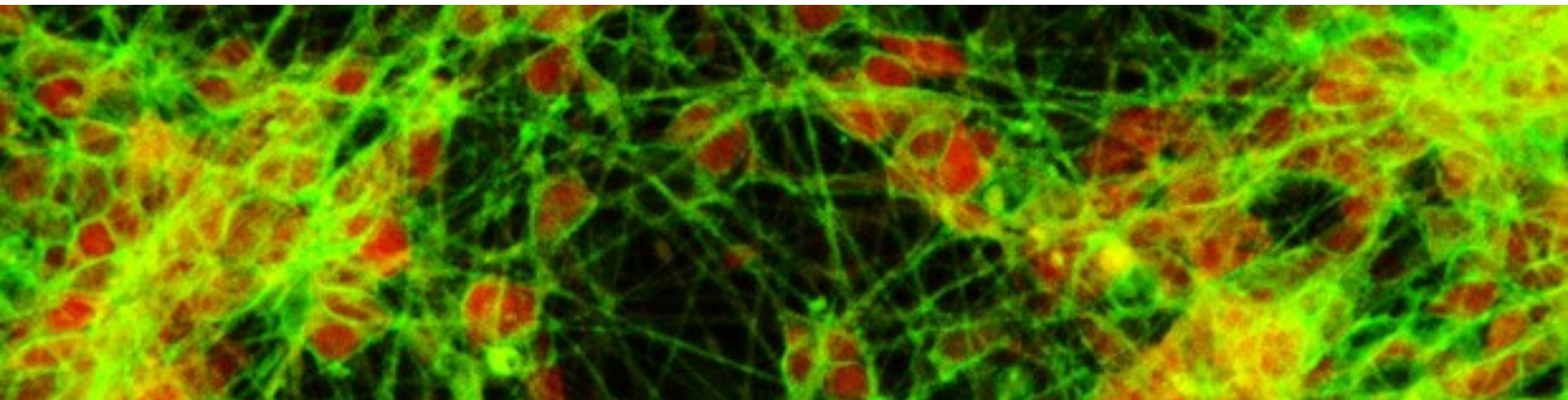


NEWSLETTER

DEPARTMENT OF NEUROSURGERY



WELCOME TO OUR QUARTERLY NEWSLETTER

2023 is off to a great start with several exciting milestones for the department. We've concluded the interview cycle for our inaugural class of Weill Cornell Neuroscience graduate students and have extended offers to four outstanding candidates. These trainees will start in July and mark the official launch of the program. In addition, our clinical residency program received 303 applications and interviewed 44 applicants for 3 spots. 174 applicants had USMLE scores of 240 or greater. Extraordinary applicants were in abundance! The new residents will begin their training on July 1st. In addition to our residency being regarded as a first-tier program evidenced by the number and quality of our resident applicants, we have further increased our educational armamentarium. Since the last academic year, we have been approved for a Neurosurgical Spine Fellowship, a Stereotactic and Functional Fellowship, and a Neurosurgical Oncology Fellowship. We anticipate approval for an Endovascular Fellowship and will be submitting for a Skull Base fellowship. The new fellowship programs will allow the residents an opportunity to complete enrolled fellowships in their PGY 7 year, as well as provide additional training for other outstanding postgraduate fellows from other institutions. These fellowships are an addition to our already ongoing Neurocritical Care Fellowship program accredited by UCNS and CAST. We are also hosting our second national Neurology and Neurosurgical Bootcamp for training, and we are creating an educational YouTube channel along with a host of other educational web-based activities. I feel a sense of pride as neurosurgery research continues our trailblazing program focused on education and collaborative translation research.



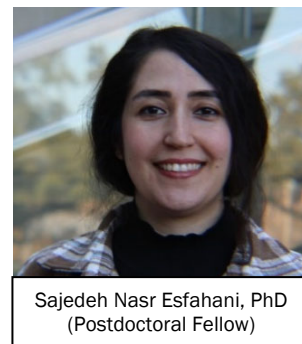
Gavin W. Britz, MBBCh, MPH,
MBA, FAANS

Candy and Tom Knudson Distinguished
Centennial Chair in Neurosurgery
Professor and Chairman, Department of
Neurosurgery
Director, Neurological Institute
Houston Methodist Hospital
Professor of Neurological Surgery, Weill
Cornell Medical College, NY

Above: Specially engineered neurons designed to regenerate brain and spinal cord tissue.
Photo credit: Matthew Hogan, The Horner Lab

EDUCATION

NIH-funded Postdoctoral Training Program: We are excited to announce that **Sajedeh Nasr Esfahani, PhD** was selected as the inaugural NIH-funded postdoctoral fellow in our Neural Control of Organ Degeneration and Regeneration (NeuralCODR) postdoctoral training program. Sajedeh has a PhD in Mechanical Engineering from the University of Michigan, Ann Arbor. As a NeuralCODR trainee, her primary mentor is Dr. **Robert Krencik** (Center for Neuroregeneration, Department of Neurosurgery, Houston Methodist), her secondary mentor is Dr. Mary C. "Cindy" Farach-Carson (UT Health), and her clinical mentor is Dr. **Amir Faraji** (Center for Translational Neural Prosthetics & Interfaces, Department of Neurosurgery, Houston Methodist). Her project titled *"Generating and Validating Astrocyte-Inspired Functionalized Hydrogels to Promote Synaptic Regeneration"* will address the lack of bioengineering strategies to promote neuroregeneration in the human central and peripheral nervous system. Her research extends her previous studies focused on using simple three-dimensional hydrogels to modulate differentiation of germ cells by shifting into neuroscience and clinical applications. For more information, please visit neuralcodr.org



Sajedeh Nasr Esfahani, PhD
(Postdoctoral Fellow)



**Weill Cornell
Medicine**

Weill Cornell Graduate Program: The Neurological Institute recently completed recruitment for its first cohort of PhD students who will attend

the Weill Cornell Graduate School of Medical Sciences at the Houston Methodist campus. Candidates attended interview rounds and a poster session presented by Postdoctoral Fellows. The Neuroscience graduate program will challenge students to develop their expertise beyond neuroscience, including organ and brain interactions, systems level physiology, engineering, *in vivo* imaging, and computational biology. Our inaugural roster of faculty includes Dr. **Philip Horner**, Dr. **Yi-Lan Weng**, Dr. **Muralidhar Hegde**, and Dr. **Dimitry Sayenko**, with four additional neuroscience faculty currently under review by Weill Cornell Graduate School.

ZUSMAN WORKSHOP

The **fourth biennial Patricia Levy Zusman International Workshop on Neuroregeneration** occurred from **March 7-10, 2023**. This workshop was built to develop a collaborative network that stimulates new ideas among scientists and encourages collaborations and research together in a hyper-focused environment with an incubator set-up. The two keynote speakers were Kristian Franze, PhD (Cambridge University), whose talk "Tension in Growth" focused on axon regeneration through modulating tissue mechanics after injury; and Ed Boyden, PhD (Massachusetts Institute of Technology), whose lecture "Expansion Microscopy" elaborated on his lab's successful use of hydrogel to magnify polymer threads in central nervous system tissue.



Zusman Workshop participants at the Houston Rodeo.

In addition, 35 speakers presented on a wide array of topics and over twenty trainees exhibited their research during the poster presentation and poster blitz session. One exciting aspect that sets the Zusman Workshop apart is our Catalyst Mini-Grant Awards in which participants are encouraged to team up and brainstorm potential projects based on the ideas exchanged during the Zusman Workshop. This year, we were able to fund three winning teams whose projects focused on topics ranging from gut and brain health, double stranded DNA breaks, and spinal stimulation. These collaborations represent the heart of the Zusman Workshop. **Funding for this workshop is made possible by the Patricia Levy Zusman Endowment and an NIH R13 grant.**

RESEARCH SPOTLIGHT

Dr. Dimitry Sayenko has been collaborating with Dr. Marcia O'Malley at Rice University on their **Neurospark funded** project titled "*Functional Reorganization of Brain-Spinal Connectivity After Stroke Using Noninvasive Neuromodulation and Robotic Upper Limb Exoskeleton for Neuromotor Rehabilitation.*" Preliminary findings provide a glimpse of insight into the potential effects of a combined transcutaneous spinal stimulation with robotics training treatment on post-stroke motor recovery. They also point to the need for not only a larger sample size, but also heterogeneous methods of assessing the outcomes when employing this type of combinatorial approach. Gaining a better understanding of the underlying mechanisms of this combinatorial approach will not only help stroke patients, but may also **impact individuals with other forms of neurologic dysfunction and neurodegenerative disease (e.g., cerebral palsy, multiple sclerosis, and Parkinson's disease).**



Dr. Dimitry Sayenko

INVITED LECTURE SPOTLIGHT

On January 5, Dr. Michelle Hook (Texas A&M University School of Medicine) presented "*Pain management after spinal cord injury: Effects of opioids.*" Given that opioids are indispensable for the treatment of moderate to severe pain, she presented data from her lab that is focused on identifying the molecular mechanisms underlying opioid-induced pain and reduced recovery after spinal cord injury. This talk was part of the **Center for Neuroregeneration's trainee-led NeuralBuzz Topics Lecture Series** where trainees identify and invite national level speakers to present at Houston Methodist. The lecture series is made possible through the generous support of the Paula and Rusty Walter Endowment to increase scholarly engagement within the Department for Neurosurgery.



Dr. Michelle Hook with Department of Neurosurgery postdoctoral fellows and graduate students

Department Spotlight: Amber Behne



Amber joined my team as a Senior Research Coordinator in Nov. 2021, just as I transitioned into management. She was assigned a multisite, one year, investigator-initiated study that had multiple delays out of everyone's control. She was given four months to enroll all 30 subjects and test 6 modalities at three different locations throughout TMC. She exceeded expectations and enrolled all 30 within about 10 weeks. Amber is a pleasure to work with and we are very lucky to have her!

—Rachel Markley

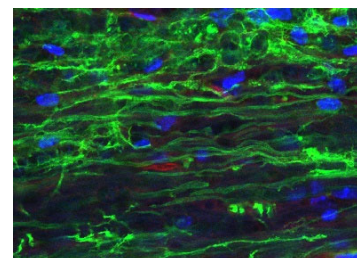
OUTREACH

Dr. **Philip Horner** traveled to Austin, TX on March 20, 2023 to testify to the Texas House of Representatives Special Council of Higher Education on H.B. 15 that would create a new Mental Health and Brain Research Institute of Texas. The proposed legislation would generate significant academic and financial support for biomedical research initiatives relating to mental health and brain-related sciences, an organizational structure that is similar to the Cancer Prevention and Research Institute of Texas (CPRIT).



NEUROART CONTEST

We are pleased to announce our NeuroArt competition, which aims to spotlight and disseminate the amazing work performed in the Department of Neurosurgery. Submitted images may include microscope images, fMRI images, illustrations, visual depictions of complex datasets, or 3D brain



reconstructions. Each month, the best image will be awarded with a \$500 travel award and the image will be printed, framed, and displayed on the walls of the 11th floor in the Houston Methodist Research Institute.

WELCOME ABOARD!

We are pleased to welcome the following members of the department



Ronak Jaisalmeria
Krencik Lab, undergraduate
student, Rice University



Olivia LaChapelle
Vahidy team, Academic
Coordinator



Sailee Sham Lavekar
Krencik Lab, Postdoctoral
Fellow



Suki Oji
Krencik Lab, Research
Assistant I



Elsa Ruiz
Vahidy team, Clinical
Research Specialist



Lina Sun
Weng Lab, Research
Technician I



Justin Wenzlawsh
Sayenko Lab, Research
Assistant I

PRESENTATIONS AND INVITED LECTURES

Several members of the **Vahidy** Neuro Informatics & Outcomes team attended the 2023 International Stroke Conference of the American Heart Association on February 7 and presented a total of 10 projects. Abstracts include:



- Thomas Potter, PhD: “A Big-data Neuro-informatics Infrastructure to Support Research Pipelines for Cerebrovascular Disease” and “Systolic Blood Pressure Variability Increases During the Initial 24 Hours After Intravenous Nicardipine Administration Among Patients with Primary Intracerebral Hemorrhage”
- Abdulaziz Bako, PhD: “Contemporary Nationwide Estimates for Outcomes Associated with Craniotomy Among Patients with Intracerebral Hemorrhage” and “Effectiveness of Minimally Invasive Surgery With Thrombolysis For Evacuation Of Intracerebral Hemorrhage: Post Hoc Bayesian Analysis Of A Phase 3 Randomized Controlled Trial”
- Jonika Tannous, PhD: “Optimizing Longitudinal Follow Up for Outcomes Research Among Patients with Intracerebral Hemorrhage” and “Sociodemographic, Clinical, and Outcomes Characteristics of Young Adult Patients with Intracerebral Hemorrhage”
- Eman Baig, Research Coordinator I, received the [Junior Investigator Travel Award](#) for “Nationwide Seasonal Variations and Increases in Incidence of Intracerebral Hemorrhage And Acute Ischemic Stroke: An Analysis Of Pre-pandemic 16-year National Data”

PUBLICATIONS

- Bhenderu, L.S., Wong, M. & **Britz, G.W.** Discovering spontaneous intracranial hypotension after failed middle meningeal artery embolization for subdural hematomas: illustrative cases. *J Neurosurg Case Lessons*. 2023 Feb 6;5(6):CASE22445. PMID: 36748753
- Chakraborty, A., Tapryal, N., Islam, A., Sarker, A.H., Manohar, K., Mitra, J., **Hegde, M.L.** & Hazra, T. Human DNA polymerase η promotes RNA-templated error-free repair of DNA double-strand breaks. *J Biol Chem*. 2023 Mar;299(3):102991. PMID: 36758800
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- Feigl, G. C., **Britz, G.W.**, Staribacher, D., & Kuzmin, D. The minimally invasive lateral occipital infracortical supra-/transtentorial approach in surgery of lesions of the pineal region: A possible alternative to the standard approaches. *World Neurosurgery*. 2023 Jan 3;S1878-8750(22)01827-7. PMID: 36608790
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- Patterson, J.D., Farach, A.M., Singh, M., **Britz, G.W.** & **Rostomily, R.C.** Leptomeningeal metastasis from neuroendocrine carcinoma of the cervix: illustrative case. *J Neurosurg Case Lessons*. 2023 Jan 30;5(5):CASE22457. PMID: 36718868
- Salazar B.H., Hoffman K.A., Fraizer A.M., Humes F., Hogan M.K., Horner M.A., Yadegar T., Trusler S., Hamilton G.F., **Horner P.J.** Rigor and reproducibility in analysis of rodent behavior utilizing the forelimb reaching task following a cervical spinal cord injury. *Behav Brain Res*. 2023 Feb 15;439:114188. PMID: 36395979
- Saveko, A., Bekreneva, M., Ponomarev, I., Zelenskaya, I., Riabova, A., Shigueva, T., Kitov, V., Abu Sheli, N., Nosikova, I., Rukavishnikov, I., **Sayenko, D.** & Tomilovskaya, E. Impact of different ground-based microgravity models on human sensorimotor system. *Front. Physiol*. 2023 Feb 15;14:1085545. PMID: 36875039
- Whalen S., Inoue F., Ryu H., Fair T., Markenscoff-Papadimitriou E., Keough K., Kircher M., Martin B., Alvarado B., Elor O., Laboy Cintron D., Williams A., Hassan Samee M.A., Thomas S., **Krencik R.**, Ullian E.M., Kriegstein A., Rubenstein J.L., Shendure J., Pollen A.A., Ahituv N., Pollard K.S. Machine learning dissection of human accelerated regions in primate neurodevelopment. *Neuron*. Mar 15;111(6):857-873.e8. PMID: 36640767

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