



**Boston
Children's
Hospital**

F.M. Kirby
Neurobiology
Center

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QUARTERLY NEWSLETTER

SPRING 2025

KIRBY CENTER HIGHLIGHTS



Jeffrey Holt, PhD, Elected to the National Academy of Sciences

We are thrilled to share that Kirby Faculty and Director of Research for Otolaryngology, **Jeffrey Holt, PhD**, has been elected to the National Academy of Sciences (NAS) — one of the highest honors in science.

This prestigious recognition celebrates Dr. Holt's pioneering research into the molecular mechanisms of hearing and balance, as well as his visionary leadership in the development of gene therapies aimed at restoring hearing

loss. Over the course of his career, Dr. Holt's work has reshaped our understanding of sensory biology and offered hope to countless families around the world.

At the Kirby Center, we've had the privilege of witnessing Jeff's brilliance, dedication, and deep compassion firsthand. His election to the NAS is not only a personal milestone but also a moment of pride for all of us who are inspired by his work and its profound impact.

Please join us in congratulating Dr. Holt on this incredible achievement!

[Read the NAS announcement](#)

Clifford Woolf, MB, BCh, PhD, Honored with 2025 USASP Gold-Haythornthwaite Lifetime Achievement Award

We are proud to share that **Clifford Woolf, MB, BCh, PhD**, has been named the recipient of the 2025 Gold-Haythornthwaite Lifetime Achievement Award by the United States Association for the Study of Pain (USASP) — one of the most prestigious honors in the field of pain research.

This award recognizes Dr. Woolf's extraordinary scientific achievements and his transformative contributions to our understanding of pain. Over the course of his distinguished career, Dr. Woolf has led groundbreaking research into neuronal plasticity and its role in both adaptive and maladaptive changes in the nervous system. His work has not only deepened our understanding of pain mechanisms but also informed more effective approaches to pain treatment.

Dr. Woolf's impact extends far beyond the lab. As a mentor, educator, and leader, he has shaped the careers of countless clinicians and researchers and has played a vital role in advancing the field of pain science globally.

"Dr. Woolf's remarkable contributions exemplify a commitment to excellence and a relentless pursuit of scientific progress that continues to shape the future of pain research and patient care. You have inspired and empowered a global community of researchers and clinicians, leaving an enduring legacy in the field," said a representative from USASP. He was recognized at the USASP's annual meeting on May 1 in Chicago.

Please join us in congratulating Dr. Woolf on this well-deserved honor and his enduring contributions to the science and treatment of pain.



2025 Kirby Center Retreat

On March 19th, the Kirby Center gathered at the Joseph B. Martin Conference Center for an amazing retreat with incredible faculty and trainee talks plus many opportunities for the Neurobiology Program and their collaborators to build connections. The day ended with a lively poster session and reception for continued discussion. Thanks to Beth Stevens, Karl Koehler, SJ Cunningham, Krishna Narayanan, and everyone who made the day possible.



IN THE MEDIA

Dr. Beth Stevens featured in *Harvard Gazette*

Featured in a recent Harvard Gazette article, **Beth Stevens, PhD** is exploring the critical role of microglia, the brain's immune cells, in the early stages of neurodegeneration. Her lab has shown that microglia may mistakenly eliminate healthy synapses in the aging brain — a process that could contribute to the cognitive decline seen in Alzheimer's.



“We’re learning that the immune system isn’t just responding to damage in the brain — it may be helping to drive it,” Stevens notes.

By identifying how and when this destructive activity begins, Dr. Stevens hopes to uncover new strategies for early detection and intervention, long before symptoms emerge.

Her groundbreaking work is a vital part of the broader effort to shift the Alzheimer's research paradigm from treating late-stage symptoms to preventing damage before it starts.

[Read the full article here](#)

Feihe Awards Funding to Kirby Researchers

The Feihe Pediatric Brain Development Initiative at Boston Children's Hospital has awarded funds to its first seven projects:

Jonathan Lipton, MD, PhD

Brian Kalish, MD

Hisashi Umemori, MD, PhD

Zhigang He, PhD, BM, Chinfai Chen, MD, PhD, & Hisashi Umemori, MD, PhD

Takao Hensch, PhD

Maria Lehtinen, PhD

Caitlin Rollins, MD, SM

Thanks to a \$10M gift from Feihe International, this initiative supports cutting-edge research into how early life experiences—from nutrition to stress—shape the architecture of the infant brain. These discoveries will deepen our understanding of conditions ranging from autism to epilepsy and beyond.

The Kirby Center continues to be at the forefront of this effort, bringing together neuroscientists, clinicians, and developmental biologists under one roof to unlock the mysteries of the brain in its most dynamic stage—early childhood.

Congratulations to the awardees, and thank you for pushing the boundaries of what's possible in pediatric neuroscience!

[Read the full article here](#)



Dr. Karl Koehler
Featured in *The Scientist*

Karl Koehler, PhD, was recently featured in *The Scientist* for his cutting-edge work using inner ear organoids to study and potentially reverse hearing loss.

By mimicking early ear development in the lab, Dr. Koehler's team is

uncovering the molecular cues that form sensory hair cells—offering a blueprint for future regenerative therapies. His work combines stem cell biology and spatial

transcriptomics to re-create key developmental processes and explore new treatments for hearing impairment.

Dr. Koehler's research is part of a broader commitment at Boston Children's to use cutting-edge science to solve complex developmental challenges and bring transformative treatments to pediatric patients.

[Read full article here](#)

EVENTS

Women in STEM Panel

In honor of Women's History Month, the Kirby Center hosted a Women in STEM panel. The panelists included Chinfai Chen, MD, PhD, Odile Peroni, PhD (Lipton Lab), and Yiming Zhang, PhD (Viral Core). The panel was moderated by Becca Lewis (Human Neuron Core), Taryn Polanco (Human Neuron



Core), and Sneham Tiwari, PhD (Poduri Lab). They discussed the experiences of being a woman in science and the panelists shared personal anecdotes, offered advice and found common ground with each other, providing valuable mentorship to our next generation of female scientists. Thanks Jordan Bessette for helping organize a great event!

Family Food Connections Food Drive

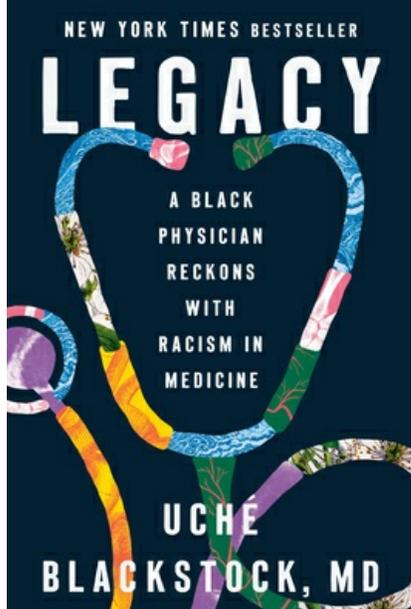
Throughout March the Kirby Center hosted a food and utensil drive to benefit Family Food Connections. This BCH-run food pantry, located in Jamaica Plain, serves many patient families, as well as the surrounding community.

We donated essential pantry items (such as olive oil, condiments, and spices), healthy snacks and breakfast items, and outdoor equipment to get kids outside to enjoy the spring weather!

Brainy Book Club Update

On May 29th, the Brainy Book Club met to discuss Uche Blackstock's book, *Legacy: A Black Physician Reckons with Racism in Medicine*. Discussion was focused on

equity in medical education as well as how race impacts medical care.



TRAINEE & LAB NEWS

RSZ-TNC Announces Partnerships

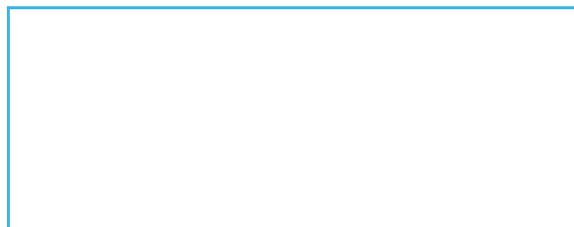
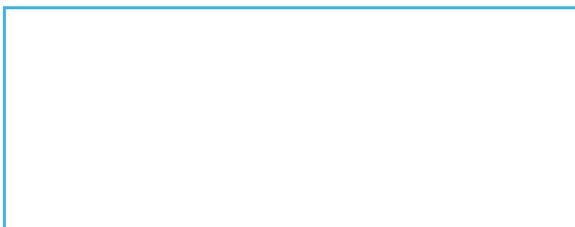
The **Rosamund Stone Zander Translational Neuroscience Center** announced two different research partnerships with organizations focused on studies associated with rare diseases.

iDefine-The Kleefstra Syndrome Foundation and **MED13L Foundation** have each made commitments to natural history studies in collaboration with the RSZ-TNC. Both will last over a three-year timespan to help create a better understanding of these rare diseases.

Both studies are part of RSZ TNC's Accelerating Clinical Trial Readiness Innovations for Monogenic Neurodevelopmental Disorders (ACTION) Initiative, an umbrella program designed to establish clinical trial readiness for rare NDDs, leveraging shared RSZ TNC resources and pilot funding. Led by Principal Investigator Dr. Maya Chopra, Clinical Geneticist and Director of Translational Genomic Medicine of the RSZ TNC at Boston Children's Hospital, ACTION provides scalable infrastructure for standardized data collection from individuals with NDDs, customized to the specific needs of individual disorders.



Recent PhD Defenses





Congrats to Dr. David Mazumder!

On March 20, David, a member of the Rotenberg lab, completed his public thesis defense titled, "The Post-Movement Beta Rebound is Attenuated in Patients with Epilepsy."



Congrats to Dr. Alec Walker!

On March 28, Alec, a member of the Stevens lab, completed his public thesis defense titled, "Stromal-immune cell crosstalk in the developing brain borders."

CONGRATS

TO KIRBY RESEARCH ASSISTANTS
HEADING TO GRAD SCHOOL

ZHIGANG HE LAB
EMILY CHOE
Neuroscientist-in Training

UC IRVINE
MD/PHD PROGRAM

ARBAB LAB
JAMES CHACHARONE

UMASS
MEDICAL SCHOOL

WOOLF LAB
EMMA CROPPER

OHIO STATE
DOCTOR OF VETERINARY
MEDICINE PROGRAM

STEVENS LAB
ANU GUPTA

TUFTS
PHD IN NEUROSCIENCE

HENSCH LAB
AVNI IYER

UT SOUTHWESTERN
MEDICAL SCHOOL

KOEHLER LAB
JIAHE JIN

HARVARD
SPEECH AND HEARING
BIOSCIENCES & TECHNOLOGY

ARBAB LAB
ALANNA KIRSCHNER

**GERMAN CANCER
RESEARCH CENTER**
DKFZ INTERNATIONAL
PHD PROGRAM

SAHIN LAB
SAM LOPEZ

PENN STATE
MEDICAL SCHOOL

DO LAB
PEARL MILLER

RUTGERS
MEDICAL SCHOOL

TANG LAB
MADLINE MOORE

**UNIVERSITY OF
BRITISH COLUMBIA**
MEDICAL SCHOOL

KOEHLER LAB
CAMILA PEREA

YALE
BIOLOGICAL &
BIOMEDICAL SCIENCES PHD

WOOLF LAB
NATALIE
MCKINNON-BOOTH

**UNIVERSITY OF
COLORADO, DENVER**
PHD BIOLOGICAL
SCIENCES PROGRAM

STEVENS LAB
**RAPHAEL
RAKOSKI-SCHMIDT**

UCSF

WOOLF LAB
SHANNON ZHEN

UMASS AMHERST
PHD IN NEUROSCIENCE

LinkedIn

The Kirby Center is now on LinkedIn

Be sure to follow our page to stay up-to-date on all the Kirby news!

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.

AWARDS & PUBLICATIONS

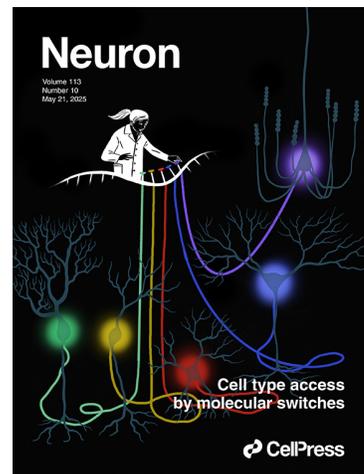
Recent Awards

Darius Ebrahimi-Fakhari, MD, PhD was awarded a Therapeutic and Medical Device Accelerator from BCH's Technology and Innovation Development Office for his project, "Comprehensive Preclinical Development of Small Molecule Modulators of Protein Trafficking to Restore AP-4 Deficiency"

Jeffrey Holt, PhD received funding from the Boston Innovation Conference for his research.

Karl Koehler, PhD was awarded funding from ECRAC for the purchase of a Nikon Spatial Array Confocal (NSPARC) detector.

Jonathan Lipton, MD, PhD and **Emily Osterweil, PhD** received a BCH BTREC pilot grant award for their project, "Defining the human synaptopathy culprit protein SynGAP as a novel RNA binding



Recent Publications

Hensch Lab. Rapid and cumulative adult plasticity in the mouse visual cortex. *Front Neural Circuits*. February 2025.

Krieman Lab. Neural correlates of minimal recognizable configurations in the human brain. *Cell Rep*. March 2025.

Tang Lab. Visualizing the Cellular and Subcellular Distribution of Fms-like Tyrosine Kinase 3 (Flt3) and Other Neuronal Proteins Using Alkaline Phosphatase (AP) Immunolabeling. *Int J Mol Sci*. March 2025.

Woolf Lab. Non-muscle myosin II inhibition at the site of

protein.”

Alexander Rotenberg, MD, PhD was awarded funding from ECRAC for the purchase of a Vibatrome for Human Brain Slice Culture and Physiology.

Thomas Schwarz, PhD was awarded funding from Advantium Health Networks for his project titled, “Pharmacological Inhibition of SARM1 in a Mouse Model of ADOA.”

Thomas Schwarz, PhD received funding from Eli Lilly and Co for his project titled, “Knockdown of SARM1 by ASO as a potential therapeutic for Autosomal Dominant Optic Atrophy.”

Youtong Huang, PhD (Stevens Lab) was the recipient of an HMS Hearst Fellowship for her project, “Interrogating the role of the ‘eat-me’ signal phosphatidylserine in selective motor neuron vulnerability during amyotrophic lateral sclerosis.”

axon injury increases axon regeneration. *Nat Commun.* March 2025.

Ebrahimi-Fakhari Lab. ap4b1 ^{-/-} zebrafish demonstrate morphological and motor abnormalities. *Hum Mol Genet.* April 2025.

Woolf Lab. Differential modification of ascending spinal outputs in acute and chronic pain states. *Neuron.* April 2025.

Ebrahimi-Fakhari Lab. Heterozygous variants in AP4S1 are not associated with a neurological phenotype. *Ann Clin Transl Neurol.* April 2025.

Woolf Lab. Correction of sodium channel mutations in sensory neurons reverses aberrant properties. *Brain.* April 2025.

Rotenberg Lab. Sex differences in seizure presentation in a Dravet syndrome mouse model. *Neuroreport.* May 2025.

Holt Lab. Mammalian TMC1 or 2 are necessary for scramblase activity in auditory hair cells. *Hear Res.* May 2025.

Chen Lab. Experience influences the refinement of feature selectivity in the mouse primary visual thalamus. *Neuron.* May 2025.

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