

Neurobiology News



**Boston
Children's
Hospital**

Until every child is well™

**FM Kirby
Neurobiology
Center**

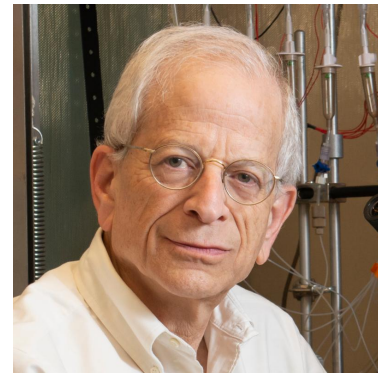
December 2018

Announcements

Congratulations to **Paul Rosenberg**, MD, PhD, whom the [Boston Children's Hospital PostDoc Association](#) (BCH PDA) selected to receive their Best Mentor Award. Gus Cervini presented the award at the PDA's annual All-Star Mentoring Event in October.

The [Child Neurology Foundation](#) has named **Scott Pomeroy**, MD, PhD, the organization's president-elect. Congratulations, Scott!

In September, at a ceremony at the John F. Kennedy Presidential Library and Museum, **Michela Fagiolini**, PhD, became a naturalized U.S. citizen. Congratulations, Michela! See [Boston Globe article](#) for details.



Research News

The investigation by **Mike Crickmore**, PhD, into the complicated brain science behind the sexual behavior of fruit flies is presented in this *Medical Express* article: [The neurobiology of fruit fly courtship helps illuminate human disorders of motivation.](#)

Health Imaging's ['See-through' EEG allows simultaneous neuroimaging and brain activity monitoring](#) article describes the work of **Michela Fagiolini**, who is using nanotechnology to capture images of mouse brain activity.

Newsweek article [Study Shows Potential New Hope for Paralyzed Patients](#) features the work of **Zhigang He**, PhD, BM, who recently conducted a study in which paralyzed mice regained motor function after treatment. This story is also covered in [Boston Globe](#), [Daily Mail](#), [Medical Express](#), [GEN](#), and [Vector](#).

WBUR (FM 90.9) reports on the TMC1 study of **Jeff Holt**, PhD, in the station's CommonHealth segment. Listen to the broadcast or read the transcript at [Harvard Scientists: 'Smoking-Gun Evidence' Of Key To Hearing In Ear's Hair Cells](#). The story is also covered at [Harvard Medical School News & Research](#) and [Vector](#).

Recent [Vector articles](#) featuring the work of Kirby Faculty:

Elizabeth Engle, MD: [Tracking the elusive genes that cause strabismus](#)

Ann Poduri, MD, MPH: [Patients with epilepsy and inflammatory bowel disease to get DNA sequenced in study](#)



Scott Pomeroy: [Typing medulloblastoma: From RNA to proteomics and phospho-proteomics](#) and [A Manhattan Project for the brain, at age 50](#)

Mustafa Sahin, MD, PhD: [Finally in the game: Patient in drug trial for PTEN mutation seems to benefit](#)

Beth Stevens, PhD: [Synapse 'protection' signal found; helps to refine brain circuits](#) and [Microglia in the brain: Which are good and which are bad?](#) (photo credit [Vector](#))

Zhigang He: [Neurons from the brain amplify touch sensation. Could they be targeted to treat neuropathic pain?](#)

Clifford Woolf: [From the ashes of a failed pain drug, potential treatments for autoimmunity and cancer](#)

Social Media Highlights

The [Boston Children's Hospital Neuroscience Center](#) Facebook group regularly posts "Meet the Researcher Monday." Kirby PIs featured so far include [Clifford Woolf](#); [Chinfei Chen](#), MD, PhD; [Gwen Geleoc](#), PhD; [Michela Fagiolini](#); [Todd Anthony](#), PhD; and [Mike Do](#), PhD.

Facebook recently highlighted work of [Ann Poduri](#) and [Alex Rotenberg](#), MD, PhD.

Facebook also presented scientific images captured by [Maria Sundberg](#), PhD, (Sahin lab) and [Nivanthika Wimalasena](#) (Woolf lab).

Check out on YouTube: [Finding answers in life's beginnings - Research at Boston Children's](#)



Featured Stories

In Boston Children's Hospital's *Thriving* article [Emily and Isis: Gratitude in the form of a bean](#), [Isis Rivera](#), a Simmons University undergraduate and former Woolf lab member, shares, in co-authorship with Emily, the remarkable story of their relationship. In June, Isis received a donated kidney from Emily. Several weeks after the successful transplant, the two met each other for the first time.

The Boston Globe reports that [Amanda He](#), daughter of [Zhigang He](#), is one of the [Fifth-graders \[who\] press Dunkin' Donuts to reduce use of plastic straws](#): In this inspiring effort of environmentalism, "the 10-year-olds are urging Dunkin' Donuts to adopt a policy that would make plastic straws available to customers upon request only."



Kirby Faculty Retreat

On Friday, November 16, Kirby Faculty and Affiliates gathered in the Skyline Room at Boston's [Museum of Science](#) for the annual Kirby Faculty Retreat. The group shared current work with one another and engaged in rich dialogue to fuel future collaboration and ongoing conversation. The agenda included several short talks, each followed by a period of question-and-answer, plus two Lightning Round sessions of "flash" presentations.



Blue Sky Day

On October 20, Boston Children's Hospital, represented by **Michela Fagiolini**, hosted the Rett Syndrome Association of Massachusetts (RSAM) 8th Annual Blue Sky Day at Harvard Medical School. The annual event is held to raise awareness about Rett Syndrome and to honor the children whom Rett Syndrome affects and their families. Families, friends, members of the Boston Rett Program, local researchers, and representatives from local organizations attended this year's event—a day of festivities, food, and fun. Learn more at [RSAM](#).



Admin News

In July, Boston Children's Hospital participated in a fundraising event for [Action for Boston Community Development](#) (ABCD) at Fenway Park. Kirby Administrative Director **Amy Weinberg** played for BCH in a softball game at Fenway against Shields Healthcare. BCH defeated Shields 24-20 in 6 innings!



In early December, members of the Kirby Center administrative staff visited the [Devon Nicole House](#) to spread some seasonal cheer with baked goods and holiday decorations. Devon Nicole House in the Longwood Medical Area provides affordable accommodation opportunities for families of long-term patients at Boston Children's Hospital.

Recent Awards

Mike Do was awarded an R01 for his project titled Properties and Mechanisms of Melanopsin Photoreception.

Dr. Do also received funding from Harvard Medical School for his project titled Form and Function of Foveal Cone Photoreceptors.

Michela Fagiolini and **Hisashi Umemori**, MD, PhD, together received a grant from the Lou Lou Foundation via the University of Pennsylvania for their project titled Testing functional and structural connectivity in CDKL5 disorder as novel biomarkers.

Dr. Fagiolini also received the following funding:

Relmada Therapeutics; project: Testing efficacy of chronic administration of D-methadone in a female mouse model of Rett Syndrome

Israel Binational Science Foundation; project: Dissecting the role of experience-induced transcriptional enhancers in regulating critical period plasticity

Simons Foundation; project: New mathematical approaches to dissect neuronal circuits' dynamics from EEG in ASD (with Dr. Stefano Panzeri of the Italian Institute of Technology)

BCH Equipment Core Resource Allocation Committee (ECRAC); to purchase a 3-Channel Multi-fiber Photometry System

Zhigang He and Dr. Fan Wang of Duke University were awarded a multi-PI R01 for their project titled Cortical Signature and Modulation of Pain.

Dr. He also received the following funding:

Gilbert Family Foundation; project: Novel strategies of protecting RGCs and promoting optic nerve regeneration.

BCH Equipment Core Resource Allocation Committee (ECRAC); for the purchase of a Nikon Inverted fluorescence microscope with a motorized stage and monochrome camera

Takao Hensch, PhD, received funding from the National Aeronautics & Space Administration for his project titled NSCOR for Evaluating Risk Factors and Biomarkers for Adaptation and Resilience to Spaceflight: Emotional Valence and Social Processes in ICC/ICE Environments.

Dr. Hensch was also awarded a grant from the NIH/NIEHS to support his project titled SPP1, Oxidative Stress, and Lead Toxicity.



Jonathan Lipton, MD, PhD, was awarded a grant from the U.S. Department of Defense for his project titled Targeting Circadian Clock Proteostasis as a Novel Therapeutic Strategy in Tuberous Sclerosis Complex.

Ann Poduri received a grant from KCNQ2 Cure Alliance for her project titled KCNQ2 Natural History Pilot Study. (photo credit: kcnq2cure.org)

Dr. Poduri was also named a Senior Investigator of the Translational Investigator Service (TIS) by Boston Children's Hospital Translational Research Program, which will provide support for three years of her work.

Mustafa Sahin received an Administrative Supplement from NIH for his U54 titled Developmental Synaptopathies Associated with TSC, PTEN and SHANK3 Mutations.

Dr. Sahin also received the following funding:

Simons Foundation; project: Investigating the mechanism of FMRP dysregulation with loss of TSC2.

BCH Tommy Fuss Fund; project: Striatal deficits in the development of schizophrenia in patients with copy number variations of 16p11.2

Massachusetts Ear and Eye Infirmary; project: Investigation of the differences in the potency of different commercial sources of FGF2.

Rettsyndrome.org; project: Rettsyndrome.org

Tom Schwarz, PhD, received an NIH/NINDS R01 for his project titled Axonal Transport of mRNA for Mitochondrial Proteins.

Judith Steen, PhD, received funding from Abbvie Inc. to support her project titled Profile Mouse Models of Alzheimer's Disease Using FLEXITau.

Dr. Steen and Dr. Anthony Fitzpatrick (of Columbia University) were awarded an NIH/NINDS U01 for their project titled Patient-Based Structural Biology of Tauopathies and TDP-43 Proteinopathies using Cryo-Electron Microscopy and Mass Spectrometry.

Beth Stevens was awarded a Health Resources in Action grant with Sandeep "Bob" Datta of Harvard Medical School for their project titled Identifying antagonists for a novel AD risk gene.

Hisashi Umemori received a Simons Foundation grant for his project titled Establishment of Parallel Cortico-Basal Ganglia Circuits by ASD-Linked Pcdh.

Clifford Woolf was awarded a Harvard Medical School Lefler Small Grant for his project titled Developing a human motor neuron model of TDP-43 related ALS for genome-wide CRISPR screens.

Dr. Woolf also received the following funding:

American Academy of Otolaryngic Allergy; project: Role of TRPV1+ sensory neurons in driving IgE production in allergic disease.

Bertarelli Foundation, Harvard Medical School; project: Peptidergic nociceptor contributions to acute and chronic pain (with colleagues Drs. Bruce Bean and David Ginty)

Lee Barrett, PhD, (Woolf lab) received an award from the BCH Equipment Core Resource Allocation Committee (ECRAC) to purchase a V11 printer and barcoder labeller.

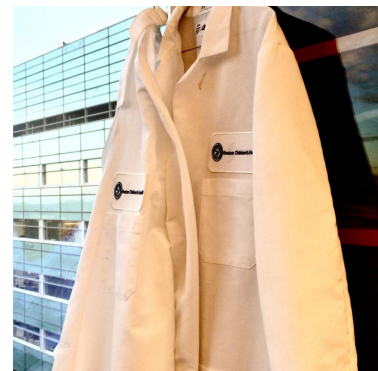
David Yarmolinsky, PhD, (Woolf lab) was awarded an NIH K99 for his project titled Defining the generators of spontaneous trigeminal pain.

Postdoc News

Support for Fellows Entering the Job Market

The postdoctoral community has requested assistance with the search for academic positions, and faculty of the Kirby Center will begin offering guidance tailored to each fellow and stage of the process. If you are preparing to enter the job market, please email Lynn Bruning (Lynn.bruning@childrens.harvard.edu) and Michael Do (michael.do@childrens.harvard.edu) well in advance of your first deadline. We will convene a committee of Kirby faculty that has expertise in your area as well as a divergent viewpoint or two. This committee will

1. Review a draft of your application.



2. Provide coaching on preliminary screenings (e.g., video interviews) if applicable.
3. Offer feedback on your job talk.
4. Take you through a mock chalk talk.
5. Provide advice on negotiations.

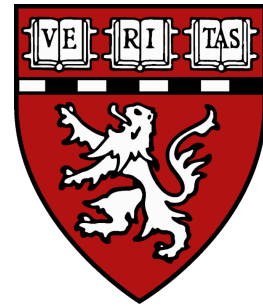
This assistance is meant to be highly individualized. If you communicate your particular needs (e.g., "I am a biophysicist with neuroethological leanings for whom English is a second language."), that would help us arrange the appropriate committee.

Graduate Student News

Recent Dissertation Defenses: Congratulations, PhDs!

Andrew Snavely (Woolf): The development and application of a human stem cell-based model of chemotherapy-induced neuropathy

Xingjie Zhang (Rogulja/Crickmore): Control of *Drosophila* Courtship by Mating Drive



Recent Featured Publications

Chen lab. Heterogeneity of Retinogeniculate Axon Arbors. *European Journal of Neuroscience*. June, 2018.

Z. He lab. Reactivation of Dormant Relay Pathways in Injured Spinal Cord by KCC2 Manipulations. *Cell*. July, 2018.

Crickmore lab. Motivation, Perception, and Chance Converge to Make a Binary Decision. *Neuron*. July, 2018.

Holt/Geleoc lab. Transgenic Tmc2 expression preserves inner ear hair cells and vestibular function in mice lacking Tmc1. *Scientific Reports*. August, 2018.

Holt/Geleoc lab. TMC1 Forms the Pore of Mechanosensory Transduction Channels in Vertebrate Inner Ear Hair Cells. *Neuron*. August, 2018.

Kreiman lab. Recurrent computations for visual pattern completion. *Proceedings of the National Academy of Sciences USA*. August, 2018.

Engle & Woolf labs. Neuronal-Specific TUBB3 Is Not Required for Normal Neuronal Function but Is Essential for Timely Axon Regeneration. *Cell Reports*. August, 2018.

Umemori lab. Tyrosine phosphorylation of the transmembrane protein SIRP α : Sensing synaptic activity and regulating ectodomain cleavage for synapse maturation. *Journal of Biological Chemistry*. August, 2018.

Z. He, Woolf, & Chen labs. Touch and tactile neuropathic pain sensitivity are set by corticospinal projections. *Nature*. September, 2018.

Woolf lab. The metabolite BH4 controls T cell proliferation in autoimmunity and cancer. *Nature*. November, 2018.

Sahin lab. Sensitive Periods for Cerebellar-Mediated Autistic-like Behaviors. *Cell Reports*. October, 2018.

Stevens, Chen, & Umemori labs. CD47 Protects Synapses from Excess Microglia-Mediated Pruning during Development. *Neuron*. October, 2018.

Stevens lab. Single-Cell RNA Sequencing of Microglia throughout the Mouse Lifespan and in the Injured Brain Reveals Complex Cell-State Changes. *Immunity*. November, 2018.

For a listing of additional recent Kirby Center publications, please visit PubMed (last name [A-K](#), last name [L-Z](#)).





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