Summer 2025

Discover

News from Brain Research Foundation

Platinum Transparency 2025 Candid.

Brain Research Foundation is among the fewer than 1% of U.S.-based non-profit organizations that have been recognized with Candid's Platinum Seal of Transparency. This distinction indicates that Brain Research Foundation shares clear and important information with the public about our goals, strategies, capabilities, achievements and progress indicators that highlight the difference the Foundation makes in the world.

Dear Friends,

The United States has historically been a leader in scientific discovery and technological innovation. However, there is growing concern about this due to current levels of government research funding. While I am concerned about funding for scientific research and innovation in the U.S., I remain hopeful that bright minds and science will prevail.

Philanthropy has been, and continues to be, a powerful catalyst for research, often accelerating discoveries and enabling projects that would otherwise be impossible. Brain Research Foundation has been part of this narrative since 1953, filling funding gaps by allowing researchers to pursue innovative, high-risk, or early-stage ideas that might not yet qualify for public funding.

Many major scientific discoveries have been made possible by philanthropic seed funding (e.g., CRISPR gene editing received early philanthropic support). In fact, Brain Research Foundation has funded several projects that have utilized CRISPR.

This year, BRF is proud to announce that we are supporting the most neuroscience we have ever supported in our 72-year history—38 projects total. In this newsletter you will see 18 new projects we are supporting that are making a difference in many brain-related areas, including brain cancer, exercise and sleep, memory storage, and vision, just to name a few. Although the project topics BRF supports may be broad, they all have one thing in common—they were selected because they have the most potential to advance the field of neuroscience now and into the future.

While these new projects are getting off the ground, we are featuring a productive seed grant that is coming to an end. Dr. Bridget Ostrem, University of California, San Francisco, is finishing up her 2-year seed grant studying the potential of the therapeutic benefit of a protein found in breast milk on brain injury in premature infants. Now a clinical trial may lead to the development of the first treatment for preterm injury on white matter, helping approximately 500,000 premature infants worldwide.

To make scientific progress, researchers must persevere. We believe that BRF's neuroscience funding is more important than ever. With your help, BRF will continue to support innovative neuroscience across the nation, enabling these early-stage projects to generate the preliminary data necessary to obtain long-term funding. These BRF grantees will have a leg up and be ready to write a detailed grant proposal when government research funding cutbacks are hopefully reversed in the near future.

You have my commitment that BRF will be there every step of the way, supporting research opportunities, collaboration, and scientific advancement. Thank you for being part of the BRF community.

Sincerely,

Terre A. Constantine, Ph.D.
Executive Director and CEO

Q&A with Scientific Review Committee Chair, Scott Brady, Ph.D.

Q: There has been a lot of news about the decrease of government funding for science research, including the National Institutes of Health (NIH), which is the largest source of funding for medical research in the world. How has the funding changed in the last few months?

The full impact for this year remains to be seen, because the NIH is currently in turmoil with arbitrary reductions in staff, arbitrary termination of grants, withholding funds from some institutions and delays in actual awards. Things are so chaotic even the number of grants terminated is not precisely known. According to the American Association of Medical Colleges, over 1400 grants worth roughly $2.5 billion were terminated without advance notice as of May 5, while the Federal Register listed another 500 terminations involving as much as $7.5 billion. Finally, Department of Government Efficiency (DOGE) claims to have cancelled almost 2000 grants worth $47 billion, but this would be roughly the entire NIH budget, so we can discount those numbers. Regardless, the effects are already occurring, with termination of grants, rejection of applications, and even the highest rated grants, ones that are not targeted, are seeing disruption and gaps in funding as notices of awards are delayed by months without any explanation. Leaving staff, students and experiments in limbo.

Q: What does that mean for researchers?

There will be many lost academic research positions and effects on junior faculty/postdoctoral fellows will be particularly harsh. Many of the best researchers will have to change careers for lack of opportunity and potentially relocate to programs in other countries. Industry would not be able to hire more than a fraction of the total as they lack the needed resources and projects.

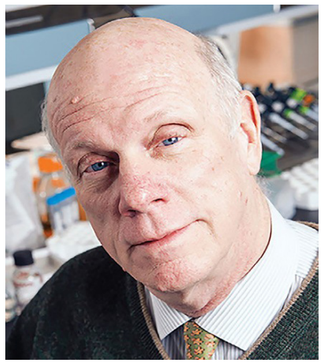
Q: What does that mean for universities?

If the proposed 40% NIH budget cut is approved and implemented, everything will be scaled back with loss of researchers, staff and graduate programs. Universities do not have the resources to maintain significant research programs or clinical trials with this kind of cut, particularly implemented in such precipitous manner. As a result, these activities and services will be lost. If the proposed cap of 15% on indirect costs is implemented, then universities may be forced to refuse grants as they cannot afford to support the necessary infrastructure. The only recourse would be to charge researchers "rent" that would be paid out of the grant direct costs, further limiting funds for research.

Q: What does it mean for medical break-throughs and the potential impact on the lives of Americans?

These NIH funding cuts will significantly hinder medical breakthroughs. Progress toward these breakthroughs will be greatly slowed and, in many cases, abandoned for lack of support, delaying the development of new treatments and therapies. This can have serious consequences for patients that have illnesses and can even impact our response to emerging health threats and outbreaks.

Q: Should we be worried that we are not investing enough in research to remain competitive globally?



Yes, we should be concerned. If these cuts are implemented, not only will we be slowing research in various critical fields, but we will also be negatively impacting training for the next generation of scientists. We will no longer be competitive globally. In fact, we will have to hope that researchers in Europe and Asia will make the breakthroughs that we will no longer be able to make.

Q: How do we ensure that researchers, especially early-career neuroscientists, have opportunities to secure funding?

Right now, funding through foundations is even more essential. Although philanthropy will not be able to entirely make up for the loss of NIH funding, organizations like the BRF provide a lifeline that is particularly critical for junior investigators. BRF can continue to fill the funding gaps of early-stage research, supporting innovative projects and promising young investigators.

Q: How do you feel about the future of science in the United States?

A year ago, I would have been optimistic, confident that new breakthroughs in our understanding of biomedical issues would lead to treatments for many of our most challenging medical problems. However, the current cutbacks proposed for NIH are highly destructive. My hope now is that most of the current proposals are never implemented due to public outcry and second thoughts, so we can outlast these ill-advised ideas. In the meantime, continued support from donors to organizations like the BRF are critical. As a researcher, I am glad there are generous donors that still understand the importance of supporting science.

The statements above are correct as of June 27, 2025

BRF Advances Clinical Trial to Protect Preemies' Brains

Brain Research Foundation Seed Grant Leads to First Ever Clinical Trial of a Drug to Treat White Matter Brain Injuries in Premature Infants

Building off her BRF-funded research on the protective effects of breast milk compounds, Bridget LaMonica Ostrem, M.D., Ph.D., a pediatric neurologist and assistant professor of clinical neurology at the University of California, San Francisco, is launching a clinical trial of a drug to treat brain injuries in premature babies.

Premature babies are at high risk of white matter brain injuries due to their fragile state and the intensive care they require. White matter injuries affect the ability of the brain and body to communicate effectively and can cause movement conditions like cerebral palsy. Current therapies for babies with these injuries focus on monitoring and rehabilitative care. **Thanks to a 2023 Seed Grant funding her studies on the brain-protective effects of breast milk compounds, Dr. Ostrem is getting closer to new therapies for these tiny patients.**

"We want to be able to identify white matter injury and treat it right when it happens," Dr. Ostrom said. "We want to harness the plasticity of the rest of the surrounding brain tissue and try to help recover brain function. Our hope is that we'll dramatically change outcomes for these babies."

Breast Milk Research

The BRF Seed Grant enabled Dr. Ostrem and her team screen 45 components of breast milk to identify compounds that provide protective effects against white matter injury. Together, they identified a promising compound called N-acetylneuraminic acid that protects oligodendrocytes grown in the laboratory. "We have identified some compounds that directly promote the survival and differentiation of those oligodendrocytes," Dr. Ostrem said. "Our goal is to stop the oligodendrocytes from dying to protect them in cases of prematurity."

Dr. Ostrem was also able to secure a $451,000 R21 grant from the Eunice Kennedy Shriver National Institute of Child Health and Development as a result of her BRF Seed Grant. She plans to apply for a prestigious R01 grant from the National Institutes of Health next, using the data and results she's been able to generate so far with BRF's support.

Infants born earlier than 37 weeks, who may experience episodes of reduced oxygen to the brain due to poor lung function, inflammation, infections, or other medical complications, are at high risk of white matter brain injuries.

Springboard to Therapies: First Ever Clinical Trial

The BRF-funded work on breast milk compounds also provided a springboard to translational and clinical studies that may help deliver new therapies for white matter brain injuries.

Dr. Ostrom's team has used what they learned from the studies on breast milk compounds to identify existing drugs that might be repurposed to protect against white matter brain injury and identified a promising candidate—the allergy drug Clemastine. **Currently, Dr. Ostrem and her team are working with the US Food and Drug Administration to launch the first-ever clinical trial of a drug for white matter brain injury in the next year.**

Clemastine has a long track record of safety in young children and is already approved for use in children as young as three years old in the United States. The clinical trial will first focus on demonstrating that the drug is safe for newborns. If the data show it is, the trial will evolve into a phase 2 study testing whether the drug is effective at protecting white matter.

This success demonstrates the power of BRF's focus on funding innovative researchers doing high-risk, high-reward work to translate discoveries into new therapies."Funding from the Brain Research Foundation has been absolutely critical to supporting these translational projects and moving us towards a clinical trial," Dr. Ostrem said.

White Matter Injury and Beyond

While the clinical trial advances, Dr. Ostrem and her team are also conducting studies on the role of the sialin gene in brain development. The sialin gene encodes a protein that helps transport a nutrient in breast milk called sialic acid into oligodendrocytes. Mice lacking the sialin gene have difficulties producing myelin and have fewer oligodendrocytes.

These discoveries may not only point Dr. Ostrem to new therapeutic approaches for white matter injury, but they may also lead to new therapies for a rare genetic condition called Salla disease. The disease is caused by a mutation in the sialin gene that cause a harmful build-up of sialic acid. The condition causes loss of muscle strength and coordination, poor growth, intellectual disability, and seizures in affected children. **The dual benefits of the work validate the importance of BRF funding transformative projects across the spectrum from basic science to translational work to deliver better therapies for patients with many types of brain diseases.**

Dr. Bridget Ostrem, BRF 2023 Women's Council Seed Grant recipient

"Our discoveries speak to the importance of doing basic science work and continuing to learn more about the nervous system and about oligodendrocyte cells and how they function," Dr. Ostrem said. "We have gained so many insights that have relevance to the clinic, even from researchers who are not explicitly doing translational science and just trying to find out more about how the brain works."

> **"Funding from the Brain Research Foundation has been absolutely critical to supporting these translational projects and moving us towards a clinical trial"**
>
> **—Dr. Bridget Ostrem**

What is White Matter Injury?

New and better therapies for white matter brain injuries could have an enormous impact. The white matter connects different parts of the brain. It acts as a conduit transmitting information from the brain to the body, controlling movement, and sending information from the sensory organs back to the brain. While it can effect people of all ages, it is most common in premature Infants. Currently, 500,000 infants worldwide experience white matter brain injuries that may impair their physical and cognitive abilities in the long term. Physical and occupational therapy can help, but there are no current therapies to prevent these brain injuries or reverse their deleterious effects.

Infants born earlier than 37 weeks, who may experience episodes of reduced oxygen to the brain due to poor lung function, inflammation, infections, or other medical complications, are at high risk of these white matter brain injuries. These insults can stop normal development or cause the death of brain cells called oligodendrocytes.

Oligodendrocytes produce a protective sheath around brain and nerve cells called myelin. Myelin helps the cells efficiently transmit electrical signals. If it is damaged, it can result in movement disorders like cerebral palsy, seizure disorders, or learning difficulties.

Selected by our Scientific Review Committee and Board of Trustees, BRF's Scientific Innovations Award Grantees and Seed Grant Winners advance neuroscience and the understanding of neurological diseases.

2025 Seed Grant Winners

José Manuel Baizabal Carballo, Ph.D.
Indiana University Bloomington

Project Title: Heterochromatin Mechanisms of Cortical Expansion

Keywords: Neurodevelopmental Disorders, Cortex, Epigenetics, Autism, Schizophrenia

Jessica L. Bolton, Ph.D.
Georgia State University

Project Title: Chemogenetic Tools in Microglia as a Novel Therapeutic Approach for Brain Disorders

Keywords: Early-life Adversity, Depression, Neurodevelopment, Synaptic pruning

Junyue Cao, Ph.D.
The Rockefeller University

Project Title: Elucidate the Molecular and Cellular Targets of Caloric Restriction in Rejuvenating Aged Mammalian Brain

Keywords: Caloric restriction, Brain Aging, Alzheimer's Disease

Vasileios Christopoulos, Ph.D.
University of Southern California

Project Title: Understanding the Mechanisms of Micturition in the Brain and Spinal Cord

Keywords: Bladder Control, Micturition, Incontinence, Spinal Cord Injury, Parkinson's Disease, Multiple Sclerosis

Jared M. Cregg, Ph.D.
University of Wisconsin

Project Title: Brainstem Blueprints: Microcircuit Basis of Left/Right Motor Decisions

Keywords: Decision-making, Locomotion, Orientation, Motor Circuits

Elizabeth Crouch, MD., Ph.D.
University of California, San Francisco

Project Title: Capillaries to Circuits: Neurovascular Coupling in the Developing Brain

Keywords: Brain Vasculature, Germinal Matrix Hemorrhage, Premature Babies

Kelsie Eichel, Ph.D.
University of Colorado, Boulder

Project Title: Investigating Extracellular Matrix Regulators of Neuronal Function in the Mammalian Brain

Keywords: Axon Initial Segment, Neuronal Signal Generation, Autism Spectrum Disorder, Bipolar Disorder, Schizophrenia, Alzheimer's Disease

Linlin Fan, Ph.D.
Massachusetts Institute of Technology (MIT)

Project Title: Probing Plasticity Mechanisms of Engram Formation with All-Optical Physiology

Keywords: Plasticity, Engram, Memory

Vikram Gadagkar, Ph.D.
Columbia University

Project Title: In Search of Memory: The Neural Substrate for the Song Template

Keywords: Auditory Templates, Songbirds, Vocal Learning, Autism

Junjie Guo, Ph.D.
Yale University

Project Title: Alternative mRNA Translation and Cell Type-Specific Proteoforms in the Brain

Keywords: Cell Type, mRNA Translation, Proteoform, Ribosome, Brain Function, Aging

Scott R. Pluta, Ph.D.
Purdue University

Project Title: Cortical and Subcortical Interactions Mediating Value-Based Sensory Processing

Keywords: Addiction, Decision-making, Sensory Processing, Learning, Plasticity

Rosalie A. Ciardullo Seed Grant

Gabrielle Pouchelon, Ph.D.
Cold Spring Harbor Laboratory

Project Title: The Development of Attention-Associated Cholinergic Inputs to the Cortex

Keywords: Development, Attention Deficit/Hyperactivity Disorder, Sleep, Sensory Inputs

Gilbert J. Rahme, Ph.D.
Stony Brook University

Project Title: Uncovering Transcription Factor Drivers of a Pathogenic Oligodendrocyte Progenitor Cell

Keywords: Brain Tumor, Glioma, Epigenetics, Developmental Disorders

Iris Titos Vivancos, Ph.D.
Northwestern University

Project Title: Deciphering Muscle Regulation of Sleep

Keywords: Sleep, Muscle, Exercise

Woman's Council Seed Grant

Anna L. Vlasits, Ph.D.
University of Illinois, Chicago

Project Title: The Role of Sensory Multiplexing in Guiding Natural Visual Behaviors

Keywords: Vision, Retina, Color, Motion

2025 Scientific Innovations Award Grantees

Robert Froemke, Ph.D.
New York University
Project Title: The Neuroscience of Families: Social Behavior in Naturalistic Controlled Environments

Keywords: Social Behavior, Oxytocin, Parenting, Territory

The family is the canonical basis of social structure for mammalian species. Families help ensure that offspring survive, learn pivotal skills, and thrive. Adults initially find mates and have behavioral adaptations to ensure the welfare of the mother and prepare for postnatal care. After parturition, offspring require intense caregiving by one or more adults for nourishment, warmth, and protection over varying periods of postnatal development. This commonly requires a lactating mother until infants transition to other food sources. Despite millennia of evolutionary adaptations, infant and adult mortality can be shockingly high, even in the seemingly ideal conditions of a laboratory. In more natural environments, families must contend with other challenges: infection, weather, predators, and conspecific competition for scarce resources. The dynamic and unpredictable nature of such stressors means that flexible strategies are required for success and survival in the face of life-or-death stakes.

Here we will develop and validate a new integrated system for life-long and high- resolution monitoring of mouse colony life. Technological and computational advances over the last decade, in part pioneered by our groups, now enable studies of neural circuits for social and parental behavior in complex environments in ways not formerly feasible or even possible. There have been major improvements in wireless recording, cell- and circuit-specific methods for measuring and manipulating brain activity and behavior, algorithms for neural data analysis, methods for quantifying multi-animal behavioral interactions, and capacity to store and share large data sets. This now provides an opportunity to build a theoretical and quantitative framework for understanding mouse social behavior and family life.

Our main hypothesis is that the duties and challenges of parenting define many aspects of mouse adult social behavior. Specifically, we predict that the need to provide safety and support to offspring leads to systematic engagement in territorialism, nest/burrow construction, foraging, mating, and then recruitment of co-parents initiated by the dam. We will study different neural systems that might help set the balance between cooperating and competing with others toobtain resources and ensure survival of the individual and the family.

Kenneth Prehoda, Ph.D.
University of Oregon
Project Title: Brain Regeneration Dynamics Using the Transparent Fish Danionella Cerebrum

Keywords: Neural Stem Cells, Regeneration, Brain Injury

We are conducting innovative research on brain regeneration using Danionella cerebrum, a unique fish species with a naturally transparent head that enables unprecedented real-time observation of brain healing processes. Our study focuses on understanding how neural stem cells respond to and repair brain injuries, tracking these cells as they activate, multiply, and develop into specific types of brain tissue. Using advanced microscopy techniques, we can observe these cellular processes through the fish's transparent skull without invasive procedures, providing insights that were previously impossible to obtain. This research has significant implications for human medicine, particularly in developing treatments for traumatic brain injury, stroke, and neurodegenerative diseases such as Alzheimer's and Parkinson's. While humans have limited capacity for brain repair, understanding how fish naturally regenerate brain tissue could reveal new therapeutic strategies to enhance healing in human patients. By bridging the gap between basic science and clinical applications, our work with D. cerebrum aims to contribute to regenerative medicine and potentially improve treatment outcomes for millions of patients affected by neurological conditions worldwide.

Doris Tsao, Ph.D.
University of California, Berkeley
Project Title: Understanding How Psychedelics Affect Top-down Belief Propagation in the Primate Brain

Keywords: Psychedelics, Perception, Consciousness, Depression, PTSD, Mental Health Disorders

Rosalie A. Ciardullo Scientific Innovations Award

Our research will try to understand how special substances called psychedelics can help the brain see the world differently. When people are sad or worried, their brains sometimes get "stuck" thinking the same way over and over again, like a broken record. Psychedelics seem to help the brain break out of those patterns. We're studying how this works by showing pictures of faces while brain activity is being carefully measured. We'll administer psychedelics to see how the brain changes when we show ambiguous pictures that can be interpreted in multiple ways. We think that psychedelics help the brain by loosening its "old ideas" and making it more open to new information.

We hope this research will help us learn more about treating diseases like depression, anxiety, and PTSD (post-traumatic stress disorder), where people's thoughts and feelings can get stuck in painful ways. We hope our work will lead to new, better treatments that help.

Brain Research Foundation
Innovate. Explore. Discover.

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From last year's Discovery Dinner: Panel discussion "Understanding the Impact of Stress and Trauma on Mental Health" with moderator, Dr. Terre A. Constantine, BRF Executive Director and CEO
-2024 Discovery Dinner

Mike Koldyke, the recipient of the Dr. Frederic A. Gibbs Discovery Award for Philanthropic Leadership celebrating with family. -2024 Discovery Dinner

Save the Date!

Please save the date for our annual
Discovery Dinner
Tuesday, November 4, 2025
Four Seasons Hotel, Chicago

Evening Panel Discussion
Behaviors: From Risky to Addiction

For information about donating to BRF, attending the event or for sponsorship opportunities, please email our Director of Philanthropy, Sandra Jaggi, **sjaggi@theBRF.org**.