

BRAIN & BEHAVIOR RESEARCH FOUNDATION

2022 ANNUAL REPORT

Awarding research grants to develop improved treatments, cures, and methods of prevention for mental illness.



\$1 MILLION CHALLENGE MATCH

Goal: To accelerate momentum in brain research as further advancements are still needed.

Contributions will be matched from:

- New Donors
- Former Donors who have lapsed, but make a 2023 contribution
- Current Donors who increase their 2023 contribution (the increase amount is matched)

As you plan your 2023 charitable donations, we hope you will help us successfully reach this generous \$1 Million Challenge Match. The cutting-edge mental health breakthroughs of BBRF grantees depend on you, so please consider making a gift this year to advance our vital research.

This match is made possible by two very generous family foundations that are passionate about BBRF's vital mission.

MISSION

THE BRAIN & BEHAVIOR
RESEARCH FOUNDATION
IS COMMITTED TO
ALLEVIATING THE
SUFFERING CAUSED
BY MENTAL ILLNESS
BY AWARDING GRANTS
THAT WILL LEAD TO
ADVANCES AND
BREAKTHROUGHS IN
SCIENTIFIC RESEARCH.

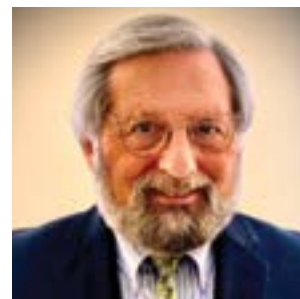
100% OF EVERY DOLLAR
DONATED FOR RESEARCH
GOES TO RESEARCH



Jeffrey Borenstein, M.D.
President & CEO



Herbert Pardes, M.D.
President, Scientific Council



Geoffrey Simon
Chair, Board of Directors

The Brain and Behavior Research Foundation (BBRF) is proud of its large, global impact on mental health. Over the past 35 years, it has become the world's largest private funder of mental health research grants.

BBRF has such a far-reaching impact because it does not limit its focus to one brain illness or mental health condition. In 2022 BBRF funded more than \$12.7 million in new research grants across a broad spectrum of brain illnesses which include: Addiction, ADHD, Anxiety, Autism, Bipolar Disorder, Borderline Personality Disorder, Depression, Eating Disorders, OCD, Psychosis, PTSD, Schizophrenia, as well as Suicide Prevention.

Since 1987, BBRF has awarded more than \$440 million in research grants to more than 5,300 scientists around the world who are searching for better treatments, cures, and methods of prevention for mental illness.

BBRF is a unique collaboration between generous donors and dedicated scientists that support new ideas that have an impact on the field of mental health. This support has led to important breakthroughs that improve our understanding of the brain and have produced new treatments for psychiatric illnesses.

All BBRF grant recipients are chosen by our world-renowned Scientific Council which is comprised of 184 scientists who rigorously evaluate every grant application, identifying the most promising, innovative science, with the greatest potential for significant breakthroughs. This past year the Council evaluated more than 750 grant proposals and awarded 150 Young Investigator grants, funding two-years of research for \$35,000 per year.

BBRF grants serve as a springboard for talented scientists to get new ideas off the ground, including basic science and clinical research. This crucial funding early in their careers often leads to additional funding from the National Institutes of Health (NIH) and other sources, both governmental and private.

Many significant Foundation-funded research breakthroughs were documented in leading psychiatric and medical journals during 2022. This annual report features Leading Research Achievements by BBRF Grantees, Prizewinners & Scientific Council Members in 2022, illustrating some of the remarkable progress being made by grant-winning investigators. These important advancements, as well as other scientific discoveries, are part of the vital role BBRF plays in helping people who live with mental illness.

Summer 2022 saw the return of BBRF's in-person Scientific Council Dinner where we awarded the highly esteemed Klerman & Freedman Prizes. In October at BBRF's fall Symposium, five outstanding scientists presented their research on schizophrenia, suicidal behavior in bipolar disorder, pediatric mood and anxiety disorders, and cognitive neuroscience.

Presentations were also given by the two winners of the Pardes Humanitarian Prize in Mental Health. All presentations from the 2022 International Mental Health Symposium are available to watch online at: www.bbrfoundation.org/event/international-mental-health-research-symposium. At our Annual Awards Dinner that evening we honored and presented the BBRF Outstanding Achievement Prizes as well as the Pardes Humanitarian Prize in Mental Health.

BBRF's periodic print publication, *Brain & Behavior Magazine*, continues to highlight some of the most important advancements in scientific research. This is supplemented by our weekly email newsletter "eNews," that's available free-of-charge to donors and the public. It features research breakthroughs of BBRF grantees, prizewinners, and Scientific Council members.

Through these and other efforts, BBRF shares current information with our donors as often as possible about what is happening in the labs, and about work that is carrying new knowledge and insights from bench to bedside.

BBRF also produces the award-winning television series, *Healthy Minds*, which is broadcast on public television (PBS). The series provides useful information to the public about psychiatric conditions and treatments as well as cutting edge research advancements. Season 8 launched in May and is available to watch on PBS stations around the U.S. and online at <https://www.pbs.org/show/healthy-minds-with-dr-jeffrey-borenstein/>

BBRF celebrated 35 years as a leader in support of global mental health research in 2022. Working alongside the BBRF Board, Scientific Council, and its donors is an honor, and we thank you for your dedication to our mission.

While continuous advancements in brain research are being made, more still needs to be done.

We are very pleased that in 2023, a gift from you can be matched through a \$1 Million Challenge Match from two very generous family foundations that are passionate about BBRF's vital mission.

Donor contributions will be matched dollar-for-dollar if they're from:

- a new donor to BBRF
- a former BBRF donor who's lapsed, but makes a new 2023 contribution
- a current BBRF donor who increases their 2023 contribution (the increased amount is matched)

As always, 100% of your contribution for research directly supports research, as our operating expenses are covered by separate foundation grants.

We very much appreciate your support. Together we will continue to fund innovative and impactful research that is making a difference in the lives of those living with brain and behavior disorders.

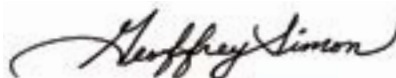
Sincerely,



Jeffrey Borenstein, M.D.
President & CEO



Herbert Pardes, M.D.
President, Scientific Council



Geoffrey Simon
Chair, Board of Directors

BBRF Major Advancements

NEW TREATMENTS

Clozapine in the Treatment of Schizophrenia

Schizophrenia is a chronic and often disabling brain disorder that affects 1 in 100 (about 2.5 million) American adults. Symptoms include delusions, hallucinations, disorganized speech, trouble with thinking, and lack of motivation. With treatment, symptoms of schizophrenia can greatly improve.

Yet roughly 750,000 Americans have “treatment-resistant schizophrenia” (TRS). *Clozapine* was the first antipsychotic drug proven to be effective in treating TRS and remains the “gold-standard” treatment. It has also been found to significantly lower the risk of suicidal behavior in schizophrenia patients.

Clozapine’s effectiveness in treating schizophrenia was demonstrated in a clinical trial in the 1980s co-led by a scientist who was working on a BBRF research grant. His work provided a scientific underpinning for the FDA’s approval of Clozapine in 1989.

This, in turn, led to the development of a whole new “second generation” of antipsychotics such as Abilify, Risperdal, and Seroquel—that are now treating millions of patients globally.

Development of the First Rapid-Acting Antidepressants

Depression is the leading cause of disability worldwide. The annual economic impact of major depressive disorders is an estimated \$400 billion in the U.S. and more than \$2 trillion worldwide.

Symptoms of major depressive disorder include: feeling worthless, having thoughts of suicide, losing interest in most or all activities, significant impairment of appetite and sleep, and having difficulty concentrating.

Each year about 8% of adults—nearly 20 million Americans—experience major depression; 8% of adolescents experience at least one depressive episode; and an estimated 3 million American adults make a suicide plan.

Unfortunately more than 50% of Americans with depression remain untreated. While many Americans who are treated for depression respond to therapy, at least one-third do not respond or do not have a full response. Non-responders have “treatment-resistant depression” (TRD).

Over the past 20 years, BBRF has awarded over 90 grants to scientists studying the use of rapid-acting

agents, like the drug ketamine, to treat TRD. In recent years, BBRF grantees have been instrumental in developing *esketamine*, a ketamine derivative, to rapidly reduce TRD and suicidal ideation. In 2019 it became the first rapid-acting antidepressant approved by the FDA. Ketamine and related drugs are now being tested by BBRF grantees for use in other disorders including post-traumatic stress disorder (PTSD) and obsessive-compulsive disorder (OCD).

Development of Transcranial Magnetic Stimulation (rTMS) to Treat Depression

In 1975, Hollywood gave moviegoers its interpretation of electroconvulsive therapy (ECT) in a mental hospital in *One Flew Over the Cuckoo’s Nest* and it wasn’t a pretty picture. While the modern application of ECT has in fact enabled tens of thousands of people with severe, treatment-resistant depression to carry on with their lives, it involves a medical procedure that must be performed under general anesthesia, usually in a clinic or hospital, and is usually considered a treatment of last resort due to side effects.

In the 1990s, a researcher used BBRF grants to study and develop a very different way of using “neuromodulation” to alter connectivity in brain circuits implicated in depression. Called rTMS (repetitive transcranial magnetic stimulation), this technology is non-invasive and is delivered on an outpatient basis. Patients experience only minor side effects such as headaches, which typically pass in minutes, and have no loss of memory. BBRF grantees demonstrated that rTMS was effective in a substantial percentage of treatment-resistant depression (TRD) patients. This led to FDA approval in 2009. The treatment is used around the country and across the globe today. More powerful and equally safe rapid-acting versions of TMS are now being tested in clinical trials and show promise not only in TRD but as treatments for hospitalized patients experiencing a suicidal crisis. Other advanced neuromodulation therapies are being tested in PTSD, OCD, and other psychiatric disorders.

Prevention: Decreasing Schizophrenia Risk Via Maternal Choline Supplements During Pregnancy

Schizophrenia is a disabling condition whose first clear symptoms often don't appear until the late teens or twenties. What if something could be done to reduce the risk of schizophrenia developing?

BBRF grantees and others have shown that the illness is highly complex. Factors thought to contribute to its causation are remarkably diverse. Chief among these are genetics: variations in one's DNA that one carries from the beginning of life and environmental factors in the months and years following birth. BBRF-funded research has shown that complications during pregnancy can greatly increase the chance that genetic risk factors in the fetus actually trigger changes in the brain development. These can affect the formation of neural cells and circuits in the fetal brain and the crucial thinning of synaptic connections early in life.

What if something as simple as taking a nutritional supplement by the mother during pregnancy could be shown to reduce risk or even prevent the future onset of schizophrenia? Researchers with BBRF funding have performed pioneering clinical studies that supplemented the diet of pregnant women with the nutrient choline. The research has shown that choline supplements during pregnancy do indeed appear to reduce the risk that a child will go on to develop psychotic disorders including schizophrenia. While the research is ongoing, the American Medical Association now recommends including choline in prenatal vitamin supplements.

Research Leading to the First Medicine to Specifically Treat Postpartum Depression

Having a baby is a life-changing event. During pregnancy and after a baby is born, parental mood shifts are much more common than many people realize. It's been estimated that 50% to 75% of new parents experience “baby blues” after delivery. Symptoms are frequent prolonged bouts of crying, sadness, and anxiety. Although unpleasant, the condition usually subsides within weeks without treatment.

BASIC RESEARCH

More worrisome is postpartum depression (PPD). It affects about 1 in 7 mothers in the perinatal period stretching from pregnancy into the months following childbirth. Its symptoms include alternating emotional highs and lows, frequent crying, irritability and fatigue, suicidal thoughts, as well as feelings of guilt, anxiety, and inability to care for one's baby or oneself. Symptoms of PPD may appear even up to a year after giving birth. In many cases, treatment with psychotherapy or antidepressants is effective.

But as with major depression, a substantial portion of PPD patients don't respond to standard depression therapy. BBRF provided research grant funding that revealed patterns of neurotransmitter fluctuations during the menstrual cycle. This led to development of *brexanolone*, a rapid-acting drug that in 2019 became the only therapy specifically approved by the FDA to treat postpartum depression.

Optogenetics Launches a Revolution in Brain Research, Enabling Manipulation of Individual Neural Cells and Circuits

The 6000+ grants awarded over 35 years by BBRF have enabled a rising generation of neuroscientists to shape a revolution in brain science. They are the generation that has begun to establish direct linkages between the devastating symptoms of mental illnesses and biological processes underlying them that alter the structure and function of genes, cells, and circuits across the brain. It's very hard to examine or perform experiments in the living brain. But BBRF grantees have devised remarkable methods and new technologies that have catapulted research forward.

BBRF support was instrumental, for instance, in the development of optogenetics, a game-changing technology that gives researchers precise control over brain circuitry in awake, behaving animals. In 2021 a BBRF-funded scientist won the prestigious Albert Lasker Basic Medical Research Award for his role in developing optogenetics.

Optogenetics involves the use of light to rapidly open and close the membrane channels that make neurons fire and cease firing, and allows for observation of the effects on behavior. Now in use at thousands of labs all over the world, this new technology is helping to enable the identification of mechanisms that give rise to depression, anxiety, schizophrenia, autism and other brain and behavior disorders.

Stem-Cell Technology Provides a Window on Developing Brain Cells and Circuits as Pathologies Arise

One of the challenges in studying the brain is not being able to sample living brain cells in patients with psychiatric disorders or healthy controls. To figure out how pathology related to mental illness arises, BBRF grantees have pioneered applications of stem-cell technology to obtain views of the brain in its earliest stages of development, a time when pathology associated with autism, schizophrenia and other disorders is thought to begin.

Harnessing the power of stem cells, BBRF-funded scientists have harmlessly sampled skin cells from people diagnosed with illnesses such as autism and schizophrenia, both of which are thought to have a strong genetic component, and "reprogrammed" them to return to the stem-cell state that marks the beginning of every cell's life.

These cells can then be induced to re-develop as mature brain cells. Using this method, scientists can study such "reborn" brain cells with the hope of seeing when and how abnormalities develop. This remarkable technology has already yielded insights into abnormalities in autism and schizophrenia that can be traced to the earliest stages of life.

Our Scientific Council

- 184** Scientific Council Members (21 Emeritus)
- 50** Members of the National Academy of Medicine
- 42** Chairs of Psychiatry & Neuroscience Departments
- 16** National Institute of Health Chiefs & Directors
- 7** Members of the National Academy of Sciences
- 3** Recipients of the National Medal of Science
- 2** Directors of the National Institute of Mental Health
- 1** Nobel Prize Winner

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L. Trevor Young, M.D., Ph.D.,

F.R.C.P.C., F.C.A.H.S.

Carlos A. Zarate, Jr., M.D.

Jon-Kar Zubieta, M.D., Ph.D.

Our New Scientific Council Members

The high quality of the research we fund is made possible by the BBRF Scientific Council.

This group of 184 prominent mental health researchers, led by Dr. Herbert Pardes, reviews each grant application and selects the most promising ideas with the greatest potential to lead to breakthroughs.

The Scientific Council guides the Foundation to fund creative and impactful basic, translational, and clinical research relevant to the whole spectrum of mental health.



"We are seeing significant advances in psychiatric research on multiple fronts. We are so pleased that these 13 leading experts have joined the Council to help keep the momentum going. They will help us continue to identify the best and brightest ideas in brain research — the very basis for awarding BBRF grants."

- Herbert Pardes, M.D.



Paola Arlotta, Ph.D.

Chair, Harvard Department of Stem Cell and Regenerative Biology
Stanley Center for Psychiatric Research, Broad Institute
Harvard University / McLean Hospital



Tallie Z. Baram, M.D., Ph.D.

Danette Shepard Professor of Neurological Sciences
Distinguished and Bren Prof. Pediatrics, Anatomy/Neurobiology, Neurology
University of California-Irvine



Ronald Cowan, M.D., Ph.D.

Distinguished Professor and Chair
University of Tennessee Health Science Center



Kathryn R. Cullen, M.D.

Head of the Child & Adolescent Mental Health (CAMH) Division
Associate Professor, Department of Psychiatry and Behavioral Sciences
University of Minnesota
2009 BBRF Young Investigator



André Fenton, Ph.D.

Professor of Neural Science
New York University
2004 BBRF Young Investigator



Rita Z. Goldstein, Ph.D.

Professor in Neuroimaging and Addiction, Department of Psychiatry
Icahn School of Medicine at Mount Sinai
2003 BBRF Young Investigator



Dorothy E. Grice, M.D.

Director of the Tics, OCD and Related Disorders Program, Department of Psychiatry
Icahn School of Medicine at Mount Sinai
1996 BBRF Young Investigator



Alicia Izquierdo, Ph.D.

Professor, Behavioral Neuroscience
UCLA



Shafali Spurling Jeste, M.D.

Chief, Division of Neurology Co-Director
Neurological Institute Las Madrinas
Chair
Children's Hospital Los Angeles



Christoph Kellendonk, Ph.D.

Associate Professor of Pharmacology and Surgeons
*Vagelos College of Physicians and Surgeons
Columbia University Irving Medical Center /
New York State Psychiatric Institute*
2019 Maltz Prize for Innovative and Promising Schizophrenia Research
2008, 2002 BBRF Young Investigator Grants



Arnold Kriegstein, M.D., Ph.D.

Professor of Neurology
University of California, San Francisco



Cecile D. Ladouceur, Ph.D.

Professor, Department of Psychiatry
University of Pittsburgh
2008, 2006 BBRF Young Investigator



David A. Morilak, Ph.D.

Professor, Dept of Pharmacology
Director
Center for Biomedical Neuroscience
Quincy and Estine Lee Endowed Chair
*University of Texas Health Science Center,
San Antonio*

PLAN YOUR FUTURE, SHAPE YOUR LEGACY

There are many ways to support the Brain & Behavior Research Foundation during your lifetime and one particularly meaningful way is through planned giving.

When you include BBRF as part of your legacy plan, you help ensure that our groundbreaking research continues.

Gifts which benefit the Foundation also personally benefit its donors by helping to fulfill important family and financial goals and ensure that our scientists will have the resources to continue making advances in mental health research, today and tomorrow.



“Marla and I donate to the Brain & Behavior Research Foundation in support of science and the hope of finding better treatments for mental illness.

Better treatments came too late for my brother, Stewart, who lost his battle with schizophrenia, and too late for my father, Ken, who suffered from depression. But we believe that with ongoing research, it will not be too late for millions of other people thanks to BBRF. We know this because we have seen the scientific breakthroughs and results that have come from funding scientists. Marla and I are dedicated to helping people who live with mental illness and doing what we can to be a part of the solution by our continued giving to BBRF.”

—Ken Harrison, Board Member

To learn more, please contact us at **646-681-4889** or plannedgiving@bbrfoundation.org.

2022 Leading Research Achievements by Foundation Grantees, Prize Winners, & Scientific Council Members

NEXT-GENERATION THERAPIES: Depression

Discovering How tDCS Brain Stimulation Therapeutically Modifies Brain Circuits in Depression



Evangelia G. Chrysikou, Ph.D.

Drexel University

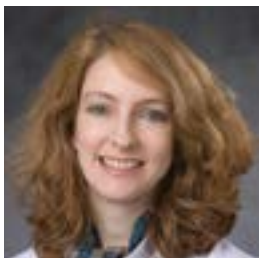
2015 BBRF Young Investigator

Journal: Biological Psychiatry: Cognitive Neuroscience & Neuroimaging
January 1, 2022

Researchers found mechanistic evidence supporting the ability of tDCS (transcranial direct current stimulation), a form of non-invasive brain stimulation, to help patients with moderate to severe depression. Among other things, they showed that tDCS influences connections between the medial prefrontal cortex and the amygdala, both of which have been implicated in emotional processing and emotion regulation. Results represent an important step toward understanding mechanisms of action of tDCS as a potentially safe, low-cost, and effective treatment for depression.

NEXT-GENERATION THERAPIES: Depression

Non-Invasive TMS Brain Stimulation Activates Deep-Brain Region Important in Depression



Sarah H. Lisanby, M.D.

National Institute of Mental Health; Duke University

BBRF Scientific Council; 2010 BBRF Distinguished Investigator; 2003 Independent Investigator; 1996 Young Investigator; 2001 BBRF Klerman Prize

Journal: NeuroImage
January 1, 2022

Individually targeted transcranial magnetic stimulation (TMS) was used to activate an important depression-related target located deep within the brain. This suggests the potential of non-invasive stimulation therapies to reach important brain areas previously thought beyond their reach, in depression and other psychiatric illnesses.

The research team included: **Zhi-De Deng, Ph.D.**, 2017 BBRF Young Investigator

BASIC RESEARCH: Depression, Anxiety, PTSD, Borderline Personality Disorder

Researchers Identify a Neural Signature Centrally Important in Restructuring Negative Self-Beliefs



Trevor Steward, Ph.D.

University of Melbourne, Australia

2020 BBRF Young Investigator

Journal: Molecular Psychiatry
January 1, 2022

Little is known about what happens in the brain when CBT or other therapies succeed in helping patients in the task of cognitive reappraisal. This research describes a novel neural signature that comes into play when a person restructures negative self-beliefs and proposes a new theory about brain mechanisms responsible for enabling people to sustain complex mental representations of the self. The findings have potential implications for targeting brain stimulation treatments to help alleviate symptoms of self-impairing negative self-beliefs.

NEXT-GENERATION THERAPIES: Depression, Anxiety, PTSD

Evidence That Cognitive Behavioral Therapy Can Help People With Insomnia Who Also Are Depressed or Anxious



Lauren D. Asarnow, Ph.D.

*University of California,
San Francisco*

2019 BBRF Young Investigator

*Journal: Current Psychiatry
Reports
January 21, 2022*

A large body of research has demonstrated the effectiveness of CBT-I, a specialized form of cognitive behavioral therapy, in treating chronic insomnia in adults without psychiatric co-morbidities. Dr. Asarnow and colleagues conducted a review of recent research and found evidence of the importance of treating insomnia symptoms in people who also suffer from either depression, anxiety, or PTSD. Comorbid participants of such trials who did experience an improvement in insomnia symptoms were more likely to have better depression outcomes; more research is needed to determine how it impacts symptoms in anxiety and PTSD.

NEXT-GENERATION THERAPIES: Addiction

A Molecule Tested in Higher Primates Reduced Alcohol Consumption By Half



Kyle H. Flippo, Ph.D.

University of Iowa

2019 BBRF Young Investigator

*Journal: Cell Metabolism
February 1, 2022*

Administering a hormone called FGF21, researchers were able to reduce alcohol consumption by about 50% in monkeys exhibiting a strong preference for alcohol. The experiments also provided evidence of a liver-to-brain circuit that specifically regulates alcohol consumption.

The research team included **Brad A. Grueter, Ph.D.**, 2016 and 2014 BBRF Young Investigator.

NEXT-GENERATION THERAPIES: Schizophrenia, Psychosis

Comprehensive Analysis Suggests Metacognitive Training Can Be Effective in Schizophrenia and Psychotic Disorders



Martin Lepage, Ph.D.

McGill University

2002 BBRF Young Investigator

*Journal: JAMA Psychiatry
March 23, 2022*

A meta-analysis of 43 prior clinical trials testing metacognitive training (MCT) for psychosis concluded MCT is an effective treatment, with benefits still evident in patients 1 year following the end of MCT sessions. In MCT, a therapist or facilitator enters into discussions with a group of patients, seeking to discover what they believe about their own thoughts. MCT targets maladaptive thinking styles common to psychosis, which include jumping to conclusions, inflexibly holding on to beliefs, and being overconfident in initial judgments.

The research team included **Steffan Moritz, Ph.D.**, 2014 BBRF Independent Investigator, 2008, 2005 Young Investigator.

BASIC RESEARCH: Schizophrenia

Important New Research on Schizophrenia Genetics Provides Strongest Evidence to Date of Problems at the Brain's Synapses



Tarjinder Singh, Ph.D.

Columbia University

2019 BBRF Young Investigator

Journal: *Nature*

April 8, 2022

In two papers published concurrently, an international team composed of hundreds of scientists provided the most comprehensive picture to date of how variations in the human genome affect schizophrenia risk. Their work contains some of the most compelling indications linking the illness with problems at the synapse—the gaps across which neurons in the brain communicate.

The research teams included several dozen recipients of BBRF grants, members of the BBRF Scientific Council, and recipients of BBRF annual prizes for outstanding achievement in research. Among senior members of the team were **Michael C. O'Donovan, M.D., Ph.D.**, 2012 BBRF Lieber Prize winner; **Stephan Ripke, M.D., Ph.D.**, 2015 BBRF Young Investigator and 2014 BBRF Baer Prize winner; and **Patrick Sullivan, M.D., FRANZCP**, 2014 BBRF Lieber Prize winner.

BASIC RESEARCH: Schizophrenia

Stem Cell Technology Helps Identify a Potential Causal Mechanism in Schizophrenia That Could Be Targeted



Lorna A. Farrelly, Ph.D.

Icahn School of Medicine at Mount Sinai

2019 BBRF Young Investigator

Journal: *Nature Communications*

April 22, 2022

Using stem-cell technology, researchers identified an aberrant gene-regulation pattern called hyperacetylation that may be causally involved in some cases of schizophrenia. Acetyl molecules attach to DNA packaging proteins to encourage or repress gene activation. Hyperacetylation means that there are too many acetyl molecules attaching to bundles of DNA called histones, causing one or more genes to be abnormally regulated. The team identified a specific protein, BRD4, which, if blocked or repressed, might help alleviate the severity of the aberration.

The research team included: included **Kristen Brennand, Ph.D.**, BBRF Scientific Council, 2018 BBRF Maltz Prize, 2016 BBRF Independent Investigator, 2012 Young Investigator; **Carol A. Tamminga, M.D.**, 2011 BBRF Lieber Prize winner, 2010 and 1998 BBRF Distinguished Investigator; **Ian Maze, Ph.D.**, 2014 BBRF Young Investigator.

NEXT-GENERATION THERAPIES: Depression

Video Game-Based Intervention Helped Reduce Cognitive Deficits in Depressed Patients



Richard S.E. Keefe, Ph.D.

Duke University

BBRF Scientific Council; 2003 BBRF Independent Investigator; 1995, 1991 Young Investigator

Journal: *American Journal of Psychiatry*

April 12, 2022

Researchers testing a novel video game-based intervention in depressed patients found that it can reduce the severity of an important form of cognitive deficit—the ability to remain engaged and pay attention to a task over a sustained interval.

The research team included **Amit Etkin, M.D., Ph.D.**, 2012 BBRF Young Investigator.

BASIC RESEARCH: Addiction

Researchers Discover Potentially Targetable Brain Circuit Controlling Cocaine Withdrawal Anxiety and Relapse



Kevin Beier, Ph.D.

*University of California Irvine
School of Medicine*

2017 BBRF Young Investigator

Journal: Cell Reports
May 3, 2022

Researchers discovered an extended brain circuit involved in cocaine addiction. The circuit regulates withdrawal anxiety and the urge to take cocaine again. Distinct from reward circuits driven by dopamine, the newly identified circuit might be targeted by novel therapeutic agents to reduce the negative affect that develops during withdrawal as well as to prevent relapse.

BASIC RESEARCH: All Mental Illnesses

Precise Imaging Reveals How a Key Receptor's Signaling Is Modulated — A Spur to Improving Psychiatric and Other Drugs



Wesley B. Asher, Ph.D.

Columbia University

2014 BBRF Young Investigator

Journal: Cell
May 12, 2022

Researchers have obtained powerful new insights into mechanisms involved in GPCRs, cellular receptors whose signaling is implicated in many psychiatric disorders. GPCRs are the target of one-third of all approved drugs, including therapeutics prescribed for psychiatric disorders such as schizophrenia, bipolar disorder, and depression. The dopamine D2 receptor, which is the target of all current antipsychotic medicines, is a GPCR, for example. The research will aid efforts to improve the action of drugs that interact with GPCRs, including psychiatric drugs, to make them more effective and/or to reduce side effects.

The study's senior author was **Jonathan Javitch, M.D., Ph.D.**, BBRF Scientific Council, 2010 Distinguished Investigator, 2003 Independent Investigator, 1992, 1990 Young Investigator.

BASIC RESEARCH, NEXT-GENERATION THERAPIES: Addiction

A Circuit Causally Linked With Spontaneous Nicotine Addiction Remissions May Be a Powerful Addiction Treatment Target



Shan H. Siddiqi, M.D.

Harvard Medical School

2022 BBRF Klerman Prize
2019 BBRF Young Investigator

Journal: Nature Medicine
June 3, 2022

By studying 129 people who were addicted to nicotine at the time they suffered brain damage, a team of researchers has identified a brain network they believe is causally linked with remission from nicotine addiction and that can be targeted with non-invasive brain stimulation.

The research team included **Nora D. Volkow, M.D.**, BBRF Scientific Council; Director, National Institute on Drug Abuse.

NEXT-GENERATION THERAPIES: PTSD

Clinical Trial Comparing Different Forms of Exposure and Drug Therapy in Combat Veterans with PTSD Is Step Toward Individualized Treatment



Francis S. Lee, M.D.

Weill Cornell Medicine

BBRF Scientific Council; 2010
BBRF Independent Investigator;
2005, 2002 Young Investigator

Journal: Translational Psychiatry
July 22, 2022

In a step toward precision medicine, a clinical trial found that two forms of exposure therapy enabled combat veterans to significantly reduce PTSD symptoms. Whether or not a patient also experienced depression affected which form of treatment was more effective. Those carrying either of two common genetic variations affecting processes that may impact fear extinction also showed evidence of having distinct therapy responses.

The research team included: **Barbara O. Rothbaum, Ph.D.**, 2012 BBRF Distinguished Investigator; **Christopher Reist, M.D.**, 1996 and 1993 BBRF Young Investigator; **Tanja Jovanovic, Ph.D.**, 2015 BBRF Independent Investigator, 2010 Young Investigator; **Seth D. Norholm, Ph.D.**, 2002 BBRF Young Investigator; **Charles E. Glatt, M.D., Ph.D.**, 2003 and 2001 BBRF Young Investigator.

BASIC RESEARCH: Depression, Anxiety, PTSD

Researchers Identify Molecule That Orchestrates Association of Events With Positive and Negative Memories



Kay M. Tye, Ph.D.

Salk Institute for Biological Studies

BBRF Scientific Council Emeritus,
2016 BBRF Freedman Prize,
2013 BBRF Young Investigator

Journal: Nature
July 20, 2022

Researchers discovered that neurotensin, a neurotransmitter, orchestrates a process in the brain's amygdala that enables us to assign positive and negative "tags" to specific memories. Targeting this molecule might be the aim of future treatments for individuals who fixate on or overstress negative memories.

The team included **Kerry J. Ressler, M.D., Ph.D.**, BBRF Scientific Council, 2009 BBRF Freedman Prize, 2005 and 2002 BBRF Young Investigator; **Romy Wichmann, Ph.D.**, 2016 BBRF Young Investigator; **Cody A. Siciliano, Ph.D.**, 2017 BBRF Young Investigator; **Xin Jin, Ph.D.**, 2018 BBRF Young Investigator; **Anna Beyeler, Ph.D.**, 2015 BBRF Young Investigator.

NEXT-GENERATION THERAPIES: ADHD

Home-Based tDCS Brain Stimulation Treatments Reduced Inattention in Adults with ADHD



Douglas Teixeira Leffa, M.D., Ph.D.

Universidade Federal do Rio Grande do Sul, Brazil

Journal: JAMA Psychiatry
August 3, 2022

Researchers have obtained promising results in a clinical trial of a home-based non-invasive brain stimulation treatment for adults with ADHD. The treatment, using low-power transcranial direct current stimulation (tDCS) technology, was associated with lower inattention symptoms in patients.

The research team included: **Joan Camprodon, M.D., Ph.D., MPH**, 2010 BBRF Young Investigator; **André Brunoni, M.D., Ph.D.**, 2013 BBRF Young Investigator.

NEXT-GENERATION THERAPIES: Depression

FDA Clears SAINT Rapid-Acting Brain Stimulation Approach for Those Suffering From Resistant Major Depression



Nolan R. Williams, M.D.

Stanford University

2019 BBRF Klerman Prize
2018, 2016 BBRF Young
Investigator

*FDA announcement made
September 6, 2022*

The FDA gave clearance for a commercial application of the SAINT brain stimulation protocol developed by Dr. Williams and colleagues. In a recent clinical trial, SAINT enabled 79 percent of patients with refractory major depression to achieve remission after only 5 days of accelerated non-invasive treatments.

NEXT-GENERATION THERAPIES: Suicide Prevention

Folic Acid Supplements Were Associated With Lower Suicidality in Large Database Study



J. John Mann, M.D.

*Columbia University/NY State
Psychiatric Institute*

BBRF Scientific Council;
2022 BBRF Colvin Prize;
2008 BBRF Distinguished
Investigator

*Journal: JAMA Psychiatry
September 28, 2022*

In a promising lead in suicide prevention, researchers found that in a cohort of over 866,000 people prescribed folic acid supplements over 5 years, there was a 44% lower rate of suicidal events during periods when the supplements were being taken vs. when they were not being taken.

NEXT-GENERATION THERAPIES: Depression

Adding an Antibiotic Improved Brain Stimulation Results in Depression



**Alexander McGirr M.D.,
Ph.D.**

University of Calgary, Canada
2018 BBRF Young Investigator

*Journal: JAMA Psychiatry
October 12, 2022*

By providing 2 weeks of antibiotic therapy using the drug d-cycloserine during a 4-week treatment course with iTBS, a form of non-invasive brain stimulation, researchers were able to show significantly improved outcomes in patients with moderate to severe major depression.

BASIC RESEARCH: All Mental Illnesses

Lab-Grown Human Neurons Transplanted into the Rat Brain Grew, Connected, and Promise to Shed Light on Psychiatric Illness



Sergiu Pasca, M.D.

Stanford University

2017 BBRF Independent Investigator; 2012 Young Investigator

Journal: *Nature*
October 12, 2022

Researchers grew organoids composed of human cortical neurons and transplanted them into the rat sensory cortex. The human cells integrated functionally into the rat brain—could receive sensory stimulation and drive behavior. The same approach enabled the team to study pathology in human cells transplanted from patients with a neuropsychiatric disorder, a strategy that can also be applied in other disorders.

The research team included: **Karl Deisseroth, M.D., Ph.D.**, BBRF Scientific Council, 2013 BBRF Goldman-Rakic Prize winner, 2007 and 2005 BBRF Young Investigator; **Felicity Gore, Ph.D.**, 2019 BBRF Young Investigator; **Neal D. Amin, M.D., Ph.D.**, 2021 BBRF Young Investigator

NEXT-GENERATION THERAPIES: Depression

After 'Priming' with Ketamine, Patients Receiving Self-Esteem Training Had Extended Antidepressant Benefits, Study Finds



Robert H. Howland, M.D.

University of Pittsburgh

1991 BBRF Young Investigator

In a randomized placebo-controlled clinical trial, ketamine's rapid antidepressant effect which normally fades within a week was still present after 30 days for treatment-resistant participants who received a single ketamine injection and 4 days of computer-administered self-esteem training.



Sanjay J. Mathew, M.D.

Baylor College School of Medicine

2009 BBRF Independent Investigator;
2006, 2001 Young Investigator

Journal: *American Journal of Psychiatry*
December 1, 2022

BBRF Grants Drive Scientific Breakthroughs Leading Toward Improved Treatments, Cures, and Methods of Prevention

SINCE 1987:



THE MULTIPLIER EFFECT

BBRF Grant recipients have gone on to receive an estimated \$4.4 billion in additional research funding in next stage NIMH and NIH grants.

No other organization outside of the federal government has funded the number of mental health research grants that the Foundation has—or been responsible for more breakthroughs in the field.

Our Grants support a broad range of the best ideas in brain research. Funding is focused on four priority areas to better understand and treat mental illness, aiming toward prevention and cures:

Research Categories

Basic Research

To understand what happens in the brain to cause mental illness

Diagnostic Tools/Early Intervention

To recognize early signs of mental illness and treat as early as possible

New Technologies

To advance or create new ways of studying and understanding the brain

Next-Generation Therapies

To reduce symptoms of mental illness and ultimately cure and prevent brain and behavior disorders

The path to being awarded a BBRF Grant starts with an application. Grant applicants describe why they think their project could help lead to new insights and advances in the field of mental illness. Applicants represent the best and the brightest talent from world-class institutions.

The BBRF's Scientific Council, which is made up of 184 preeminent mental health researchers and led by Dr. Herbert Pardes, volunteer their time to review and evaluate applications. The Scientific Council not only looks for projects with the greatest potential for immediate advances in neurobiological and psychiatric research, but also at projects which can yield additional benefits for many years to come.

This venture capital-like approach to research funding has had tremendous success in advancing the field and helping more people live full, happy, and productive lives.

"BBRF Young Investigator Grants have led to innovative research that has improved the lives of people living with mental illness. These early-career scientists are making significant strides in basic research, early intervention, diagnostic tools, new technologies, and next-generation therapies that will offer the best hope for advances in treatments for psychiatric illness."

Herbert Pardes, M.D.

President, BBRF Scientific Council

BBRF Young Investigator Grants in 2022



BBRF Young Investigator Grants give early-career scientists the initial funding they need to begin to test their ideas and solidify their academic research careers. Young Investigator Grants provide scientists with \$35,000/year for two years totaling \$70,000. This seed money enables them to generate the preliminary data, or “proof of concept” that they need to compete for larger grants from traditional funding sources like the National Institute of Health.

The 2022 Young Investigators are focused on a broad range of psychiatric illnesses, including depression, schizophrenia, and PTSD. Nearly two dozen grantees will perform innovative research on addiction, including the epidemics of opioid- and alcohol-use disorders, which appear to have intensified during the pandemic. As rates of suicide in the U.S. continue to increase, seven grantees are creatively addressing new and better ways of predicting who among us is at greatest risk of suicide, and on ways of preventing or reducing suicidal behavior.

It is also notable that a dozen of the 2022 projects involve brain stimulation, including approaches that are both invasive and non-invasive, and new applications which are rapid-acting. Several seek to better understand how transcranial magnetic stimulation (TMS) changes neural cells and circuits to achieve therapeutic effects.

Some 2022 Young Investigators are performing pioneering studies of new and yet unproven methods of brain stimulation. Several are working with t-FUS (focused transcranial ultrasound stimulation), which delivers acoustic energy to targets of interest deep in the brain. This potentially could be a non-invasive alternative to deep-brain stimulation.

These are just a few highlights of the research projects that our grantees will be working on. It’s an exciting and very promising time in brain research that we hope will lead to improved treatments in the years to come.

Co-Chairs of the Young Investigator Grant Selection Committee



Judy M. Ford, Ph.D.

Professor, Department of Psychiatry

University of California, San Francisco

BBRF Scientific Council Member

2003 BBRF Independent Investigator



Suzanne N. Haber, Ph.D.

Professor, Department of Pharmacology and Physiology

University of Rochester School of Medicine and Dentistry

BBRF Scientific Council Member

2011 BBRF Distinguished Investigator

“BBRF Young Investigators represent a new generation of researchers who will pioneer breakthroughs in mental health research. We are excited to be able to support the work of these young scientists, who will apply powerful new technologies and insights to finding better treatments, cures, and methods of prevention for mental illness.”

Dr. Jeffrey Borenstein

2022 BBRF Young Investigator Grants by Illness

Some grantees are listed under multiple categories as their grant projects are relevant to more than one illness.

ADDICTION / SUBSTANCE-USE DISORDERS

Aditi Banerjee, Ph.D.

 *Basic Research*

Inbal Ben-Ami Bartal, Ph.D.

 *Next-Generation Therapies*

Sujan Chandra Das, Ph.D.

 *Basic Research*

Matthew P. Gardner, Ph.D.

 *Basic Research*

Ahmed N. Hassan, M.D.

 *Diagnostic Tools/Early Intervention*

 *Basic Research*

Max Emanuel Joffe, Ph.D.

 *Basic Research*

 *Next-Generation Therapies*

Kari A. Johnson, Ph.D.

 *Basic Research*

Thang M. Le, Ph.D.

 *Basic Research*

Emilia M. Lefevre, Ph.D.

 *Basic Research*

Snigdha Mukerjee, Ph.D.

 *Basic Research*

Lyonna F. Parise, Ph.D.,

 *Basic Research*

Rachel Rabin, Ph.D.

 *Next-Generation Therapies*

David J. Reiner, Ph.D.

 *Basic Research*

Zhenhao Shi, Ph.D.

 *Basic Research*

Benjamin M. Siemsen, Ph.D.

 *Basic Research*

Hua Tang, Ph.D.

 *Basic Research*

Victor M. Tang, M.D.

 *Next-Generation Therapies*

Sarah A. Thomas, Ph.D.

 *Basic Research*

Jason M. Tucciarone, M.D., Ph.D.

 *Basic Research*

Mark Wagner, Ph.D.

 *Basic Research*

Kevin S. Weiner, Ph.D.

 *Basic Research*

Genevieve J. Yang, M.D., Ph.D.

 *Next-Generation Therapies*

 *New Technologies*

Farhana Yasmin, Ph.D.

 *Basic Research*

ATTENTION-DEFICIT HYPERACTIVITY DISORDER (ADHD)

Samuel William Centanni, Ph.D.

 *Basic Research*

Xiaomo Chen, Ph.D.

 *Basic Research*

Sarah M. Clark, Ph.D.

 *Basic Research*

Ahmed Eltokhi, Ph.D.

 *Basic Research*

Aaron Kucyi, Ph.D.

 *Next-Generation Therapies*

 *New Technologies*

Kristina Lanko, Ph.D.

 *Basic Research*

Violeta G. Lopez-Huerta, Ph.D.

 *Basic Research*

Jessica Taubert, Ph.D.

 *Next-Generation Therapies*

Genevieve J. Yang, M.D., Ph.D.

 *Next-Generation Therapies*

 *New Technologies*

ANXIETY DISORDERS

Ryan T. Ash, M.D., Ph.D.

 *New Technologies*

Jessica Lynn Bolton, Ph.D.

 *Basic Research*

Stefano Brigidi, Ph.D.

 *Basic Research*

Samuel William Centanni, Ph.D.

 *Basic Research*

Joseph M. Cichon, M.D., Ph.D.

 *Basic Research*

Romain M. Durand, Ph.D.

 *Basic Research*

Carlos Fernandez-Pena Acuna, Ph.D.

 *Basic Research*

Jakob Hartmann, Ph.D.

 *Basic Research*

Daniel A. Jercog, Ph.D.

 *Basic Research*

Erin Kang, Ph.D.

 *Basic Research*

Sabine Krabbe, Ph.D.

 *Basic Research*

Shibin Li, Ph.D.

 *Basic Research*

Indira Mendez-David, Ph.D.

 *Basic Research*

 *Next-Generation Therapies*

Saptarnab Naskar, Ph.D.

 *Basic Research*

Nancy Padilla-Coreano, Ph.D.

 *Basic Research*

Lyonna F. Parise, Ph.D.

 *Basic Research*

Zachary T. Pennington, Ph.D.,

 *Basic Research*

Jose Rodriguez-Romaguera, Ph.D.

 *Basic Research*

Stefanie Russman Block, Ph.D.

 *Next-Generation Therapies*

 *New Technologies*

Anna Schroeder, Ph.D.

 *Basic Research*

Sheila R. Shanmugan, M.D., Ph.D.

 *Basic Research*

Thomas Steinkellner, Ph.D.

 *Basic Research*

Michelle E. Stepan, Ph.D.

 *Next-Generation Therapies*

Alex Tang, Ph.D.

 *Next-Generation Therapies*

Hua Tang, Ph.D.

 *Basic Research*

Sarah M. Tashjian, Ph.D.

 *Basic Research*

Xinzhu Yu, Ph.D.

 *Basic Research*

AUTISM SPECTRUM DISORDER (ASD)

Sarah M. Clark, Ph.D.

 *Basic Research*

Ahmed Eltokhi, Ph.D.

 *Basic Research*

Erin Kang, Ph.D.

 *Basic Research*

Saskia B.J. Koch, Ph.D.

 *Diagnostic Tools/Early Intervention*

Kristina Lanko, Ph.D.

 *Basic Research*

Violeta G. Lopez-Huerta, Ph.D.

 *Basic Research*

Adele Mossa, Ph.D.

 *Basic Research*

Aya Osman, Ph.D.

 *Basic Research*

Nancy Padilla-Coreano, Ph.D.

 *Basic Research*

Nisha Raj, Ph.D.

 *Basic Research*

Jeff L. Waugh, M.D., Ph.D.

 *Basic Research*

Xingjian Zhang, Ph.D.

 *Basic Research*

BIOLOGY OF THE BRAIN

These projects focus on how the brain works

CELLULAR MATURATION

Fernando C. Alsina, Ph.D.

 *Basic Research*

EMOTION REGULATION/AGGRESSION

Macià Buades-Rotger, Ph.D.

 *Basic Research*

IMMUNITY & BRAIN DEVELOPMENT

Maria Ester Coutinho, M.D., Ph.D.

 *Basic Research*

OXYGENATION & BRAIN DEVELOPMENT

Laura R. Fenlon, Ph.D.

 *Basic Research*

TRANSDIAGNOSTIC MARKERS

Antonia N. Kaczurkin, Ph.D.

 *Diagnostic Tools/Early Intervention*

MARKERS OF MEMORY IMPAIRMENT

Darrin J. Lee, M.D., Ph.D.

 *Basic Research*

RESPONSE INHIBITION

Aqilah M. McCane, Ph.D.

 *Basic Research*

CHROMATIN REGULATORS

Hume Akahori Stroud, Ph.D.

 *Basic Research*

IMPULSIVITY & REWARD

Karly M. Turner, Ph.D.

 *Basic Research*

MATERNAL MICROBIOME & DEVELOPMENT

Denise M. Werchan, Ph.D.

 *Basic Research*

ULTRASONIC NEUROMODULATION

Sangjin Yoo, Ph.D.

 *New Technologies*

 *Next-Generation Therapies*

BIPOLAR DISORDER

Ahmed Eltokhi, Ph.D.

 *Basic Research*

Judit García-González, Ph.D.

 *Diagnostic Tools/Early Intervention*

Inge R. Holtman, Ph.D.

 *Diagnostic Tools/Early Intervention*

Rebekah S. Huber, Ph.D.

 *Basic Research*

 *Diagnostic Tools/Early Intervention*

Anouar Khayachi, Ph.D.

 *Next-Generation Therapies*

 *Diagnostic Tools/Early Intervention*

Camila Nayane D.C. Lima, Ph.D.

 *Diagnostic Tools/Early Intervention*

Sarah H. Sperry, Ph.D.

 *Diagnostic Tools/Early Intervention*

BORDERLINE PERSONALITY DISORDER

Sarah Kathryn Fineberg, M.D., Ph.D.

 *Basic Research*

Jenna M. Traynor, Ph.D.

 *Diagnostic Tools/Early Intervention*

DEPRESSION

Jessica Lynn Bolton, Ph.D.

 *Basic Research*

Davide Balos Cappon, Ph.D.

 *Next-Generation Therapies*

Samuel William Centanni, Ph.D.

 *Basic Research*

Kenny L. Chan, Ph.D.

 *Next-Generation Therapies*

Jun Chen, Ph.D.

 *Diagnostic Tools/Early Intervention*

 *New Technologies*

Tina Chou, Ph.D.

 *Next-Generation Therapies*

 *New Technologies*

Joseph M. Cichon, M.D., Ph.D.

 *Basic Research*

Ana Paula Costa, Ph.D.

 *Diagnostic Tools/Early Intervention*

Adam J. Culbreth, Ph.D.

 *Basic Research*

Romain M. Durand, Ph.D.

 *Basic Research*

Immanuel Elbau, M.D., Ph.D.

 *Next-Generation Therapies*

Joline M. Fan, M.D.

 *Basic Research*

Itay Hadas, Ph.D.

 *Diagnostic Tools/Early Intervention*

Jakob Hartmann, Ph.D.

 *Basic Research*

Frederick L. Hitti, M.D., Ph.D.

 *Basic Research*

 *Next-Generation Therapies*

Inge R. Holtman, Ph.D.

 *Diagnostic Tools/Early Intervention*

Caroline P. Hoyniak, Ph.D.

 *Diagnostic Tools/Early Intervention*

 *Next-Generation Therapies*

Kyle D. Ketchesin, Ph.D.

 *Basic Research*

 *Next-Generation Therapies*

Daniel C. Kopala-Sibley, Ph.D.

 *Diagnostic Tools/Early Intervention*

Thang M. Le, Ph.D.

 *Basic Research*

Stephanie L. Leal, Ph.D.

 *Basic Research*

Shibin Li, Ph.D.

 *Basic Research*

Dong Liu, Ph.D.

 *New Technologies*

 *Next-Generation Therapies*

Hermany Munguba, Ph.D.

 *Basic Research*

Corina Nagy, Ph.D.

 *Basic Research*

Saptarnab Naskar, Ph.D.

 *Basic Research*

Sean M. Nestor, M.D., Ph.D.

 *Next-Generation Therapies*

Nancy Padilla-Coreano, Ph.D.

 *Basic Research*

Lyonna F. Parise, Ph.D.

 *Basic Research*

Zachary T. Pennington, Ph.D.

 *Basic Research*

Dominique Piber, M.D.

 *Next-Generation Therapies*

Stefanie Russman Block, Ph.D.

 *Next-Generation Therapies*

 *New Technologies*

Sheila R. Shanmugan, M.D., Ph.D.

 *Basic Research*

Thomas Steinkellner, Ph.D.

 *Basic Research*

Michelle E. Stepan, Ph.D.

 *Next-Generation Therapies*

Yue Sun, Ph.D.

 *Basic Research*

 *Next-Generation Therapies*

Tuan Leng Tay, Ph.D.

 *Next-Generation Therapies*

Joseph J. Taylor, M.D., Ph.D.

 *Next-Generation Therapies*

Sarah A. Thomas, Ph.D.

 *Basic Research*

Nicholas T. Trapp, M.D.

 *Next-Generation Therapies*

Akina Umemoto, Ph.D.

 *Basic Research*

Manuel Valero Garcia, Ph.D.

 *Basic Research*

Akila S. Weerasekera, Ph.D.

 *Next-Generation Therapies*

 *Diagnostic Tools/Early Intervention*

Kevin S. Weiner, Ph.D.

 *Basic Research*

EATING DISORDERS

Sofia Beas Parodi, Ph.D.

 *Basic Research*

Lauren Breithaupt, Ph.D.

 *Basic Research*

Marie A. Labouesse, Ph.D.

 *Basic Research*

Fernando Midea Cuccovia V. Reis, Ph.D.

 *Basic Research*

Alejandro Ramirez, M.D., Ph.D.

 *Basic Research*

Chen Ran, Ph.D.

 *Basic Research*

Rachel Amy Ross, M.D., Ph.D.

 *Basic Research*

OBSESSIVE-COMPULSIVE DISORDER (OCD)

Samuel William Centanni, Ph.D.

 *Basic Research*

Iakovos Lazaridis, Ph.D.

 *Basic Research*

Nan Li, Ph.D.

 *Basic Research*

Dong Liu, Ph.D.

 *New Technologies*

 *Next-Generation Therapies*

Alex Tang, Ph.D.

 *Next-Generation Therapies*

Hua Tang, Ph.D.

 *Basic Research*

Nicholas T. Trapp, M.D.

 *Next-Generation Therapies*

Jeff L. Waugh, M.D., Ph.D.

 *Basic Research*

Brian Zaboski, Ph.D.

 *Diagnostic Tools/Early Intervention*

OTHER DISORDERS

EPILEPSY

Allison M. Ahrens, Ph.D.

 *Basic Research*

CONDUCT DISORDER

Gregor Kohls, Ph.D.

 *Basic Research*

TOURETTE SYNDROME

Iakovos Lazaridis, Ph.D.

 *Basic Research*

TOURETTE SYNDROME

Jeff L. Waugh, M.D., Ph.D.

 *Basic Research*

FRAGILE X

Nisha Raj, Ph.D.

 *Basic Research*

SEVERE MENTAL ILLNESS

Jie Song, Ph.D.

 *Basic Research*

PARKINSON'S DISEASE

Yue Sun, Ph.D.

 *Basic Research*

PERSONALITY DISORDERS

(General)

Jenna M. Traynor, Ph.D.

 *Diagnostic Tools/Early Intervention*

POST-TRAUMATIC STRESS DISORDER (PTSD)

Ryan T. Ash, M.D., Ph.D.

 *New Technologies*

Jessica Lynn Bolton, Ph.D.

 *Basic Research*

Stefano Brigidi, Ph.D.

 *Basic Research*

Samuel William Centanni, Ph.D.,

 *Basic Research*

Kirstie A. Cummings, Ph.D.

 *Basic Research*

 *Next-Generation Therapies*

Daniel A. Jercog, Ph.D.

 *Basic Research*

Shibin Li, Ph.D.

 *Basic Research*

Saptarnab Naskar, Ph.D.

 *Basic Research*

Zachary T. Pennington, Ph.D.

 *Basic Research*

Stefanie Russman Block, Ph.D.

 *Next-Generation Therapies*

 *New Technologies*

Anna Schroeder, Ph.D.

 *Basic Research*

Alex Tang, Ph.D.

 *Next-Generation Therapies*

Sarah M. Tashjian, Ph.D.

 *Basic Research*

Nicholas T. Trapp, M.D.

 *Next-Generation Therapies*

Hein Johan Floris van Marle, M.D., Ph.D.

 *Next-Generation Therapies*

 *New Technologies*

PSYCHOSIS

Marieke J. H. Begemann, Ph.D.

 *Next-Generation Therapies*

Kara Dempster, M.D.

 *Next-Generation Therapies*

Ilvana Dzafic, Ph.D.

 *Basic Research*

Roselinde (Roos) M.C.A. Pot-Kolder, Ph.D.

 *Next-Generation Therapies*

Alejandro G. Szmulewicz, M.D.

 *Next-Generation Therapies*

Sunny Xiaojing Tang, M.D.

 *Diagnostic Tools/Early Intervention*

Umit H. Yesilkaya, M.D.

 *Basic Research*

Tingting Zhou, Ph.D.

 *Basic Research*

SCHIZOPHRENIA

Aurina Arnatkeviciute, Ph.D.

 *Basic Research*

Marieke J. H. Begemann, Ph.D.

 *Next-Generation Therapies*

Anya Bershad, M.D., Ph.D.

 *Next-Generation Therapies*

Sean P. Carruthers, Ph.D.

 *Diagnostic Tools/Early Intervention*

Jingyuan Chen, Ph.D.

 *Basic Research*

Sarah M. Clark, Ph.D.

 *Basic Research*

Adam J. Culbreth, Ph.D.

 *Basic Research*

Kara Dempster, M.D.

 *Next-Generation Therapies*

Shalini Dogra, Ph.D.

 *Next-Generation Therapies*

Ilvana Dzafic, Ph.D.

 *Basic Research*

Ahmed Eltokhi, Ph.D.

 *Basic Research*

Chris Greene, Ph.D.

 *Basic Research*

Jia Guo, Ph.D.

 *Basic Research*

 *Diagnostic Tools/Early Intervention*

Inge R. Holtman, Ph.D.

 *Diagnostic Tools/Early Intervention*

Kiyohito Iigaya, Ph.D.

 *Basic Research*

Agnieszka Kalinowski, M.D., Ph.D.

 *Basic Research*

David B. Kastner, M.D., Ph.D.

 *Basic Research*

Linda Katona, Ph.D.

 *Basic Research*

Kristina Lanko, Ph.D.

 *Basic Research*

Dong Liu, Ph.D.

 *New Technologies*

 *Next-Generation Therapies*

Violeta G. Lopez-Huerta, Ph.D.

 *Basic Research*

Tina Fabia Notter, Ph.D.

 *Basic Research*

Aarron J. Phensy, Ph.D.

 *Basic Research*

Roselinde (Roos) M.C.A. Pot-Kolder, Ph.D.

 *Next-Generation Therapies*

Seung-Eon Roh, Ph.D.

 *Basic Research*

Audrey Sederberg, Ph.D.

 *Basic Research*

Zhixiong Sun, Ph.D.

 *Basic Research*

Alejandro G. Szmulewicz, M.D.

 *Next-Generation Therapies*

Hua Tang, Ph.D.

 *Basic Research*

Sunny Xiaojing Tang, M.D.

 *Diagnostic Tools/Early Intervention*

Fumihiko Ueno, M.D.

 *Basic Research*

 *Next-Generation Therapies*

Milene Vandal, Ph.D.

 *Basic Research*

Umit H. Yesilkaya, M.D.

 *Basic Research*

Tingting Zhou, Ph.D.

 *Basic Research*

SUICIDE PREVENTION

Sean P. Carruthers, Ph.D.

 *Diagnostic Tools/Early Intervention*

Rebekah S. Huber, Ph.D.

 *Basic Research*

 *Diagnostic Tools/Early Intervention*

Autumn Joy Kujawa, Ph.D.

 *Diagnostic Tools/Early Intervention*

Gonzalo Martinez-Ales, M.D., Ph.D.

 *Diagnostic Tools/Early Intervention*

Eric T. Monson, M.D., Ph.D.

 *Diagnostic Tools/Early Intervention*

Jenna M. Traynor, Ph.D.,

 *Diagnostic Tools/Early Intervention*

Kevin S. Weiner, Ph.D.

 *Basic Research*

2022 Young Investigators

Institutional Affiliation at the Time of the Grant

(in alphabetical order)

Abarbanel Mental Health Center
Tel Aviv University, Israel

Albert Einstein College of Medicine

Amsterdam University Medical Centers,
Netherlands

Bakirköy Prof. Mazhar Osman Training and
Research Hospital, Turkey

Boston University (2)

Bradley Hospital, Brown University

Brigham and Women's Hospital

California Institute of Technology (2)

Centre for Addiction and Mental Health,
University of Toronto, Canada (3)

Chan School of Public Health, Harvard University

Charité – Universitätsmedizin Berlin, Germany

Freie Universität Berlin, Germany

Columbia University (6)

Concordia University

Deutsches Zentrum für Neurodegenerative
Erkrankungen, Germany

Douglas Mental Health University Institute,
Canada (2)

Duke University

Emory University

ETH Zurich, Switzerland

Erasmus Medical Center, University Medical Center
Rotterdam, Netherlands

Feinstein Institute for Medical Research /
Northwell Health

Georgia State University

Harvard Medical School (3)

Harvard University (9)

Icahn School of Medicine at Mount Sinai (8)

INSERM, France

Johns Hopkins University

Karolinska Institutet, Sweden

McGill University, Canada

McLean Hospital (2)

Massachusetts General Hospital (4)

Massachusetts Institute of Technology (2)

Medical University of Vienna, Austria

Monash University, Australia

Montclair State University

National Autonomous University of Mexico

National Institute of Mental Health (NIMH/NIH)

National Institute on Drug Abuse (NIDA/NIH)

National Institutes of Health (NIH)

New York University (2)

Northeastern University

Northwestern University (2)

Nova Scotia Health Authority, Canada

Oregon Health and Science University

Paris-Saclay University, France
Radboud University, Netherlands
Rice University
St. Jude Children's Research Hospital
Stanford University (5)
Sunnybrook Health Sciences Centre, University of
Toronto, Canada,
Swinburne University of Technology, Australia
Technical University of Dresden, Germany
Trinity College, Dublin, Ireland
Uniformed Services University of the
Health Sciences
University of Alabama at Birmingham (2)
University of Barcelona, Spain
University of Calgary, Canada (2)
University of California, Berkeley
University of California, Los Angeles (4)
University of California, Davis
University of California, Irvine
University of California, San Diego
University of California, San Francisco (3)
University College Cork, Ireland
University of Coimbra, Portugal
University of Florida
University of Freiburg, Germany
University of Illinois
University of Iowa
University of Maryland
University of Maryland, Baltimore (2)

University Medical Center Groningen,
Netherlands (2)
University of Melbourne, Australia (2)
University of Michigan (2)
University of Minnesota (2)
University of New South Wales, Australia
University of North Carolina at Chapel Hill
University of Pennsylvania (2)
University of Pennsylvania School of Medicine
University of Pittsburgh (2)
University of Pittsburgh School of Medicine
University of Queensland, Australia (2)
University of Southern California
University of Texas Health Science Center at
Houston
University of Texas Southwestern Medical Center
at Dallas (4)
University of Utah (3)
University of Washington
University of Western Australia
University of Zurich, Switzerland
Vanderbilt University (4)
Wake Forest University
Washington University, St. Louis
Weill Cornell Medical College (3)
Yale University (3)

Scientific Council Dinner Honoring Stephen A. Lieber



August 30, 1925–March 31, 2020

In 2022, the Brain & Behavior Research Foundation honored and recognized the extraordinary life of Stephen A. Lieber, a global champion of psychiatric research. Steve, along with his wife Connie, passionately believed in seeding the field of neuropsychiatric research with as many talented scientists as possible to make a substantive impact on the broad spectrum of mental health research. Steve fervently understood that

research holds our best hope for alleviating the immense suffering caused by mental illness. Steve saw the need to nurture and encourage young scientists.

The evening also celebrated the exceptional work of six outstanding young researchers, who have previously received awards through BBRF's Young Investigator Grant program, with its annual Klerman & Freedman Prizes for exceptional clinical and basic research in mental illness.

These prizes pay tribute to Drs. Gerald L. Klerman and Daniel X. Freedman, whose legacies as researchers, teachers, physicians, and administrators have indelibly influenced neuropsychiatry. The prizewinners are selected by committees of the Foundation's Scientific

Council, led by its founding President, Dr. Herbert Pardes.

The researchers were recognized for significant findings related to schizophrenia, psychosis, depression, neurodevelopmental disorders, and the biology of brain circuitry. Their important work is furthering the quest to identify the biological roots of mental illness to enable the development of new diagnostic tools, more effective and targeted treatments, and to pave the way toward prevention.



ANNUAL KLERMAN PRIZE FOR EXCEPTIONAL CLINICAL RESEARCH

Shan H. Siddiqi, M.D.

*Brigham & Women's Hospital
Harvard Medical School*

HONORABLE MENTIONS

Rachel Emma Lean, Ph.D.

Washington University School of Medicine, St. Louis

Sunny Xiaojing Tang, M.D.

*Feinstein Institutes for Medical Research, Institute of Behavioral Science
Zucker School of Medicine, Hofstra/Northwell Health*

ANNUAL FREEDMAN PRIZE FOR EXCEPTIONAL BASIC RESEARCH

Antonio Fernandez-Ruiz, Ph.D.

Cornell University

HONORABLE MENTIONS

Chandramouli Chandrasekaran, Ph.D.

Boston University, Boston University School of Medicine

Mohsen Jamali, M.D., Ph.D.

Massachusetts General Hospital, Harvard Medical School



Clockwise from top left:

Geoffrey Simon, Chairman of the BBRF Board

Dr. Herbert Pardes, President of the
BBRF Scientific Council with the
2022 Klerman & Freedman Prizewinners

Dr. Jeffrey Borenstein, BBRF President & CEO



STRIVING TOWARD CURES THROUGH RESEARCH

Scientist Spotlight with: Shan H. Siddiqi, M.D.

2022 BBRF Klerman Prize for Exceptional Clinical Research

2019 BBRF Young Investigator Award

Dr. Siddiqi's research is focused on causal mapping of human brain function and dysfunction. Using techniques such as functional connectivity MRI, he maps brain circuits to link brain lesions and brain stimulation sites that can modify different psychiatric symptoms. His BBRF-funded project, which sought to validate the existence of personalized circuit-based treatment targets for different depressive symptom clusters, has grown greatly in scope. Dr. Siddiqi's team is testing these treatment targets in a clinical trial which may indicate how to personalize treatment targets based on a patient's symptom profile. They have also developed methods to expand their approach to different syndromes and comorbidities, such as addiction and PTSD. The lab is also implementing precision brain network mapping techniques to further personalize treatment targets based on brain connectivity.

WHAT IS THE CURRENT STATE OF YOUR BBRF FUNDED RESEARCH?

My BBRF-funded project, which sought to validate the existence of personalized circuit-based treatment targets for different depressive symptom clusters, has grown greatly in scope. First, we are testing these treatment targets in a real-world clinical trial which will hopefully show us how to personalize treatment targets based on a patient's symptom profile. Second, we have developed methods to expand our approach to different syndromes and comorbidities, such as addiction and PTSD. Third, we are implementing precision brain network mapping techniques to further personalize treatment targets based on brain connectivity.

"My BBRF grant provided much-needed early support towards my vision of bringing circuit-targeted neuromodulation to clinical psychiatry. This was instrumental in launching my career at a stage when many investigators struggle to find their footing."

HOW DO YOUR INTERACTIONS WITH PEOPLE LIVING WITH MENTAL ILLNESS AFFECT YOUR RESEARCH AND VICE-VERSA?

Mental illness can impose a form of suffering that is nearly unparalleled in its impact on patients and their families. I have seen this not only as a psychiatrist, but also as a family member. On multiple occasions, I have agonizingly watched as loved ones were tormented by their own mind for months or years. I am grateful that many of them now have their lives back after treatment, and I am eternally motivated to ensure that everybody has the same opportunity.

WHAT HAS BBRF SUPPORT MEANT TO YOUR CAREER?

BBRF has provided enduring support not only for our group, but also for many of our esteemed collaborators. This has perpetually reassured me of the significance of our line of research. In addition to my Young Investigator grant itself, I have immensely appreciated BBRF's interest in highlighting our work (and other brain stimulation studies) in their public communications. In this way, BBRF has been invaluable in spreading awareness of novel circuit-based treatment approaches.

IN THE BEST POSSIBLE SCENARIO, HOW WOULD YOUR WORK IMPACT THE PEOPLE LIVING WITH MENTAL ILLNESS AND THEIR FAMILIES?

We all agree that our current treatments are ineffective for many patients. But for another important and under-recognized group of patients, our treatments are too slow. Even when a patient loses months or years of their youth while waiting for treatment to work, we often consider this to be a "treatment success." If we can find the right treatment targets for the right patients, we will hopefully learn how to alleviate human suffering faster and more effectively. We have already seen the beginnings of this with accelerated TMS treatments for depression, and it is now time to apply these lessons to other mental illnesses. We hope to give these valuable years back to our patients.

Scientist Spotlight with: Antonio Fernandez-Ruiz, Ph.D.

2022 BBRF Freedman Prize for Exceptional Basic Research

2019 BBRF Young Investigator Award

The aim of Dr. Fernandez-Ruiz's research is to understand how neuronal dynamics in distributed brain circuits support complex cognitive functions and how small imbalances can lead to pathological states. This process is supported by the fine-tuned coordination of different neuronal populations in distributed brain circuits. A major obstacle to answering this question is limitations imposed by current technology; thus, the lab seeks to develop new methods for a more precise interrogation and manipulation of brain circuit dynamics in behaving animals. The team is investigating alterations in hippocampal and cortical circuit dynamics underlying memory deficits in genetic mouse models of Alzheimer's disease and schizophrenia. They seek to develop novel intervention strategies, such as closed-loop optogenetic manipulations of neural dynamics, to reverse pathological memory deficits.

WHAT IS THE CURRENT STATE OF YOUR BBRF FUNDED RESEARCH?

My current research on the neural mechanisms of memory deficits in schizophrenia is funded by a BBRF Young Investigator Award. In this project, which is still ongoing, we have characterized the mechanisms underlying impaired hippocampo-cortical communication that lead to learning and memory deficits in a mouse model of schizophrenia predisposition. We are currently employing closed-loop optogenetic manipulation to try restore those memory deficits.

HOW DO YOUR INTERACTIONS WITH PEOPLE LIVING WITH MENTAL ILLNESS AFFECT YOUR RESEARCH AND VICE-VERSA?

My interest in understanding the neural mechanisms of schizophrenia sparked when I was growing up living with a relative affected by the disease. I realized how the lack of knowledge and stigma about the disease in rural Spain was a big burden for my relative, and many other people living in similar circumstances. That made me

"The BBRF grant provided me with the necessary funds in a key stage of my early career, enabling me to jump-start my independent research program."

aware of the importance of understanding the biological basis of the disease and educating the public about it.

WHAT HAS BBRF SUPPORT MEANT TO YOUR CAREER?

The BBRF Young Investigator Award provided fundamental support in a key stage of my career. I was able to use the funds to hire my first postdoc and start a new research project that culminated in my first publication as a senior author. This award also helped me start a completely new line of research in my lab on the neural mechanisms of cognitive deficits in schizophrenia, which would not have been possible without the BBRF support.

IN THE BEST POSSIBLE SCENARIO, HOW WOULD YOUR WORK IMPACT THE PEOPLE LIVING WITH MENTAL ILLNESS AND THEIR FAMILIES?

One of the goals of our research is to develop more selective intervention strategies to revert cognitive deficits in schizophrenia and other mental illnesses. While this work is being conducted in rodents, our findings open the door to potential clinical applications aimed at improving memory deficits in schizophrenia patients. In most neuropsychiatric disorders, traditional therapies are based on changes in clinical symptoms measured over time. These therapies involve typically surgical interventions or the administration of drugs and thus are either irreversible or cannot be adjusted rapidly to changes in the symptoms. On the other hand, closed-loop methods based on neural activity provide intervention only when needed by detecting abnormal neurological patterns. We aim to develop minimally invasive closed-loop manipulation approaches that one day can be translated to patients.



STRIVING TOWARD CURES THROUGH RESEARCH

2022 INTERNATIONAL MENTAL HEALTH RESEARCH SYMPOSIUM

The Brain & Behavior Research Foundation's annual symposium was held both in-person and virtually in 2022. Five 2022 Outstanding Achievement Prizewinners gave presentations on topics that included schizophrenia, suicidal behavior in bipolar disorder, pediatric mood and anxiety disorders, and cognitive neuroscience.

The symposium also featured informative presentations from the two winners of the 2022 Pardes Humanitarian Prize in Mental Health.

This year's program was reflective of the greatly accelerating pace of discovery in mental health research as well as the expanded range of studies the Brain & Behavior Research Foundation has grown to support.

An overview of the entire Symposium was provided by Dr. Robert Hirschfeld, a BBRF Scientific Council member who had served as the moderator at the in-person Symposium since its inception more than 30 years ago.

The symposium is available to watch on the BBRF You Tube channel:

<https://www.bbrfoundation.org/event/international-mental-health-research-symposium>



2022 BBRF Symposium Speakers. From L to R: Dr. J. John Mann, Dr. Sophie Erhardt, Dr. Robert Schwarcz, Dr. Robert Hirschfeld, Dr. Altha Stewart, Dr. Jeffrey Borenstein, Dr. Peter Strick, Dr. Robert van Voren, and Dr. Boris Birmaher. Photo by Chad David Kraus.

Presentations

From Obscurity to Hot Topic: The Kynurenic Acid Story

Robert Schwarcz, Ph.D.

*University of Maryland
School of Medicine*

BBRF LIEBER PRIZEWINNER FOR
OUTSTANDING ACHIEVEMENT IN
SCHIZOPHRENIA RESEARCH

New Evidence for Translationally Relevant Roles of Kynurenic Acid in Schizophrenia

Sophie Erhardt, Ph.D.

*School of Global Public Health,
Karolinska Institutet*

BBRF MALTZ PRIZEWINNER FOR INNOVATIVE
AND PROMISING SCHIZOPHRENIA
RESEARCH

Unlocking the Mysteries of Mood Disorders by Science Instead Of Guesswork

J. John Mann, M.D.

*Columbia University & New York State
Psychiatric Institute*

BBRF COLVIN PRIZEWINNER FOR
OUTSTANDING ACHIEVEMENT IN MOOD
DISORDERS RESEARCH

Who is at Risk To Develop Bipolar Disorder?

Boris Birmaher, M.D.

*University of Pittsburgh Medical
Center & Western Psychiatric Institute*

BBRF RUANE PRIZEWINNER FOR
OUTSTANDING ACHIEVEMENT IN CHILD &
ADOLESCENT PSYCHIATRIC RESEARCH

Solutions to the Brain-Body Problem: Neural Substrates for Psycho-somatic Disease

Peter L. Strick, Ph.D.

*University of Pittsburgh School of
Medicine*

BBRF GOLDMAN-RAKIC PRIZEWINNER FOR
OUTSTANDING ACHIEVEMENT IN COGNITIVE
NEUROSCIENCE

Recommendations for Addressing Mental Health Disparities Through Research

Altha J. Stewart, M.D.

PRIZEWINNER, BBRF PARDES
HUMANITARIAN PRIZE IN MENTAL HEALTH

Providing Psychological Support to Victims of State Repression and War

**Robert van Voren,
FRCPsych (HON.)**

PRIZEWINNER, BBRF PARDES
HUMANITARIAN PRIZE IN MENTAL HEALTH

We would also like to thank our
2022 Sponsors



The Pardes Humanitarian Prize in Mental Health

Bestowed annually since 2014, the Pardes Prize recognizes a person(s) or organization whose humanitarian work is transformative and of great magnitude, changing the lives and bringing the joy of living to those facing challenges to mental health.

It was established to honor those who comprehensively care, teach, investigate, work, and passionately advocate for improving the mental health of society and have had a powerful impact on reducing the pain inflicted by psychiatric illness.

The recipient of the Pardes Humanitarian Prize in Mental Health is chosen by a distinguished international Selection Committee from nominations solicited worldwide. The Prize focuses public attention on the burden of mental illness on individuals and on society, and the urgent need to expand and enhance mental health services in the United States and globally.

Established in 2014, the Pardes Humanitarian Prize is named in honor of Dr. Herbert Pardes, the first recipient of the award.



From L to R: Joel Corcoran, Sean Mayberry, Dr. Jeffrey Borenstein, Dr. Altha Stewart, and Dr. Robert van Voren.
Photo by Chad David Karus



The 2022 Pardes Humanitarian Prize in Mental Health honored two extraordinary mental health advocates committed to serving people disadvantaged by structural racism and a lack of human rights.

The winners are:



Altha J. Stewart, M.D.



Robert van Voren, FRCPSYCH (Hon.)

Two 2022 Pardes Honorary Prize Recipients were also announced and acknowledged for their important work in mental health.

They are:



Sean Mayberry



In 2022 the Pardes Humanitarian Prize in Mental Health was sponsored in part by Janssen Research & Development, LLC, one of the Janssen Pharmaceutical Companies of Johnson & Johnson.

PREVIOUS PRIZE WINNERS

2021

Kay Redfield Jamison, Ph.D.,
Elyn R. Saks, J.D., Ph.D., &
Charlene Sunkel

Honorary Tribute:

*John M. Davis, M.D.,
Michael R. Phillips, M.D., MPH, &
Norman Sartorius, M.D., Ph.D., FRCPSych*

2020

Myrna M. Weissman, Ph.D.
& Sir Michael Rutter, FRS

Honorary Tribute:

E. Fuller Torrey, M.D.

2019

William T. Carpenter, Jr., M.D.

Honorary Tribute:

*Cynthia Germanotta &
Born This Way Foundation*

2018

Judge Steven Leifman

Honorary Tribute:

Suzanne and Bob Wright

2017

Doctors Without Borders/
Médecins Sans Frontières

Honorary Tribute:

Constance E. Lieber

2016

Vikram Patel, Ph.D., F.Med.Sci. &
Charles F. Reynolds, III, M.D.

Honorary Tribute:

Senator Edward M. Kennedy

2015

Beatrix (Betty) A. Hamburg, M.D.
and David A. Hamburg, M.D.

Honorary Tribute:

Rosalynn Carter

2014

Herbert Pardes, M.D.

INTERNATIONAL AWARDS DINNER 2022

The BBRF International Awards Dinner honored the winners of the Pardes Humanitarian Prize in Mental Health as well as the five Outstanding Achievement Prizewinners who are advancing the science that is changing what it means to live with a mental illness.

LIEBER PRIZE

Outstanding Achievement in Schizophrenia Research



Robert Schwarcz, Ph.D.

Professor of Psychiatry,
Pharmacology and Pediatrics,
University of Maryland School of Medicine

Foreign Adjunct Professor (elected) of
Physiology and Pharmacology,
Karolinska Institute, Stockholm

- BBRF Scientific Council
- 2002 BBRF Distinguished Investigator

RUANE PRIZE

Outstanding Achievement in Child & Adolescent Psychiatric Research



Boris Birmaher, M.D.

Distinguished Professor of Psychiatry

Endowed Chair in Early Onset Bipolar Disorder

Directors of the Child and Adolescent
Bipolar Spectrum Services

*University of Pittsburgh Medical Center
and Western Psychiatric Institute*

MALTZ PRIZE

Innovative & Promising Schizophrenia Research



Sophie Erhardt, Ph.D.

Professor of Experimental Psychiatry

Chair, Department of Physiology and
Pharmacology

Karolinska Institute, Stockholm

GOLDMAN-RAKIC PRIZE

Outstanding Achievement in Cognitive Neuroscience



Peter L. Strick, Ph.D.

Detre Professor & Chair of
Neurobiology

Scientific Director,
University of Pittsburgh Brain Institute

Director, *Systems Neuroscience Center*

Co-Director, Center for Neuroscience
University of Pittsburgh

COLVIN PRIZE

Outstanding Achievement in Mood Disorders Research



J. John Mann, M.D.

Professor of Translational Neuro-
science in Psychiatry and Radiology
and Director, Molecular Imaging and
Neuropathology Division,

*Columbia University and New York State
Psychiatric Institute*

Co-Director, *Columbia Center for Pre-
vention and Treatment of Depression*

- BBRF Scientific Council
- 2008 BBRF Distinguished Investigator

Healthy Minds with Dr. Jeffrey Borenstein



"Today there is increased openness to discussing mental health, however stigma and misunderstanding remain prevalent and still often keep people from seeking help for themselves or their loved ones. Healthy Minds inspires conversations about mental illness, provides understandable information and resources for viewers, and demonstrates that with help, there is hope."

– Dr. Jeffrey Borenstein

Healthy Minds

Managing a Mental Health Crisis and the New #988:
A Conversation With William H. Carson, M.D.

Healthy Minds aims to remove the stigma of mental illness and demonstrate that with help, there is hope. The series features inspiring personal stories from people who have experienced mental health issues, as well as the latest information from experts on new approaches to the diagnosis, treatment, and prevention of mental illness.

Healthy Minds is available on PBS stations around the U.S. and online at PBS.org.

Season 8 is now available to watch at:
<https://www.pbs.org/show/healthy-minds-with-dr-jeffrey-borenstein/>

Previous seasons can be found online at:
www.bbrfoundation.org/healthyminds-tv

Season 7 Episodes:

- 701 – How COVID-19 Affects the Brain
- 702 – National Institute of Mental Health: An Update on Promising Research
- 703 – Rapid-Acting Transcranial Magnetic Stimulation
- 704 – Optogenetics with Karl Deisseroth, M.D., Ph.D. — Part One
- 705 – Optogenetics with Karl Deisseroth, M.D., Ph.D. — Part Two
- 706 – Deep Brain Stimulation — Treatment-Resistant Depression
- 707 – Psychedelic-Assisted Psychotherapy and Post-Traumatic Stress
- 708 – Bipolar Disorder, What You and Your Family Need to Know
- 709 – Living with Bipolar: A Conversation with Maurice Benard
- 710 – Managing a Mental Health Crisis and the New # 988
- 711 – Depression — Intersection of Faith and Mental Health

Meet the Scientist Webinar Series

Dr. Jeffrey Borenstein hosts the free monthly “Meet the Scientist” webinar series where leading brain and behavior researchers discuss their current work on the latest in new technologies, early intervention strategies, and next-generation therapies for mental illness. Each hour-long webinar includes time for researchers to answer questions posed by the audience participants. This popular series offers the public access to some of the world’s top scientists who discuss their cutting-edge research.

All webinars are available for viewing on the BBRF website.



Prenatal Exposures and Experiences: Impact on Children’s Early Brain Development and Risk for Disease

Tuesday, January 11, 2022

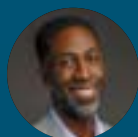
Claudia Lugo-Candelas, Ph.D.
Columbia University Medical Center
New York State Psychiatric Institute



When Medicine is Not Enough for Schizophrenia and Psychosis

Tuesday, July 12, 2022

Dawn Velligan, Ph.D.
University of Texas Health Science
Center in San Antonio



Investigating Neurobiology and New Treatments for Addiction, Depression, and Anxiety

Tuesday, February 8, 2022

Nii A. Addy, Ph.D.
Yale School of Medicine



Manipulating Memories to Help Treat Brain Illness

Tuesday, August 9, 2022

Steve Ramirez, Ph.D.
Boston University



Rapid-Acting Treatments for Pediatric Depression and Suicidality: Where are We Now?

Tuesday, March 8, 2022

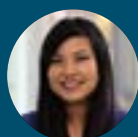
Jennifer Dwyer, M.D., Ph.D.
Yale School of Medicine



Identification of Symptom-Specific Brain Circuit Abnormalities in Obsessive-Compulsive Disorder

Tuesday, September 13, 2022

Brian P. Brennan, M.D., MMSc
McLean Hospital / Harvard Medical School



How Does a Fearful Experience Alter Our Past Memories?

Tuesday, April 12, 2022

Denise Cai, Ph.D.
Icahn School of Medicine at Mount Sinai



Exploring New Pathways of Discovery for Eating Disorders

Tuesday, October 11, 2022

Sahib S. Khalsa M.D., Ph.D.
University of Tulsa
Oxley College of Health Sciences



Brain/Behavior Alterations Underlying Self-Injury and Suicide Among Children and Adolescents

Tuesday, May 10, 2022

Daniel P. Dickstein, M.D., FAAP
McLean Hospital and Harvard Medical School



The Neurobiology of Pain Processing and Suicide: A Potential Marker for Suicide Risk

Tuesday, November 8, 2022

Sakina Rizvi, Ph.D.
University of Toronto



Does Early Life Inflammation Contribute to the Risk for Developing Psychiatric Conditions?

Tuesday, June 14, 2022

Galen Missig, Ph.D.
Cerevel Therapeutics



Online Video Education and Assessment to Empower Individuals with Borderline Personality Disorder

Tuesday, December 13, 2022

Lois W. Choi-Kain, M.D. M.Ed.
McLean Hospital / Harvard Medical School

Warning Signs & What to Look for: **Anxiety and Depression in Childhood** With Joan Luby, M.D.



Joan Luby, M.D.

Samuel and Mae S. Ludwig
Professor of Psychiatry (Child)

Director and Founder,
Early Emotional Development Program

*Washington University School of Medicine
in St. Louis*

**The webinar was broadcast via Zoom on
December 1, 2022.**

Teachers, school counselors and other educational professionals are on the front line of dealing with kids with mental health issues and can often be among some of the first people to see that a child is struggling.

Enhancing the potential for early intervention is important and because educational professionals have relationships with students and their families, they are often the people who guide students and their families to resources. As educational professionals learn more about mental health issues, their ability to make appropriate referrals for evaluation will improve for students and their families.

This new series is hosted by Jeffrey Borenstein, M.D., President & CEO of the Brain & Behavior Research Foundation and host of the public television series *Healthy Minds*.

This special program was created to help inform parents and educators who are on the front line of dealing with children and teens with mental health issues and can often be among some of the first people to see that a child is struggling.



The webinar is available on the BBRF website:

<https://www.bbrfoundation.org/event/warning-signs-what-look-anxiety-and-depression-childhood>



In 2019, the **Moritz Hilder Innovative Brain Research Fund** was established by the Trustee of the Jane Hilder Harris Trust with an endowment gift of \$3.5 million. It was created to preserve and honor the memory of Moritz Hilder, the father of the late Jane Hilder Harris.

This generous endowment will be held in perpetuity to advance medical research with the objective of gaining a basic understanding of post-traumatic stress disorder (PTSD) and its prevention, treatment and cure. Primary emphasis will be given to research involving innovative concepts where, although there may be a high risk of failure, the rewards of success would be substantial, and to researchers who typically would not be in a position to secure funding from more traditional funding sources.

The Moritz Hilder Innovative Brain Research Fund is held in a professionally managed, separate endowment fund. On an annual basis, 5% of the endowment fund will be expended to support PTSD research. A special committee of the BBRF Scientific Council selects which BBRF Grants will be funded by this Endowment. In 2022, the Endowment provided \$203,489 for the first year of funding of six PTSD research projects.

We are deeply honored to have received this generous and impactful gift.

THANK YOU TO OUR DONORS

Your support this year enabled us to fund \$12.7 million to scientists looking for better treatments, cures, and methods of prevention for mental illness.

Since 1987, in partnership with you, our donors, BBRF has awarded more than \$440 million to fund more than 6,200 grants to more than 5,300 leading scientists around the world.

With your help BBRF has been able to foster new research pathways that led to transformative breakthroughs. We deeply appreciate your support and commitment to advance psychiatric research.



BENEFITS OF BECOMING A RESEARCH PARTNER

Barbara Toll

BBRF Board Member & Research Partner

Many BBRF donors have a very personal interest in brain and behavior research. They know from often difficult, first-hand experience the devastation mental illness can bring upon family and friends, and they know that research will ultimately bring about better understanding and treatments.

Our **Research Partners Program** offers donors the opportunity to personally select and support scientists based on various criteria, including, but not limited to, illness specialty area or specific institutions, or a combination of these. Researchers are selected by the donor (our Research Partner) after members of our all-volunteer Scientific Council have conducted an independent peer review of the submitted applications and have made their recommendations for grant awards.

The **Research Partners Program** enables donors to choose among the best and brightest scientists and the most promising, cutting-edge proposals in mental illness research.

The results from these studies often provide the pilot data needed to apply for much larger federally funded grants (from the National Institute of Mental Health and the N.I.H., for example).

To date the BBRF **Research Partners Program** has funded more than 1,500 research grants.

To learn more about the Research Partners Program, please contact us at **646-681-4889** or **researchpartner@bbrfoundation.org**.

Visit us at bbrfoundation.org/researchpartners.

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With the support of family, friends and your community, you can make a difference in the fight against mental illness. The Brain & Behavior Research Foundation relies on the generosity of our donors to help fund leading brain and behavior research. You fuel the hope and promise of future discoveries that will improve the lives of those living with a mental illness. 100% of all donor contributions for research are invested in research grants. When you hold a fundraiser, you play a key role in helping us fund research toward improved treatments, cures, and methods of prevention for our loved ones.

“Every event brings us that much closer to a day free of mental illness. Thank you for partnering with BBRF.”

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Joelle Stocks-Dunnwald
Jean L. Stone
Kaitlyn Rose Strobe
Brenda Swanson
The Swenson Family
Peter J. Tarr, Ph.D.
Floyd Taylor
Warren Teo
Reggie Terrazas
Alex Thiel
Alina Thiele
James C. Thies
Barry D. Thomasson
Chengyuan Thornberry
Those service members who battle
the unseen enemy everyday
Gil Tiamsic
Dan Tierney
Janet Tierney
Kristen Tizon
Bosworth M. Todd, Jr.
Barbara Toll
Victoria Tom
Princessa Topping
Linda M. Tortorice
Steven R. Town
Tracy's birthday
Siddharth Tripathi
George Tsanos
Chi Tsui
Travis Tuerff
Trillian Turner
Kay M. Tye, Ph.D.
John Tyler and Caroline Kelly
David M. Unger
Susan E. Unvarsky
Martin Ureel
Josh Valdez
Barbara Van Noppen
Vipin Vats
Olivia Veri
Vijayaellementa
Gustavo Villota
Irantha Vinayagachelvan
Carl Vogtsberger
Cha VW

Adam Wachs
Jesse B. Wagner
Richard E. Wahlfeldt
Victor Walka, Jr.
Jen Ward
Scott Warpool
Deanna Warrick
Melynda Wayne
Robert and Frances Weisman
The Wells Family
Rachel Wendorph
Mike West
Mr. and Mrs. R. Graham White III
Perry White
Drew A. White-Jacobson
Brooke Wilken
The kind folks from the livestream
(W.W. Patreon Server)
Christian Willenbacher
William
Kate Williams' daughter on her
5th birthday
Sarah Williams
Paul Witschger
Bonnie Wolf
Jessica Wolfe
Jonathan and Becca Wonder
Rebecca Worcester
Tracy Worcester
Cheryl Wright, LPC
Mike Yamanaka
Keely Young
Kifayah S. Youssef
YYES, Co.
Alex Zeigler

Memorial Tributes

A friend's father
A loved one
A.S.
Kathy Abaray
John (Jed) B. Abrams
William F. Abrams
Elizabeth Adams-Addorio
Addison
Florie Adiutori
Aria N. Albertelli
All those who have been affected
All who have suffered with mental illness
Laona L. Allen
Janice M. Allison
Jose F. Amaya
Vincent S. Amoroso, Jr.
Katrina Anderson
Shirley A. Anderson's twin sister, Sharon
Susan (Sue) K. Anderson
Douglas S. Appelman
Nicholas W. Argall
Edward Arvey
Allan G. Atherton, Jr.
Zerqa Atiq
Dahl L. Atterbury
Elizabeth C. Attwood
Susan Auerbach
Jonathan T. Aylward
David Ayres
Elizabeth E. Bailey, Ph.D.
John D. Bailey, Sr.
Jordan A. Bailey
Susan L. Bair
Gregory T. Bak
Anna Balek
Scott Balgemann
John G. Banich
Jason Scott Bankert
Cynthia L. Barazowski-Kassel
Teresa C. Barganier
Colin M. Barkley
Brandon L. Barnhouse
Dr. Herbert F. Barrack, Sr.
Mary Jane Barrack
Carol A. Barrett
Marylene (Mary) Barrient-Crawford
Alan Barsky
Scott R. Bartlett
Nicholas (Nick) R. Bartos
Brian A. Bass
Panagiota (Pam) Batistas-Koliopoulos
Michael (Mike) T. Baumgardner
Tina Beavers

Memorial Tributes (continued)

Tyler J. Becker
Robert Beliak
Little Belle
Rick Belli
P. Bruce Benzler
Ronald Berger
Virginia J. Berl
Jamie Bernard
Kurt M. Bertram
Kalyan Bhandari
Stephen J. Binder
Joyce Blomker
Susan K. Blume-Babcock
William (Bill) H. Bodden
Matthew J. Bogdovitz
Kathleen P. Bohanon
Kirk D. Boise
Aidan J. Bone
Amy J. Boone
David W. Borks
Sebastian Boyum
Timothy Braggins
Angela Brancato
Robert Branch
Christopher D. Brehl
Concepcion Breslin
David Breuer
Jamie Brickley
Keli E. Brittain
Catherine (Cathie) A. Brodie
John W. Brooke
Daniel S. Brown
David Brown
Bruce Brownlee
Robert W. Bruno
Bobbie Buchieri
Walter W. Bundschuh
Peter R. Bunning
Colleen M. Burke
Amy J. Bush
C.K.
Alan E. Cabito
Patrick M. Caires
Colin M. Cameron
Ewan Cameron
Jon Capaldi
Robert (Bob) Capparell, M.D.
Sandra (Sandy) P. Capparell
Rachel Caprari
Tyler Carr
Dr. Edson G. Case, Jr.
Richard M. Casey
Paula A. Cassarino

Suzanne L. Castellani
Patrick J. Chaloux
Joyce Champion
Thomas D. Childers
Michelle Chiles
Micah Chiotti
Allison A. Chlan-Fellner
Patrick O. Clancy
Chris Cleary
Gena A. Cleland
Barbara E. Cole
James (Jimmy) R. Cole
Valerie L. Collar
Andrew Collins
Lynn Conaway
Alexander B. Conley
Andrew Connell-Fraser
Ryan J. Cook
Victoria (Tori) Trang Cook
Grace Cook-Blasingame
David Cooper-Claire
Maureen Copper
Wilson Cory
Cameron M. Cosentino
Cassie L. Costanzo
Mary V. Coughlan
Christopher M. Cowan
Joseph (Joe) F. Cronin
Ryan R. Crookston
Peter Cross
James Croves
Jacob W. Crowder
Steven E. Cruickshank
Joan (Joanie) M. Curtin
Sherry Cusumano, RN, LCDC, MS, DPN
Steve Daigle
Colter Dallman
Richard D. Daly
Anthony D'Angelo
Margaret M. Dann
Stanley F. Dann
Vincent A. Dann
Ross M. DaPrato
Terrence (King Terry) A. Davis
Marc Davis-Ribatto
A. Louise DeAngelis
Alexa DeCapua
Mary M. Deely
Eden DeFrain
Angeline DeLorenzo
James Demovich
Amanda Derr
Peter L. Derrick
Katherine Deschner

Henry (Hank) J. Deutschendorf II
Jack V. Devereaux, Jr.
Nathaniel J. Dickinson
John Dilanni
Jane Dissin
Brandon Dixon
Jonathan E. Dixon
Mary Louise Dixon
Nicholas (Nick) A. Dobbert
Leonard (LJ) W. Dobson, Jr.
Steven J. Dolinar
Una G. Donnelly
Stephen G. Doochin
Peter J. Dooher
Edward Doon
Eric T. Dorris
August (Gus) E. Doskey
Allison Lee Doyle
Michael Doyle
Rachel L. Drabenstott
Max N. Drabkin
Drew
William Driscoll
Lorraine (Lory) Dryden
Laurin Duban
Tegan V. Dubey
John L. Duda
Marcia K. Duncan
Ronald P. Dyer
Christopher (Chip) W. Dzumaryk
Edward
Ronald (Ronnie) O. Edwards
Robert Egan
Ann Eisner
Sheldon J. Elfenbein, D.O.
Sean Elkind
David W. Elliott
Heather Rae Elliott Staudacher
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Justin B. Evarian
Marian (Molly) P. Everdell
Benjamin C. Faetanini
John Farmer
Garrett R. Farr
Jonathan S. Farrer
James (Alec) A. Fentum
Victoria Ferland
Vincent P. Ferraro
Anthony Ferrero-Rankin
Lucas B. Fesko
Andy Fischer
Lucia Anna K. Fischer
David (Dave) M. Fittro
Dr. Judith (Judy) A. Fitzpatrick Davis

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Helen Flanders
Ruth H. Flick
Raymond J. Flood, Jr.
Trocar Flook
Helen C. Fontana
Jessica A. Forbes
Billy Foster
Dan Foutz
Jacob J. Fox
Frank
Carole Franklin-Monk
Gail W. French
Harvey Friedenber
Jason C. Frisco
Eric A. Fritts
Charles Fulton
Janet S. Funke
Christopher Furay
Stanton E. Gagel
Jack Galante
Diane N. Galba
Mary Garson
Tyler M. Gates
David Germany
Vito J. Giambanco
Chantal Gibli
Melody D. Gibson
Erin Gilmer
Hillary Ginsberg
Marietta M. Gjessing
Daniel J. Glorioso
Brian D. Go
Marc Goldberg
Dr. Patricia Goldman-Rakic
Jerry Goldstein
Dr. Menek Goldstein
Zachary Golub-Rosen
Dr. Jaime L. Gomez
Susan Goodwin-Cox
Ellen Gottfried
Michael Gould-Fadaie
Adam J. Grainawi
Annie Granger
William F. Grant, Sr.
David E. Green
Rose K. Greenberg
Mark J. Greenlee
Matthew J. Gregory
Noah J. Grimes
Phil Grimm
Wilfred L. Guerin
Thomas S. Gumport
Amanda G. Gurley
Clarence Gushurst

Evelyn Gutlaizer
Sharon Guzy-Levine
Jack Hadley
Dana A. Hafertepen
John B. Haldeman
Stephen B. Ham
Thomas H. Hambric
Ruth Handleman
John R. Hardesty
Matthew J. Hardin
John B. Harlow
Margaret Harrington
Stewart G. Harrison
Gary E. Hart
Dr. S. Ann Hartlage Feltes
Cynthia (Cindy) M. Harwell-Paar
Christopher J. Hashim
Rachel C. Hashim
Michael Heafield
Peter A. Healey
Bradley R. Heilman
Schuyler Henderson
Carl A. Hendrickson
Gary E. Heussler, Ph.D.
Brian D. Hill
Daniel (Danny) G. Hinden
Perry D. Hoffman, Ph.D.
Michael J. Holbrook
Jack Holden
Mark Hollander
Harold (Hal) B. Hollister
Corinne H. Holt
Dr. Philip S. Holzman
Sheldon K. Hooper
Marc Hopkinson
Beth Howard
Ling Hu
John D. Huberty
Rennie E. Hughes
William (Billy) W. Humphrey
Alan N. Hundert
Larry D. Huskey
Stephen J. Imarata
Naveed A. Iqball
Germaine Israel
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Shirley Jackson
Thomas Jackson
Vivian B. Jackson
G. Reed Jameson
William Jamnik
Miriam W. Javitch
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Michael D. Johnson

Ryan P. Johnson
Scott A. Johnson
Linda K. Johnston
Ashley (AJ) O. Jones
Herbert (Skip) R. Jones, Jr.
Matt Jorgensen
Savit Joshi
Herman Juffer
Leif Kamara
Sean B. Kamp
Zbigniew R. Karas
John R. Karatheodoris
Raymond J. Karoly, Sr.
June Karp's friends whose children
lost their battle with addiction
Steven M. Karp
Titus J. Kauffman
Claude R. Kaufman
Brian J. Kelly
Helen K. Kemp
Ken
Michael F. Kenigsberg
Enya L. Kent
Rashidul H. Khan-Shiply
Gerry Kiel
Paul Killea
Gilbert D. Kimzey
Sammy Kins
Jonathan S. Kinsley
Jill A. Kirby
George (Tom) T. Kirkman
Sharyl K. Kittilson
Elly Klamo
Doris M. Knapp
Michael Knutson
Allison (Alli) S. Kohl
Christine Kohlstedt
Peter C. Kohn
John N. Kolman
Robert Kolozsvar
Arty Kononchik
Michael Kort
Diane A. Koskinas
Adrian Koziel
Patrick H. Krause
John C. Kruger
Michael Krusell Nelson
Kendal (Ken) A. Kucera
Marc A. Kuder
Howard Kusten (Howie Pyro)
Antonio La Peruta
Berenice Lancis
Carole Jean Laping
Mary Ann Lapinskas
Jerry L. Lapp

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Susan Lasker-Brody, MPH
Jenna R. Laubach
Brendan L. Lauderdale
Robert E. Lauer
Justin A. LaVenter
Megan Lavin
Rodrigo Leclerc
Peter Lee
Virginia (Ginny) A. Lee-Hopseker
Marvin Leichtung
Ryan Lennon
Jorie Lester-Mark
Eva Levin Dalkoff
Judy Levine
Michael S. Levine
Paulette Levy
Paul A. Lewalski
Jacob Lichtenstein
Constance E. Lieber
Mary M. Lieber
Samuel A. Lieber
Stephen A. Lieber
Hans K. Lindgren
Richard E. Little
Frank J. Lodanosky
Cleta F. Logan
John (Jack) S. Logue II
Danielle M. Lorenz
Victor G. Lottmann
Joanna Lowry
Thomas A. Luby, Jr.
Michael Lucente
Gary A. Lund
Robert Lynne
Shirley S. Lynne
Steve Lynne
Barbara Lyons
Matthew C. Lyons
Nicola Lyons
Marissa N. MacLaughlin
Antal Magosi
Roman Makuch
Robert T. Malison, M.D.
Merrill M. Manning III
Rajneesh Manocha's beloved mother
Philippe Marchiset
Roland Marchiset
Albert Mark
Kathleen A. Marnock
Matthew Marshall
Jonathan D. Martin
Kim Martin
Stephen C. Martinelli

Adam (Atom) Martinez
Elizabeth Martino
Louise Maskell
Liam Masters
Michael D. Mattoon
Thomas Matye
Travis Matye
Andrew B. Mayer
Elizabeth L. McAnulty
Kevin P. McAward
Timothy P. McBride
Michael P. McClain
Lynne McClure, Ph.D.
Skye McCole-Bartusiak
Jacob A. McConkey
Adam T. McCurry
Elmer (Mac) H. McGilvray
Ann B. McGrory
John R. McLain, D.C.
Donald P. McPherson III
Kelsey (Kissie) H. McSwain
Larry A. McWilliams
Theodore (Ted) A. McWilliams
Dani Meadows
Victor P. Medellin-Sterling
Ann (Annie) M. Meehan
Peter Melnik
Jeffrey M. Mercer
Abigale O. Merrifield
Jake Meyer
Elisabeth Z. Meyers
Stuart Meyers
Daniel Michaels
Apphia Michelich
Ronald Michelich
Christopher F. Miehlich
Darlene C. Miller
Lori Miller-Levine
Pete Mills
Angela (Angie) M. Minestra
Mir
Keith Mirailh
Duncan N. Mitchell
Linda Mitchell
Neil Molberger
Gregory A. Monk
Juan (Joji) Maniquis Montelibano
Dakota Moon
Jeffrey D. Moon
Laura M. Moreau
Morgan (Mort) L. Morton
Ellen Mosher
Rick Mosher
Virginia (Ginny) L. Mott

Truly Mount
Juliet D. Mowrey
Patrick Rory Muldoon
Ronald (Ronnie) P. Mullan
Jack T. Mulos
Bradley Munroe
Andrew (Andy) L. Munson
Lisa (Tish) P. Murphy
Adam Neely
Connor D. Neely
Jonathan Nelson
Debjani Neogi
Gregory D. Nerode
Kristina Nestlerode
Christopher J. Neubecker
David Newman Art
Noah
Brandon Norrie
Rachel L. Okon
Aaron D. Olander
Rose A. Olandese
Elizabeth M. O'Neill's beloved spouse
Cameron R. Orr
William J. Osterburg
Rosa Y. Padilla-Seville
Barbara W. Page
Adria Pals
Albert L. Pan
Sue C. Paoletta
Judith E. Pardes
Peter E. Parisi
Alaina (Laney) Chantal Parkhurst
Silas Parry
Brad L. Paschal
Jarad M. Patko
Louis W. Patko
William F. Paul III
Arthur Peck, M.D.
Samantha (Sam) Saint Aubyn
Peluso-Swartzlander
Seymour Pestronk
Daniel L. Peterson
Morgan Phillips' beloved friends
lost to suicide
Parker E. Phillips II
William Brodie Phillips
Gilda N. Pickford
Sybil Pierce
Cecile (Ceci) Pieroni
Jessica A. Piesman
Wright Pillow
Robert A. Pini, Jr.
Dennis (Den) G. Pinson
Dee Ann Pitts

Memorial Tributes (continued)

Michael C. Polis
Donald (Donnie) C. Pounders
George C. Powell, Sr.
Trisha A. Prante
Andrew Premo
Michael Provo
Peppino Puleo
Joel M. Purrington
Vu Huynh Quang
Dylan Quast
Bert R. Queen
Ramez E. Qureshi
Arthur J. Radin, C.P.A.
Matthew R. Radula
Evelyn R. Rafferty
James Rafferty
Hotan Rafiee
Lisa M. Raimondo-Nowell
Sidharth Ramakrishnan
Brendan (Kira) Rasenberger
Rev. Wayne (Ras) R. Rasmussen
Cassandra (Cassie) N. Ray
Evan G. Rea
John D. Reardon
John Reason
Carol and Gerry Rees
Timothy Reese
Steven (Stevie) R. Reid II
Samuel (Sam) D. Rendall
Jay L. Renfro
Michael Reschke
Douglas W. Resh
Chris Reuter
Dorothy A. Reynolds
Eamonn P. Reynolds
Liam C. Rhinehart
Scott T. Richards
Linda (Sheryl) Richardson
Caasi A. Rich-Vogel
Priscilla Riddick-Trotter
David A. Rock
Kylista Rodriguez
Dr. John P. Rohar
Elizabeth Rolland
Brian Rorick
Thomas Rorick
Jill Rose
Melissa Rose's beloved sister
Zack Rosen
Diane E. Rosevear
Dr. John W. Rosevear
Alan G. Ross
Christina (Chrissy) Rossi

Matthew S. Rothman
David H. Roy
Donald J. Rully
John G. Ryan
Patricia E. Rzasa-Blum
Gloria F. Sack
Dr. Rajneesh Salwan
Dorothy Samels London
Catherine Sanacora
Carol Sanchez
Glory A. Sandberg, M.D.
Adam Schaffer
Max Schaffer
David A. Schaner
Betsy Scheld
Victoria Scheld
Michael W. Schemansky
Wendy L. Schenck
Scott W. Scheurer
Rochelle (Shelly) Schlesinger
Paul Schnobelen
Lee R. Schoolmeesters
Randolph (Randy) R.A. Schrade
Andy Schroer
Lori A. Schuh Fortner
Briana M. Schutze
Jack Schwartz
Timothy P. Scott
Kelly M. Scruggs
Michael Scullin
Ezra Seegull
Harriet Segal
Kenneth F. Selig
Timothy B. Sennott
Eddy Kwok-Hin Seto
Gary S. Sevitsky
William D. Shannon
Megan L. Sharp
William (Bill) Shepard
Edwin N. Sherr
Sheldon and Elaine Silverman
Duncan N. Simic
Kevin Simms
Frances L. Simon
Marcia Simon-Kaplan
James W. Simpson
Alyssa M. Sinclair
Dr. Surinder B. Singh
John T. Sinnott
Jean C. Sloan's loved ones
Edmund Smith
Edward J. Smith
William H. Smith II
Donald E. Snyder

Dr. Anthony (Tony) T. Soares
Drew Sobotka
Michael V. Solomon
Carol A. Solverson
Chris E. Sorensen
Kelly L. Sorensen
Nathan A. Soukup
Susan K. Soyka
Gena Spaulding
Ann Spencer
Jeffrey T. Sramek
Gregory St. Amand
Doretha St. Clair
Samuel R. Stack
Ian J. Stancato
Brian A. Stapleton
Gregory L. Starling
Tyler R. Starling
Jonathan E. Stavis
John (Wes) W. Stermole
Evelyn Stoddard-Crane
John H. Streicker
Mollie E. Stricker
Trevor S. Strnad
Mary J. Strub-Caulkins
Hilda R. Studebaker
Kenneth E. Stutzman
Michael D. Sugarman
Ms. Sumathi
Dawn E. Sumlin
Anthony M. Supino, Esq.
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Andrew Taddy
H. Vonn Taylor
Bruce G. Taymor
Gerald (Jerry) P. Tchir
Marc A. Tenenbaum
Rocky Terrell
Mary N. Thawley
William Theos
Bradley I. Thomas
George M. Thomas
Thomas
Camilla (Cammie) L. Thompson
George M. Thompson
Dr. Richard D. Todd
Ethel M. Toepel
Emily I. Tomlin
Jake M. Topley
C. Dominique Toran-Allerand, M.D.
Paul A. Truman
Robert P. Truman
Donald Trybula
Alexandros Tsaoussis-Maddock

Memorial Tributes (continued)

Amanda Tucci
Robert (Bob) T. Tucker
Andrew (Andy) J. Tullos III
Lidia A. Tursini
Adele C. Tursone
Joseph Tursone
Julian B. Tylka
Mackenzie E. Tynan
Christian M. Unger
Marie Upton
Flor A. Valencia Torres
Stephanie L. Van Gundy
Charles Varkoly
Mary Ann F. Verhaalen
Joaquin B. Villarreal
Richard R. Vinyard
John (JM) M. Visbal
Gregory Von Burg
Paul Von Burg
Dean Voukelatos
Riley P. Wachhorst
Wm. F. Wagner, Jr.
Deniece (Niece) J. Waidhofer
Capt. Anders (Andy) G. Wallin II
Tordis Wallin
Cameron D. Walsh
Thomas Walsh
Dannie Wan Fontaine
Sharon Wang
Andrew W. Ward
Kenneth R. Warning
Leonard Warren
Paul J. Weintraub
Kenneth R. Weisz
James C. Welbourne
Thomas J. Wendt
Josh Wertz
Eugenia (Gene) West Ferrell
Thomas C. Whisler
Dan Wicker, Jr.
Michael G. Wieman
Jon K. Wilbur
Gary Williams
Penny Williams
Martin S. Willick, M.D.
Joseph A. Wills II
Margaret Wills
Richard K. Wilson
Timothy (Timo) Wilson
Marjorie (Margie) Wineburgh
Douglas Wistner
Barbara (Bonnie) L. Wolf
Kenneth A. Wood

Alan H. Woodard
Ryan M. Woodland
Ross Worrell
Bernard Wortman, Ph.D.
Christian D. Yeatts
Ernest M. Yeghian, Jr.
Charlotte Young
Marilyn Zalokar
Anna Zarski
Peter W. Zartman
Edward N. Ziegler
Gladys P. Ziegler
Barry L. Zimmerman

Financial Summary*

Consolidated Statement of Financial Position

	DECEMBER 31, 2022	DECEMBER 31, 2021
ASSETS		
Current Assets		
Cash and cash equivalents	\$19,059,866	\$16,218,222
Investments, at fair value, current portion	11,104,800	16,798,962
Contributions receivable	2,202,142	281,162
Pledges receivable, current portion	190,277	210,000
Prepaid expenses and other assets	225,037	175,982
Total Current Assets	32,782,122	33,684,328
Assets held in charitable remainder trust	1,701,437	2,127,513
Fixed assets, net	6,884	10,152
Pledges receivable, net, less current portion	9,738	190,015
Investments, at fair value, less current portion	8,947,449	8,947,449
Right-of-Use Asset	424,126	—
Total Assets	\$43,871,756	\$44,959,457
LIABILITIES AND NET ASSETS		
Liabilities		
Accounts payable and accrued expenses	\$95,271	\$243,940
Grants payable	15,522,195	19,354,810
Operating lease liability, current portion	353,580	—
Accrued compensation	40,776	40,007
Annuities payable	778,644	1,013,277
Charitable gift annuities payable	142,918	152,582
Total Current Liabilities	16,933,384	20,804,616
Operating lease liability, net, less current portion	144,891	—
Total Liabilities	17,078,275	20,804,616
Net Assets		
Without donor restrictions	17,792,107	14,145,437
With donor restrictions	9,001,374	10,009,404
Total Net Assets	26,793,481	24,154,841
Total Liabilities and Net Assets	\$43,871,756	\$44,959,457

* The Foundation's complete audited financial statements are available on our website.

Consolidated Statement of Activities

	YEAR ENDED DECEMBER 31, 2022	YEAR ENDED DECEMBER 31, 2021
SUPPORT AND REVENUE		
Contributions	\$12,828,748	\$14,201,498
Special events, net	46,716	—
Contribution of services	2,116,704	2,315,959
Bequests	8,618,365	2,563,135
Net realized and unrealized (losses) gains on investments	(4,857,163)	3,426,155
Net (depreciation) appreciation of assets held in charitable remainder trusts	(426,076)	364,528
Dividend and interest income	268,882	234,294
Total Support and Revenue	18,596,176	23,105,569
EXPENSES		
Program Services		
Research grants and awards	8,868,584	9,805,853
Scientific advancement	2,414,690	2,396,220
Program support	2,258,132	2,125,712
Total Program Services	13,541,406	14,327,785
Supporting Services		
Fundraising**	850,240	802,458
Administration**	1,565,890	1,507,275
Total Supporting Services	2,416,130	2,309,733
Total Expenses	15,957,536	16,637,518
Change in Net Assets	2,638,640	6,468,051
Net Assets, beginning of year	24,154,841	17,686,790
Net Assets, end of year	\$26,793,481	\$24,154,841

** All fundraising and administration expenses are funded by specially designated grants.

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