SPRING 2023

Boston Children's Hospital | F.M. Kirby Neurobiology Center

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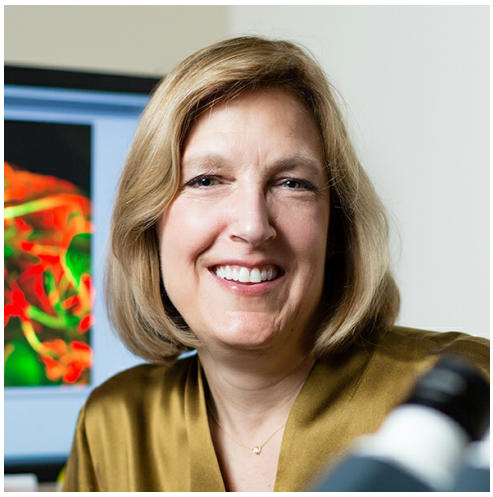
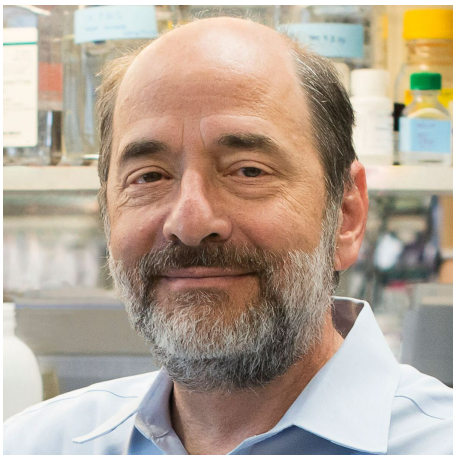
Kirby Center News & Updates



Elizabeth Engle, MD, Professor of Ophthalmology and Neurology at Harvard Medical School and Associate Director of the Ocular Genetics Institute at Harvard Ophthalmology, has been elected as a member of the American Academy of Arts and Sciences. Founded in 1780, The Academy is both an honorary society recognizing the excellence of its members and an independent research center convening leaders from across disciplines to examine new ideas and to work together to address issues of worldly importance. Dr. Engle is considered one of the world's leading authorities on the genetics of eye movement disorders, and has conducted groundbreaking research throughout her career that has dramatically advanced our knowledge of the human motor neuron and brainstem development. Congratulations, Elizabeth!

The Kirby Center proudly awarded the first Steve Samuels & Ami Cipolla Innovation Grant to **Anne Arnett**, PhD, and **Virginia Peisch**, PhD. This one-year grant provides $120,000 for studies at Boston Children's Hospital focused on attention, anxiety, and their associated disorders. The winning proposal is titled, Differentiating Neurocognitive and Behavioral Profiles of Inattention in Pediatric ADHD and Anxiety. The selection committee included faculty from the Kirby Center, the Rosamund Stone Zander Translational Neuroscience Center, and the Departments of Neurology, Psychiatry, and Developmental Medicine at Boston Children's Hospital.

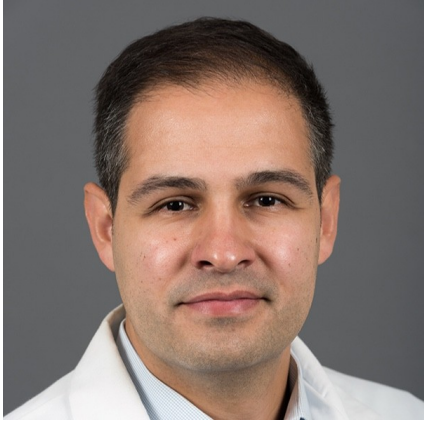
Michael Greenberg, PhD, former Director of the Kirby Center, was one of the three winners of The Brain Prize 2023, a prestigious award presented by the Lundbeck Foundation. The Brain Prize, first awarded in 2011, is an international award honoring one or more active researchers who have distinguished themselves by an outstanding contribution to neuroscience. The award accompanies a 10,000,000 DKK award (~1.45MM USD) to winners, which is the world's largest brain research prize. Dr. Greenberg was awarded The Brain Prize 2023 for his ground-breaking discoveries of how the synthesis of new proteins is triggered in different parts of the neuron. Congratulations and well done, Michael!



Chinfei Chen, MD, PhD, has been appointed Associate Director of the Program in Neuroscience at Harvard University.

Beth Sheidley, MS, CGC, of the Epilepsy Genetics Program, and **Stephanie Jo Brewster**, MS, CGC, of the Rosamund Stone Zander Translational Neuroscience Center, have both been promoted to Director of Genetic Counseling, a newly created leadership position at Boston Children's Hospital.

Maya Chopra, MBBS, FRACP, has been appointed Assistant Professor of Neurology at Harvard Medical School. Dr. Chopra is the Director of Translational Genomic Medicine at the Rosamund Stone Zander Translational Neuroscience Center (RSZ TNC). Congratulations, Maya!

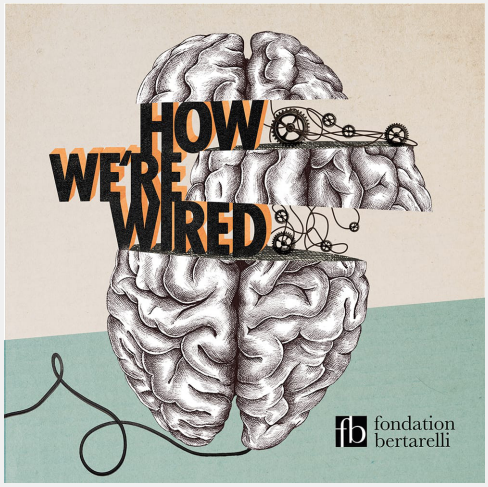


Darius Ebrahimi-Fakhari, MD, PhD, has been promoted to Assistant Professor of Neurology at Harvard Medical School. Dr. Ebrahimi-Fakhari is the Director of the Movement Disorders Program, and a physician-scientist in the Department of Neurology. Congratulations, Darius!

This Valentine's Day, the Kirby Administrative team organized and donated gift bags to 13 families staying at The Yawkey Family Inn. The gift bags included crayons, stickers, and puzzles, and were donated along with snack foods and chocolate to share. The Yawkey Family Inn was opened at BCH in 2009, and provides children and their families an affordable, safe place to rest while their kids are being treated at Boston Children's Hospital. Between The Yawkey Family Inn and The Devon Nicole House, the hospital serves over 1,700 families per year.

Research in News & Media

In a recent episode of the podcast How We're Wired, Director of the Kirby Center, **Clifford Woolf**, MB, BCh, PhD, is interviewed about the neuroscience of pain. The podcast was conceptualized by The Bertarelli Foundation, a private foundation that partners with scientists, NGOs, and governments across the world to help provide solutions to critical issues within the fields of marine conservation and life science research. The Foundation sought to create a 12 episode series specifically exploring their work in neuroscience - other episodes in this series include "How We Love" and "How We See". In this episode, Dr. Woolf discusses the neural mechanisms of pain, including the complexity of treating certain pain conditions, and the new ways we are looking to develop novel pain relievers. Listen to the full episode here: How We Feel Pain.



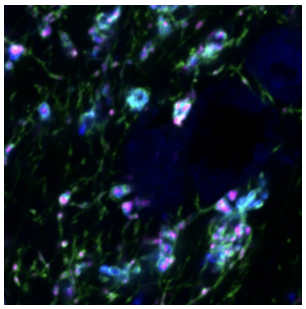
A systemic study led by Kathrin Wenger, a graduate student in the lab of **Judith Steen,** PhD, found that commonly used mouse models don't capture the pathology of the later-stage disease. Wenger and Steen were interviewed about this particular research by Nancy Fliesler, asking the question: Why do so many dementia treatments fail? In the study, Wenger discusses the

The number of genes implicated in epilepsy has grown rapidly in recent years, leading to questions about what tests should be offered to those with unexplained epilepsy, and whether the

limitations of current mouse models based on genetic mutations of the tau protein in patients with frontotemporal dementia.

information obtained through them yielded clinical action. **Beth Sheidley**, MS, CGC, co-director of the Epilepsy Genetics Program, led the first systematic evidence review of epilepsy genetic testing literature to examine commonly ordered and clinically available tests. The data collected from this review was then used by **Lacey Smith**, MS, CGC to begin the development of a practice guideline, which was recently published in the *Journal of Genetic Counseling*. Director of the Epilepsy Genetics Program **Ann Poduri**, MD, MPH, along with Sheidley and Smith hope that this work will provide a path forward for genetic testing in unexplained epilepsy, and help persuade insurance providers to cover testing.

World Science Festival featured Kirby faculty **Takao Hensch**, PhD, along with other noted neuroscientists in a video about neuroplasticity on their Youtube channel. The video - Rewiring the Brain: The Promise and Peril of Neuroplasticity - is part of World Science Festival's project of bringing together noted scientists and artists to create exhibits, live events, and multimedia that communicate scientific concepts to the public.



Internal states like fear, hunger, and arousal can affect the ways sensory information is processed and registered within the human brain. This effect on sensory perception and processing was originally thought to occur in the cortex or thalamus, however researchers **Chinfei Chen**, MD, PhD, **Mark Andermann**, PhD, and collaborators found that serotonergic neurons in the brainstem play a role in monitoring the transfer of visual information from the eyes to the thalamus. Experiments showed that serotonin can reduce the transmission of visual signals from the eye to the thalamus, and found that some classes of retinal axons, particularly those that responded to broad changes in light levels, were more affected than those responding to finer visual details. In the future, these findings will inform new studies that explore the impact of neuromodulatory systems in the brain and perception in animal and human models.

Events & Resources

On April 10 & 11, 2023, the Kirby Center had its first Scientific Advisory Committee (SAC) review at the American Academy of Arts and Sciences in Cambridge. The Kirby Center was reviewed along with the Departments of Endocrinology and Orthopedics at Boston Children's Hospital. This process included private interviews with our director, faculty, and trainees, short talks by select faculty, and poster presentations from junior Kirby faculty and trainees at a reception that boasted posters from each department reviewed. Thank you to all who participated in the review and helped represent the Kirby Center in such an impactful way.

Twice a year - once in each hemisphere - the Sun reaches its highest point in the sky, and inhabitants of that lucky hemisphere enjoy their longest day and shortest night of the year. For many, this event is known as the Summer Solstice, and it holds significance in myriad cultures as an opportunity to embrace culmination, achievement, and victory. **This year, the Kirby Center would like to invite everyone to celebrate the end of Spring with us on the Summer Solstice, June 21, 2023, on the Main 11 Rooftop Garden**. We will enjoy refreshments and activities in the sun and share the abundance that we have with others. Interested? RSVP here.

Brielle Ferguson, PhD, was one of the speakers at the second annual Women in Science Symposium, held at Harvard Medical School on April 3, 2023.

Sponsored by HMS Office for Clinical and Academic Affairs, BCH Office of Faculty Development, and HMS Dean's Innovation Award in Diversity and Inclusion, this symposium was created to inspire and empower women in research, and to celebrate all the innovations women have contributed to our community. Brielle joined the Kirby Center last year and her lab explores the role of prefrontal inhibitory microcircuits in attention as well as their disruption in disease. Watch a recording of the symposium here.

On April 1, 2023, **Michela Fagiolini**, PhD, and **Takao Hensch**, PhD, in conjunction with the Conte Center at Harvard, hosted the event "My Brother Chases Dinosaurs: Embracing Neurodiversity". Attendees viewed the movie *My Brother Chases Dinosaurs* based on Giacomo Mazzariol's book about his experience growing up with a younger brother with Down Syndrome. After the movie, there was a discussion and reception with the author.

The Kirby Center welcomed **Katie Rogers** as a Program Coordinator at the end of February 2023. Prior to her start at Children's, Katie worked as a high school science teacher. Katie helps in the planning and execution of the Neurobiology Seminar Series and Lab Results Talks for the Kirby Center, social media and website updates, as well as general administrative tasks. You can reach her at Katie.Rogers@childrens.harvard.edu.

Applications for Rosamund Stone Zander Translational Neuroscience Center Pilot Research Grants are open! Each year, the RSZ TNC sponsors up to four $100,000 awards to BCH investigators for one-year pilot projects, with the possibility for a renewal the subsequent year. Projects that include EDI and Community Engagement initiatives will be prioritized. LOIs due by 5pm on June 2, 2023. Please contact TNC@childrens.harvard.edu for more info.

ROSAMUND STONE ZANDER TRANSLATIONAL NEUROSCIENCE CENTER

Trainee & Lab News

Whitney Gibbs, PhD, a postdoctoral fellow in the Schwarz lab, and partner Kesha Williams welcomed their baby Zhuri Symone Williams on January 26, 2023 at 10:24pm. Congratulations Whitney and Kesha, and welcome to the world, Zhuri!

Zihe (Alex) Zhang (Woolf lab) successfully defended his thesis at Harvard Medical School on Thursday, March 2, 2023. He has transitioned the role of postdoctoral fellow in the Woolf lab. Well done, Alex!

Olumide Fagboyugen, a PhD student in the Stevens lab, was appointed co-president of Underrepresented Scholars of Neuroscience at HMS. Congrats, Olumide!

Support for Fellows Entering the Job Market

If you are entering the market and would like assistance preparing to do so, please email SJ Cunningham and Mike Do well in advance of your first deadline. If you communicate your particular needs/research interests (e.g., "I am a biophysicist with neuroethological leanings for whom English is a second language"), we will convene a Practice Committee of Kirby faculty members who are appropriate for your research. This Committee will:

1. Review a draft of your application.
2. Provide coaching on preliminary interviews.
3. Offer feedback on your job talk.
4. Take you through a mock chalk talk.
5. Provide advice on closing the deal.

When reaching out to us, please copy your advisor and ask them to give the green light for this process. We are most effective when your application, talk, and chalk talk are each at the fine-tuning stage.

Note that BCH offers a related service. Please choose one to avoid overburdening our faculty.

Kirby Center Awards & Publications

Recent Awards

Maya Chopra, MBBS, FRACP, received funding from the Buffalano Family Research Fund to support Chopra-Amiel-Gordon syndrome research within the Department of Neurology.

Zhigang He, PhD, BM, was awarded an NIH R01 diversity supplement for work on his project titled, Mechanism and optimization of CBD-mediated analgesic effects.

Karl Koehler, PhD, received an NIH R01 award for his project titled, Development of CRISPR/Cas9-based exon-skipping strategies for the treatment of USH-associated deafness.

Mustafa Sahin, MD, PhD, received an R01 from NIMH for his project titled, Effects of 16p11.2 copy number variation on neuronal development and pathology.

Chen Ding, PhD (Schwarz lab) was selected for a two-year Rosamund Stone Zander Translational Neuroscience Center (RSZ TNC) Postdoctoral Fellowship.

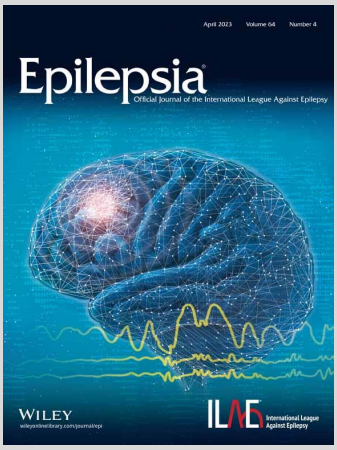
Elyza Kelly, PhD (Fagiolini lab) was awarded an NIH F32 for her project titled, Determining the Impact of Callosal Connectivity on Visual Cortical Structure and Cortical Visual Impairment in CDKL4 Deficiency Disorder.

Sivapratha Nagappan Chettiar, PhD (Umemori lab) was awarded a 2023 Fuss Fellowship award for her project titled, Neuron-microglia signaling in synapse elimination: Co-opting developmental mechanisms as therapeutic strategies for schizophrenia.

Afshin Saffari, MD (Sahin lab) received funding from the Tom Wahlig Foundation for his project titled, Using Label-free Proteomics for Target Identification and Validation of Novel Treatments for AP-4-associated Hereditary Spastic Paraplegia.

Sneham Tiwari, PhD (Poduri lab) was selected for a two-year RSZ TNC Postdoctoral Fellowship.

Recent Featured Publications



Kreiman lab. Cross-task specificity and within-task invariance of cognitive control processes. Cell Reports. Jan 2023.

Steen lab. Common mouse models of tauopathy reflect early but not late human disease. Molecular Neurodegeneration. Feb 2023.

Fagiolini and Umemori labs. CDKL5 sculpts functional callosal connectivity to promote cognitive flexibility. Molecular Psychiatry. Feb 2023.

Woolf lab. Nav1.7 gain-of-function mutation I228M triggers age-dependent nociceptive insensitivity and C-LTMR dysregulation. Experimental Neurology. March 2023.

Poduri lab. Epileptic Spasms in CDKl5 Deficiency Disorder: Delayed Treatment and Poor Response to First-line Therapies. Epilepsia. April 2023.

Ferguson lab. Pharmacogenetic activation of parvalbumin interneurons in the prefrontal cortex recues cognitive deficits induced by adolescent MK801 administration. Neuropsychopharmacology. April 2023.

Ferguson lab. Prefrontal PV interneurons facilitate attention and are linked to attentional dysfunction in a mouse model of absence epilepsy. eLife. April 2023.

For a listing of additional recent Kirby Center publications, please visit PubMed:

- last name A-K
- last name L-Z