



# Neuroscience Research Institute Newsletter

Issue 3

June 2022

## 2022 NRI Seed Grant Proposal Winners

The Neuroscience Research Institute just finished the 2nd year of another successful Seed Grant review process! Thank you to the 18 scientific teams that submitted grants as well as our 23 grant reviewers. Our hope is that these grants help catalyze new collaborations and lead to future funded grants.



### Maria Balch, PhD

*Postdoctoral Scholar - Neurology*

#### **"Impact of Central Nervous System Injury on Form and Function of the Neuromuscular Junction"**

*Elucidation of the cellular and molecular alterations within paretic muscle tissue following injury to the brain or spinal cord.*



### Michael Butler, PhD

*Postdoctoral Scholar - Institute for Behavioral Medicine Research*

#### **"The Impact of Western Diet Consumption on T-cell Brain Infiltration in a Mouse Model of Alzheimer's Disease"**

*Comprehensive assessment of a western diet on brain infiltration and reactivity of proinflammatory T-cells, Alzheimer's Disease pathology, and cognitive deficits.*

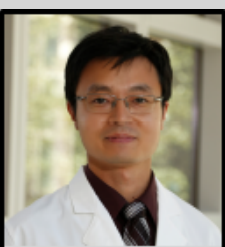


### Jerusha Naidoo, PhD

*Research Scientist - Neurosurgery*

#### **"Novel Intracranial Delivery of AAV-based Gene Therapy for Sensorineural Hearing Loss"**

*Comparison of cochlea transduction efficiency of multiple AAV vector serotypes following intracranial administration.*



### Yinan Zhang, MD

*Assistant Professor - Neurology*

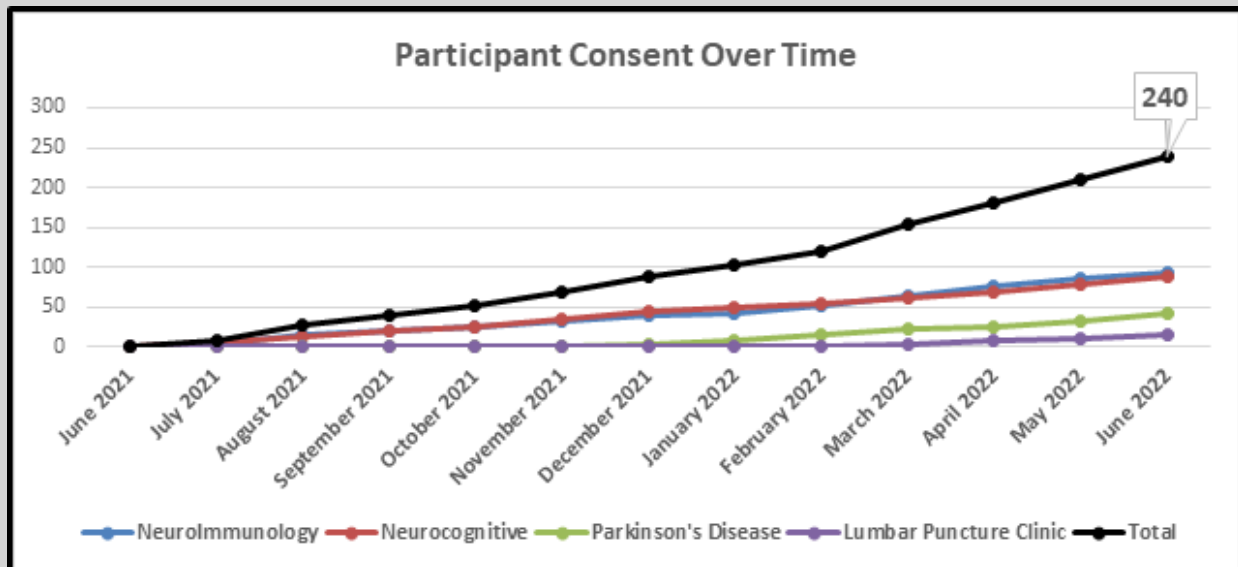
#### **"Markers of Biological Aging in Primary Progressive Multiple Sclerosis"**

*Investigation of the association of multiple mechanisms of biological aging in Primary Progressive Multiple Sclerosis patients with disease outcomes.*

# NRI - Brain Bank and Biorepository Update

The primary purpose of the Neuroscience Research Institute Brain Bank and Biorepository (NRI-BBB) is to provide a robust specimen bank as a resource for the neuroscience research community at The Ohio State University (OSU). The technology for profiling biospecimens continues to evolve, and it is of utmost importance that OSU maintains a robust and well-characterized brain bank and biorepository to stay at the forefront of translational research in the field of neuroscience. A number of significant milestones have been made since the beginning of 2022 for the NRI-BBB including:

- Began routine participant recruitment at the Lumbar Puncture Clinic every Thursday at Martha Morehouse Pavilion
- Fully integrated the Buckeye Brain Bank with the NRI-BBB and enrolled our first two new participants to the Brain Bank
- Began DNA extractions on all blood samples received for the biorepository
- Expanded recruitment to the Neuromuscular division
- Received approval to add remote consenting for the Movement Disorders Registry to the NRI-BBB
- Routinely collecting blood and cerebral spinal fluid
- Specimens in the bank include: peripheral blood mononuclear cells (PBMCs), cerebral spinal fluid cell pellet and supernatant, plasma, serum, and DNA
- Enrollment of over 240 participants as of June 2022



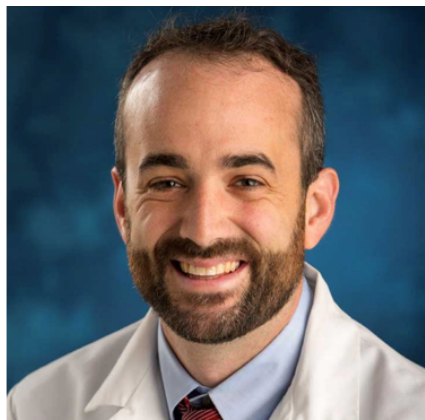
To request or inquire about specimens please access our [REDCap request form here](#).

## Highlight - New Health Services Research Division

The Department of Neurology has established a Division of Health Services Research (HSR). To our knowledge, this is the first division of HSR to be housed in a Neurology Department. HSR aims to understand, evaluate, and intervene on problems that relate to value, delivery, and sustainability in healthcare – both from the micro level of the patient and the macro level of the system. The division is co-directed by Jim Burke, MD and Kevin Kerber, MD. Jim and Kevin joined OSU in December 2021 from the University of Michigan. They are long time collaborators on projects that have applied a variety of methods including clinical epidemiology, predictive modeling, decision support development, and implementation clinical trials. They have led or collaborated on studies about dizziness, stroke, headache, epilepsy, neuropathy, and vision disorders, and more broadly about understanding racial disparities, and exploring how patient preferences affect health outcomes. The group will be collaborating closely with Ohio State's Center for the Advancement of Team Science, Analytics, and Systems Thinking in Health Services and Implementation Science Research (CATALYST). The division has hired a Research Manager, Jamie Turner, and will be hiring analysts, other staff, and recruiting additional faculty.

**Jim Burke, MD**

Professor  
Co-Director,  
Health Services Division  
Department of Neurology



**Kevin Kerber, MD**

Professor  
Co-Director,  
Health Services Division  
Department of Neurology



## NRI Early Career Development Lunch & Learn Series

- The NRI Education & Mentorship Committee is looking for ideas for a new lunch & learn series focused on mentorship primarily for postdocs as well as graduate students.
- Topics may include:
  - Navigating the NIH
  - Practice Faculty Interview Talk Sessions for Postdocs
  - Meet-the-Expert Lunches with OSU Leadership
  - Grant Writing
- This will be a monthly lunch meeting with invited internal and external speakers. The committee is looking for ideas and to formalize the first round of speakers. Please fill out this [survey](#) to submit your ideas.
- The Education & Mentorship Committee is also looking for suggestions for a Keynote speaker for the NRI Annual Retreat. Submit ideas to [OSU-NRI@osumc.edu](mailto:OSU-NRI@osumc.edu) by July 15th.

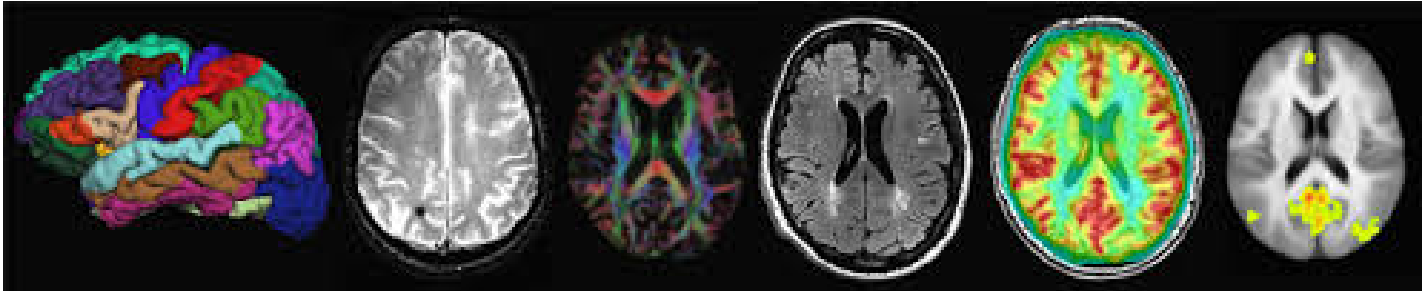
# NRI Neuroimaging Symposium

**October 28-29, 2022 (Blackwell Inn & Pfahl Conference Center)**

- Topics highlighted will include neuroimaging and artificial intelligence in neurodegeneration and vascular diseases as well as ocular imaging in neurological diagnosis and management.

## **Confirmed Keynote Speakers**

- Rory Pilgrim (Ophthalmology Product Manager, Google Health)
- Charles DeCarli (Director, UC Davis Health's Alzheimer's Disease Center)
- William Jagust (Professor of Neuroscience, UC Berkeley)
- Greg Albers (Professor of Neurology, Stanford University)



OHSU

A flash talk session and a poster session comprised of only OSU presenters will be held and junior faculty and trainees are highly encouraged to apply.

## **Important Dates**

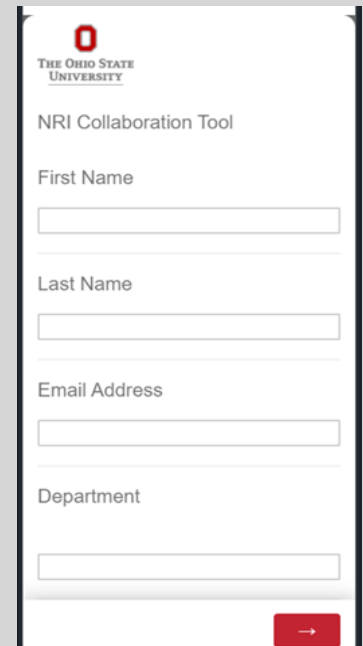
**Abstract Deadline for Flash Talks & Poster Session – September 15th**

**Registration Deadline (registration is free) – September 30th**

To register and submit your abstract, please use this [survey](#).

## **NRI Collaboration Tool**

- Based on survey, NRI-affiliated faculty requested assistance with making connections and collaborations
- An additional identified need is in support of experimental design of translational projects
- Given this feedback the NRI Collaboration Tool was created and is currently on NRI website
- All requests will go to faculty that serve on the NRI Translational & Cross-Collaborations Committee
- Visit: [OSU-NRI website](#)



# Recent Achievements

within last 6 months

## Grants

- **Dr. David Arnold** was awarded an AD supplement on his R01 to investigate the impact of AD on motor function and the motoneuron as a possible link. In addition, he also awarded funding from NIA/NIH for a SBIR grant to investigate an improved measure of muscle health in older adults and a diversity supplement for Carlos Padilla to explore the impact of diet on motoneuronal health.
- **Dr. Erica Glasper** received a NINDS R01, "From social disruption to neural compromise: Establishing markers and mediators" and along with **Dr. Leah Pyter** (Psychiatry) – Center for Clinical and Translation Science (CCTS), "Mechanisms by which mate bonding attenuates chemotherapy neurobehavioral side effects"
- **Dr. Harry Fu**, received a grant from National Institute on Aging, "Ectodermal-neural cortex 1 and neuronal vulnerability to tau pathology in Alzheimer's disease"
- **Dr. Glenn Lin** was awarded a grant from Edward N. and Della L. Thome Memorial Foundation, "Restoration of synapses as a therapeutic strategy for Alzheimer's disease"
- **Dr. Phil Popovich** was awarded a grant from Third Frontier Research Initiative - Spinal Cord injury - Ohio Department of Higher Education for "Development of Novel Pro- and Prebiotic Interventions to Improve Gut Dysbiosis after Spinal Cord Injury".
- **Dr. Phil Popovich, Dr. Krissy Kigerl** and **Dr. Jan Schwab** (Neurology) awarded grant from the Ohio Department of Higher Education, "Metagenomic analysis of gut microbiota after SCI to identify novel therapeutic targets"
- **Dr. Marc J. Tassé** received ACL funding for Increasing the Public Health Workforce and ID/DD
- **Dr. Dana McTigue** was awarded OSU President's Research Excellence Accelerator Grant – "Discovery of Novel Therapeutic Targets to Improve Healthspan after Spinal Cord Injury: A Collaboration Between Colleges of Medicine and Education & Human Ecology"
- **Zoe Tapp** (trainee), **Dr. Niki Kokiko-Cochran** and **Dr. Jon Godbout** received a grant from NINDS, "Microglia dysregulation and altered responses to stress after traumatic brain injury"
- **Dr. Jan Schwab** was awarded a research grant from Wings for Life Spinal Cord Research Foundation for "Elevation In Spinal Cord Injury Translation: Combining Literature Inference, Meta-Analysis, Bioinformatics Evidence Research (CLIMBER)"
- **Dr. Wenjing Sun** received a NINDS R01 grant for "Novel molecular mediators for activity-dependent myelination"
- **Dr. Jacy Wagnon** was awarded a grant from Dravet Syndrome Foundation, "Targeting molecular responses to seizures in Dravet syndrome"
- **Dr. Lihua Ye** was awarded a grant from the National Institute of Diabetes and Digestive and Kidney Diseases, "Enteroendocrine cells sense gut bacteria and activate a gut-brain pathway"

## High-impact Publications

- Atkinson J.R., Jerome A.D., Sas A.R., Munie A., Wang C., Ma A., Arnold W.D., **Segal B.M.**. "Biological aging of CNS-resident cells alters the clinical course and immunopathology of autoimmune demyelinating disease." *JCI Insight* (2022)
- Bray, C.E., Witcher, K.G., Adekunle-Adegbite, D., Ouvina, M., Witzel, M., Hans, E., Tapp, Z.M., Packer, J., Goodman, E., Zhao, F., Chunchai, T., O'Neil, S., Chattipakorn, S.C., **Sheridan, J., Kokiko-Cochran, O.N., Askwith, C., Godbout, J.P.** "Chronic Cortical Inflammation, Cognitive Impairment, and Immune Reactivity Associated with Diffuse Brain Injury Are Ameliorated by Forced Turnover of Microglia." *Journal of Neuroscience* (2022)
- Cox B, Alharshawi K, Mena-Palomo I, Lafuse WP and **Ariza ME.** "EBV/HHV-6A dUTPases Contribute to Myalgic Encephalomyelitis/Chronic-Fatigue-Syndrome pathology by exacerbating TFH Cell Differentiation and extrafollicular activities." *J Clinical Investigation Insight*.(2022)
- Du, Y., Brennan, F.H., **Popovich, P.G., Zhou, M.**, "Microglia maintain the normal structure and function of the hippocampal astrocyte network." *Glia* (2022)
- Elliott, C.S., Kopp, M.A., Stampas A., **Schwab J.M.**, Chen Y., Shem K., Crew J. "The Effect of Early Infection on the Rate of Volitional Voiding after Spinal Cord Injury: A Potential Modifiable Risk Factor for Bladder Outcomes." *Journal of Urology* (2022)
- Fitzgerald, J., Houle, S., Cotter, C., Zimomra, Z., **Martens, K.M., Haar, C.V., Kokiko-Cochran, O.** "Lateral Fluid Percussion Injury Causes Sex-Specific Deficits in Anterograde but Not Retrograde Memory." *Behavioral Neuroscience* (2022)
- Hoyt, K.R., **Obrietan, K.** "Circadian clocks, cognition, and Alzheimer's disease: synaptic mechanisms, signaling effectors, and chronotherapeutics." *Molecular Neurodegeneration* (2022)
- Jerome, A., Atkinson, J., McVey Moffatt, A., Sepeda, J., **Segal, B., Sas, A.** "Characterization of Zymosan-Modulated Neutrophils With Neuroregenerative Properties." *Frontiers in Immunology* (2022)
- Jogia T. Kopp M.A., **Schwab J.M.**, Ruitenber M.J "Peripheral white blood cell responses as emerging biomarkers for patient stratification and prognosis in acute spinal cord injury." *Current Opinion In Neurology* (2021)
- Naeimi Kararoudi M., Alsudayri A., Hill C.L., Elmas E., Sezgin Y., Thakkar A., **Hester M.E.**, Malleske D.T., Lee D.A., Neal M.L., Perry M.E., Harvilchuck J.A., Reynolds S.D. "Safety Assessment of Beta-2 Microglobulin Gene Edited Airway Epithelial Stem Cells in a Preclinical Model of Sulfur Mustard Inhalation" *Frontiers in Genome Editing* (2022)
- Noble B.T., Brennan F.H., Wang Y., Guan Z., Mo, X., **Schwab J.M., Popovich P.G.** "Thoracic VGLuT2+ Spinal Interneurons Regulate Structural and Functional Plasticity of Sympathetic Networks after High-Level Spinal Cord Injury." *Journal of Neuroscience* (2022)
- **Rajappa, P.**, Eng K.W., Bareja R., Bander E.D., Yuan M., Dua A., Maachani U.B., Snuderl M., Pan H., Zhang T., Tosi U., Ivasyk I., Souweidane M., Elemento O., Sboner A., Greenfield J.P., Pisapia D.J., "Utility of Multimodality Molecular Profiling for Pediatric Patients with Central Nervous System Tumors" *Neuro-Oncology Advances* (2022)
- Rodgers K.A., Kigerl K.A., **Schwab J.M., Popovich P.G.** "Immune dysfunction after spinal cord injury - A review of autonomic and neuroendocrine mechanisms." *Current Opinion in Pharmacology* (2022)
- Seicol, B.J., Lin, S., **Xie, R.** "Age-Related Hearing Loss Is Accompanied by Chronic Inflammation in the Cochlea and the Cochlear Nucleus." *Frontiers in Aging Neuroscience* (2022)
- Sydney, A., Kiyoshi, C.M., Arzola, E.P., Patterson, J.A., Taylor, A.T., Du, Y., Guiher, A.M., Philip, M., Camacho, E.G., Mediratta, D., Collins, K., Boni, K., Garcia, S.A., Kumar, R., Drake, A.N., Hegazi, A., Trank, L., Benson, E., Kidd, G., Terman, D., **Zhou, M.** "Ultrastructural view of astrocyte arborization, astrocyte-astrocyte and astrocyte-synapse contacts, intracellular vesicle-like structures, and mitochondrial network." *Progress in Neurobiology* (2022)
- Taylor S, Isobe S, Cao A, Contrepolis K, Benayoun B, Jiang L, Wang S, Melemenidis, S., Ozen, M.O., Otsuki, S., Shinohara, T., Kaplan, J., Moonen, J-R., Marciano, D., Gu, M., Miyagawa, K., Hayes B, Sierra RG, Kupitz CJ, Roof, M.B., His, D., Thompson, R., **Ariza, M.E.**, Demirci, U., Zamanian, R., Haddad, F., Nicolls, M.R., Snyder, M.P., Rabinovitch, M. Endogenous Retroviral Elements Generate Pathologic Neutrophils in Pulmonary Arterial Hypertension. *Am J Respir Crit Care Med.* (2022)
- **Tedeschi, A.**, Larson, M., Zouridakis, A., Mo, L., Bordbar, A., Myers, J.M., Qin, H.Y., Rodocker, H.I., Fan, F., Lannutti, J.J., McElroy, C.A., Nimjee, M., Peng, J., **Arnold, W.D.**, Moon, L.D.F., **Sun, W.** "Harnessing cortical plasticity via gabapentinoid administration promotes recovery after stroke" *Brain* (2022)

## Awards

- **Dr. Dave Arnold** was asked to join the Rehabilitation Medicine Scientist Training Program (RMSTP) advisory board. RMSTP is funded by NIH's National Center for Medical Rehabilitation Research (NCMRR) grant number R25HD098048. This is the premier career development program for PM&R.
- **Dr. Faith Brennan** (2021 NRI Seed Grant Winner) is starting a faculty position at Queen's University in Kingston, Ontario (Canada) on October 1st.
- The Columbus City Council recognized **Christine Brown**, clinical research assistant and self-advocate faculty in the LEND program, for DD Awareness Month.
- **Anaya Das**, undergraduate in Schwab lab, was awarded by the 2022 Undergraduate Research Apprentice Program (URAP) Scholarship (OSU) for "Investigating the inflammatory lung response effects applying a controlled experimental pneumonia to characterize SCI-associated pneumonia."
- **Dr. Angela R. Filous**, Research Scientist in the Schwab lab, received an Early Career Award from The American Spinal Injury Association (ASIA), May 18-20, 2022, New Orleans, Louisiana.
- **Dr. Deepak Gulati** received an OSU Accelerator Award for the 2021-2022 cycle. It is a joint grant with Dr. Alper Yilmaz (College of Engineering) on "Machine Learning Tool Detection and Monitoring of Stroke".
- **Markus E. Harrigan**, MD PhD Student in the Schwab lab, presented an oral presentation (abstracts of distinction) at the American Academy of Neurology (AAN) Meeting, April 24-25, 2022. The title was "Loss of regained or spared function after spinal cord injury (Neuroworsening): Evidence and Dimension."
- **Raghav Khan**, an undergraduate in the Schwab lab, received an Honors award by the College of Arts and Sciences 2022 (ACS Honors Program) (OSU) for "Investigating longitudinal changes in adrenal gland structure and function following spinal cord injury".
- **Dr. Steve Kolb** received a Lead.Serve.Inspire award by the medical students: Outstanding Educator Award, Understanding Patients with Special Medical Needs. Part 2. Dr. Kolb has also been invited by the NIH to serve as a Member of the Chronic Dysfunction and Integrative Neurodegeneration Study Section (CDIN), Brain Disorders and Clinical Neuroscience Integrated Review Group (BDCN), Center for Scientific Review (CSR), for a term beginning 07/01/2022 and ending 06/30/2026.
- **Dr. Sandra Kostyk** of the OSU Department of Neurology was elected to a three-year term as a Co-Chair of the Huntington Study group (HSG). The HSG is an international network of over 100 academic centers that include credentialed investigators, coordinators, scientists and Huntington's disease experts dedicated to facilitating high quality clinical research trials to improve the lives and outcomes of those affected by Huntington's disease, a rare but devastating neurodegenerative disorder.
- **Dr. Jay Singh** was invited to speak at the 2023 American Clinical Neurophysiology Society meeting on "Practical fundamentals and pitfalls of EEG Source Imaging: Case-Based Discussion".
- **Lauren Shepler**, LEND Self-Advocate Trainee, earned a Certificate of Inclusive Excellence from the OSUMC Diversity Council.

## Announcements

- A successful Explorations in Neuroscience Summer Camp was held June 6-10th with 62 participants. A huge thank you to all NRI faculty and staff who gave seminars, opened their labs for rotations and contributed to its success!
- June 16th was the start of the 7-week R25 Explorations in Neuroscience Internship Program consisting of 12 participants. Again, thank you to the PIs and bench mentors who will be hosting these students in their lab.
- The 4th Americas School of Neuroimmunology (ASNI) of the International Society of Neuroimmunology will take place at OSU this July 11-14<sup>th</sup>. ASNI will feature 25 lecturers from Canada, USA and South America on several topical areas of neuroimmunology across a spectrum of neurological conditions. The program is available at <https://www.asnicourse.isniweb.org>.
- Information for Other Foundation Grants with Upcoming Deadlines (NRI website) can be found [here](#).



## Upcoming Events - Save the Date

**NRI Neuroimaging Symposium**  
**October 28-29, 2022**  
**BLACKWELL INN &**  
**PFAHL CONFERENCE CENTER**  
(See pg 4 for registration details)

**2022 NRI Annual Retreat**  
**Friday, November 4th, 2022**  
**FAWCETT CENTER**  
**Registration Details Coming Soon!**

- To submit announcements for future newsletters, please email [OSU-NRI@osumc.edu](mailto:OSU-NRI@osumc.edu).