, the program will have established community partnerships, trained an initial cohort of neuroscience ambassadors, developed multiple workshop modules, and begun pilot implementation across partner sites. Preliminary implementation metrics and early evaluation data will be presented. Ongoing assessment will guide program refinement and development of a sustainable model for community-engaged neuroscience education that may strengthen connections among neuroscience research, trainee development, and public engagement.

Disclosures: J.L. Hoffman: None.

Theme K Poster

TKP05: Outreach Activities of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP05.16SU/MM16

Topic: K.03. Public Awareness of Neuroscience

Support: UAB Comprehensive Neuroscience Center
International Brain Research Foundation/Dana Foundation
Society for Neuroscience Early Career Policy Ambassadors program

Title: Neuroscience for All: From Brain Awareness Week to Year-Round Neuroscience Outreach

Authors: A. E. GRYSHYNA[1], D. K. GREY[2], C. E. NEWMAN[3], C. T. EICKSTEAD[2], T. E. WALTERS[4], A. PIPER[2], M. BULLOCK[4], A. GWINN[6], A. COACHMAN[5], K. M. VISSCHER[3], ***J. R. ROTH**[3];
[2]Psychology, [3]Neurobio., [4]Neurol., [5]Comprehensive Neurosci. Ctr., [1]The Univ. of Alabama at Birmingham, Birmingham, AL; [6]McWane Sci. Ctr., Birmingham, AL

Abstract: Science communication plays an essential role in bridging the gap between researchers and the general public. Now, more than ever, it is essential for neuroscientists to interact with their communities to increase understanding of basic neuroscience concepts and enhance trust in academic scientists as members of the community. However, it can be difficult, as scientists, to develop and maintain effective lines of communication with the public. To address this, we have organized multiple modular outreach events aimed to educate the public about various aspects of neuroscience. These events range from Brain Snacks, a portable set of neuroscience demos, to an annual Brain Awareness Week hosted by our local McWane Science Center during the Birmingham city schools' spring break. Here, we share our strategy of expanding the annual Brain Awareness Week into a year-round "Neuroscience for All" program. We provide practical materials including a dedicated, interactive GitHub-based platform (https://github.com/Neuroscience-for-All/) for discussion of personal experiences and extensions and improvements to materials. Our goal is that the resources and examples we outline will facilitate other institutions to easily expand existing programs or create new ones from scratch and that our online forum will facilitate broader discussion and improvement of neuroscience outreach initiatives across institutions.

Disclosures: A.E. Gryshyna: None. **D.K. Grey:** None. **C.E. Newman:** None. **C.T. Eickstead:** None. **T.E. Walters:** None. **A. Piper:** None. **M. Bullock:** None. **A. Gwinn:** None. **A. Coachman:** None. **K.M. Visscher:** None. **J.R. Roth:** None.

Theme K Poster

TKP05: Outreach Activities of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP05.17SU/MM17

Topic: K.03. Public Awareness of Neuroscience

Support: Sprout Ideas Fellowship

Title: Embedding community engagement and integrated knowledge translation practices within basic neuroscience research

Authors: *H. B. SIDDIQUI, D. RACIOPPA, J. H. KRYKLYWY;
Psychology, Lakehead Univ., Thunder Bay, ON, Canada

Abstract: Background: To strengthen public accountability and transparency, funding bodies are increasingly calling for researchers to demonstrate the societal impact of their projects. One of the mechanisms through which this is accomplished is integrated knowledge translation (iKT), which is a continuum of practices ranging from information dissemination to active collaborations with members of the public. Although the relevance of integrated knowledge translation practices is more readily apparent in clinically-oriented research, basic science research also relies on trust, participation, and investment from the public. However, even though basic neuroscience operates in unique contexts compared to its clinical counterparts, guidance on how to operationalize iKT principles is limited. The objective of this project is to examine how iKT principles can be adapted to basic neuroscience research. **Methods:** There were two phases to this project: i) a review of existing iKT practices and guidelines within basic neuroscience literature, and ii) a public engagement project to complement ongoing empirical MRI and psychophysiology studies. Phase I consisted of a literature review of how the concepts of socially accountable research, patient-oriented research, and iKT are implemented within basic neuroscience. In Phase II, we delivered community engagement sessions on how neuroscience methods are used in research, with a focus on neuroimaging and psychophysiology. These sessions were designed to move beyond a traditional researcher-participant model by creating opportunities for community members to learn about research methods, ask questions, and create spaces for dialogue about neuroscience research. Engagement sessions were evaluated using measures of attendance, knowledge transfer, clarity, and public trust. **Implications:** Although sparse, basic science iKT literature supports education-based outreach as a strategy for improving public understanding of the slow, incremental nature of basic science, as well as building relationships between researchers and the public to motivate future research directions. This work provides novel insight into how the iKT continuum can be applied to basic neuroscience. Specifically, we demonstrate - drawing on both the literature and feedback obtained during our community outreach - that public education and opportunities for dialogue can serve as meaningful forms of iKT in basic neuroscience. They act to facilitate informed participation while strengthening public trust, thus expanding the societal impact of neuroscience research.

Disclosures: H.B. Siddiqui: 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.; Sprout Ideas Fellowship. **D. Racioppa:** None. **J.H. Kryklywy:** None.

Theme K Poster

TKP05: Outreach Activities of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP05.18SU/Web Only

Topic: K.03. Public Awareness of Neuroscience

Support: SECITHI DIVULGACION-1019

Title: Promoting neuroscience literacy through health education, science outreach, art and community engagement at USEP in 2025-2026

Authors: *M. TORRES GARCÍA[1], Y. COSME HERRERA[2], D. CRUZ TREJO[2], E. MARTIN ZAYAGO[2], L. CID AQUINO[3], M. FUENTES MORALES[4], A. RAMOS SANTANA[5]; [2]Licenciatura en Médico Cirujano, [3]Vinculación y Extención Universitaria, [1]Univ. de la Salud del Estado de Puebla, Puebla, Mexico; [4]Licenciatura en Médico Cirujano, Univ. de la Salud del Estado de Puebla, PUEBLA, Mexico; [5]Communication and Image, Univ. de la Salud del Estado de Puebla, Puebla, Mexico

Abstract: Neuroscience knowledge and public awareness remain limited in many regions of Mexico, especially among populations with limited access to science communication and health education. The Universidad de la Salud del Estado de Puebla (USEP) is a public university supported by the Puebla government, targeting students from priority regions who want to become doctors. In this regard, university outreach activities could effectively promote public engagement in neuroscience and enhance the social responsibility and communication skills of medical students. Academic faculty and the Office of Academic Outreach and Partnership created a project to outline the development and impact of the International Brain Week 2025 and 2026. It involves a two-week multidisciplinary neuroscience outreach with various activities for a broad audience each year. The program involves mental health education, science communication, art and storytelling contests, hands-on workshops, lab demonstrations, holographic exhibitions, and community efforts centered on brain health and neuroscience. Medical students actively participate in these activities under faculty supervision. They designed workshops, prepared exhibition materials, infographics, and informative banners for the dissemination and public outreach of science, with scientific rigor. Some activities, such as art contests and talks, were conducted both in-person and online. Creative methods enhanced audience interaction and presented neuroscience ideas in accessible ways. Artistic elements, such as tales and paintings or drawings, increase interest in neuroscience and health promotion and promote scientific careers among participants. Student organizers reported improved science communication, teamwork, and community skills through the program's integrative project. Interdisciplinary neuroscience outreach could effectively promote neuroscience literacy and health education in communities. Both International Brain Week Awareness events at USEP highlight integrating public engagement, art, and participatory education into neuroscience communication with Latin American health science institutions, strengthening university-community ties, and expanding access for underserved groups.

Disclosures: M. Torres García: None. **Y. Cosme Herrera:** None. **D. Cruz Trejo:** None. **E. Martin Zayago:** None. **L. Cid aquino:** None. **M. Fuentes Morales:** None. **A. Ramos Santana:** None.

Theme K Poster

TKP05: Outreach Activities of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP05.19SU/MM18

Topic: K.03. Public Awareness of Neuroscience

Title: Neural Exposome Research at the National Institute of Neurological Disorders and Stroke

Authors: *C. FIGUEROA-ROMERO, N. T. DHRUV, S. SAMENI, S. M. SPRIGGS;
NIH, Natl. Inst. of Neurolog. Disorders & Stroke (NINDS), Rockville, MD

Abstract: Most neurological diseases are not explained by genetics alone. The neural exposome includes all environmental, biological, and psychosocial exposures that influence brain health across the lifespan. The Office of Neurological Exposome and Toxicology (ONETOX) at the National Institute of Neurological Disorders and Stroke (NINDS) was established to advance research on how these exposures affect nervous system development, function, and disease. This abstract highlights ONETOX's role in driving neural exposome research and collaboration.
NINDS used a two-phase process to define research priorities.
In Phase 1 (2023-2024), the Neural Exposome Top Priorities Working Group identified key gaps in the field. In Phase 2 (2025), ONETOX developed implementation strategies to address these priorities.
Phase 1 (strategic planning) identified six priorities: (1) identify exposome factors affecting neurological health; (2) define underlying mechanisms; (3) study exposures in human populations; (4) build a multidisciplinary community; (5) develop exposure assessment tools; and (6) strengthen collaborations. Phase 2 (implementation) focused on five actions: (1) foster partnerships; (2) leverage existing resources; (3) train investigators; (4) convene workshops; and (5) support research. These efforts aim to expand collaboration, improve access to tools and data, and increase support for neural exposome studies.
Neural exposome research can reveal disease mechanisms and identify modifiable risk and protective factors. ONETOX at NINDS is advancing this field through coordinated resources, expertise, and partnerships. This work strengthens the neuroscience research ecosystem and supports NINDS's mission to improve brain health across the lifespan.

Disclosures: C. Figueroa-Romero: None. **N.T. Dhruv:** None. **S. sameni:** None. **S.M. Spriggs:** None.

Theme K Poster

TKP05: Outreach Activities of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP05.20SU/Web Only

Topic: K.03. Public Awareness of Neuroscience

Title: University of Guanajuato Girl and Woman in Science Meeting

Authors: *M. ORTIZ CORTÉS[1,2], Y. G. VILLALPANDO CHAGOLLA[1], N. Y. CORTÉS[1]; [1]Nursing and Midwifery, Univ. de Guanajuato, Guanajuato, Mexico; [2]Intercultural Develop. and Mgmt., Univ. Nacional Autónoma de México, León, Mexico

Abstract: The "Girl and Woman in Science" program at the University of Guanajuato promotes scientific vocations from an early age and recognizes the achievements of female university researchers. It includes forums, workshops, and conferences to close the gender gap in STEM fields. It is celebrated every February 11th to commemorate the International Day of Women and Girls in Science. The 3rd Meeting of Girls and Women in Science UG 2026 aimed to connect the university community and society with women and girls in science, weaving bonds and generating strategies aimed at improving their future and contributing to a more inclusive society. To achieve this objective, interactive workshops, scientific exhibitions, astronomical observations, practical demonstrations, and experiments aimed at elementary and high school students were conducted. The University of Guanajuato's Department of Nursing and Midwifery actively participated in this meeting by conducting the workshop Tracking Memories: An Interactive Experience. The workshop introduced the participating girls and adolescents to the basic functioning of the nervous system. This educative experience also highlighted the importance of brain health through simple explanations, practical examples, and participatory activities such as games and challenges. First, the nervous system and its main components were explained: the brain, the spinal cord, and the nerves. The role of neurons as the cells responsible for transmitting messages was also presented. Subsequently, the functioning of the brain was addressed, highlighting the importance of structures such as the hippocampus and glial cells, especially astrocytes. The workshop also promoted health education by explaining various risk factors that can affect brain function and cognitive abilities, such as lack of sleep, poor diet, and excessive screen time, among others. Finally, photobiomodulation was introduced, a technology that uses infrared light to stimulate brain cell activity. The participants were able to see the photobiomodulation helmet at the workshop stand.In conclusion, through this workshop, the participants achieved a greater understanding of how the nervous system works, recognized the importance of taking care of their brain, and promoted habits that favor their health and cognitive well-being.

Disclosures: M. Ortiz Cortés: None. **Y.G. Villalpando Chagolla:** None. **N.Y. Cortés:** None.

Theme K Poster

TKP05: Outreach Activities of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP05.21SU/MM19

Topic: K.03. Public Awareness of Neuroscience

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

Title: Proceedings of the 39th Northeast Undergraduate and Graduate Research Organization for Neuroscience (NEURON) conference held at Quinnipiac University's Science, Innovation, Technology and Exploration (SITE) Building

Authors: *A. J. BETZ[1], G. R. TANNER[3], J. L. HAIGHT[2], A. ECEVITOGLU[5], E. KLINE[4], K. SCHMIDT[6], V. FRANCONE[7], D. G. WINDER[8];
[2]Psychiatry, [1]Quinnipiac Univ., Hamden, CT; [3]Physiol. and Neurobio., Univ. of Connecticut, Storrs Mansfield, CT; [4]Mol. and Cell Biol., Univ. of Connecticut, Storrs, CT; [5]Dept. of Psychiatry, McLean Hosp., Belmont, MA; [6]Psychology, Fairfield Univ., Fairfield, CT; [7]Frank H Netter MD Sch. of Medicine, Quinnipiac Univ., Hamden, CT; [8]UMass Chan Med. Sch., Worcester, MA

Abstract: The NEURON Conference continues its longstanding tradition of advancing the professional development and educational enrichment of undergraduate and graduate neuroscientists while offering a dynamic platform for student-led research dissemination. The 39th annual NEURON Conference convened on April 11, 2026, at Quinnipiac SITEs new 137,000 square foot academic building. This year's keynote address was delivered by Dr. Danny Winder, Chair of the Department of Neurobiology at UMass Chan Medical School, who presented *"Diverse Minds, Shared Struggle: Neurobiological Insights into Alcohol Use Disorder through Heterogeneity and Co-Morbidity."* Dr. Winders's lecture explored the neurobiological mechanisms underlying substance use disorders, with particular emphasis on how stress interacts with addiction-related circuitry. In addition to the keynote, attendees participated in a range of thematic workshops, including *Careers in Science, Intraoperative Neuromonitoring and Surgical Neurophysiology, Connectomics in the Classroom, AI Tools in Neurobiology, Implementing Rat Tickling for Welfare Enhancement, Scientific Communication: Strategies for Open-Access Peer Reviewing and Scientific Podcast Curation, Community for Rigor Workshops, and a Faculty Workshop on Overcoming Challenges Facing Faculty.* Parallel programming included undergraduate and graduate poster sessions, rapid-fire Data Blitz presentations, and graduate school recruitment activities, fostering interdisciplinary dialogue and professional networking. Excellence in student research was recognized through the Tieman Outstanding Poster Awards and Data Blitz presentation awards. Nu Rho Psi, the national neuroscience honor society, also presented a student poster award. Quinnipiac University continues to serve as the main site for NEURON, hosting online resources including registration, abstract submission, archives of past presentations, and photo galleries (www.quinnipiac.edu/neuron). Looking ahead, the 40th NEURON Conference will be held on Sunday, April 10, 2027, at Quinnipiac University's new academic facility, SITE, featuring a modern, 700-seat auditorium. Supported by regional faculty committed to mentorship and neuroscience education, and co-sponsored by Quinnipiac University (notably the College of Arts and Sciences and the Department of Psychology) and the University of Connecticut, NEURON has evolved into a regional hub for neuroscience collaboration across the Northeast. Stay connected via Instagram @neuronconference.

Disclosures: A.J. Betz: None. **G.R. Tanner:** None. **J.L. Haight:** None. **A. Ecevitoglu:** None. **E. Kline:** None. **K. Schmidt:** None. **V. Francone:** None. **D.G. Winder:** None.

Theme K Poster

TKP05: Outreach Activities of Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP05.22SU/LL27

Topic: K.03. Public Awareness of Neuroscience

Title: The EASE Framework: A Scalable Auricular Self-Care Approach for Mental Health Promotion

Authors: K. LI[1], Z. ZHANG[2], *J. KONG[2];
[1]Massachusetts Gen. Hosp., Cambridge, MA; [2]Massachusetts Gen. Hosp., Charlestown, MA

Abstract: Mental health and emotion regulation are central to resilience and quality of life across the lifespan, yet scalable, low-burden strategies that complement clinical care remain limited, particularly as demand for mental health services continues to outpace the available clinical workforce. This gap has intensified interest in self-administered approaches that individuals can practice independently, at low cost, and at sufficient scale to support prevention and promotion rather than treatment alone. Recently, spurred in part by the Stimulating Peripheral Activity to Relieve Conditions initiative, auricular stimulation has emerged as a promising intervention for mental health. Its appeal reflects the auricle's status as a uniquely advantageous site for neuromodulation, owing to a convergence of practical, traditional, and neuroanatomical factors: it carries a long history of therapeutic mapping across Chinese and French traditions; and it is densely innervated by cranial and cervical afferents—most notably the auricular branch of the vagus nerve—that project to brainstem and limbic networks implicated in stress and mood. However, the field remains fragmented across point systems, mechanistic models, delivery methods, dosage, and implementation pathways. In this study, we propose the EASE Framework—Ear-wide engagement, Acupoint-informed prioritization, Self-administration, and Evaluation of emotional and related outcomes—as a pragmatic model for scalable manual auricular self-care that unifies disparate point systems and afferent targets into a single reproducible workflow. EASE builds on established auricular medicine while incorporating contemporary afferent-based concepts as complementary mechanistic support: rather than targeting a single set of points or one auricular nerve, it engages multiple acupoints and afferents simultaneously that may converge on brainstem nuclei and propagate to limbic structures, offering a plausible multi-afferent route to autonomic, affective, and inflammatory regulation. Specifically, we propose a four-step workflow, moving systematically from focal acupoint stimulation toward broad ear-wide engagement, with graded dosage tiers that scale repetitions per step to fit brief daily, extended, or research use. By emphasizing safety, simplicity, and repeated home or community practice, EASE may provide a practical, hypothesis-generating foundation for promoting mental well-being and future research.

Disclosures: K. Li: None. **Z. Zhang:** None. **J. Kong:** E. Ownership Interest (stock, stock options, royalty, receipt of intellectual property rights/patent holder, excluding diversified mutual funds); Equity in MNT and BTT startup; inventor on granted patent US 2018/0339148 plus pending applications.

Theme K Poster

TKP06: Public Awareness of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP06.01SA/MM20

Topic: K.03. Public Awareness of Neuroscience

Support: Field-Spicer Fellowship in Research

Title: Examining the understanding of concepts of neuroscience associated with endocrine disruption by bisphenols: An overview of neuroendocrine impacts of plastics.

Authors: *G. M. LANGE, R. LANGE;
Saginaw Valley State Univ., University Center, MI

Abstract: Bisphenols are an array of ubiquitous endocrine-disrupting chemicals that are integral in many forms of plastics manufactured for use in everyday life. Evidence shows that bisphenols can and do alter a variety of key aspects of nervous system function including altering brain development, impairing synaptic plasticity, and promoting neuroinflammation. It is known that bisphenols can cross the blood-brain barrier, triggering cellular damage, affecting gene regulation, and increasing the risk of neurodevelopmental and psychiatric disorders. With brain development highly dependent on precise hormone signaling, endocrine disruption by bisphenols can induce developmental anomalies in brain organization, and because bisphenols mimic or interfere with estrogen and thyroid hormones, early-life exposure can alternatively shape many facets of neural physiology. In this poster, examination of the general public's understanding of the impacts of bisphenols is discussed. Special emphasis explores the dichotomy between what science research has identified and what the public perceives as the impact of bisphenol pollution on health and wellness. These findings are discussed across the spectrum of plastics pollution in the environment.

Disclosures: G.M. Lange: None. **R. Lange:** None.

Theme K Poster

TKP06: Public Awareness of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP06.02SA/MM21

Topic: K.03. Public Awareness of Neuroscience

Support: R01AG098263
UWM Advanced Opportunity Fellowship

UWM SURF Fellowship
Helen Bader Age and Community Fellowship

Title: Bridging the Gap: Prioritizing Healthy Aging by way of Subjective Cognitive Experiences

Authors: *C. I. CHARLES, P. E. IWOK, C. R. BOWMAN;
Psychological and Brain Sci., UW-Milwaukee, Milwaukee, WI

Abstract: In 2025, the National Institute on Aging allocated over 70% of its $4 billion funding budget to Alzheimer's Disease and related dementias, leaving healthy cognitive aging relatively understudied. Crucially, traditional research paradigms frequently overlook the subjective, lived experiences of older adults, creating a disconnect between laboratory focus areas and community priorities. To bridge this gap and foster community-engaged science, our lab developed a survey that built on prior tools to further understand older adults' experience of their own cognition. We partnered with local older adults (aged 60+) in the Milwaukee-area to characterize their subjective cognitive experiences, measuring perceived changes and the value they place on specific abilities relative to their young adulthood. Preliminary data from this community cohort suggest that while reported cognitive gains and declines partially map onto objective lab-based trends (e.g., in memory and processing speed), participants' self-identified priorities differed from traditional research focus areas, placing the highest premium on maintaining learning capacity and emotional regulation. This initiative demonstrates a scalable model for public engagement in neuroscience, directly involving a historically passive research population as active stakeholders. Ultimately, these results provide a framework for translating community feedback into targeted, citizen-centered cognitive interventions and ensuring that future healthy cognitive aging research directly addresses the lived concerns and priorities of older adults.

Disclosures: C.I. Charles: None. **P.E. Iwok:** None. **C.R. Bowman:** None.

Theme K Poster

TKP06: Public Awareness of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP06.03SA/MM22

Topic: K.03. Public Awareness of Neuroscience

Support: This research was supported by the Regional Innovation System & Education(RISE) program through the Daejeon RISE Center, funded by the Ministry of Education(MOE) and the Daejeon Metropolitan City , Republic of Korea.(2026 -RISE-06-005)
This research was supported by the Regional Innovation System & Education(RISE) program through the Daejeon RISE Center, funded by the NRF, Republic of Korea.(RS-2022-NR070207)

Title: Mesical Parcanto: A Five-Year Development of an Ethical Arts-Participation Framework Through the Singing of Patients with Parkinson's Disease

Authors: *H. YOO[1], M. PARK[2], H. SON[3], J. HUR[3];
[2]Korean Med., [1]Daejeon Korean Med. Hosp. of Daejeon Univ., Daejeon, Korea, Republic of;
[3]Daejeon university, Daejeon, Korea, Republic of

Abstract: Parkinson's disease (PD) involves not only motor symptoms but also non-motor features such as depression, anxiety, restricted self-expression, and social isolation; as it progresses, declining vocal and respiratory function and dysphagia can become significant burdens. Mesical Parcanto began from this understanding, treating singing not merely as artistic activity but as a practice that also considers vocal function, self-expression, and social participation. Yet performance-based participation carries an ethical burden, requiring patients to expose their illness before others. The program's name joins Mesical (medical + musical) with Parcanto (Parkinson Can Together; Part Can Together; bel canto), emphasizing that patients are not passive recipients of treatment but agents expressing recovery and solidarity through their own voice and song.Derived from a program in which PD patients, clinicians, and artists participated together from 2022 to 2026, the framework rests on four concepts. Patient Agency holds that the patient chooses the form, intensity, and direction of participation rather than being a passive object of intervention. Visibility Burden denotes the doubled exposure by which patients must disclose their illness simultaneously to general audiences and to family or acquaintances. The Tiered Participation Model lets patients self-select exposure across stage, video, audience seating, and interview. Permission-to-Withdraw Design ensures patients may exit at any time without explanation or guilt.These concepts arose not as theory but through repeated performance, failure, and redesign. When most participants withdrew during the first performance in 2022, it became clear that such intervention can impose a new exposure burden, prompting redesign as a tiered structure in which patients adjust participation to their condition. Withdrawal was treated not as failure but as a normal choice respecting chronic illness variability. The song was thereby redefined as both an activity attentive to vocal function and an ethical act that makes illness socially visible while safeguarding psychological safety.Mesical Parcanto reframes arts participation by PD patients as an ethical participatory structure addressing patient agency, the social visibility of illness, psychological safety, and the right to withdraw. Without requiring patients to "become artists," it shows that song grounded in clinical understanding, with each small role, can converge into a restorative experience. The framework extends beyond PD to participatory arts for chronic neurological illness, public engagement, and patient-centered medical humanities.

Disclosures: H. Yoo: None. **M. Park:** None. **H. Son:** None. **J. Hur:** None.

Theme K Poster

TKP06: Public Awareness of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP06.04SA/MM23

Topic: K.03. Public Awareness of Neuroscience

Support: CIC-UMSNH 18099
ICTI/DA/102/2026
CIC-UMSNH 18096

Title: Inhibitory Control and Performance on a Go/No-Go Task in High School and College Students

Authors: *L. F. ORTEGA-VARELA[1], L. M. VAZQUEZ RANGEL[2], M. FERREIRA RODRIGUEZ[1], E. GONZÁLEZ[1], M. Y. GAUTHEREAU-TORRES[3], C. J. GUTIERREZ-GARCIA[4], A. RODRIGUEZ MEDINA[1];
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Abstract: Inhibitory control is a fundamental executive function for behavioral self-regulation, decision-making, and academic performance. During adolescence and emerging adulthood, these abilities continue to develop due to the progressive maturation of the prefrontal cortex. The objective of this study was to evaluate inhibitory control using a Go/No-Go task and to analyze the influence of the application environment in high school and college students in the Brain Awareness Week at UMSNH. A quantitative, descriptive, cross-sectional study was conducted with a sample of 220 students (56.8% female and 43.2% male), with a mean age of 18.2 years. Participants performed the task in digital (63.6%) or manual (36.4%) formats with or without noise (Digital Format (DM), Digital Format with noise (DMN), Manual Format (MF) and Manual Format with noise (MFN)); and the number of errors per task were recorded as indicator of response inhibition failure. Data on sleep, caffeine consumption, digital multitasking, and mental fatigue were also collected.
The results showed a significantly higher number of errors per task in the digital modality (DF=2.09 ± 0.17 SEM; DFN=2.36 ± 0.20 SEM) compared to the manual modality (MF=0.69 ± 0.13 SEM; MFN=0.91 ± 0.18 SEM); in the same modalities, a higher level of errors was observed in noise groups in comparison to the groups without noise (Student´s t test, $p \leq 0.05$). These findings suggest that technological environments increase cognitive demand and may affect inhibitory control. Overall, the results highlight the relevance of the performance context on inhibitory performance and provide useful evidence for the design of psychoeducational strategies aimed at strengthening executive functions, mental health, and academic performance.

Disclosures: L.F. Ortega-Varela: None. **L.M. Vazquez Rangel:** None. **M. Ferreira Rodriguez:** None. **E. González:** None. **M.Y. Gauthereau-Torres:** None. **C.J. Gutierrez-Garcia:** None. **A. Rodriguez Medina:** None.

Theme K Poster

TKP06: Public Awareness of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP06.05SA/MM24

Topic: K.03. Public Awareness of Neuroscience

Title: A review of social and neurobiological factors contributing to racial disparities following mild traumatic brain injury

Authors: *C. DONDJI[1], Z. LOPEZ[2], R. E. HARTMAN[3];
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Abstract: Mild traumatic brain injury (mTBI) can produce cognitive, emotional, and functional symptoms that persist beyond the acute recovery period. Although mTBI is often framed as a biological injury, recovery occurs within social and healthcare systems that may distribute diagnostic accuracy, rehabilitation access, and long-term support unequally. This review examines racial and ethnic disparities after mTBI as a neuroethical issue involving justice, representation, and culturally responsive care. We reviewed the literature on post-mTBI outcomes, rehabilitation access, patient-provider interactions, medical mistrust, psychosocial stress, mental health burden, pain, inflammation, and representation of diverse populations in neurotrauma research. Across studies, racial and ethnic minority patients often experience reduced access to rehabilitation services, shorter duration of care, worse recovery trajectories, and greater psychological distress compared with White patients. These disparities appear to reflect structural inequities and differential healthcare experiences rather than race or ethnicity as biological risk factors. Chronic stress, depression, pain, sleep disruption, and/or inflammatory dysregulation may interact with injury-related neural recovery processes, linking social disadvantage with the biological mechanisms of prolonged symptoms. The literature also suggests that underrepresentation of diverse populations in neurotrauma research may limit the validity and fairness of neuropsychological assessment tools and/or rehabilitation recommendations. These findings raise neuroethical concerns about equity in diagnosis, access to treatment, and the generalizability of mTBI research. Addressing disparities after mTBI will require pro-active inclusive research practices, culturally informed clinical assessment, community trust-building, and equitable access to rehabilitation services.

Disclosures: C. Dondji: None. **Z. Lopez:** None. **R.E. Hartman:** None.

Theme K Poster

TKP06: Public Awareness of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP06.06SA/MM25

Topic: K.03. Public Awareness of Neuroscience

Title: Adoption, use, and perceived value of continuous digital monitoring technologies in animal research: A mixed-methods survey

Authors: *L. P. NOLDUS[1,2], S. BARAN[3,4], J. ESWARAKA[5], M. VAN GAALEN[6], A. R. STEPHENS[7], M. R. LAFOLLETTE[7];

[1]Donders Inst. for Brain, Cognition and Behavior, Radboud Univ., Nijmegen, Netherlands; [2]Noldus Information Technol. BV, Wageningen, Netherlands; [3]Instem Ltd, Boston, MA; [4]Digital Preclinical Society, Cambridge, MA; [5]Office for Res., Rutgers Univ., Piscataway, NJ; [6]Translational Sci., Evotec Intl. GmbH, Goettingen, Germany; [7]The 3Rs Collaborative, Denver, CO

Abstract: Home cage monitoring (HCM) enables longitudinal, high-resolution measurement of behavior and physiology in minimally disruptive conditions, offering clear value for neuroscience. Despite growing interest, adoption remains uneven. To assess use, value, and barriers, the 3Rs Collaborative conducted a global mixed-methods survey (Oct-Nov 2025) of individuals working with research animals. A total of 123 respondents met inclusion criteria, representing academic (50%), industry, and contract research settings across 19 countries, including 59 current and 64 potential users. Familiarity with HCM was moderate and implementations were limited in scope, with only 20% reporting broad integration. Interest in digital monitoring was high across neuroscience-relevant applications, such as behavioral phenotyping, disease modeling, and translational studies. Behavioral (88%) and physiological (74%) endpoints were most frequently prioritized, reflecting core needs such as tracking activity, sleep-wake cycles, and functional outcomes in models of neurological and psychiatric disorders. Scientific value, particularly improved data quality, granularity, and the ability to capture continuous, longitudinal datasets, was the most consistently reported benefit (56% in both groups). Financial barriers were the dominant constraint, cited by 92% of potential users, with initial investment as the primary challenge. Notably, potential users more frequently anticipated animal welfare (59% vs 35%) and operational benefits (46% vs 26%) than current users reported, suggesting a gap between expectations and realized outcomes. Respondents also identified persistent challenges related to cost, IT infrastructure, and workflow integration. At the same time, commonly reported pain points, such as labor-intensive behavioral assays and concerns about variability or accuracy in behavioral data, highlight clear opportunities for digital monitoring to enhance rigor and reproducibility. Overall, these findings suggest that digital monitoring technologies are transitioning from early adoption toward defined use cases in neuroscience. Broader integration will depend on aligning validation frameworks, infrastructure, and funding models with clearly articulated experimental and translational applications.

Disclosures: L.P. Noldus: None. **S. Baran:** None. **J. Eswaraka:** None. **M. van Gaalen:** None. **A.R. Stephens:** None. **M.R. LaFollette:** None.

Theme K Poster

TKP06: Public Awareness of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP06.07SA/MM26

Topic: K.03. Public Awareness of Neuroscience

Support: Edwards PhD Fellowship in Chronic Pain Research from the Louise and Alan Edwards Foundation
Healthy Brains, Healthy Lives Neuro Commercialization Grant

Title: A Digital Arts-Based Knowledge Translation Tool for the Enhancement of Chronic Pain Literacy and Patient-Provider Communication

Authors: *H. DERUE;
Integrated Program in Neurosci., McGill Univ., Montreal, QC, Canada

Abstract: In 1971, the McGill Pain Questionnaire established a foundational framework for structured, multidimensional, language-based pain reporting in clinical contexts. Over 50 years later, patients living with chronic pain continue to struggle to characterize the temporal, affective, and contextual dimensions of their experience, limiting information available to treating clinicians and reinforcing persistent gaps in public understanding of pain neuroscience. We present Doloris, a web-based platform that extends this legacy by supporting structured self-monitoring, introspective practice, and richer patient-provider communication. Doloris supports brief daily engagement through body mapping and guided, evidence-informed reflection tasks. A machine learning pipeline converts unstructured patient testimony into personalized, structured longitudinal insights, functioning as an active knowledge translation tool rather than a passive tracker. Purpose-built arts-based reflection tasks apply curated imagery from the National Gallery of Art open-access database to scaffold somatic and emotional awareness, supporting users in articulating aspects of their pain experience that resist conventional description. The platform is currently in beta, with a commercial launch planned for September 2026, and will be presented at an invited symposium at the National Gallery of Art in November 2026. Doloris illustrates a complementary approach to chronic pain education: embedding neuroscience literacy into a daily-use tool that deepens patient self-understanding and supports productive dialogue with healthcare practitioners and community members. Future directions include secure HCP data-sharing and community connection through curated programming at arts and culture institutions. Doloris initially targets women's chronic pain, long underserved by existing reporting frameworks, with planned expansion to other conditions of high linguistic and affective complexity, including pediatric chronic pain.

Disclosures: H. Derue: E. Ownership Interest (stock, stock options, royalty, receipt of intellectual property rights/patent holder, excluding diversified mutual funds); Derue Technologies Inc..

Theme K Poster

TKP06: Public Awareness of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP06.08SA/MM27

Topic: K.03. Public Awareness of Neuroscience

Title: Patient and advocacy partnership in early neurotechnology design: acceptance, surgical risk tolerance, and willingness to pay for tinnitus neuromodulation

Authors: *N. GNINENKO[1,2], J. FRENCH[3];
[1]Neurosoft Bioelectronics, Geneva, Switzerland; [2]Neuro-X Inst., Ecole Polytechnique Federale de Lausanne (EPFL), Geneva, Switzerland; [3]Neurotech Network/American Brain Coalition, Saint Petersburg, FL

Abstract: Chronic subjective tinnitus can be severely disabling, and for a subset of individuals, only palliative and symptom management strategies exist. This unmet need has historically motivated exploratory invasive neuromodulation approaches, including deep brain (DBS) and cortical stimulation, in treatment-refractory patients. Engaging the affected community at the early device development stage raises questions that reach beyond efficacy to patient usability preferences, surgical-risk tolerance, and equitable access, and is central to responsible and ethical neurotechnology development.
In partnership with the patient and neurotechnology-advocacy organizations Neurotech Network and Tinnitus Hub, we conducted an online preference survey (NCT06782308). To date, 630 adults with tinnitus have completed it (68% male; largest age band 65-74 years). Severity was measured with the Mini-Tinnitus Questionnaire (Mini-TQ); device acceptance, willingness-to-pay (WTP), and surgical risk tolerance were assessed on standardized scales.
The cohort is heavily affected (66% severe/very severe; 93% experience daily tinnitus). A majority reported high acceptance (VAS ≥ 8) of implantable neurostimulation (DBS 57%, a soft cortical implant 56%, both 62%), with preferences split evenly between fully implanted and wearable systems. Median out-of-pocket WTP was \$5-10k for 50% loudness reduction and \$15-20k for 90%; more-severely affected patients were willing to pay significantly more ($p < 0.001$). Surgical-risk tolerance was substantial and efficacy-dependent (acceptance of mild complications rose from 61% to 84% as expected relief increased from 50% to 90%). Notably, if insurance covered the main treatment cost (\$20-35k), 85% would still pay a remaining \$5k co-payment.
Community co-designed surveying reveals public openness to neurostimulation for tinnitus alongside clear economic and policy constraints on access, with reimbursement emerging as the main barrier. These preliminary data (study is ongoing until August 2026) show how partnership with patient organizations can inform ethical neurotechnology design and reimbursement policy.

Disclosures: N. Gninenko: A. Employment/Salary (full or part-time):; Neurosoft Bioelectronics. E. Ownership Interest (stock, stock options, royalty, receipt of intellectual property rights/patent holder, excluding diversified mutual funds); Neurosoft Bioelectronics. **J. French:** None.

Theme K Poster

TKP06: Public Awareness of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP06.09SA/MM28

Topic: K.03. Public Awareness of Neuroscience

Support: ICTI/D.A./102/2026
CIC-UMSNH 18099
CIC-UMSNH 18096

Title: Physiological and perceptual responses of students to virtual reality simulations

Authors: *C. J. GUTIERREZ-GARCIA[1], M. FERREIRA RODRIGUEZ[2], E. GONZÁLEZ[2], A. RODRIGUEZ MEDINA[2], L. F. ORTEGA-VARELA[3], L. M. VAZQUEZ RANGEL, Sr.[4], M. Y. GAUTHEREAU-TORRES[5];
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Abstract: Virtual reality (VR) has evolved into a widely used tool in education, training, rehabilitation, and entertainment. Its main characteristic is the ability to generate a sense of perceptual presence, understood as the subjective perception of being within a virtual environment. This work was achieved during Brain Awareness Week (March 16-20) at Universidad Michoacana de San Nicolás de Hidalgo. More than 998 highschool and undergraduate students participated, a random sample was selected (n=175) with 95% confidence interval and a 6.75% margin of error. 40% were male and 60% were female with an average age of 17.84 years. The activity consisted in viewing an immersive, first-person video of a BASE jump using VR headsets. Heart rate was recorded before, during, and after the experience using a pulse oximeter in beats per minute (bpm). Additionally, a survey was conducted to collect sociodemographic data and assess perceptions of dizziness, falling, emotional disturbance, and movement. Results showed significant differences between the initial and maximum heart rates reached during the experience ($t = -10.04$; $p = 5.36 \times 10^{-19}$). Participants experienced an increase of 11.01 beats per minute in average. Furthermore, the final heart rate remained significantly higher than the initial rate, indicating that the physiological effect persisted after the simulation ended. From the perspective of perceptual presence theory, these findings suggest that virtual experience generated a sufficiently convincing illusion to elicit responses comparable to those observed in real-life situations. A significant association between dizziness and sex was also identified ($\chi^2 = 5.714$; $p = 0.0168$); 52.4% of women reported dizziness compared to 32.8% of men. Furthermore, the perception of falling was significantly associated with emotional disturbances ($\chi^2 = 5.714$; $p = 0.0168$). Among those who experienced the sensation of freefall, 50.7% reported euphoria or fear, compared to 30.7% of those who did not perceive this sensation. Virtual reality can induce measurable physiological and perceptual responses. These findings reinforce the potential of brief immersive experiences for educational, scientific, and professional training applications.

Disclosures: C.J. Gutierrez-Garcia: None. **M. Ferreira Rodriguez:** None. **E. González:** None. **A. Rodriguez Medina:** None. **L.F. Ortega-Varela:** None. **L.M. Vazquez Rangel:** None. **M.Y. Gauthereau-Torres:** None.

Theme K Poster

TKP06: Public Awareness of Neuroscience

Location: WCC Halls A-C

Time: Saturday, November 14, 2026, 1:00 PM - 5:00 PM

Program #/Poster #: TKP06.10SA/MM29

Topic: K.03. Public Awareness of Neuroscience

Title: The brain and the creation of sound

Authors: M. LEVINE[1], M. VOLOSHIN[2], ***J. PARATO**[3];
[1]Christopher Newport Univ., Norfolk, VA; [2]Mighty Data, Inc., Asheville, NC; [3]SUNY Empire, Brooklyn, NY

Abstract: Interdisciplinary collaborations between music and neuroscience offer exciting opportunities for educational outreach across both disciplines. As part of SUNY Empire's Brain Awareness programming, we organized the 2026 event *The Brain and The Creation of Sound*. This event used measures of brain and neuronal activity (pre-recorded electroencephalograms, intracellular and extracellular recordings, and simple real time measurements from a commercially available headband) for music composition. Audience members were also able to participate in an interactive set where they listened to compositions with a background beat tied to varying heart rates, and they were able to observe how their brain activity changed according to what they were listening to. This event demonstrates the capacity of neuroscience to inspire musical innovation, while also highlighting the effectiveness of music as a tool for communicating and promoting foundational concepts in both music and neuroscience.

Disclosures: M. Levine: None. **M. Voloshin:** None. **J. Parato:** None.

Theme K Poster

TKP07: Ethical and Policy Issues in Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP07.01SU/MM30

Topic: K.04. Ethical and Policy Issues in Neuroscience

Title: Are There WEIRD Biases in Human-Centered Neuroscience?

Authors: *O. G. POOLE, J. S. ROBERT;
Sch. of Life Sci., Arizona State Univ., Tempe, AZ

Abstract: Translational success in neuroscience requires a more focused shift toward research strategies integrating both innovative animal models and human or human-centered non-animal models. While animal models remain indispensable to clinical translation, their predictive limitations continue to contribute to high failure rates in human clinical trials. This is an ethical

problem in need of further scrutiny (Disney and Robert 2019; Robert 2008). NIH has helped develop human-centered alternatives to animal models, and these are improving. In 2025, the NIH created the Office of Research Innovation, Validation, and Application (ORIVA), part of a new initiative to “prioritize human-based research technologies” to reduce the over-reliance on animal models in biology and biomedicine, as too many findings from animal studies fail to translate into clinical treatment (NIH 2026). In the past, we have outlined several challenges this new orientation might pose to the neurosciences (Redacted, SfN, 2025). Here we address one concern more thoroughly. We must be vigilant that this recent NIH-prompted shift to human-centered models does not contain an underexamined assumption: that the "human" being centered is a stable, universal baseline or somehow otherwise representative of humans as such. Meanwhile, the US federal government has gutted human research efforts to understand human diversity - in this case, apparently, deviation from the ideal, the white man. Drawing on the WEIRD (Western, Educated, Industrialized, Rich, and Democratic) approach (Henrich, Heine & Norenzayan, 2010) we explore whether and how WEIRD bias has permeated neuroscience not only through uneven participant sampling but also through the intentional exclusion of human diversity, reflecting who gets studied. At base, we must ask: Human-based-on who? Human-centered for whom? A holistic human-centered neuroscience requires not only a diverse participant pool, but the production of technical paradigms with non-WEIRD researchers and communities. Without this, the translational gap between pre-clinical research and human health continues to rest on a narrow piece of humanity. The result is a translational science that centers a particular kind of human while calling it universal. References: Disney AA, Robert JS. 2019. PNAS USA 116.52: 26181-26186. doi: www.pnas.org/cgi/doi/10.1073/pnas.1902280116.Henrich J, Heine SJ, Norenzayan A. 2010. Behav Brain Sci. 33(2-3):61-83; discussion 83-135. doi: 10.1017/S0140525X0999152X.NIH. 2026. https://dpcpsi.nih.gov/proposed-reorg-establish-oriva-orepaRobert JS. 2008. Phil Psychology 21: 425-436.

Disclosures: O.G. Poole: None. **J.S. Robert:** None.

Theme K Poster

TKP07: Ethical and Policy Issues in Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP07.02SU/MM31

Topic: K.04. Ethical and Policy Issues in Neuroscience

Title: Examining the growing development of large-scale models of neural responses through UNESCO's Recommendation on the Ethics of Neurotechnology

Authors: A. GAMA-KRUMMEL, *C. A. SHARP;
Univ. of Rochester, Rochester, NY

Abstract: In March, 2026 Meta Fundamental AI Research launched the TRIBE v2, an open-source foundation model of neural responses to visual, auditory, and language-based stimuli.

This technology exemplifies the growing development of large-scale computational models of neural activity that may redefine how we study, interpret, and apply our understanding of the nervous system. In light of these advancements, regulating the use of these models to ensure adherence to ethical standards is of paramount importance. In 2025, the United Nations Educational, Scientific, and Cultural Organization (UNESCO) drafted and adopted the Recommendation on the Ethics of Neurotechnology to establish a foundation of principles that the use of technology involved in the assessment, prediction, or modulation of neural activity should abide by. These include autonomy and freedom of thought, protection of neural data, trustworthiness and transparency, epistemic justice, inclusive engagement, and public empowerment. The current project addresses how foundation models of neural activity can adhere to UNESCO's human-centered principles in the rising age of AI.

Disclosures: A. Gama-Krummel: None. **C.A. Sharp:** None.

Theme K Poster

TKP07: Ethical and Policy Issues in Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP07.03SU/Web Only

Topic: K.04. Ethical and Policy Issues in Neuroscience

Support: JST RISTEX RInCA (JPMJRS25J2)
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JST RISTEX RInCA (JPMJRS22J4)
JSPS KAKENHI (24K03355)
JST Moonshot R&D (JPMJMS2012)

Title: Who Governs the Mind? Human Rights, Responsibility, and Feasibility in the UNESCO Recommendation on the Ethics of Neurotechnology

Authors: *M. NAKANO-OKUNO[1], H. YOSHIZAWA[1], S. TAKAHASHI[1], S. TAMAMIYA[1], T. SAWAI[2], K. TACHIBANA[4], M. TAKEMI[3], F. ARIE[5], T. FUKUSHI[6];
[1]Ctr. for Human Nature, Artificial Intelligence, and Neurosci. (CHAIN), Hokkaido Univ., Sapporo, Japan; [2]Hiroshima Univ., Higashi-Hiroshima, Japan; [3]Grad. Sch. of Advanced Sci. and Engin., Hiroshima Univ., Hiroshima, Japan; [4]Chiba Univ., Chiba, Japan; [5]Yamanashi Prefectural Univ., Kofu, Japan; [6]Tokyo Online Univ., Tokyo, Japan

Abstract: In 2025, UNESCO adopted the Recommendation on the Ethics of Neurotechnology, the first global intergovernmental framework dedicated specifically to the governance of neurotechnology. As neurotechnologies increasingly intersect not only with neuroscience research and clinical practice, but also with consumer, workplace, educational, military, and artificial intelligence applications, questions of governance and underlying principles are

becoming increasingly urgent.
This presentation draws on an interdisciplinary analysis conducted by a working group comprising scholars in neuroethics, neuroscience, philosophy, constitutional law, clinical ethics, and technology governance. Based on written critiques and collective deliberation on the Recommendation, we identify three interrelated themes: human rights, responsibility, and feasibility. First, we examine unresolved conceptual questions concerning autonomy, agency, mental privacy, and the definition of "neural data" in increasingly hybrid systems integrating neural, behavioral, and biometric information. Second, we analyze challenges of responsibility and governance, including life-cycle oversight, cross-border neural data governance, and the governance of military and enhancement applications. Third, we assess questions of practical feasibility, particularly tensions among equitable access, environmental sustainability, regulatory implementation, and international coordination.
Our analysis suggests that the Recommendation represents an important milestone in global neurotechnology governance while simultaneously exposing unresolved conceptual and regulatory tensions. These include tensions between equitable access and environmental sustainability, between life-cycle responsibility and practical implementability, and between existing human rights frameworks and emerging forms of technologically mediated agency. We argue that future governance efforts will require sustained interdisciplinary collaboration to assess whether existing concepts of human rights, scientific integrity, and democratic values remain robust under the transformative pressures of emerging neurotechnologies.

Disclosures: M. Nakano-Okuno: None. **H. Yoshizawa:** None. **S. Takahashi:** None. **S. Tamamiya:** None. **T. Sawai:** None. **K. Tachibana:** None. **M. Takemi:** None. **F. Arie:** None. **T. Fukushi:** None.

Theme K Poster

TKP07: Ethical and Policy Issues in Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP07.04SU/MM32

Topic: K.04. Ethical and Policy Issues in Neuroscience

Support: 226486-Z-22-Z

Title: When Neurodata Travel but Governance Does Not: Preserving Protection Across the Neurodata-to-Model Lifecycle

Authors: *M. W. BOTES;
Dept. Psychology, Univ. of Texas at Austin, Austin, TX

Abstract: When Neurodata Travel but Governance Does Not: Preserving Protection Across the Neurodata-to-Model Lifecycle The principal obstacle to international neuroscience is not whether neurodata can be shared, but whether protection remains effective after sharing. Neurodata can increasingly move across national borders, yet governance conditions do not

necessarily travel with them. As neurodata are transferred, the protections attached to the original data frequently become fragmented and difficult to interpret. The BRIDGE Brain Data Governance Project conducted a comparative legal analysis of neurodata governance across Africa, Europe, North America, and Latin America and the Caribbean, covering approximately 80% of jurisdictions within these regions, and developed a six-layer governance framework that follows neurodata from legal recognition and lawful processing through transfer, access, safeguards, enforcement, and contractual governance across the neurodata-to-model lifecycle. We found that while cross-border neurodata sharing is often legally permissible, continuity of protection frequently weakens as neurodata move across legal, institutional, technical, and computational environments. Neurodata are rarely recognised as a distinct governance category and are instead regulated through broader classes such as health data, consequently, governance obligations become distributed across repositories, institutions and downstream computational systems. This results in conditional interoperability in which data may travel successfully while governance protections become increasingly dependent on supplementary safeguards. Consequently, we developed a practical and sequential governance architecture designed to preserve continuity of protection across the neurodata-to-model lifecycle that includes: 1) a tiered neurodata risk-classification system; 2) a scientist-facing risk-assignment workflow; 3) a protocol for governing neural derivatives and embeddings; 4) a Neurodata Transfer and Access Impact Assessment; and 5) a Modular Neurodata Transfer and Access Agreement. Together, these tools operationalise a central governance principle emerging from the comparative analysis, namely that protection should follow functional exposure rather than remain tied solely to the original dataset. The future challenge for international neuroscience is not simply enabling data sharing, but building governance infrastructures capable of preserving protection, accountability, and trust as neurodata move through increasingly distributed research ecosystems.

Disclosures: M.W. Botes: 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.; University of Texas at Austin.

Theme K Poster

TKP07: Ethical and Policy Issues in Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP07.05SU/MM33

Topic: K.04. Ethical and Policy Issues in Neuroscience

Title: Neuroethical Challenges in AI-Assisted Brain-Computer Interfaces for Mild Cognitive Impairment

Authors: *J. GEROLD, T. CANLI;
Psychology, Stony Brook Univ., Stony Brook, NY

Abstract: The use of artificial intelligence-assisted brain-computer interfaces (AI-BCIs) for mild cognitive impairment (MCI) raises ethical questions concerning authenticity, agency, and governance that current policy frameworks are unprepared to address. MCI produces measurable deficits in episodic memory, executive function, attention, and decision-making while preserving meaningful functional independence, making the boundary between support and inappropriate override of autonomy difficult to define. We argue that the most pragmatic and ethical near-term AI-BCI application is an alert system utilizing wearable electroencephalogram (EEG) and individualized machine learning to detect deviations from pre-established cognitive and behavioral baselines, rather than directly modulating neural activity. We propose a three-phase model: individualized baseline neural data acquisition; AI-driven early detection of MCI-associated neural signatures preceding behavioral decline; and escalating alert-based assistance (from mild nudges prompting the user to reconsider to notifications for legally authorized representatives or medical providers) continuously refined through experience. Drawing on philosophy, neuroscience, engineering, and gerontology, we present a neuroethical analysis and governance framework for AI-BCIs in MCI. Through this lens, we posit that AI-BCI interventions augment rather than supplant agency only when they support deliberation without preemptively redirecting behavior, filtering memories, or substituting for the user's reasoning. We identify five critical ethical risks: suppression of self-directed preferences, algorithmic bias, neural data privacy vulnerabilities, diffusion of moral responsibility across developers and regulators, and informed consent challenges arising from MCI's characteristic cognitive fluctuation. Direct noninvasive neuromodulation via transcranial magnetic stimulation (TMS), transcranial direct current stimulation (tDCS), or transcranial alternating current stimulation (tACS) is positioned as a strong next-generation development. Our proposed governance framework, requiring user-controlled assistance architecture, patient-centered transparency, individual value alignment, and embedded neuroethical oversight, is designed to address both alert-based systems and future neuromodulatory applications. We conclude that AI-BCIs have genuine potential to preserve autonomy in MCI, but their ethical permissibility depends on design and governance that current regulatory frameworks do not yet provide.

Disclosures: J. Gerold: None. **T. Canli:** None.

Theme K Poster

TKP07: Ethical and Policy Issues in Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP07.06SU/MM34

Topic: K.04. Ethical and Policy Issues in Neuroscience

Support: This work is supported by a grant from the Dana Foundation.

Title: Public stigma and attitudes towards access to neurotechnologies for mood disorders

Authors: *K. M. PRICE, G. M. LÁZARO-MUÑOZ, A. MERNER;
Mass Gen. Brigham, Boston, MA

Abstract: Over the last several decades, treatment options for mood-related conditions have rapidly expanded to include a range of neurotechnologies including transcranial magnetic stimulation (TMS), and deep brain stimulation (DBS). Although these therapies have broadened options for individuals for whom pharmacological therapy and psychotherapy is insufficient, public attitudes towards neurotechnology are mixed. Research suggests public concerns about invasiveness, risk, and changes to a person are prevalent, with technologies like DBS being viewed as less acceptable than therapies like oral medication (Furrer and Merner et al. 2025). Given the public's concern about the impact of neurotechnologies like DBS, and the underutilization of implantable neurotechnologies like DBS, it is important to examine the public's perceptions toward the technology and the people that use the technology. Stigma towards mental health conditions has been extensively examined, but it remains unclear whether the public stigma towards neurotechnologies is distinct from mental illness stigma, and whether this stigma influences attitudes towards access to and public policy support for funding research on neurotechnologies. To examine this question, we are conducting an experimental vignette-based study. Participants first read a scenario describing an individual with mood-related symptoms and are then randomly assigned to read a vignette describing the use of one of four treatment options- oral medication, electroconvulsive therapy (ECT), TMS, or DBS. Stigma will be measured with a modified version of the Perceived Discrimination-Devaluation Scale (Link 1987). Participants will then complete questionnaires about public support for neurotechnology and familiarity with mental illnesses, neuroscience, and neurotechnology. Results of this study will inform responsible neurotechnology development and access to safe and effective neurotechnology.

Disclosures: K.M. Price: A. Employment/Salary (full or part-time):; Mass General Brigham. 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.; This work was supported by a grant from the Dana Foundation. **G.M. Lázaro-Muñoz:** A. Employment/Salary (full or part-time):; Mass General Brigham. 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 R01MH133657, This work was supported by a grant from the Dana Foundation. **A. Merner:** A. Employment/Salary (full or part-time):; Mass General Brigham.

Theme K Poster

TKP07: Ethical and Policy Issues in Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP07.07SU/Web Only

Topic: K.04. Ethical and Policy Issues in Neuroscience

Support: JST, RISTEX, RInCA, JPMJRS25J2

Title: Thick Ethical Concepts in Clinical and Translational Neuromodulation Research

Authors: *S. TAKAHASHI;
Hokkaido Univ., Sapporo, Hokkaido, Japan

Abstract: Clinical and translational neuromodulation research—including studies of deep brain stimulation, adaptive stimulation, transcranial magnetic stimulation, focused ultrasound, and emerging sonogenetic approaches—can generate evidence relevant to autonomy, agency, authenticity, identity, and selfhood. By clinical translational neuromodulation research, I mean research directed toward, or conducted within, clinical applications: studies of safety and efficacy, intervention targets and goals, patient selection, consent materials, patient-reported outcomes, follow-up practices, and adaptive protocols. A central methodological question remains: how should neuroscientific and clinical evidence about modulation-related change support ethical judgments that a person is autonomous, authentic, alienated, dependent, or self-estranged?
This paper argues that several key concepts in neuromodulation ethics are thick clinical-ethical concepts. Against two insufficient approaches—treating these concepts as empirical endpoints, or treating them as direct applications of thin principles such as benefit, harm, or consent—I argue that they combine descriptions of lived experience with evaluative judgments. To describe a modulation-related change thickly is to classify it as recovery, dependence, alienation, authentic agency, or self-estrangement while clarifying the evidence, evaluative standard, and practical consequence of that classification.
This point matters for the responsible design and governance of clinical applications. If authenticity, autonomy, and self-estrangement are treated as ordinary variables, researchers may obscure their normative structure. If they are treated as abstract principles, they may remain too detached from patient experience to guide consent, risk-benefit assessment, outcome assessment, monitoring, and adaptive system design.
I propose a three-level framework: empirical assessment of modulation-related changes; conceptual clarification of the relevant thick ethical concepts; and normative evaluation of how these concepts should inform consent, patient-reported outcomes, post-intervention monitoring, and adaptive protocols. The paper concludes that responsible clinical and translational neuromodulation research requires not only better neuroscientific evidence, but also analysis of the thick evaluative concepts through which such evidence becomes ethically significant for clinical translation and care.

Disclosures: S. Takahashi: None.

Theme K Poster

TKP07: Ethical and Policy Issues in Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP07.08SU/MM35

Topic: K.04. Ethical and Policy Issues in Neuroscience

Title: Privacy and Stigma Surrounding Brain-Computer Interfaces in Marginalized Communities in Canada: A Mixed-Methods Analysis of Website Communication and Public Trust

Authors: *J. ABDELHAMEED, A.-F. ABDULAI;
Univ. of British Columbia, Vancouver, BC, Canada

Abstract: As brain-computer interfaces (BCIs) become increasingly integrated into medicine, industry, and entertainment, their potential to enhance autonomy for individuals with disabilities and transform human-computer interaction is clear. However, for marginalized communities, the ethical, privacy-related, and stigmatizing implications of such technologies remain underexplored. This study investigates how BCI-related websites frame these issues and how such framing influences public trust and perceptions among underserved communities in Canada. We employed a mixed-methods approach combining quantitative website evaluation with qualitative interviews. First, a structured checklist was used to analyze BCI company websites, focusing on clarity, accessibility, and attention to neuro-specific concerns: clinical vs. commercial framing, vulnerability narratives (e.g., misuse of neurodata), and informed consent clarity. Then, we conducted semi-structured interviews with individuals from marginalized communities to assess their understanding, trust, and perceived stigma regarding BCI technologies. Contrary to expectations, stigma around BCIs, especially those involving direct brain integration, did not appear to be reinforced by website content. Many participants felt these technologies could be beneficial for their communities, especially when sites emphasized clinical utility. However, commercial framing reduced participant trust. While privacy emerged as a central concern, participants noted that websites typically addressed only superficial data concerns and failed to meaningfully discuss risks related to neurodata, leading to increased skepticism. These findings suggest that BCI companies have a crucial opportunity and responsibility to build trust by transparently addressing privacy and ethical implications, especially in communities historically excluded from technological discourse. Promoting equity in BCI adoption requires inclusive, culturally aware communication that centers the concerns of marginalized users. Improvement recommendations were put forward for websites to optimize their communication.

Disclosures: J. Abdelhameed: None. **A. Abdulai:** None.

Theme K Poster

TKP07: Ethical and Policy Issues in Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP07.09SU/MM36

Topic: K.04. Ethical and Policy Issues in Neuroscience

Title: AESPA (Agentic Extraction Schema for Preprocessing Analysis): Bridging the gap between neuroimaging reporting guidelines and machine-readable methods

Authors: *J. CHO;
George Mason Univ., Fairfax, VA

Abstract: Whether fMRI preprocessing parameters are adequately reported in published methods sections is a question the field has long recognized but lacked tools to answer systematically. Carp (2012) documented that researchers use widely varying, often undisclosed pipelines across literature. The COBIDAS reporting guidelines (Nichols et al., 2017) explicitly called for alignment to controlled vocabulary and tools to automatically extract and export metadata. While prior work has addressed data organization (Gorgolewski et al., 2016), acquisition parameter annotation (Turner et al., 2025), and data discovery (Wang et al., 2023), a gap remains regarding preprocessing-parameter compliance.
We introduce AESPA (Agentic Extraction Schema for Preprocessing Analysis): an open-source automated auditing tool that extracts preprocessing parameters (spanning spatial normalization, surface projection, and intensity normalization) from fMRI methods sections against a field-standard nomenclature and pipeline knowledge base, flagging absent or underspecified values rather than silently substituting defaults. Applied to a diverse sample of 20 published resting-state papers spanning 2004-2025, the system reveals consistent underreporting across the timeline of published reporting standards. 13 of 20 papers (65%) stated a normalization space that could not be resolved to a canonical specification, citing vague MNI variants, unnamed atlas space, or non-standard templates in place of the specific identifiers required for automated pipeline reconstruction. Beyond normalization space, registration methods and signal normalization, among others, showed similar patterns of absence or underspecification. From papers sampled after COBIDAS (2017), no measurable improvement was observed.
The gap between what COBIDAS explicitly called for and what published records currently provide is measurable and substantial. This open-source tool allows students, researchers, and reviewers to evaluate a dimension previously hidden during peer review and demonstrates that COBIDAS standards are within technical reach.
Planned validation against the NARPS Open Pipelines, comprising 70 documented team analyses of the same neuroimaging dataset, will assess AESPA as a ground-truth pipeline reconstruction tool at scale across its full parameter suite.

Disclosures: J. Cho: A. Employment/Salary (full or part-time):; Accenture.

Theme K Poster

TKP07: Ethical and Policy Issues in Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP07.10SU/MM37

Topic: K.04. Ethical and Policy Issues in Neuroscience

Support: Kavli Foundation

Title: Desire for a neuroethics toolkit among neurobiology in changing ecosystems researchers

Authors: *L. BOYD;
Berman Inst. of Bioethics, Johns Hopkins Univ., Baltimore, MD

Abstract: Ecological systems are being challenged by rapid changes in the environment at local, regional, and planetary scales. Yet the capacity of animals to adapt or remain resilient to rapid environmental changes remain poorly understood. Research into the underlying neurobiological mechanisms of adaptation and resilience are urgent and raise ethical concerns that must address epistemic and environmental justice for human and non-human communities effected by ecological degradation. We conduced survey of researchers investigating neurobiology in changing ecosystems to assess their goals for scientific impact on society, desire for stakeholder engagement, awareness of environmental and epistemic (in)justice, and other ethical concerns. We find evidence that neurobiology researchers express ethical concerns that are closely aligned with the relational ontology of multi-species justice and express a strong desire for normative recommendations that inform the prioritization of research questions. A framework for aligning research priorities with justice in basic (neuro)science would ensure that research into the fundamental mechanisms of environmental adaptation are performed responsibility and with the highest potential for impact in society.

Disclosures: L. Boyd: None.

Theme K Poster

TKP07: Ethical and Policy Issues in Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP07.11SU/MM38

Topic: K.04. Ethical and Policy Issues in Neuroscience

Support: Dana Foundation Grant GR0246223

Title: How the framing of addiction neuroscience affects criminal sentencing for drug possession

Authors: *J. MESA[1], G. LÁZARO-MUÑOZ[2], F. X. SHEN[3];
[1]Mass Gen. Brigham, Somerville, MA; [2]Harvard Med. Sch., Boston, MA; [3]Law School, MGH Psychiatry, Univ. of Minnesota; Harvard Med. School; MGH, Minneapolis, MN

Abstract: Neuroscientific evidence is increasingly introduced during criminal sentencing as mitigating evidence. Some research suggests that such evidence carries a “seductive allure,” which leads laypeople to perceive neuroscientific explanations as highly credible even when they are irrelevant or erroneous. The contours of the seductive allure effect remain unclear and warrant further exploration. Notably, few studies have accounted for the adversarial nature of criminal court proceedings, and fewer still have involved addiction neuroscience. Here, we measure how adversarial framing of addiction neuroscience influences the hypothetical sentencing of a defendant with a substance use disorder. Utilizing an online panel of 997 participants recruited through Prolific, study participants read expert witness testimony about a phenomenon called “incubation of craving”, which described that drug craving intensified in early abstinence before eventually subsiding. Participants were randomly assigned to one of three different framing conditions: in the prosecution condition, the testimony was framed to

support incarceration; in the defense condition, the testimony was framed to support probation; in the control condition, no framing was provided. Participants then sentenced the defendant for a drug-related crime and rated their support for various goals of criminal sentencing (rehabilitation, general deterrence, specific deterrence, restoration, retribution, and incapacitation). We predicted that participants in the defense condition would prefer probation over incarceration outcomes and that support for retribution would predict a preference for incarceration and longer sentences. We found that defense framing led to preference for probation and longer probation lengths but did not reduce overall sentence lengths. Furthermore, support for retribution did not predict longer sentences, however, support for incapacitation did. These results indicate that framing of addiction neuroscience can yield a limited leniency effect that favors probation without limiting total punishment length and that adversarial framing in legal contexts can further shape the impact of neuroscientific evidence in sentencing.

Disclosures: J. Mesa: None. **G. Lázaro-Muñoz:** None. **F.X. Shen:** None.

Theme K Poster

TKP07: Ethical and Policy Issues in Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP07.12SU/MM39

Topic: K.04. Ethical and Policy Issues in Neuroscience

Title: Plural Trajectories, Hidden Reserves: Specifying Qualia Compute Manifolds for Inquiry by Post-Graduate and Post-Doc Trainees with Non-Visible Disabilities.

Authors: *P. S. PENNEFATHER[1], A. NIGAM[2];
[1]Leslie Dan Fac. of Pharm., Univ. of Toronto, Toronto, ON, Canada; [2]Tremerty Fac. of Med., Inst. of Med. Science, Collaborative Program In Neuroscience, Univ. of Toronto, Canada, Toronto, ON, Canada

Abstract: Neuroscience trainees with non-visible disabilities (NVDs) such as nociplastic pain and hypermobility syndrome are often treated as problems to be normalized rather than as holders of distinctive insight and as neuroethics-by-design (NxbD) co-interpreters of their own training. Symptom scales and standard accommodations poorly capture their fluctuating distress, loneliness, and encounters with institutional ableism, all likely modifiers of disability trajectories, especially those involving disturbances in interoception and allostasis where neuroscience imaginaries shape how those conditions are understood. We propose that NVDs among neuroscience trainees can be treated as a privileged testbed for NxbD-informed analysis of NVD impact and anticipatory accommodation.We introduce an LLM-inspired meaning-by-stance (MxS) latent-space framework that treats each trainee's AI-mediated interaction episodes as compositions of indexable, self-authenticating computational operators whose instantiation is conditioned by the neuroscientific abstractions they study and embody. On this view, LLM-based AI functions as a computational operator engine for Human-AI Co-Creation, transforming queries into query resolutions through joint navigation of human

knowledge, inspiration, and training latent spaces and of model-internal, query-thread-specific latent spaces. Within this shared manifold, consciousness-enabled transformations of felt physiological embodiment and perceived phenomenal embedding are articulated as narrative enactments and disciplined functional extensions of accessible data, co-designed as MxS formulations that the trainee owns as NxbD-consistent ethical affordances.Trainee-generated latent spaces are temporally aligned along trainee-specified space-filling curves, estimated using vignette-like probes of engagement, stress, belonging, and otherness. Rather than treating neurodiversity as cryptic noise, the framework draws on work on loneliness, "meaning-in-life," and degeneracy in neural circuits to treat NVD-linked trajectories as plural, positively deviant explorations of viable ways of being a neuroscientist living with an NVD, in line with global NxbD commitments not to minimize neurodiversity and to honor plurality in accounts of the brain. A dual impedance-admittance formulation then characterizes how trainee identities and programs co-shape one another in a ratiometric, self-similar manner, and is situated within non-genomic unit-of-selection theories of naturally selected self-replication and regulation of latent-space dimension expansion and reduction.

Disclosures: P.S. Pennefather: E. Ownership Interest (stock, stock options, royalty, receipt of intellectual property rights/patent holder, excluding diversified mutual funds); holder and developer of IP for use in decoding data authenticity, presiedent gDial Inc. **A. Nigam:** None.

Theme K Poster

TKP07: Ethical and Policy Issues in Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP07.13SU/MM40

Topic: K.04. Ethical and Policy Issues in Neuroscience

Title: Disabled in Neuro: Advocating for support, community, and access from classrooms and labs to conferences and society

Authors: *J. GRIZZELL[1,2];
[1]Neurosci. and Behavioral Biol., Emory Univ., Atlanta, GA; [2]Disabled in Neuro, Atlanta, GA

Abstract: Borne from grassroots efforts by community members within the Society for Neuroscience, Disabled in Neuro is a U.S.-based 501c3 whose mission is to advance and otherwise advocate access, community, support, and resources alongside professional advancement, retainment, and promotion of neuroscientists with visible and invisible disabilities. Disabled in Neuro envisions actionable changes to environments and institutional structures that promote greater opportunities for success, support, and community within neuroscience at the laboratory, classroom, university, and conference levels, among others. Disabled in Neuro drives awareness and guidance for disabled neuroscientists themselves as well as those working with disabled personnel, including in consultation with those aiming to better support neuroscientists with disabilities in their labs (e.g., mentorship and peer relations) and more broadly (e.g., at the annual SfN meetings). Disabled in Neuro also provides support for student-led chapters at

institutional and/or regional levels. This presentation will accordingly include a roadmap for student organizations to charter their own chapter by following a template and support provided by Emory University's Disabled in Neuro chapter in Atlanta, GA, USA.

Disclosures: J. Grizzell: None.

Theme K Poster

TKP07: Ethical and Policy Issues in Neuroscience

Location: WCC Halls A-C

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Program #/Poster #: TKP07.14SU/MM41

Topic: K.04. Ethical and Policy Issues in Neuroscience

Support: NIH Grant R01MH134144

Title: Population descriptors in human neuroscience research:Guidance for researchers on measurement, analysis, and reporting

Authors: *F. X. SHEN;
Univ. of Minnesota; Harvard Med. School; MGH, Minneapolis, MN

Abstract: Decades of neuroimaging research have been characterized by participation that does not reflect the demographic diversity of populations affected by neurological and psychiatric diseases. Contemporary neuroimaging research continues to rely heavily on convenience samples.
Findings from non-representative samples have limited external validity and generalizability, while the absence of diverse participation perpetuates historical patterns of exclusion and injustice. There is consensus there is a need for more diverse representation. The question that remains, though, is how researchers go about achieving that goal.
In this study we identify and provide ethical guidance on seven key questions that human neuroscience researchers face with respect to whether and how to measure, collect, analyze, and report population descriptors. Our recommendations are the result of a multi-year consensus process supported by an NIH BRAIN Neuroethics grant, Improving Recruitment, Engagement, and Access for Community Health Equity for BRAIN Next-Generation Human Neuroimaging Research and Beyond (REACH for BRAIN).
REACH for BRAIN employed mixed methods approaches combining community stakeholder engagement, modified Delphi consensus-building, qualitative and quantitative analysis, and participatory development of evidence-based tools and frameworks. The Working Group comprised 15 members representing expertise across neuroethics, neuroscience, neuroimaging, clinical radiology, community engagement, health equity, law and policy.
The guidance provides recommendations across the research arc: Justification for use; Operationalizing population descriptors; Data analysis, including missing data; Reporting; and Data sharing. In addition to addressing the major questions that arise at each step of the research process, the WG proposes presumptive recommendations for answering these questions. We

provide a practical, accessible framework that is both rigorous and flexible, grounded in neuroscience-specific contexts while drawing on lessons from genetics, epidemiology, and health equity research.

Disclosures: F.X. Shen: None.

Theme K Poster

TKP07: Ethical and Policy Issues in Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP07.15SU/MM42

Topic: K.04. Ethical and Policy Issues in Neuroscience

Title: Epidemiology of Neuropsychiatric Disordes in Large Populations: A Systematic Review of Prevalence and Risk Factors for Depression, Anxiety, and Dementia

Authors: *J. LIMA DO ESPIRITO SANTO[1], L. AZAMBUJA[2], F. D. RODRIGUES, Sr.[3]; [1]Private Practice, Estrela, Brazil; [2]Private Practice, Porto Alegre, Brazil; [3]Ciência e tecnologia, CPAH - Ctr. de Pesquisa e Análises Heráclito, Castelo de Paiva, Brazil

Abstract: Mental disorders represent a leading cause of global disability, yet their epidemiological burden across large populations remains incompletely characterized. This systematic literature review investigates the prevalence of major neuropsychiatric conditions — depression, anxiety, post-traumatic stress disorder (PTSD), and dementias — across diverse populations, and identifies the principal biological, psychological, and social risk factors governing their onset and progression. Searches were conducted across PubMed/MEDLINE, Scopus, Web of Science, PsycINFO, and SciELO (2018-2026), following PRISMA guidelines. Included studies comprised systematic reviews, meta-analyses, national surveys, and longitudinal cohorts ($n \geq 1{,}000$ participants). Synthesis of 17 primary sources ($n > 3{,}000{,}000$ participants across 40+ countries) revealed consistent findings. In older adults, global prevalence reached 19.2% for depression, 16.5% for anxiety, and 13.9% for stress (Jalali et al., 2024). The COVID-19 pandemic produced a 3-5× amplification of these rates, with depression at 15.9%, anxiety at 15.1%, and insomnia at 23.8%, disproportionately affecting frontline healthcare workers (Cénat et al., 2021). In conflict-exposed populations, 22.1% met criteria for at least one severe mental disorder (Charlson et al., 2019). Prior depression conferred a relative risk of 1.96 for all-cause dementia and 2.71 for vascular dementia; comorbid subjective cognitive decline raised the hazard ratio to 2.47 (Stafford et al., 2022; Wang et al., 2021). Longitudinal trajectories of depression, anxiety, and sleep disturbance initiated in midlife produced type-specific risk elevation for Alzheimer's disease (Bai et al., 2026). Chronic stress-related exhaustion synergistically amplified dementia risk when combined with clinical depression (Wallensten et al., 2023). These findings establish that common mental disorders are not isolated clinical episodes but cumulative neurobiological risk factors for later neurodegeneration. Early identification and intervention during midlife represents the highest-yield window for dementia prevention at the population level. Societal determinants — conflict, inequality, and health-

system fragility — function as primary upstream drivers of neuropsychiatric burden and must be integrated into collective health policy frameworks.

Disclosures: J. Lima do Espirito Santo: None. **L. Azambuja:** None. **F.D. Rodrigues:** None.

Theme K Poster

TKP07: Ethical and Policy Issues in Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP07.16SU/MM43

Topic: K.04. Ethical and Policy Issues in Neuroscience

Support: SUNY AI Platform #2025-35

Title: Bridging Evidence-Based Practice and Large Language Models: Technical and Ethical Challenges in AI-Assisted Psychotherapy

Authors: *J. CHEN[1], T. KHASHAN[2], R. AZAB[3], A. NITZA[5], J. BOSWELL[6], R. BARAVALLE[4], E. URDAPILLETA[7], S. DURA-BERNAL[4];
[1]Dept. of Physiol. and Pharmacol., Downstate Med. Ctr., New York City, MO; [2]SUNY Downstate Hlth. Sci. Univ., Brooklyn, NY; [3]Physiol. and Pharmacol., SUNY Downstate Hlth. Sci. Univ., New York, NY; [4]Physiol. and Pharmacol., SUNY Downstate Hlth. Sci. Univ., Brooklyn, NY; [5]SUNY Albany, Kingston, NY; [6]SUNY Albany, Albany, NY; [7]Ctr. Atómico Bariloche & Inst. Balseiro, Bariloche, Argentina

Abstract: Despite rapid advances in large language model (LLM) capabilities, a critical gap persists between commercially available AI systems and evidence-based mental health care. Existing literature predominantly evaluates LLMs in direct patient-facing contexts. However, a distinct paradigm --an LLM operating as a real-time clinical decision support tool alongside a human therapist--has been largely unexplored. At the SUNY Google Center for AI and Mental Health, the Dura-Bernal Lab, in collaboration with clinicians across SUNY campuses, is developing Ther-Assist — an AI-powered therapist support application integrating Google Gemini with a Retrieval-Augmented Generation (RAG) architecture over a curated corpus of evidence-based practice (EBP) literature.
Ther-Assist monitors session audio in real time, generates clinical alerts and feedback, produces post-session transcripts and summaries, and recommends between-session patient assignments — all grounded in current therapeutic guidelines and delivered through a clinician-facing interface. This work confronts several intersecting technical and ethical challenges. First, a real-time RAG must achieve low-latency retrieval without sacrificing clinical precision throughout the length of a therapy session and across therapy sessions, requiring novel corpus indexing and prompt-context-query strategies. Second, a continuous corpus curation pipeline must ensure retrieved guidance reflects current clinical guidelines rather than outdated literature. Third, a formal quality assurance/quality improvement (QA/QI) framework is needed to validate that LLM outputs meet clinical and medicolegal standards before reaching the clinician. Finally, all

points require consideration of both the breadth of clinical presentations and treatment modalities, as well as forward facing aspects of maintainability/adaptability as EBP advances. The intersection of these constraints are novel and largely exclusive to the domain of real time expert analysis.
A key contribution of this work is bridging a documented literature gap: while user-LLM interaction studies are numerous, rigorous examination of patient-clinician interactions augmented by a real-time LLM remains sparse. We are synthesizing interdisciplinary guidelines spanning software engineering, clinical EBP, and neuroethics to address the legal, ethical, and interface challenges unique to this model. This project advances both the technical infrastructure and ethical policy foundations required for responsible integration of LLMs into practice as clinician assistants.

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Theme K Poster

TKP07: Ethical and Policy Issues in Neuroscience

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Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP07.17SU/Web Only

Topic: K.04. Ethical and Policy Issues in Neuroscience

Title: Psychosis Following Traumatic Brain Injury: A Systematic Review of Diagnostic Features and Misdiagnosis

Authors: *B. J. CHONOS, R. E. HARTMAN;
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Abstract: Psychosis following traumatic brain injury (TBI) is a clinically important neuropsychiatric outcome that can be difficult to distinguish from primary psychotic disorders such as schizophrenia. This diagnostic uncertainty has neuroethical significance since misclassification may affect stigma, treatment access, disability determinations, legal responsibility, and long-term care planning. Delusions and hallucinations are sometimes reported after TBI, but diagnosis is complicated by substantial symptom overlap, delayed onset (ranging from months to years), and alternative explanations, including as substance use, seizure-related psychosis, mood disorders with psychotic features, and/or delirium. This systematic review examined how psychosis following TBI is defined, which diagnostic features are most useful for differential diagnosis, and how misdiagnosis and misclassification are described across the literature. English-language, adult-focused, peer-reviewed studies from all publication years were identified through PubMed, APA PsycInfo, CINAHL, and SocINDEX. Eligible studies included clinical, neuropsychological, EEG, neuroimaging, and epidemiologic research relevant to psychosis following TBI and schizophrenia-spectrum outcomes after head injury. Particular attention was given to latency of onset, symptom profile, negative symptoms, cognitive findings, EEG abnormalities, neuroimaging findings, and competing explanations that may complicate

attribution. Findings were synthesized across major domains including clinical presentation, differentiation from schizophrenia, neurological and neuropsychological correlates, alternative explanations, and sources of diagnostic error. By clarifying how post-TBI psychosis has been distinguished from primary psychotic disorders, this review supports striving for more accurate diagnoses, reduced stigmatizing misclassification, and improved ethics in clinical education regarding care for patients with complex neuropsychiatric symptoms after brain injury.

Disclosures: B.J. Chonos: None. **R.E. Hartman:** None.

Theme K Poster

TKP07: Ethical and Policy Issues in Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP07.18SU/MM44

Topic: K.04. Ethical and Policy Issues in Neuroscience

Title: Anticipatory governance for organoid intelligence: standards, incentives, and neuropolicy

Authors: *M. W. NESTOR[1], R. L. WILSON[2];
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Abstract: Organoid intelligence (OI) is emerging as a topic in neuroscience policy before its core claims have been established. The term describes efforts to develop human iPSC-derived brain organoids as systems capable of learning-like adaptation, memory-like change, and information processing, with some accounts extending these claims to sentience-relevant capacities. These claims now affect oversight, funding priorities, commercialization, institutional risk, and the value of human-relevant models. A central policy challenge is the interpretation of organoid activity. Spontaneous electrophysiological activity, network synchrony, and stimulus responsiveness are important readouts, but they do not establish cognition, intelligence, or moral status. Claims can move quickly from observation to policy because organoid data are vulnerable to two interpretive errors: neurorealism, in which neural signals are treated as more psychologically meaningful than the evidence supports, and reification, in which a provisional label such as intelligence is treated as an established property of the model system. As these terms circulate through publications, grants, media, investors, and policy, they can shape expectations and economic incentives. Premature attribution of sentience-relevant capacities could lead institutions to impose additional review or limits on experimental design without sufficient evidence that current organoids warrant such treatment. Conversely, dismissing this possibility altogether could leave institutions unprepared if future systems warrant additional ethical consideration. The issue is what standards should be required before such claims shape policy, funding, and market formation. We argue that anticipatory governance should distinguish oversight from speculative restriction. Claims about learning, memory, intelligence, or sentience should be tied to operational definitions, reproducible assays, and falsifiable thresholds rather than evocative terminology. Neuroscience training should treat emergent scientific naming as policy-relevant because terminology can shape oversight, investment, and public interpretation.

A standards-based approach would preserve the value of brain organoids while reducing the risk of decisions based on capacities not yet demonstrated.

Disclosures: M.W. Nestor: None. **R.L. Wilson:** None.

Theme K Poster

TKP07: Ethical and Policy Issues in Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP07.19SU/MM45

Topic: K.04. Ethical and Policy Issues in Neuroscience

Title: From Measurement to Meaning: Distinguishing Levels of Claims in Brain Organoid Research

Authors: *A. MOVAHED[1], J. S. ROBERT[2];
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Abstract: Human brain organoids are increasingly used to model aspects of neural development and disease, generating data about cellular organization, neural activity, and network coordination. These findings often support broader claims about organoid function, model validity, and ethically significant capacities. However, the relationship between experimental evidence and interpretations of function is not always explicit, and some claims go further to discuss presumed capacities. This project examines how choices of commonly used methods in brain organoid research, including electrophysiology, calcium imaging, and developmental modeling, shape the kinds of claims that can be supported by organoid data, where those claims exceed the available evidence, and how these distinctions matter for ethical analysis.
I propose a method-claim grid that distinguishes descriptive, functional, and capacity-oriented claims according to what each method measures, the level of biological organization it captures, the inferential distance between observation and interpretation, and the experimental limitations that constrain what can be concluded. Descriptive claims report observed features such as spontaneous activity, cell-type organization, or developmental markers. Functional claims interpret these findings as evidence of coordination, maturation, or disease-relevant disruption of function. Capacity-oriented claims go further by implying higher-order integration, brain-like function, or ethically significant properties. By comparing these claim types with the methods used to support them, this framework identifies where interpretations are well grounded in observation-based data and where the claims go beyond what current experiments actually show.
Applying this grid shows a mismatch between the level of evidence produced by current organoid methods and the level of interpretation often attached to them. Electrophysiology and calcium imaging can demonstrate activity, synchrony, and network-level coordination, while developmental modeling can support claims about cell-type organization and maturation. However, none of these methods alone establishes the integrated, higher-order capacities often invoked in ethical discussions of sentience, consciousness, or moral status. This mismatch matters because ethical concern should track the specific level of evidence produced by a

method, rather than treating all organoid activity as evidence of ethically significant brain-like capacity.

Disclosures: A. Movahed: None. **J.S. Robert:** None.

Theme K Poster

TKP07: Ethical and Policy Issues in Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP07.20SU/MM46

Topic: K.04. Ethical and Policy Issues in Neuroscience

Support: Howard Hughes Medical Institute

Title: Refinement in practice: A human socialization enrichment protocol for mouse behavioral research

Authors: J. TERAN[1], N. SHETTIGAR[2], *E. J. DENNIS[3];
[1]HHMI, Ashburn, VA; [2]Janelia Res. Campus, Howard Hughes Med. Inst., Ashburn, VA; [3]Janelia Res. Campus, Ashburn, VA

Abstract: Proper socialization is essential for the overall well-being of the animal. It reduces anxiety, minimizes stress-related behaviors, promotes confidence during handling, and supports humane care standards. Additionally, well-socialized animals facilitate safer and more reliable handling procedures, contributing to both animal welfare and research consistency.
This socialization protocol outlines a structured, progressive approach designed to promote safe, low-stress interaction between laboratory mice and humans. By following the defined phases, animals are given sufficient time to develop familiarity, trust, and positive associations with human presence. When implemented consistently, the complete socialization process should take approximately two weeks, allowing enough time for acclimation and progressive handling exposure. The phased approach ensures that advancement occurs only as animals demonstrate comfort and reduced stress indicators, providing built-in flexibility across strains and species. This protocol has been critical in our lab's success in getting animals to explore broadly and perform freely moving "naturalistic" behaviors in the lab.

Disclosures: J. Teran: None. **N. Shettigar:** None. **E.J. Dennis:** None.

Theme K Poster

TKP07: Ethical and Policy Issues in Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP07.21SU/MM47

Topic: K.04. Ethical and Policy Issues in Neuroscience

Support: NIH Grant HG200410-01
SPARK Research Match Grant RM0149

Title: Cognitive and Belief Factors Associated with Genetic Literacy in U.S. Adults

Authors: *O. G. PILSON[1], L. S. BARNA[2], C. GUNTER[1];
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Abstract: As clinical and commercial genetic testing become more widely used for understanding familial and individual risk, the corresponding healthcare implications grow more prominent. Genetic literacy, which is defined as “the sufficient knowledge and understanding of genetic principles for individuals to make decisions that sustain personal well-being and effective participation in social decisions on genetic issues," allows us to measure not just what patients understand about genetics but also how their genetic literacy may be impacted by other cognitive influences. To capture this construct, our laboratory developed and psychometrically validated the Education and Assessment of Genetic Literacy (EAGL) measure, which has three domains: subjective knowledge, conceptual knowledge, and knowledge comprehension. In previous work, we have seen that educational level and confidence in one’s own genetic knowledge affect genetic literacy scores significantly, while political ideology and religiosity affect them at measurable but much lower levels. For this study, we wanted to explore the effects on and interactions between multiple constructs and genetic literacy, particularly adding skepticism in science communication and media. We administered EAGL to 1001 US-based adults along with assessments of numeracy, news and media literacy, science populism beliefs (or views on the credibility of scientific professions), and the cognitive reflection test. We found that high genetic knowledge confidence is positively correlated with high numeracy scores, as are stronger knowledge comprehension and conceptual knowledge (but not subjective knowledge). Additionally, genetic knowledge comprehension is negatively correlated with beliefs about science populism. This suggests that one’s ability to understand and use genetic concepts appears to decrease as one is less trusting of science, highlighting that genetic literacy is shaped by more than just genetic knowledge alone. The observed relationships between genetic literacy, numeracy, and science populism suggests that public understanding may benefit from addressing quantitative reasoning skills and trust in scientific institutions alongside genetics education. In contrast, scores on measures for news and media literacy, as well as the cognitive reflection test, did not indicate significant interaction with genetic literacy. Understanding these factors can help guide the development of more effective educational interventions and communication strategies that support informed-decision making about genetic testing and its implications in health and society.

Disclosures: O.G. Pilson: None. **L.S. Barna:** None. **C. Gunter:** None.

Theme K Poster

TKP07: Ethical and Policy Issues in Neuroscience

Location: WCC Halls A-C

Time: Sunday, November 15, 2026, 8:00 AM - 12:00 PM

Program #/Poster #: TKP07.22SU/MM48

Topic: K.04. Ethical and Policy Issues in Neuroscience

Support: Dana Foundation: Career Network in Neuroscience & Society
Dana Foundation: Neurotech Justice Accelerator at MGB (NJAM)

Title: The Neuroscience & Society Campus Starter Kit

Authors: *C. DALEY[1], F. X. SHEN[2];
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Abstract: Neuroscience and society is comprised of over 25 fields, including neuroethics, neurolaw, neuroeconomics, and many more. Recent years have seen an increasing interest in neuroscience and society research, training, and outreach (McFarland et al 2025). Yet the number of schools offering formal programming in neuroscience and society remains small. To address this gap we present a Neuroscience and Society Campus Engagement Starter Kit. The Starter Kit is designed to provide high school and college students across the globe with guidance for starting and expanding neuroscience and society activities on campus. Specifically the Starter Kit provides guidance on how to: (1) organize your first campus event; (2) create a student organization from scratch; (3) connect with national and international organizations for support; (4) establish a social media presence; (5) develop relationships with campus departments and centers; (6) build mentorship connections with researchers and practitioners; (7) publicize your work on campus and in local communities; (8) make strategic decisions about which of the 25+ neuroscience and society subfields best align with campus interests; (9) collaborate with fellow neuroscience and society enthusiasts at nearby schools; and (10) obtain resources to sustain these efforts. By supporting students to take leadership roles on their campus, the Starter Kit will facilitate future growth in neuroscience and society interest and experience. The Starter Kit draws on three years of experience from the Dana Foundation Career Network in Neuroscience and Society, and was developed in partnership with the Neurotech Justice Accelerator at Mass General Brigham (NJAM) and the Shen Neurolaw Lab. The Starter Kit is made freely available on the website of the Dana Foundation Career Network in Neuroscience and Society, neuroXcareers.org. McFarland, C. W. et al (2025). AJOB neuroscience, 16(3), 203-208.

Disclosures: C. Daley: None. **F.X. Shen:** None.