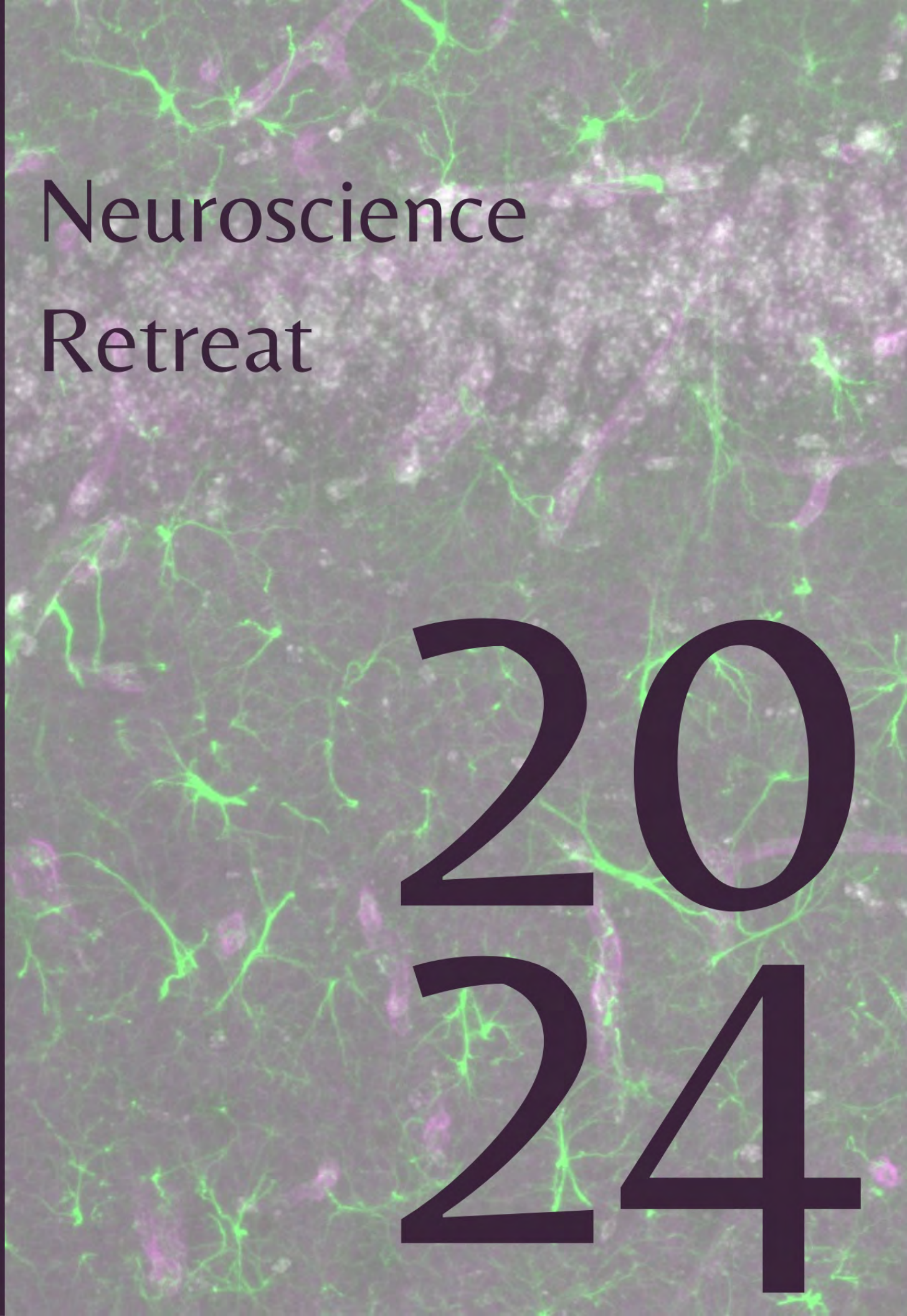
University of Rochester School of Medicine and Dentistry

Neuroscience Retreat

2024



Program

Memorial Art Gallery

April 19, 2024

Continental Breakfast

8:00am - Parlor

Welcome & Land Acknowledgement

8:30am - Auditorium

Krishnan Padmanabhan PhD

Graduate Student Speaker

8:45am-9:20am - Auditorium

Linh Le, PhD

Poster Session I & Coffee Break

9:20am - Ballroom

SfN Chapter Meeting

11:00am - Auditorium

Chris Holt, PhD

Program

Memorial Art Gallery

April 19, 2024

State of the Neuroscience Graduate Program

11:10am - Auditorium

Chris Holt, PhD

Awards Presentation

11:20am - Auditorium

Schrager Award and Doty Award

Overview of the Neuroscience Department

11:40am - Auditorium

John Foxe, PhD

Lunch

12:00pm - 1:00pm - Ballroom

Group Photograph

1:00pm - Pavillion

Program

Memorial Art Gallery

April 19, 2024

Post-Doctoral Fellow Speaker

1:15pm-1:50pm - Auditorium

Mathew Cavanaugh, PhD

Faculty Speaker

1:55pm-2:30pm - Auditorium

M. Kerry O'Banion, MD, PhD

Poster Session II & Coffee Break

2:30pm - Ballroom

Keynote Address

4:00pm-5:00pm - Auditorium

Takao Hensch, PhD

Poster Award Presentation

5:00pm - Auditorium

Cocktail Reception

5:15pm - Parlor

Speaker Biographies

Linh Le, PhD
Department of Neuroscience
Majewska Lab

The microglial response to inhibition of Colony-Stimulating-Factor-1 Receptor differs by sex in adult mice

Linh Le was born in Hanoi, Vietnam. She attended Truman State University in Kirksville, Missouri, and graduated with a Bachelor of Science in Biology. During her undergraduate studies, she worked in the lab of Dr. Brett Berke at Truman State and the lab of Dr. Marcos Vidal Melo at Massachusetts General Hospital, studying Drosophila neuromuscular junction and acute lung injury, respectively. She began her doctoral studies in Neuroscience at the University of Rochester School of Medicine and Dentistry in 2019. She then joined the labs of Dr. Kerry O'Banion and Dr. Anna K. Majewska in 2020 and pursued her research in neurodegeneration and neuroinflammation.

Speaker Biographies

Mathew Cavanaugh, PhD
Department of Ophthamology
Research Assistant Professor

Special Status of Motion Perception in Occipital Stroke Survivors

Stroke-induced damage to primary visual cortex (V1) causes a loss of vision in the contralateral visual hemifield. Surprisingly, work from our lab showed that this loss was not immediate nor absolute, with preservation of conscious direction discrimination of moving stimuli inside a small proportion of perimetrically-defined blind fields <3 months post-stroke. Given the close functional links between orientation and direction processing, we now ask if patients with preserved motion discrimination also have preserved static orientation discrimination abilities. Fine direction discrimination thresholds were measured using random dot stimuli and controlled fixation in a new sample of 33 subacute stroke patients as part of an ongoing clinical trial (NCT04798924). Ten of these patients were able to perform direction discriminations within their blind field. Static orientation discrimination was then tested in a smaller subset of 24 patients, including all those with preserved motion processing. None of these 10, nor the remaining 14 patients tested were able to discriminate orientation above chance. Patient age, deficit size, and sex ratios were equivalent between preserved and non-preserved patients. In contrast, preserved patients were found to be earlier post-stroke than non-preserved patients. The impact of time may arise from retrograde degeneration present in the visual system, prompting further investigation of this possible substrate. Optic tract integrity was assessed with structural MRI, and integrity of the retinal ganglion cell complex was assessed with Optical Coherence Tomography (OCT). A laterality index (LI) was calculated for both metrics to quantify shrinkage relative to structures subtending intact vision. While optic tract integrity was similar between preserved and non-preserved patients, OCT LI revealed 4-fold greater amounts of inner retinal thinning in non-preserved patients relative to those with preserved blind-field motion abilities. Our findings provide new evidence about the motion specificity of preserved, conscious discrimination abilities after V1 damage in humans. They also suggest the existence of a neural substrate evident at the level of the retina that survives early post-stroke, but degenerates over time. Ongoing work is measuring the persistence of preserved motion abilities in the blind-field, and critically testing if they can be bootstrapped to enhance training efficacy.

Speaker Biographies

M. Kerry O'Banion, MD, PhD
Department of Neuroscience
Professor of Neuroscience

Promoting the Benefits of Microglia in Alzheimer's Disease Pathogenesis

M. Kerry O'Banion, MD, PhD, is Professor and Vice-Chair of Neuroscience, Professor of Neurology, and a member of the Del Monte Institute for Neuroscience and the Wilmot Cancer Center at the University of Rochester School of Medicine & Dentistry in Rochester, New York. His research focuses on neuroinflammation and glial cell biology, emphasizing cellular interactions in in neurodegenerative disorders, including Alzheimer's disease, as well as in CNS radiation exposure, and how these contribute to pathology and cognitive deficits in preclinical models. Originally trained as a molecular virologist, Dr. O'Banion received his MD and PhD in Microbiology degrees from the University of Illinois, Champaign-Urbana and carried out postdoctoral work as a Wilmot Cancer Fellow at the University of Rochester that contributed to the discovery of cyclooxygenase-2 (COX-2) as a critical mediator of inflammation. Dr. O'Banion has trained 5 postdoctoral fellows and 25 graduate students, including five MD-PhD students. His research has been supported by NIA, NINDS, NIDA, NIAID, NCI, NASA and the Department of Energy. In addition to his research, Dr. O'Banion has directed Rochester's Medical Scientist Training (MD-PhD) Program since 2000. He is past chair of the Steering Committee of the AAMC GREAT Group's MD-PhD Section and served on the Board of Directors for the American Physician Scientists Association (APSA) from 2006 until 2023.

Speaker Biographies

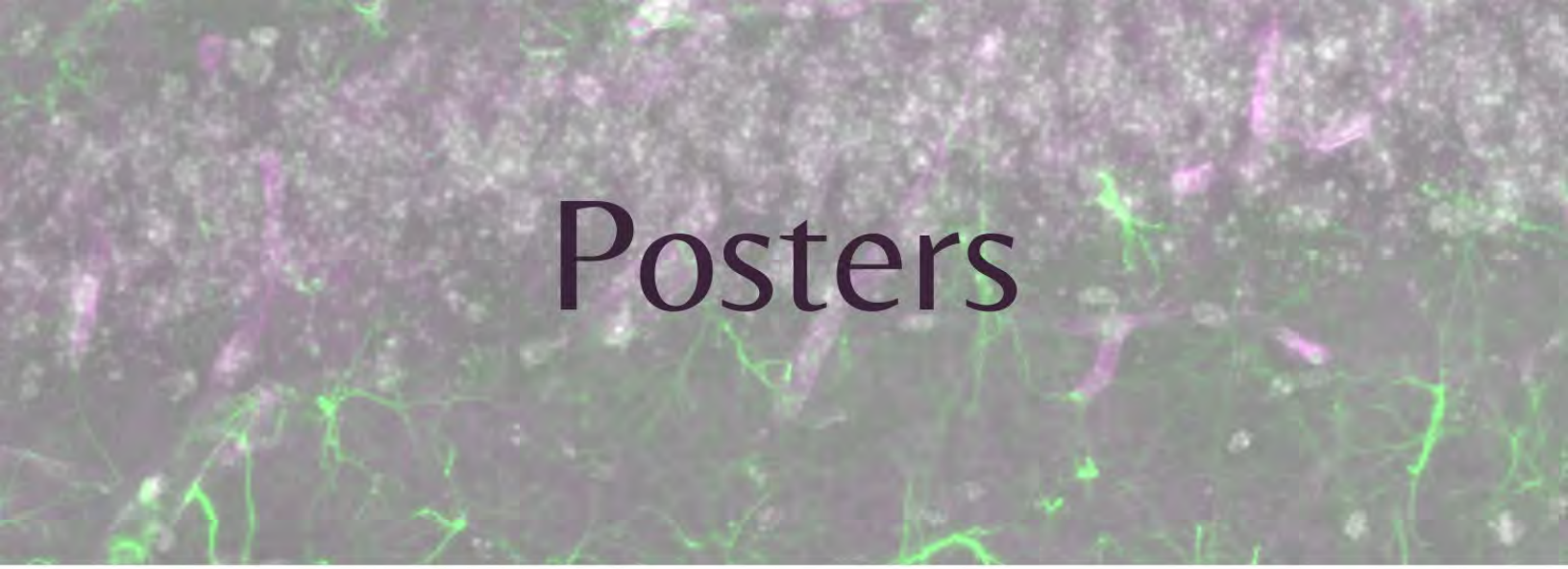
Takao Hensch, PhD

Harvard University

Professor of Molecular and Cell Biology, Professor of Neurology

Keynote Address - Translating Critical Periods

Takao K. Hensch is joint Professor of Molecular Cellular Biology at Harvard's Center for Brain Science and Professor of Neurology, Harvard Medical School at Boston Children's Hospital. He is a graduate of Harvard, the University of Tokyo, UCSF and a former Fulbright Fellow at the Max-Planck Institute (Frankfurt). After his PhD, Hensch helped to launch the RIKEN Brain Science Institute (Japan) as Laboratory Head for Neuronal Circuit Development and Group Director of Critical Period Mechanisms Research, before returning to Harvard in 2006. There he directs an NIMH Silvio Conte Center for Mental Health Research and is a prominent leader and advisor to important global research networks, such as the International Research Center for Neurointelligence (Japan), CIFAR Child Brain Development network (Canada), NCCR Synapsy (Switzerland), OECD-CERI (France) and National Scientific Council on the Developing Child (USA). Professor Hensch has received several honors, including the Sackler Prize (2016), NIH Director's Pioneer Award (2007), Young Investigator Awards from the Society for Neuroscience both in the US (2005) and Japan (2001 Tsukahara Prize), while serving on various editorial boards, including Neuron, J Neurosci (reviewing editor) and Frontiers in Neural Circuits (chief editor). His lab explores how brain functions are shaped by early life experience, identifying pivotal roles for specific inhibitory circuit 'triggers' and molecular 'brakes' which can be lifted to enable adult plasticity. These insights shed light on the etiology, biomarkers and potential reversibility of derailed neurodevelopmental trajectories in cognitive disorders, recovery from brain injury in adulthood, and life-long learning more broadly.



Posters

Leonor Afrima, PhD
P2X7 drives pathophysiological remodeling of the inner retina during progressive photoreceptor loss

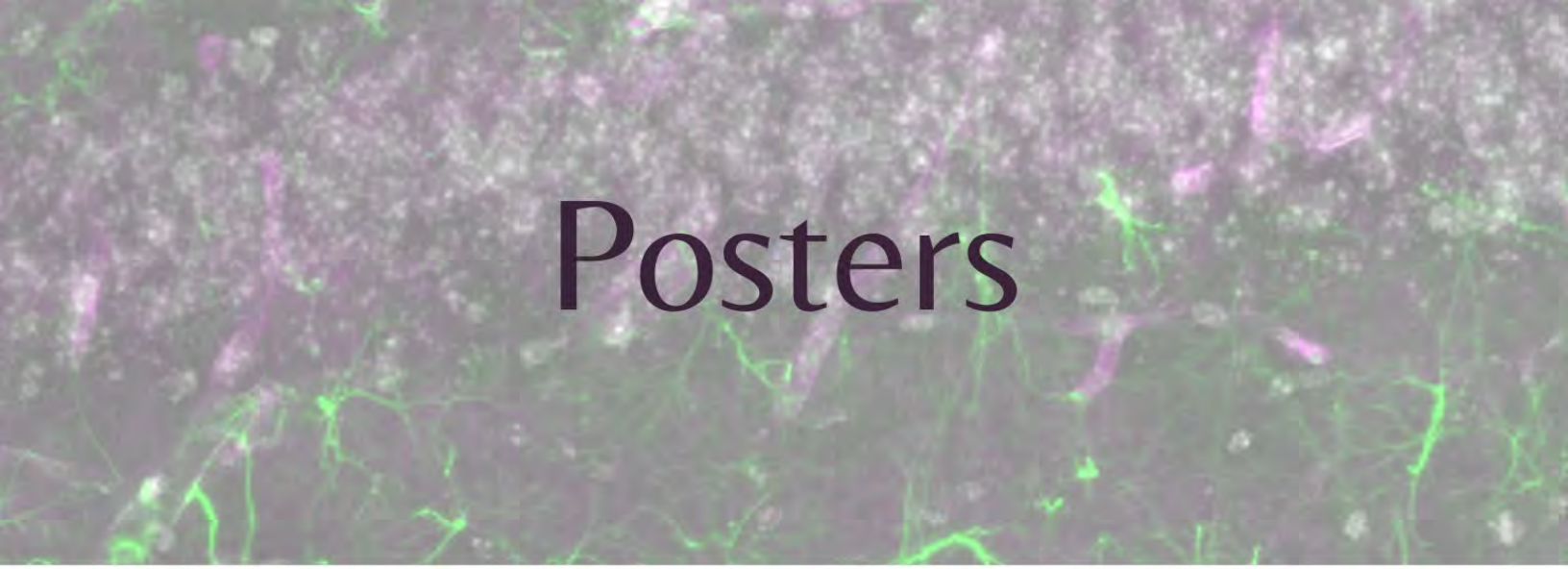
Soumaya Belhadj
In vivo and ex vivo characterization of photoreceptor cell replacement therapy using scaffolds in a non-human primate model of vision loss

Yunshan Cai
Contextual Modulation in Primate Ventrolateral Prefrontal Neurons during Audiovisual Task-switching

Lia Calcines Rodriguez
Characterizing the Sex Differences in Plaque Morphology in the 5xFAD Mouse Model of Amyloidosis

Andrea Campbell
Visualizing immune cell dynamics in the living non-human primate eye following retinal surgery.

Hayley Chang
Exploring the neurophysiologic and neuropathologic basis of visual deficits in cystinosis



Posters

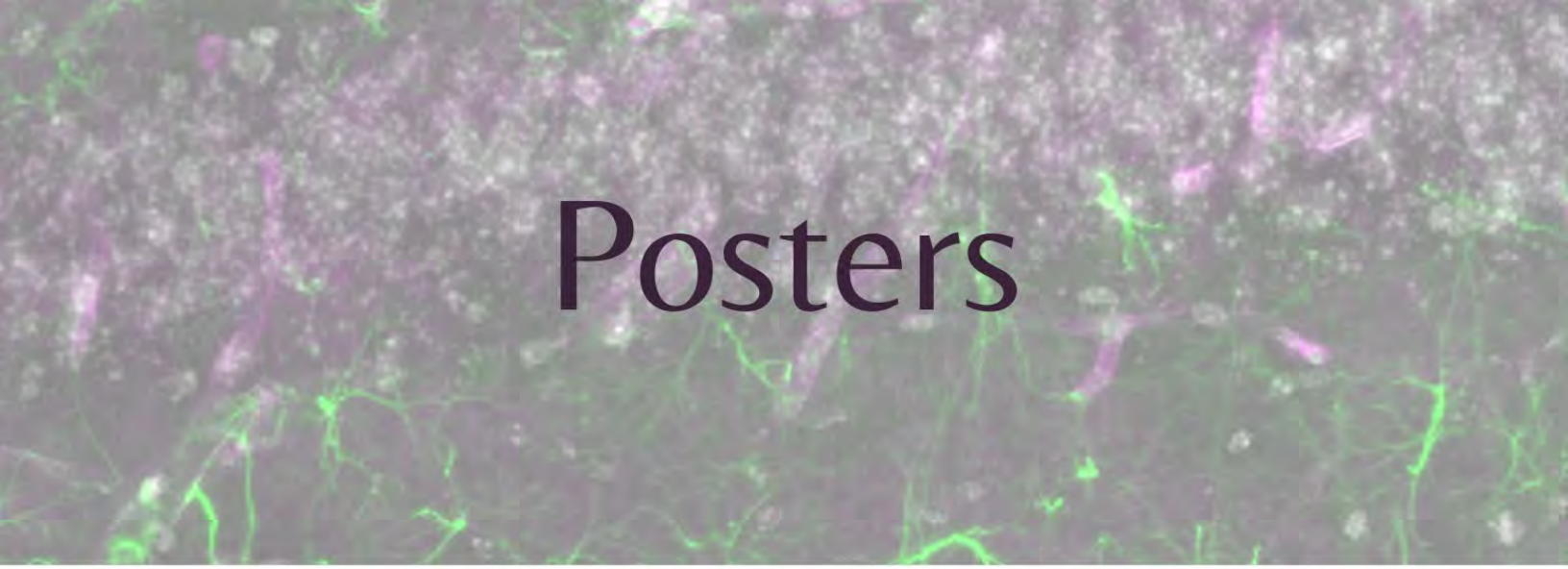
Kaihua (Chloe) Chen
Introduction of circulating factors to the μSiM-BBB for in vitro studies of sepsis-associated brain injury

Siddharth Chittaranjan
The Role of Astrocytes in Acute Insulin Resistance

Thomas Delgado
Depletion of Astrocytic TG2 Enhances the Ability of Astrocytes to Metabolically Support Neurons Through Lipid Metabolism

Yanya Ding
Age and Sex Related Changes of Auditory Duration Mismatch Negativity in a Knockout Mouse Model of the CLN3 Disease

Matthieu Fuchs
Contextual Modulation in Primate Ventrolateral Prefrontal Neurons during Audiovisual Task-Switching



Posters

Leslie Gonzales
Auditory Nerve Fiber Responses in the Budgerigar: Tuning curves and phase locking to tones

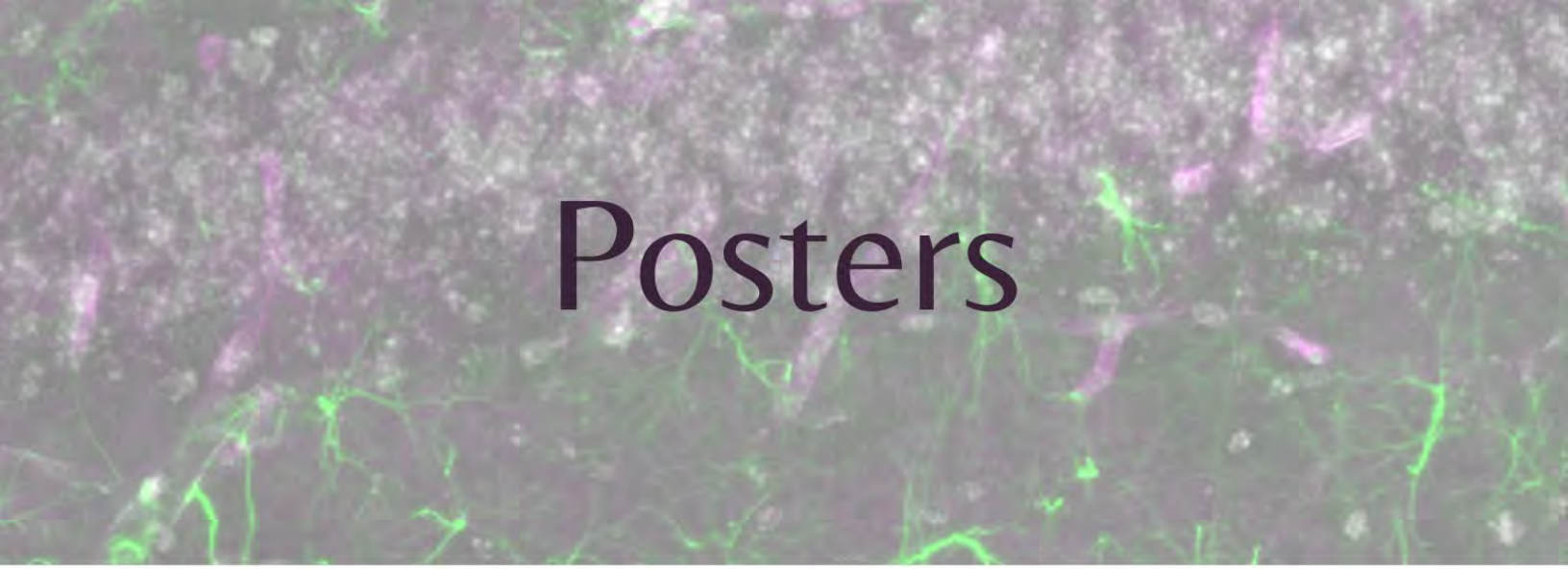
Anna Kolstad
Characterizing olfactory responses in ventral CA1 region of the hippocampus

Howard Li
Ultra-fine knowledge of gaze position in saccade planning

Hussein Mreydem, MD
Neural Mechanisms May Explain Altered Eating Behaviors and Obesity in Chronic Low Back Pain (CLBP) Patients

Daulton Myers
Prefrontal Cortex Sends Discrete Inputs to pgACC and sgACC of the Macaque Brain

Mark Ayor Osabutey
Population-level analysis of Microglial Inflammatory States after Low-Dose Space Radiation Exposure



Posters

Sara Patterson
Functional Classification of Foveal Ganglion Cells in the Living Primate Eye

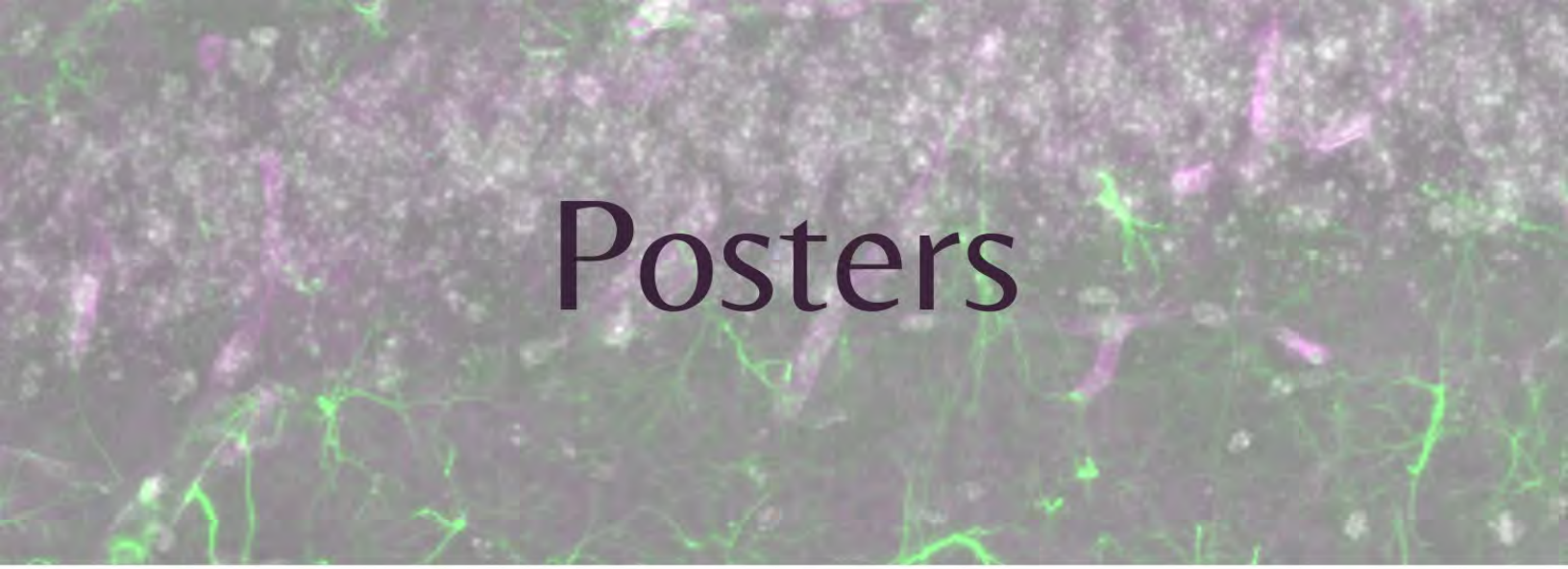
Elizabeth Plunk
Effects of Gestational and Lactational Exposure to Perfluorohexanoic Acid (PFHxA) on Mouse Behavior in Early Adulthood

Fei Shang
Limited Vascular change after one year of hypergycemia

Mark Stoessel
Mechanisms of cerebellar microglial dynamics and their influence on behavior

Rianne Stowell, PhD
Dopaminergic signaling regulates microglial surveillance and adolescent plasticity in the frontal cortex

Bingyu Sun
Investigating the effect of cannabidiol in Alzheimer's disease



Posters

Karol Szymula
Stability and variability of population activity in the main olfactory bulb across different behavioral states

Michelle Trempel
Development of an in vitro 'diseased' BBB model for studies of post-operative delirium superimposed on dementia

Andy Vu
Microglial morphology, density, and distribution are modulated by signaling of purinergic P2Y12 receptor.

Benedikt Winzer
Using Causal Lesion Evidence to Map the Role of Broca's Area in Word Production

Sala Young
Assessing the Effects of Voluntary Wheel Running on Alzheimer's Disease Progression

Retreat Committee

Lia Calcines Rodriguez
Committee Chair

Krishnan Padmanabhan, PhD
Faculty Advisor

Mark Stoessel
Member

Alexis Feidler
Member

Jingyi Yang
Member

Silei Zhu
Member

Amelia Hines
Member

Pam LaDuke
Event Coordinator

Tori D'Agostino
Event Coordinator

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