BRAIN & BEHAVIOR RESEARCH FOUNDATION

2019 ANNUAL REPORT

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



BBRF is the world's largest private funder of mental health research grants, supporting transformative discoveries in order to develop improved treatments, cures, and methods of prevention for our loved ones.

CONTENTS

Mission	4	BBRF Events	28
Leadership Letter	6	The Research Partners Program	42
Important Advancements	8	Team Up for Research	50
BBRF Scientific Council	12	2019 Donor Listing	52
2019 Leading Research Achievements	14	Getting the Word Out	76
BBRF Grants	18	Financial Summary	78
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The Research We Fund

We invest in innovative research because we believe that only by pursuing the boldest and most ambitious ideas will we find better treatments, cures, and methods of prevention for mental illness.

We are at the Forefront of Critical Discoveries

Since 1987, the Brain & Behavior Research Foundation has awarded more than \$408 million in grants that have led to discoveries that change the way we think about recovery. BBRF-funded research has contributed to:

- FDA approval of the first rapid-acting antidepressants (esketamine and brexanalone) to alleviate severe depression symptoms within hours.
- Dietary supplements for pregnant women to potentially help prevent subsequent mental illness in the child.
- Development of Transcranial Magnetic Stimulation (TMS) and continued improvement of TMS and other non-invasive brain stimulation treatments for treatment-resistant depression and obsessive compulsive disorder.
- Computer-guided training for cognitive remediation in people with schizophrenia.

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.

VISION

To dramatically improve the lives of those living with mental illness, ultimately enabling them to live full, happy, and productive lives.

We fund leading-edge research for mental health that:

- Patients require to recover
- Parents desire for their children
- Psychiatrists need to provide better care
- Pioneering Scientists depend upon to make new discoveries
- Philanthropists can point to with pride

Our goal: new treatments, cures, and methods of prevention.

30+ years

For more than 30 years the Brain & Behavior Research Foundation has fostered new research pathways and transformative breakthroughs.

70k+
donors

Our 70,000 donors have joined together in the great challenge of modern medical science — overcoming mental illness. \$408M+
awarded

Since 1987 the Foundation has awarded more than \$408 million to fund more than 5,900 grants. 4,800+ researchers

Grants have been given to more than 4,800 leading scientists around the world.

WHAT WE SUPPORT

BBRF funds research in the following areas: addiction, ADHD, anxiety, autism, bipolar disorder, borderline personality disorder, depression, eating disorders, OCD, PTSD, schizophrenia, and suicide prevention.

OUR SCIENTIFIC COUNCIL

The high quality of the research we fund is made possible by the BBRF Scientific Council. This group of 181 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.

"Together we can dramatically improve the lives of those living with mental illness and enable more people to live full, happy, and productive lives."

Jeffrey Borenstein, M.D. BBRF President & CFO

OF EVERY DOLLAR
DONATED FOR RESEARCH
GOES TO RESEARCH

Our operating expenses are covered by separate foundation grants.



Jeffrey Borenstein, M.D.President & CEO



Herbert Pardes, M.D.President, Scientific Council



Stephen A. LieberChair, Board of Directors

Since 1987, the Brain & Behavior Research Foundation has invested in the future. The research we fund is innovative, visionary and transformative. We are proud to present you with our 2019 Annual Report.

BBRF is a collaboration between generous donors and dedicated scientists. We understand that advances in science often happen where innovative ideas are nurtured. And we foster it in the best way possible—by supporting scientists with the funding they need to bring their ideas to fruition. We provide the initial funding they need to pursue their hypothesis, concepts and strategies that we believe have the greatest chance of advancing the field.

BBRF has provided more than \$408 million in research grants to more than 4,800 scientists around the world. We are proud to report that in 2019 BBRF funded more than \$15.2 million in research grants across a broad spectrum of brain illnesses including addiction, ADHD, anxiety, autism, bipolar disorder, borderline personality disorder, depression, eating disorders, OCD, psychosis, PTSD, schizophrenia, as well as suicide prevention.

100% of every dollar donated for research is invested in our research grants. Our operating expenses are covered by separate foundation grants. This means that if you donate a dollar for research, that dollar goes directly to the scientist.

All BBRF grantees are chosen by our world-renowned Scientific Council. Led by Dr. Herbert Pardes, the Council is comprised of 181 scientists who rigorously evaluate every grant application, identifying the most promising and high-quality science. The Council selects those proposals, submitted from around the world, with the

greatest potential to lead to significant breakthroughs; projects that will bring benefits by producing new research tools, better treatments, and methods of prevention. It is a formidable task and one that each Council member enjoys and looks forward to. This past year the Council evaluated more than 900 grant proposals. BBRF awarded 200 Young Investigator research grants for \$35,000 per year over two years.

One reason that research funded by BBRF has such great impact is because we do not limit our focus to one illness or condition. It is important that we continue to award grants to those investigators who try to determine how the brain works through basic research, as well as develop prevention measures and better treatments—such as the recent development of rapid-acting antidepressants for treatment-resistant depression.

BBRF grants are often the springboard that young scientists need to get a new idea off the ground, create an improved treatment or new methods for prevention, to generate the crucial preliminary data to secure additional funding from the National Institutes of Health. BBRF grants often have great impact on a scientist's career because of their multiplier effect. BBRF grantees usually go on to receive sustained grant support from other sources (both federal and private) that on average has equaled 10 times the original research grant amount.

Many significant Foundation-funded research results were published in articles in leading psychiatric and medical journals during 2019. This annual report features our "Top 10" Leading Research Achievements by BBRF Grantees, Prizewinners & Scientific Council Members in 2019.

illustrating just some of the remarkable progress being made by investigators we have funded. These important advancements, as well as other scientific discoveries, are changing how we help people who live with mental illness.

In November at our fall Symposium nine outstanding scientists presented their research on depression, ADHD, bipolar disorder, and schizophrenia. Their work is distinguished by their devotion to finding innovative new therapies that will improve care for those living with mental illness. Later that evening at our International Awards Dinner we presented the Pardes Humanitarian Prize in Mental

Health to Dr. William T. Carpenter, Jr., the Honorary Pardes Humanitarian Prize in Mental Health to Cynthia Germanotta and Born This Way Foundation, and we celebrated the nine outstanding scientific achievement prizewinners. At our "Breaking the Silence About Mental Illness Luncheon" this past May, Tipper Gore spoke with us about the stigma that is all too often still associated with mental illness

Our main print publication, *Brain & Behavior Magazine*, continues to highlight the most important advancements in scientific research. This is supplemented by our weekly eNews, a weekly email newsletter written for our donors and the general public featuring the research of BBRF grantees, prizewinners, and Scientific Council members. Through these and other efforts, we aim to share 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 television series, "Healthy Minds," which is broadcast on public television stations around the nation and is available online. The series provides useful information to the public about psychiatric

conditions and treatments as well as cutting edge research advancements.

In summary, 2019 was a strong testament to more than 30 years of our leadership in supporting mental health

research. Working alongside the BBRF Board, Scientific Council, and our donors is an honor and we thank you for your dedication to our mission.

Together, we will continue to fund innovative and impactful research that will drive the field forward. Our shared goal of a world free from debilitating mental illnesses relies first and foremost upon you, our donors—in partnership with the scientists chosen by the BBRF Scientific Council—who are working

to transform your donations into improved treatments, cures, and methods of prevention for our loved ones.

We are inspired by the magnitude and scope of the discoveries that are being made by the scientists we fund together and appreciate your ongoing generous support.

Sincerely,

Innovative

technology.

scientists. Novel

ideas. Cutting edge

Jeffrey Borenstein, M.D.

President & CEO

Herbert Pardes, M.D. President, Scientific Council

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Stephen A. Lieber Chair, Board of Directors

Important Advances Funded Through BBRF Grants

2019

Rapid-Acting Antidepressants Approved

The FDA approves the first-ever rapid-acting antidepressants for use in treatment-resistant depression (esketamine) and postpartum depression (braxanalone). 90 BBRF grants over 20 years helped provide the foundation.

2018

More Rapid Form of Non-Invasive Brain Stimulation for Depression

Dr. Daniel Blumberger and colleagues successfully demonstrate iTBS, a way of delivering repetitive transcranial magnetic stimulation in sessions lasting a few minutes, as opposed to over a half-hour.

2018

Pregnancy Complications and Schizophrenia

Dr. Daniel Weinberger and colleagues show that pregnancy complications and related stresses amplify the child's inherited risk for schizophrenia by a factor of 10, with male children affected more than females.

2017

Choline Supplementation in Pregnancy

Dr. Robert Freedman pioneers choline supplementation in the diet of pregnant women to potentially reduce risk of mental illness in children. The American Medical Association (AMA) recommends including choline in prenatal vitamin supplements.

2019

A New Perspective on Anorexia

Dr. Cynthia Bulik and a large international team of geneticists demonstrate that anorexia nervosa is a metabolic disorder as well as a psychiatric one.

2018

Computer-Delivered Cognitive Training Enhances Recovery in Schizophrenia

Dr. Gregory Light and team demonstrate that a training program delivered by a personal computer can help many patients with chronic schizophrenia improve cognition and social skills.

2018

Machine Learning Facilitates Early Diagnosis

Dr. Bo Cao uses machine learning to read and analyze brain scans in order to confirm newly diagnosed schizophrenia and predict individual response to antipsychotic medication.

2017

Bright Light Therapy for Bipolar Depression

Drs. Dorothy Sit and Katherine Wisner demonstrate the potential efficacy of bright light therapy delivered at mid-day in treating bipolar depression, dispelling concerns about inducing mania. "The Brain & Behavior Research Foundation is the most remarkable organization that I've ever interacted with. It has had such a profound impact on not only my career, but on generations of young investigators. Through its BBRF Grants, it has been a catalyst to the development of young scientists and through that mechanism has fueled innovation in psychiatry since its inception."

- John Krystal, M.D.

(pioneer in rapid-acting antidepressant research)

2016

Metabolism and **Depression**

Dr. Lisa Pan and colleagues discover that treating metabolic problems can dramatically lessen symptoms in some patients with treatment-resistant depression.

2015

Stem-Cell Technology and Autism Research

Dr. Flora Vaccarino shows that brain "organoids" grown from reprogrammed skin cells sampled from autism patients can recapitulate developmental flaws associated with autism.

\bigcirc 2015

Coordinated Care Can Make a Big Difference in Schizophrenia

Drs. Nina Schooler and Tim Mueser and colleagues provide strong clinical evidence that early intervention and coordinated team care can make a real, positive difference in outcomes for first-episode psychosis patients.

2009

Thinning of Brain's Right Hemisphere is Linked to Depression Risk

Dr. Myrna Weissman and colleagues discover this in one of the largest-ever imaging studies of depression.

2016

Gut Microbes as Possible Treatments for Stress-Related Illness

Dr. Christopher Lowry and colleagues show that mice could be treated mice with immune system-regulating gut bacteria to boost their immune system against the harmful impact of stress.

2015

Predicting Suicide Risk

Dr. J. John Mann and team show that parents' history of suicide attempts can be used to predict suicide risk in their children.

2013

Using Stem Cells to Make Brain Cells

Dr. Stuart Anderson and colleagues induce stem cells to redevelop as cortical interneurons, a milestone in research to study brain pathology using cells sampled from people with psychiatric disorders.

2008

FDA Approval of Transcranial Magnetic Stimulation (rTMS) as **Non-Invasive Alternative** to Electroconvulsive **Therapy**

Dr. Mark George and colleagues publish research paving the way to FDA approval for rTMS treatment in certain patients with severe, treatment-resistant depression.

Important Advances Funded Through BBRF Grants

2007

A Way Forward for Diagnostics on Mental Illness

Dr. Grigori Enikolopov and colleagues develop the first biomarker enabling neural stem and progenitor cells (NPCs) to be tracked, noninvasively, in the brains of living human subjects.

2004

Clarifying Suicide Risk in Teens Taking Antidepressants

In multicenter Treatment of Adolescent Depression Study (TADS) Dr. John March and colleagues show risk can be greatly reduced if antidepressant is combined with cognitive behavioral therapy.

2003

Deep Brain Stimulation (DBS) in Treatment of **Depression**

Dr. Helen Mayberg uses this technology to target 'area 25,' a place in the brain she earlier found to be an important locus of depression pathology.

The Brain's Capacity to Recover

Dr. Bruce McEwen's pathbreaking studies of the impact of stress on the hippocampus lead to key insights about neural plasticity and the potential for recovery of function.

2005

Invention of Optogenetics to Better Understand and Treat Mental Illness

Dr. Karl Deisseroth and colleagues invent this experimental method that involves the use of light to switch neurons on or off, one at a time or in groups. Opens new research opportunities worldwide to study mechanisms behind depression and other psychiatric illnesses.

2003

Proof that Clozapine Reduces the Risk for Suicide

A study directed by Dr. Herb Meltzer provides definitive proof leading to the first approval by the FDA of any drug for this purpose and for any specific component of a psychiatric disorder, rather than a disorder as a whole, e.g. schizophrenia.

2001

Trauma Center for 9-11 Survivors

Dr. Yuval Neria sets up a trauma center to study the effects of the WTC attacks.

2000

Nobel Prize for Discoveries on Signaling in the Nervous System and Providing a Molecular Window on the Brain

Dr. Eric Kandel and Dr. Paul Greengard are awarded the Nobel Prize (along with Dr. Arvid Carlsson) for this work that eventually impacts treatments for Parkinson's, schizophrenia, and depression and holds promise for the improvement of memory in dementia.

"I cannot say how much BBRF helped my career, actually not just my career but all of my research 'offspring.' I think since I've been at Columbia, postdocs in my lab must have received somewhere around 35 Young Investigator Grants. So I don't think I would be standing here if it wasn't for this Foundation."

- René Hen, Ph.D.

(pioneer in neurogenesis research)

2000

Transcranial Magnetic Stimulation for Treatment of Depression

Dr. Mark George reports on development of this new kind of non-invasive brain stimulation as an alternative to electroconvulsive therapy.

1998

Identification of Shared Susceptibility Genes in Bipolar Disorder and Schizophrenia

Dr. Elliot Gershon and others report on and assess evidence of shared susceptibility genes.

Identification of Risk Factors for Depression

Dr. Jane Costello and colleagues initiate the Great Smoky Mountain Study which helps reveal which young people tend to get mental illness, how useful treatments are, and promising directions for future research and treatment

1989

FDA Approval of the 2nd-**Generation Antipsychotic Drug Clozapine for Treatment-Resistant** Schizophrenia

Studies by Dr. Herbert Meltzer lead to this development.

1999

Medication Plus Therapy Improves Results in Children with ADHD

A large multicenter clinical trial called MTA (Multimodal Treatment for ADHD) directed by Dr. John March and others shows that children who receive drugs and therapy usually fare best.

1996

Diagnostic Screen for Prevention of Teen Suicide

Dr. David Shaffer confirms that most teen suicides occur in the context of psychiatric illness and creates the Columbia Teen Screen, soon adopted nationwide.

Ó 1991

PET and MRI Functional Imaging Studies

Dr. Helen Mayberg begins pioneering functional imaging studies in neuropsychiatric disorders and develops an influential model of depression.

1988

Identification of Risk Factor for Adolescent Suicide

Dr. David Brent helps establish mood disorders, substance abuse, impulsive aggression, parental suicidal behavior, and access to guns as significant risk factors.

Our Scientific Council

- **181** Members (12 Emeritus)
- **54** Members of the National Academy of Medicine
- **41** Department & Program Chairs
- **16** National Institute of Health Chiefs & Directors
- **11** Members of the National Academy of Sciences
- 4 Recipients of the National Medal of Science
- **3** Directors of the National Institute of Mental Health
- 1 Nobel Prize Winner

President

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Our New Scientific Council Members

Led by Dr. Herbert Pardes, the founding President of our Scientific Council, the all-volunteer group of preeminent mental health researchers reviews hundreds of grant applications each year and selects the most promising research ideas with the greatest potential to lead to breakthroughs.

The Scientific Council guides the Foundation to fund creative and impactful research relevant to the whole spectrum of mental illness.

We welcome our six newest members.



"We are seeing significant advances in psychiatric research on multiple fronts. We are pleased that these six leading experts joined our Council to keep the momentum going by helping us to identify the best ideas in brain research—the basis for awarding **BBRF** grants."

- Herbert Pardes, M.D.



KRISTEN BRENNAND, Ph.D.

Associate Professor, Departments of Genetics and Genomics, Neuroscience, and Psychiatry Icahn School of Medicine at Mount Sinai 2018 BBRF Maltz Prizewinner for Innovative & Promising Schizophrenia Research 2016 BBRF Independent Investigator Grant 2012 BBRF Young Investigator Grant



LISA B. DIXON, M.D., M.P.H.

Professor of Psychiatry at CUMC Director, Division of Behavioral Health Services and Policy Research

New York State Psychiatric Institute, Columbia University Vagelos College of Physicians and

1999 BBRF Independent Investigator Grant 1991 BBRF Young Investigator Grant



ROBERT L. FINDLING, M.D., MBA

Director of Child and Adolescent Psychiatry Vice President for Psychiatry Services and Research

Johns Hopkins Medicine / Kennedy Krieger

1993 BBRF Young Investigator Grant



YASMIN L. HURD, Ph.D.

Ward-Coleman Chair in Translational Neuroscience

Professor of Psychiatry, Neuroscience and Pharmacological Sciences Icahn School of Medicine at Mount Sinai



LISA M. MONTEGGIA, Ph.D.

Barlow Family Director, Vanderbilt Brain

Professor, Department of Pharmacology Vanderbilt University Medical Center 2014 BBRF Distinguished Investigator Grant 2010 BBRF Independent Investigator Grant 2005 BBRF Freedman Award 2003, 2001 BBRF Young Investigator Grant



CARLOS A. ZARATE, JR., M.D.

Chief, Experimental Therapeutics & Pathophysiology Branch and Section on the Neurobiology and Treatment of Mood

National Institute of Mental Health 2011 BBRF Bipolar Mood Disorders Award Prizewinner (Colvin Prize) 2005 BBRF Independent Investigator Grant 1996 BBRF Young Investigator Grant

2019 Leading Research Achievements by **Foundation Grantees**

Next-Generation Therapies: Schizophrenia

Adding Guanfacine Boosted Benefits of Cognitive Remediation Therapy in a Schizophrenia Spectrum Disorder



Margaret M. McClure, Ph.D.

Icahn School of Medicine at Mount Sinai

2013 BBRF Young Investigator American Journal of Psychiatry, **April 2019**

Adding the FDA-approved drug guanfacine to a validated therapy program to treat cognitive deficits led to even better results for individuals with a schizophrenia spectrum disorder. This was demonstrated in a study of 28 patients with schizotypal personality disorder. Like others across the schizophrenia spectrum, these patients had cognitive impairments affecting verbal and spatial memory, attention, abstract reasoning, and verbal fluency. Those receiving quanfacine in addition to cognitive remediation plus social skills training showed significantly greater improvement in reasoning, problem-solving, functional skills, and in some cases, social skills, compared with patients who received only cognitive remediation therapy plus social skills training.

Diagnostic Tools/Early Intervention: Schizophrenia, Psychosis, ADHD **Higher Maternal Choline Levels in Pregnancy Had Protective Role in Infant Brain Development**



Robert R. Freedman, M.D.

University of Colorado Denver School of Medicine

BBRF Scientific Council. 2015 Lieber Prize, 2006 and 1999 BBRF Distinguished Investigator



M. Camille Hoffman, M.D.

University of Colorado Denver School of Medicine

2015 Baer Prize Journal of Pediatrics, May 2019 A study of 132 pregnancies found that children born to mothers who had infections during the first 16 post-conception weeks performed better in two key postnatal measures of healthy brain function when their mothers had higher levels of choline—an essential nutrient—during pregnancy, compared with children whose mothers had lower choline levels. A deficiency of choline, affecting up to half of pregnant women, appears to impair the development of inhibitory circuitry around the time of birth, possibly contributing to pathology seen in schizophrenia, psychosis, attention-deficit and other disorders. This research supports the case for choline supplementation during pregnancy.

The research team included: **Amanda Law, Ph.D.**, BBRF Scientific Council, 2011 Baer Prize, 2009 BBRF Distinguished Investigator and 2006 Young Investigator; Sharon Hunter, Ph.D., 2003 BBRF Young Investigator.

Diagnostic Tools/Early Intervention: Anxiety

Over-sensitivity to Sound, Smell, Touch, or Taste in Preschoolers Predicted **Higher Risk for Anxiety at Age 6**



Kimberly L. H. Carpenter,

Duke University School of Medicine

2015 BBRF Young Investigator Journal of Abnormal Child Psychology, June 2019

Researchers reported that sensory over-sensitivity in children of preschool age (2 to 5) is a risk factor for subsequent anxiety disorder, and can predict the appearance of anxiety symptoms at age 6. The intensity of anxiety symptoms, in turn, was found to correspond with the seriousness of concurrent behavioral issues such as irritability, picky eating, and sleep problems. Fifty-two percent of preschool children in the study with at least one sensory sensitivity went on to meet criteria for anxiety disorder at school age. These included physical contact with other people or fabrics and clothes tags; food textures; visual experience such as bright lights; auditory experiences such as loud or high-pitched noises; olfactory experiences; tastes; and sensations of motion.

The research team included: Helen L. Egger, M.D., 2006 and 2000 BBRF Young Investigator and 2004 Klerman Prize; William E. Copeland, Ph.D., 2008 BBRF Young Investigator; **Scott Compton, Ph.D.**, 2001 BBRF Young Investigator.

Next-Generation Treatments: Bipolar Disorder

Study Finds Lithium Has Advantages Over Other Mood Stabilizers in Youths with Bipolar Disorder



Boris Birmaher, M.D.

University of Pittsburgh School of Medicine

2013 Colvin Prize

Journal of the American Academy of Child & Adolescent Psychiatry, July 2019

The drug lithium is widely regarded as a first-line treatment for adults with bipolar disorder. Its suitability for younger patients has now been demonstrated. Taking advantage of a 15-year study that has followed 413 youths with bipolar disorder recruited at ages 7 to 17, researchers compared outcomes in 340 of the youths. These participants had over 2,600 follow-ups: 886 were in participants being maintained on lithium, while 1,752 were in participants taking other medications. Lithium use was associated with fewer suicide attempts, fewer depression symptoms, better psychosocial function, and less parent-reported aggression, the team found.

The research team included: Martin Keller, M.D., BBRF Scientific Council, 1998 Selo Prize; Benjamin Goldstein, M.D., Ph.D., 2014 BBRF Independent Investigator, 2007 Young Investigator, 2018 Colvin Prize.

Basic Research: Eating Disorders

Large Genome Study Suggests Anorexia Nervosa is a Metabolic Disorder as Well as a Psychiatric One



Cynthia Bulik, Ph.D.

University of North Carolina, Chapel Hill and Karolinska Institute, Sweden

2017 BBRF Distinguished Investigator

Nature Genetics, August 2019

The largest genetic study to date of anorexia nervosa, involving nearly 17,000 patients and over 55,000 controls, has identified eight areas in the human genome where DNA variations contribute to risk for the illness. More important, potentially: the research extends our understanding of this psychiatric illness by showing that genetic factors that influence metabolism, and specifically body mass index (BMI), also contribute to its origins. Thus, processes in the body that normally regulate metabolism, including weight regulation, may be malfunctioning in anorexia nervosa patients, underlying some of the weight and feeding symptoms previously explained as psychological.

The research team included: Patrick F. Sullivan, M.D., FRANZCP, 2014 Lieber Prize, 2010 BBRF Distinguished Investigator; Gerome Breen, Ph.D., 2007 BBRF Young Investigator; Dan Rujescu, M.D., Ph.D., 2006 BBRF Independent Investigator; Wade H. Berrettini, M.D., Ph.D., BBRF Scientific Council, 2009 and 2004 BBRF Distinguished Investigator, 1996 Selo Prize; **Stephan** Ripke, M.D., Ph.D., 2015 BBRF Young Investigator, 2014 Baer Prize; Sarah E. Medland, Ph.D., 2017 BBRF Independent Investigator.

Basic Research: Bipolar Disorder

Long-term Study Reveals Trajectory of How Bipolar Disorder Emerges in High-Risk Youth



Anne Duffy, M.D., F.R.C.P.C.

Queen's University at Kingston, Ontario

2005, 2003 BBRF Independent Investigator; 2000 Young Investigator

American Journal of Psychiatry, September 2019 A multi-decade study focusing on children of parents diagnosed with bipolar disorder quantifies the risk—24.5%—that they themselves will develop bipolar illness, and suggests a "progressive sequence" in which the illness typically unfolds between the ages of 12 and 30. The "trajectory" established in the study is expected to help doctors to diagnose bipolar disorder in young people, which is challenging partly because acute symptoms are often not specific to bipolar disorder and often overlap with those of other disorders. The study found that childhood sleep and anxiety disorders are important predictors of emerging bipolar disorder and that progression to a diagnosis was typically heralded by an episode of mania or hypomania and/or a first episode of psychosis following a single episode or recurrent major depression.

The research team included: **Paul Grof, M.D., Ph.D.**, 2005 and 2003 BBRF Independent Investigator, 2002 Falcone Prize, 2000 Young Investigator.

Diagnostic Tools/Early Intervention: Autism Spectrum Disorder

Progress in Research on Brain Wave Patterns to Predict Autism Outcomes



Charles A. Nelson III, Ph.D.

Harvard University, Boston
Children's Hospital

2017 Ruane Prize



April R. Levin, M.D.

Harvard University, Boston
Children's Hospital

2016 BBRF Young Investigator.

Nature Communications, September 2019 Researchers made an important discovery about the relationship between patterns in brain waves—oscillations created by the activity of neurons—and pathology in autism spectrum disorder (ASD) that emerges in the first 3 years of life. They used EEG (electroencephalograms) to measure brain waves in infants beginning 3 months after birth and continuing until a full behavioral assessment at age 3. The infants were born with high risk for ASD, as each had at least one older sibling who had already been diagnosed. In the 30% who went on to an ASD diagnosis at age 3, when outward symptoms are evident, it was clear in retrospect that brain wave differences predicting that outcome were clearest in the first postnatal year. While not yet ready for the clinic, the biomarker is a strong step toward early diagnosis.

Basic Research: PTSD, Anxiety

In Mice, and Perhaps People, Gut Organisms Impact the Ability to Extinguish Fear



Conor Liston, M.D., Ph.D.

Weill Cornell Medical College

2013 BBRF Young Investigator

Nature, October 2019

Researchers demonstrated that changes in the microbiome—organisms and viruses living in the gut—can result in an impaired ability to extinguish fear. In experiments with mice raised without gut organisms and others treated with organism-killing antibiotics, the ability to extinguish fear was impaired, compared with mice whose microbiome was not altered. The difference suggested that signals from the microbiome were necessary for optimal extinction of conditioned fear responses. Such extinction comes into play when a stimulus initially feared is found to be of little or no danger. The inability to extinguish such fears can be an important factor in post-traumatic stress disorder and anxiety. Bacteria and viruses in the gut may affect the central nervous system through their production and circulation of metabolites, four of which were identified in this preliminary study.

The research team included: **Francis S. Lee, M.D., Ph.D.**, BBRF Scientific Council, 2010 BBRF Young Investigator, 2005 and 2002 Young Investigator; **Dequiang Jing, M.D., Ph.D.**, 2012 BBRF Young Investigator

Next-Generation Therapies: Depression

Deep-Brain Stimulation Showed Multi-Year Effectiveness in Severely Depressed, Treatment-Resistant Patients



Helen S. Mayberg, M.D.

Icahn School of Medicine at Mount Sinai

BBRF Scientific Council, 2007 Falcone Prize, 2002 BBRF Distinguished Investigator, 1995 Independent Investigator, 1991 Young Investigator

American Journal of Psychiatry, November 2019

A long-term follow-up study of 28 people whose serious, treatmentresistant major depression was treated surgically with deep-brain stimulation (DBS) found that 21 of the patients experienced a sustained and robust antidepressant response (at least 50% symptom reduction). The follow-up period ranged from 4 to 8 years. Dr. Mayberg, who pioneered DBS, said these results justify continued clinical testing of DBS, since the level of relief it provided to many of the participants over time "is unmatched" by other treatment types in patients with comparably severe treatment resistance. Participants in the study had failed to respond to at least four prior antidepressant treatments, including electroconvulsive therapy (ECT).

The research team included: **Paul Holtzheimer, M.D.**, 2016 BBRF Independent Investigator, 2007 Young Investigator; Steven Garlow, M.D., Ph.D., 1997 BBRF Young Investigator

Basic Research; Diagnostic Tools/Early Intervention: Addiction— Alcohol

Activity in Newly Discovered Brain Circuit Predicted Future Compulsive Drinking in Mice



Kay M. Tye, Ph.D.

Salk Institute for Biological Studies

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

Science, November 2019

While nearly every adult has an alcoholic drink at some point, only some develop an alcohol use disorder. This research sought to discover biological differences between adults who do and do not drink compulsively, via experiments in mice, which can accurately model human drinking behaviors. The researchers discovered a circuit in the mouse brain whose functioning appears to provide a mechanistic explanation for compulsive alcohol drinking. The mice sorted themselves into three distinct groups one with little appetite for alcohol; another that developed a desire to drink regularly but was sensitive to experiencing discomfort because of it; and a third that drank compulsively regardless of any discomfort. The circuit found to drive the behavior was experimentally manipulated, resulting in increased or decreased compulsive drinking in specific individuals. Importantly, the team was able to see, in retrospect, which animals would go on to drink compulsively based on neural circuit activity that occurred the very first time they drank alcohol. Future research will determine if this finding has translational value in people.

The research team also included: Cody Siciliano, Ph.D., 2017 BBRF Young Investigator

BBRF Grants: The Way Forward to Advances & Better Treatments

SINCE 1987





BBRF Grant recipients have gone on to receive an estimated \$3.9 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 how the brain works and what happens to cause mental illness

Diagnostic Tools/Early Intervention

Development of tools, therapies and methods to support earliest possible diagnosis and treatment

New Technologies

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

IDMIN Next-Generation Therapies

Developing and testing the next wave of therapeutics to address psychiatric disorders

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

The BBRF's Scientific Council, which is made up of 181 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 breakthroughs in neurobiological and psychiatric research, but also at projects which can yield 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.

"I really have to say that BBRF has played an enormous role in my development as a scientist. The first grant that I ever received was a BBRF Young Investigator Award. BBRF grants came to me at particular times that were really critical to the development of research. There was a period where my funding was questionable, when I was a postdoctoral research fellow. And BBRF grants provided the critical boost that led me to apply for and receive funding from the NIH and from other agencies. And it was that preliminary data that I collected on that influenza study in 1993, which I think is the big reason I'm standing here today telling you about this research."

 Alan S. Brown, M.D., M.P.H.
 2019 BBRF Lieber Prize for Outstanding Achievement in Schizophrenia Research

BBRF Young Investigator Grants in 2019





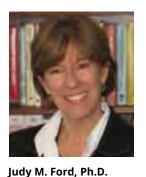


BBRF Young Investigator Grants give early-career scientists the initial funding they need to begin to test their ideas and solidify their academic research careers. Young Investigator Grants provide scientists with \$35,000/year for two years totaling \$70,000. This seed money enables them to generate 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.

An extraordinary aspect of many of the 2019 Young Investigator research projects is their coverage of multiple disorders. This reflects the growing realization that many symptoms of psychiatric illnesses are experienced by patients with different diagnoses—for instance, symptoms shared by depression and anxiety, or schizophrenia and bipolar disorder. In many instances, when our Young Investigators conduct research that crosses diagnostic boundaries, they are exploring biological processes that underlie these illnesses.

It's an exciting and very promising trend in research that we hope will lead to improved treatments in the years to come.

Co-Chairs of the Young Investigator Grant Selection Committee



Professor, Department of Psychiatry University of California, San Francisco BBRF Scientific Council Member 2003 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 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."

Jeffrey Borenstein, M.D.

2019 Grants by Illness

Institutions listed represent where the grant was awarded. Some grantees are listed under multiple categories as their grant projects are relevant to that illness.

ADDICTION / SUBSTANCE-USE DISORDERS

Ream Al-Hasani, Ph.D.

St. Louis College of Pharmacy and Washington University Basic Research

Maxime Assous, Ph.D.

Rutgers University Basic Research

Gerard Beaudoin, III, Ph.D.

Trinity University Basic Research

Erin Campbell, Ph.D.

Florey Institute of Neuroscience and Mental Health, Australia Diagnostic Tools/Early Intervention

Daniel Christoffel, Ph.D.

Stanford University Basic Research

Luis Colon Perez, Ph.D.

University of California, Irvine Diagnostic Tools/Early Intervention

Gregory Corder, Ph.D.

University of Pennsylvania Basic Research

Johannes de Jong, Ph.D.

University of California, Berkeley Basic Research

Hanan El Marroun, Ph.D.

Erasmus University Medical Center. Netherlands Basic Research

Kyle Flippo, Ph.D.

University of Iowa Hospitals and Clinics Basic Research

Felicity Gore, Ph.D.

Stanford University Basic Research

Matthew Hearing, Ph.D.

Marauette University Basic Research

Alexander Herman, M.D., Ph.D.

University of Minnesota **IDMI** Next-Generation Therapies

Andrea Hobkirk, Ph.D.

Pennsylvania State University Diagnostic Tools/Early Intervention

Danique Jeurissen, Ph.D.

Columbia University Basic Research

Erica Jung, Ph.D.

University of Illinois at Chicago Basic Research

Angela Mabb, Ph.D.

Georgia State University Basic Research

Philipp Mews, Ph.D.

Icahn School of Medicine at Mount Sinai Basic Research

lacquelyn Meyers, Ph.D.

State University of New York, Downstate Basic Research

Daniela Neuhofer, Ph.D.

Medical University of South Carolina **Basic Research**

Greg Perlman, Ph.D.

Stony Brook University School of Medicine Diagnostic Tools/Early Intervention **IIVII** New Technologies

Mina Rizk, M.D.

Columbia University Basic Research

Samantha Scudder, Ph.D.

University of California, Santa Barbara Basic Research

Alessandra Vergallito, Ph.D.

University of Milano Bicocca, Italy **IDMI** Next-Generation Therapies

Corinde Wiers, Ph.D.

National Institute on Alcohol Abuse & Alcoholism, NIH **IDMI** Next-Generation Therapies

Hideaki Yano, Ph.D.

National Institute on Drug Abuse, NIH Basic Research

ATTENTION-DEFICIT HYPERACTIVITY DISORDER (ADHD)

Mariam Aly, Ph.D.

Columbia University Basic Research

Weidong Cai, Ph.D.

Stanford University **Basic Research**

Kimberly Chiew, Ph.D.

University of Denver Basic Research

Supriya Ghosh, Ph.D.

University of Chicago Basic Research

Rachel Lean, Ph.D.

Washington University School of Medicine Basic Research

Claudia Lugo-Candelas, Ph.D.

Columbia University/Research Foundation for Mental Hygiene/NYSPI Basic Research

Joanna Martin, Ph.D.

Cardiff University, UK Basic Research

Fabian Munoz Silva, Ph.D.

Columbia University **IDMI** Next-Generation Therapies

Mew Technologies

Adele Stewart, Ph.D.

Florida Atlantic University Basic Research

ANXIETY DISORDERS

Rany Abend, Ph.D.

National Institute of Mental Health, NIH Diagnostic Tools/Early Intervention

Jessica Ables, M.D., Ph.D.

Icahn School of Medicine at Mount Sinai Basic Research

Lauren Asarnow, Ph.D.

Stanford University **IDUIL** Next-Generation Therapies

Jeremy Borniger, Ph.D.

Stanford University **■** Basic Research

George Buzzell, Ph.D.

University of Maryland Basic Research

Gregory Corder, Ph.D.

University of Pennsylvania Basic Research

Laura DeNardo, Ph.D.

University of California, Los Angeles Basic Research

Roman Dvorkin, Ph.D.

Cold Spring Harbor Laboratory **Basic Research**

Dawn Eichen, Ph.D.

University of California, San Diego **IDMI** Next-Generation Therapies

Courtney Filippi, Ph.D.

National Institute of Environmental Health Sciences, NIH Diagnostic Tools/Early Intervention

Adam Gorka, Ph.D.

National Institute of Mental Health, NIH **IDMI** Next-Generation Therapies Diagnostic Tools/Early Intervention

Melissa Herman, Ph.D.

University of North Carolina at Chapel Hill **IDMI** Next-Generation Therapies

Jesse Jackson, Ph.D.

University of Alberta, Canada Basic Research

Munir Kutlu, Ph.D

Vanderbilt University Basic Research

Daniel Levey, Ph.D.

Yale University

Diagnostic Tools/Early Intervention

Elizabeth Lucas. Ph.D.

North Carolina State University Basic Research

Angela Mabb, Ph.D.

Georgia State University Basic Research

Joanna Martin, Ph.D.

Cardiff University, UK Basic Research

Jordan McCall, Ph.D.

Washington University Basic Research

Ciaran Murphy-Royal, Ph.D.

University of Calgary, Canada Basic Research

Agnes Norbury, Ph.D.

Icahn School of Medicine at Mount Sinai Basic Research

Catherine Pena, Ph.D.

Princeton University Basic Research

David Root, Ph.D.

University of Colorado, Denver Basic Research

Lindsay Schwarz, Ph.D.

St. Jude Children's Research Hospital Basic Research

Helen Schwerdt, Ph.D.

Massachusetts Institute of Technology **Basic Research**

Samantha Scudder, Ph.D.

University of California, Santa Barbara **Basic Research**

Ashwini Tiwari, Ph.D.

McMaster University, Canada Diagnostic Tools/Early Intervention

Chelsea Vadnie, Ph.D.

University of Pittsburgh **Basic Research**

Alessandra Vergallito, Ph.D.

University of Milano Bicocca, Italy **IDMIT** Next-Generation Therapies

Yuanzhong Xu, Ph.D.

University of Texas Health Science Center at Houston Basic Research

Katherine Young, Ph.D.

King's College London, UK Mext-Generation Therapies

AUTISM SPECTRUM DISORDER (ASD)

Andre Berndt, Ph.D.

University of Washington Basic Research

Shelly Buffington, Ph.D.

University of Texas Medical Branch at Galveston

Basic Research

Michael Cahill, Ph.D.

University of Wisconsin-Madison Basic Research

Alicia Che, Ph.D.

Weill Cornell Medical College Basic Research

Karina Genaro, Ph.D.

University of California, Irvine **Basic Research**

Suk Jun Hong, Ph.D.

Child Mind Institute Basic Research

Jacque Pak Kan Ip, Ph.D.

Massachusetts Institute of Technology Basic Research

Moshen Jamali, M.D., Ph.D.

Harvard University / Massachusetts General Hospital Basic Research

Magdalena Janecka, Ph.D.

Icahn School of Medicine at Mount Sinai Basic Research

Tae Hyun Kim, Ph.D.

Case Western Reserve University

Basic Research

Benjamin Kleaveland, M.D., Ph.D.

Whitehead Institute for Biomedical Research

Basic Research

Madeleine Kyrke-Smith, Ph.D.

University of Utah

Basic Research

Johannes Larsch, Ph.D.

Max-Planck Institute of Neurobiology, Germany

Basic Research

Angela Mabb, Ph.D.

Georgia State University

Basic Research

Devanand Manoli, M.D., Ph.D.

Gladstone Institutes/University of California, San Francisco

Basic Research

Pierre Matter, Ph.D.

Ottawa Hospital Research Institute, Canada

Basic Research

Ralda Nehme, Ph.D.

The Broad Institute at MIT and Harvard University

Basic Research

Jason Nomi, Ph.D.

Miami University

Basic Research

Won Chan Oh, Ph.D.

University of Colorado, Denver

Basic Research

Rui Peixoto, Ph.D.

University of Pittsburgh

Basic Research

New Technologies

Mu Qiao, Ph.D.

California Institute of Technology

Basic Research

Brian Rash, Ph.D.

Yale University

Basic Research

Christopher Rodgers, Ph.D.

Columbia University

Basic Research

Steven Sloan, M.D., Ph.D.

Emory University

Basic Research

Anne Takesian, Ph.D.

Harvard Medical School

Basic Research

Next-Generation Therapies

Stefon van Noordt, Ph.D.

McGill University, Canada

Diagnostic Tools/Early Intervention

Thomas Vierbuchen, Ph.D.

Memorial Sloan-Kettering Cancer Center

Basic Research

Lu Wang, Ph.D.

University of California, San Diego

Basic Research

Yi-Lan Weng, Ph.D.

Houston Methodist Research Institute

Basic Research

Leena Williams, Ph.D.

University Hospital of Geneva, Switzerland

Box Basic Research

Jingqi Yan, Ph.D.

Albert Einstein College of Medicine

Basic Research

Jun Yokose, Ph.D.

University of Texas Southwestern Medical Center at Dallas

Basic Research

BIPOLAR DISORDER

Azmeraw Tayelgn Amare, Ph.D.

University of Adelaide, Australia

Basic Research

New Technologies

Michele Bertocci, Ph.D.

University of Pittsburgh

Basic Research

June Gruber, Ph.D.

University of Colorado, Boulder

Diagnostic Tools/Early Intervention

Danella Hafeman, M.D., Ph.D.

University of Pittsburgh

Diagnostic Tools/Early Intervention

Kristen Haut, Ph.D.

Rush University Medical College

Basic Research

Philipp Homan, M.D., Ph.D.

Feienstein Institute for Medical Research / Northwell Health

Diagnostic Tools/Early Intervention

Muhammad Husain, MBBS, M.D.

University of Toronto / Center for Addiction and Mental Health, Canada

Basic Research

Moshen Jamali, M.D., Ph.D.

Harvard University / Massachusetts General Hospital

Basic Research

Paul Jenkins, Ph.D.

University of Michigan

Basic Research

Danique Jeurissen, Ph.D.

Columbia University

Basic Research

Daniel Joyce, Ph.D.

Stamford University

Mext-Generation Therapies

Mew Technologies

Munir Kutlu, Ph.D.

Vanderbilt University

Basic Research

Jessica Lipschitz, Ph.D.

Harvard University / Brigham and Women's Hospital

Diagnostic Tools/Early Intervention

New Technologies

Amanda Lyall, Ph.D.

Harvard Medical School

Basic Research

Ralda Nehme, Ph.D.

The Broad Institute at MIT / Harvard
University

MMI Basic Research

Brian Rash, Ph.D.

Yale University

Basic Research

Marcos Santoro, Ph.D.

Universidade Federal de Sao Paulo, Brazil

Diagnostic Tools/Early Intervention

Andrey Shabalin, Ph.D.

University of Utah

Basic Research

Yasuyuki Shima, Ph.D.

RIKEN Brain Science Institute, Japan

Basic Research

Chelsea Vadnie, Ph.D.

University of Pittsburgh

Basic Research

Thomas Vierbuchen, Ph.D.

Memorial Sloan-Kettering Cancer Center

Basic Research

BORDERLINE PERSONALITY DISORDER

Laura DeNardo, Ph.D.

University of California, Los Angeles

Basic Research

Emily Finn, Ph.D.

National Institute of Mental Health, NIH

Diagnostic Tools/Early Intervention

Angela Mabb, Ph.D.

Georgia State University

Basic Research

DEPRESSION

Jessica Ables, M.D., Ph.D.

Icahn School of Medicine at Mount Sinai

Basic Research

Azmeraw Tayelgn Amare, Ph.D.

University of Adelaide, Australia

Basic Research

New Technologies

Lauren Asarnow, Ph.D.

Stanford University

Next-Generation Therapies

Jennifer Barredo, Ph.D.

Brown University

Next-Generation Therapies

Venkat Bhat, M.D., M.Sc., FRCPC

University of Toronto, Canada

Next-Generation Therapies

New Technologies

Jeremy Borniger, Ph.D.

Stanford University

Basic Research

Catherine Brownstein, Ph.D., M.P.H.

Harvard University/Harvard Medical School

Basic Research

Nadia Cattane, Ph.D.

IRCCS Centro San Giovanni di Dio Fatebenfratelli, Italy

Robin Chan, Ph.D.

Virginia Commonwealth University

Basic Research

Natali Chanaday Ricagni, Ph.D.

Vanderbilt University

Next-Generation Therapies

Daniel Christoffel, Ph.D.

Stanford University

Basic Research

Federico Daray, M.D., Ph.D., M.Sc.

University of Buenos Aires, Argentina

But Basic Research

Laura DeNardo, Ph.D.

University of California, Los Angeles

Basic Research

Julien Dupuis, Ph.D.

Interdisciplinary Institute for Neuroscience
- CNRS/University of Bordeaux, France

Next-Generation Therapies

Natalia Duque-Wilckens, D.V.M., Ph.D.

Michigan State University

Basic Research

Dawn Eichen, Ph.D.

University of California, San Diego

Next-Generation Therapies

Claudia Espinosa-Garcia, Ph.D.

Emory University

Basic Research

Emily Finn, Ph.D.

National Institute of Mental Health, NIH

Diagnostic Tools/Early Intervention

Bharathi Gadad, Ph.D.

Texas Tech University Health Sciences Center

Basic Research
New Technologies

Damien Gallagher, M.D.

University of Toronto, Canada

Diagnostic Tools/Early Intervention

Felicity Gore, Ph.D.

Stanford University

Basic Research

Hanne Hansen, Ph.D.

Harvard University / Massachusetts General Hospital

Mext-Generation Therapies

Matthew Hearing, Ph.D.

Marquette University

Basic Research

Melissa Herman, Ph.D.

University of North Carolina at Chapel Hill

Next-Generation Therapies

Philipp Homan, M.D., Ph.D.

Feienstein Institute for Medical Research/ Northwell Health

Diagnostic Tools/Early Intervention

Nicholas Hubbard, Ph.D.

Massachusetts Institute of Technology

Diagnostic Tools/Early Intervention

Rainbo Hultman, Ph.D.

University of Iowa

Basic Research

Daniel Joyce, Ph.D.

Stamford University

Next-Generation Therapies

Mew Technologies

Yuki Kageyama, M.D., Ph.D.

Weill Cornell Medical College

Basic Research

Janine Knauer-Arloth, Ph.D.

Max-Planck Institute of Psychiatry, Germany

Diagnostic Tools/Early Intervention

Christoph Kraus, M.D., Ph.D.

Medical University of Vienna, Austria

Next-Generation Therapies

Munir Kutlu, Ph.D.

Vanderbilt University

Basic Research

Daniel Levey, Ph.D.

Yale University

Diagnostic Tools/Early Intervention

Laura Lewis, Ph.D.

Boston University

Basic Research

New Technologies

Angela Mabb, Ph.D.

Georgia State University

Basic Research

Erika Manczak, Ph.D.

University of Denver

Basic Research

Merry Mani, Ph.D.

University of lowa

Next-Generation Therapies

Devanand Manoli, M.D., Ph.D.

Gladstone Institutes/University of California, San Francisco

Basic Research

Joanna Martin, Ph.D.

Cardiff University, UK

Basic Research

Jordan McCall, Ph.D.

Washington University

Basic Research

Giorgia Michelini, Ph.D.

Stony Brook University

Diagnostic Tools/Early Intervention

Jean-Philippe Miron, Ph.D.

University of Toronto, Canada

Next-Generation Therapies

Laurel Morris, Ph.D.

Icahn School of Medicine at Mount Sinai

Next-Generation Therapies

Ciaran Murphy-Royal, Ph.D.

University of Calgary, Canada

Basic Research

Carla Nasca, Ph.D.

The Rockefeller University

Diagnostic Tools/Early Intervention

Ralda Nehme, Ph.D.

The Broad Institute at MIT and Harvard University

Basic Research

Kieran O'Donnell, Ph.D.

Douglas Mental Health University
Institute, Canada

Diagnostic Tools/Early Intervention

Jason Oliver, Ph.D.

Duke University

New Technologies

Jocelien Olivier, Ph.D.

University Medical Center Groningen, Netherlands

Basic Research

Alexey Ostroumov, Ph.D.

University of Pennsylvania

Basic Research

Thomas Papouin, Ph.D.

Washington University School of Medicine

Basic Research

Catherine Pena, Ph.D.

Princeton University

Basic Research

Roseann Peterson, Ph.D.

Virginia Commonwealth University

Diagnostic Tools/Early Intervention

Juliet Richetto, Ph.D.

Brain Research Institute, University of Zurich, Switzerland

Basic Research

David Root, Ph.D.

University of Colorado, Denver

Basic Research

Shogo Sato, Ph.D.

University of California, Irvine

Basic Research

Lindsay Schwarz, Ph.D.

St. Jude Children's Research Hospital

Basic Research

Helen Schwerdt, Ph.D.

Massachusetts Institute of Technology

Basic Research

Andrey Shabalin, Ph.D.

University of Utah

Basic Research

Shan Siddiqi, M.D.

Harvard Medical School

Next-Generation Therapies

Sandeep Singh, Ph.D.

Virginia Commonwealth University

Basic Research

Colenso Speer, Ph.D.

University of Maryland

Basic Research

Louisa Steinberg, M.D., Ph.D.

Columbia University

Diagnostic Tools/Early Intervention

Ashwini Tiwari, Ph.D.

McMaster University, Canada

Diagnostic Tools/Early Intervention

Chelsea Vadnie, Ph.D.

University of Pittsburgh

Basic Research

Matilde Vaghi, Ph.D.

University of London/University College London

Basic Research

Leandro Valiengo, M.D., Ph.D.

Universidade de São Paulo, Brazil

Next-Generation Therapies

Alessandra Vergallito, Ph.D.

University of Milano Bicocca, Italy

Next-Generation Therapies

Christian Wozny, M.D., Ph.D.

University of Strathclyde, Scotland, UK

Basic Research

Yao Wu. Ph.D.

Children's National Medical Center/
Children's Research Institute

Next-Generation Therapies

New Technologies

Katherine Young, Ph.D.

King's College London, UK

Next-Generation Therapies

Sanghee Yun, Ph.D.

University of Pennsylvania/Children's Hospital of Philadelphia

Basic Research

Xian Zhang, Ph.D.

Cold Spring Harbor Laboratory

Basic Research

EATING DISORDERS

Lauren Asarnow, Ph.D.

Stanford University

Next-Generation Therapies

Daniel Christoffel, Ph.D.

Stanford University **Basic Research**

Dawn Eichen, Ph.D.

University of California, San Diego **IDUIL** Next-Generation Therapies

Felicity Gore, Ph.D.

Stanford University Basic Research

Yuanzhong Xu, Ph.D.

University of Texas Health Science Center at Houston

Basic Research

Zeynep Yilmaz, Ph.D.

University of North Carolina at Chapel Hill Basic Research

OBSESSIVE-COMPULSIVE **DISORDER (OCD)**

Matthew Hearing, Ph.D.

Marauette University Basic Research

Christoph Kraus, M.D., Ph.D.

Medical University of Vienna, Austria **IDMI** Next-Generation Therapies

Kai Miller, M.D., Ph.D.

Mayo Clinic College of Medicine, Minnesota

IDUIL Next-Generation Therapies

Allison Waters, Ph.D.

Icahn School of Medicine at Mount Sinai **IDMI** Next-Generation Therapies

Zeynep Yilmaz, Ph.D.

University of North Carolina at Chapel Hill Basic Research

PSYCHOSIS

Benjamin Buck, Ph.D.

University of Washington

Diagnostic Tools/Early Intervention

Simon Chamberland, Ph.D.

New York University

IDUIL Next-Generation Therapies

Mew Technologies

Alexis Cullen, Ph.D.

King's College London, UK Mew Technologies

Sarah DuBrow, Ph.D.

University of Oregon **Basic Research**

Philipp Homan, M.D., Ph.D.

Feienstein Institute for Medical Research/ Northwell Health

Diagnostic Tools/Early Intervention

Lana Kambeitz-Ilankovic, Ph.D.

Institue of Psychiatric Phenomics and Genomics (IPPG), University Hospital, LMU, Germany

Diagnostic Tools/Early Intervention

Pierre Le Merre, Ph.D.

Karolinska Institutet, Sweden Basic Research

Marcos Santoro, Ph.D.

Universidade Federal de Sao Paulo, Brazil Diagnostic Tools/Early Intervention

Karuna Subramaniam, Ph.D.

Gladstone Institutes/University of California, San Francisco Mext-Generation Therapies

Sunny Tang, M.D.

University of Pennsylvania Diagnostic Tools/Early Intervention

Ross Williamson, Ph.D.

University of Pittsburgh Basic Research

Kun Yang, Ph.D.

Johns Hopkins University School of Medicine

Basic Research

Katherine Young, Ph.D.

King's College London, UK **IDUIT Next-Generation Therapies**

POST-TRAUMATIC STRESS **DISORDER (PTSD)**

Mariam Aly, Ph.D.

Columbia University Basic Research

Jennifer Barredo, Ph.D.

Brown University **IDMI** Next-Generation Therapies

Laura DeNardo, Ph.D.

University of California, Los Angeles Basic Research

Yael Deri, Ph.D.

Stony Brook University **Basic Research**

Gregory Fonzo, Ph.D.

Dell Medical School, University of Texas at Austin

Basic Research

Gabrielle Girardeau, Ph.D.

Sorbonne University, France Basic Research

Matthew Girgneti, Ph.D.

Yale University School of Medicine Basic Research

Ann Hoffman, Ph.D.

University of California, Los Angeles Basic Research

Munir Kutlu, Ph.D.

Vanderbilt University **Basic Research**

Elizabeth Lucas, Ph.D.

North Carolina State University **Basic Research**

Angela Mabb, Ph.D.

Georgia State University Basic Research

Jordan McCall, Ph.D.

Washington University Basic Research

Agnes Norbury, Ph.D.

Icahn School of Medicine at Mount Sinai Basic Research

David Root, Ph.D.

University of Colorado, Denver Basic Research

Tomas Ryan, Ph.D.

Trinity College, Dublin, Ireland Basic Research

Lindsay Schwarz, Ph.D.

St. Jude Children's Research Hospital Basic Research

Helen Schwerdt, Ph.D.

Massachusetts Institute of Technology Basic Research

Andrey Shabalin, Ph.D.

University of Utah Basic Research

Benjamin Suarez-Jimenez, Ph.D.

Columbia University/Research Foundation for Mental Hygiene, Inc./NYSPI

Basic Research

Ashwini Tiwari, Ph.D.

McMaster University, Canada

Diagnostic Tools/Early Intervention

Jon Willie, M.D., Ph.D.

Emory University/Emory University Hospital

IDMI Next-Generation Therapies

SCHIZOPHRENIA

Tim Bigdeli, Ph.D.

State University of New York, Downstate

Diagnostic Tools/Early Intervention

Urs Andreas Braun, M.D.

University of Pennsylvania

Basic Research

Catherine Brownstein, Ph.D., M P H

Harvard University/Harvard Medical School

Basic Research

Yao Chen, Ph.D.

Washington University School of Medicine

Basic Research

Alexis Cullen, Ph.D.

King's College London, UK

New Technologies

Senthilkumar Deivasigamani, Ph.D.

European Molecular Biology Laboratory, Germany

Basic Research

Kristen Delevich, Ph.D.

University of California, Berkeley

New Technologies

Antonio Fernandez-Ruiz, Ph.D.

New York University

Basic Research

Michael Francis, M.D.

Indiana University School of Medicine

Next-Generation Therapies

Matthew Hearing, Ph.D.

Marquette University

Basic Research

Philipp Homan, M.D., Ph.D.

Feienstein Institute for Medical Research/ Northwell Health

Diagnostic Tools/Early Intervention

James Howard, Ph.D.

Northwestern University

Basic Research

Hailiang Huang, Ph.D.

Harvard University / Massachusetts General Hospital

Basic Research

Moshen Jamali, M.D., Ph.D.

Harvard University / Massachusetts General Hospital

Basic Research

Danique Jeurissen, Ph.D.

Columbia University

Basic Research

Daniel Joyce, Ph.D.

Stamford University

Next-Generation Therapies

New Technologies

Annie Kathuria, Ph.D.

Harvard University / Massachusetts General Hospital

Diagnostic Tools/Early Intervention

Madeleine Kyrke-Smith, Ph.D.

University of Utah

Basic Research

Johannes Larsch, Ph.D.

Max-Planck Institute of Neurobiology, Germany

Basic Research

Pierre Le Merre, Ph.D.

Karolinska Institutet, Sweden

Felix Leroy, Ph.D.

Columbia University

Basic Research

Devanand Manoli, M.D., Ph.D.

Gladstone Institutes/University of California, San Francisco

Basic Research

Jacquelyn Meyers, Ph.D.

State University of New York, Downstate

Basic Research

Ralda Nehme, Ph.D.

The Broad Institute at MIT and Harvard University

Basic Research

Jason Olivier, Ph.D.

Duke University

Manage New Technologies

Thomas Papouin, Ph.D.

Washington University School of Medicine

Basic Research

Johannes Passecker, Ph.D.

Columbia University

Basic Research

Rui Peixoto, Ph.D.

University of Pittsburgh

Basic Research

New Technologies

Mu Qiao, Ph.D.

California Institute of Technology

Basic Research

Brian Rash, Ph.D.

Yale University

Basic Research

Can Ruan, Ph.D.

Capital University of Medical Sciences, Beijing Anding Hospital, People's Republic of China

Diagnostic Tools/Early Intervention

Andrey Shabalin, Ph.D.

University of Utah

Basic Research

Tarjinder Singh, Ph.D.

Harvard University / Massachusetts General Hospital

Massachusetts

Basic Research

Steven Sloan, M.D., Ph.D.

Emory University

Basic Research

Karuna Subramaniam, Ph.D.

Gladstone Institutes/University of California, San Francisco

Mext-Generation Therapies

Jorien Treur, Ph.D.

University of Amsterdam, Netherlands

Basic Research

Thomas Vierbuchen, Ph.D.

Memorial Sloan-Kettering Cancer Center

Basic Research

Ross Williamson, Ph.D.

University of Pittsburgh

Basic Research

Zachary Wills, Ph.D.

University of Pittsburgh

New Technologies

Jingqi Yan, Ph.D.

Albert Einstein College of Medicine

Basic Research

Katherine Young, Ph.D.

King's College London, UK

Next-Generation Therapies

SUICIDE PREVENTION

Jennifer Barredo, Ph.D.

Brown University

Mext-Generation Therapies

Emily Diblasi, Ph.D.

University of Utah

Basic Research

Daniel Levey, Ph.D.

Yale University

Diagnostic Tools/Early Intervention

Jordan McCall, Ph.D.

Washington University

Basic Research

Mina Rizk, M.D.

Columbia University

Basic Research

Andrey Shabalin, Ph.D.

University of Utah

Basic Research

Sandeep Singh, Ph.D.

Virginia Commonwealth University

Basic Research

BIOLOGY OF THE BRAIN (THESE PROJECTS FOCUS ON HOW THE BRAIN WORKS.)

Chandramouli Chandrasekaran, Ph.D.

(Decision-Making)

Boston University

Basic Research

New Technologies

Gilad Evrony, M.D., Ph.D.

(Cellular Development)

New York University School of Medicine

New Technologies

Stephanie Moon, Ph.D.

(White Matter Formation)
University of Colorado, Boulder

Basic Research

Brian Rash, Ph.D.

(Cortical Folding)

Yale University

Basic Research

Tomas Ryan, Ph.D.

(Memory Access)

Trinity College, Dublin, Ireland

Basic Research

Anindita Sarkar, Ph.D.

(Transposons and Stress)
Salk Institute for Biological Studies

Basic Research

Adam Snyder, Ph.D.

(Multi-scale Brain Activity)
University of Rochester

Basic Research

Maite Solas, Ph.D.

(Insulin Signaling)

University of Navarra, Pamplona, Spain

Bull Basic Research

Andre Sousa, Ph.D.

(Brain Development)

Yale University

Basic Research

Colenso Speer, Ph.D.

(Circadian Regulation)
University of Maryland

Basic Research

Matthew Wright, M.D., Ph.D.

(Coping Response)
Stanford University
Basic Research

Sangjin Yoo, Ph.D.

(Neuronal Manipulation)
California Institute of Technology
New Technologies

ALL DISORDERS (THESE PROJECTS PERTAIN BROADLY TO ALL DISORDERS.)

John Naslund, Ph.D.

(Population Screening)
Harvard Medical School

Diagnostic Tools/Early Intervention

Tan Hoang Nguyen, Ph.D.

(Cross-Disorder Trait Analysis)
Virginia Commonwealth University

Basic Research

OTHER DISORDERS

Alzheimer's Disease

Thomas Papouin, Ph.D.

Washington University School of Medicine

Basic Research

Angelman Syndrome

Emmanuel Cruz-Torres, Ph.D.

New York University

Basic Research

Epilepsy

Christoph Kraus, M.D., Ph.D.

Medical University of Vienna, Austria

Next-Generation Therapies

Corinde Wiers, Ph.D.

Jon Willie, M.D., Ph.D

National Institute on Alcohol Abuse & Alcoholism, NIH

Mext-Generation Therapies

•

Emory University/Emory University

IDUIL Next-Generation Therapies

Fragile X Syndrome

Karina Genaro, Ph.D.

University of California, Irvine

Basic Research

Jacque Pak Kan Ip, Ph.D.

Massachusetts Institute of Technology

Basic Research

Benjamin Kleaveland, M.D., Ph.D.

Whitehead Institute for Biomedical Research

Basic Research

Jingqi Yan, Ph.D.

Albert Einstein College of Medicine

Basic Research

Parkinson's Disease

Christoph Kraus, M.D., Ph.D

Medical University of Vienna, Austria

Next-Generation Therapies

Scientific Council Dinner Presenting the Klerman & Freedman Awards July 26, 2019, New York, NY

This evening recognized and honored the exceptional work of six outstanding young researchers who have received awards through the BBRF's Young Investigator Grant program.

The Klerman & Freedman Prizes pay tribute to Drs. Gerald L. Klerman and Daniel X. Freedman, whose legacies as researchers, teachers, physicians and administrators have indelibly influenced neuropsychiatry.

Their outstanding contributions to the field of brain and behavior research continue to inspire scientists who knew them, as well as those who are just entering the field.

The prizewinners were selected by committees of the Foundation's Scientific Council.



ANNUAL KLERMAN PRIZE FOR EXCEPTIONAL CLINICAL RESEARCH

Nolan R. Williams, M.D.

Stanford University Wu Tsai Neurosciences Institute, Stanford Bio-X

HONORABLE MENTIONS

Bo Cao, Ph.D.

University of Alberta, Canada

Sarah A. O. Gray, Ph.D.

Tulane University

ANNUAL FREEDMAN PRIZE FOR EXCEPTIONAL BASIC RESEARCH

Anna Victoria Molofsky, M.D., Ph.D.

University of California, San Francisco Weill Institute for Neurosciences

HONORABLE MENTIONS

Erin S. Calipari, Ph.D.

Vanderbilt University School of Medicine

Dorothy Schafer, Ph.D.

University of Massachusetts Medical School

Dr. Herbert Pardes presenting the Klerman & Freedman Awards.









Dr. Eric Kandel



Scientist Spotlight with:

Anna Victoria Molofsky, M.D., Ph.D.

2019 BBRF Freedman Prize for Exceptional Basic Research 2016 BBRF Young Investigator

Dr. Anna Molofsky is an Assistant Professor in the Department of Psychiatry and the Weill Institute for Neurosciences at the University of California, San Francisco. The Molofsky lab studies synapses — the essential connections between nerve cells in the brain. In particular, the lab investigates the role of the immune system in helping synapses to form properly. While the immune system plays many healthy roles in the brain, inflammation caused by infection and brain injury can also increase the risk for some mental illnesses, including autism spectrum disorders, schizophrenia, and depression.

What is the current state of your BBRF-funded research?

When I was awarded my BBRF Young Investigator award, I was a brand-new investigator, with two people in my lab, investigating a new immune molecule that I hypothesized could impact synaptic connections between nerve cells in the brain. The studies that proved this hypothesis were published in the journal Science in 2018, and launched many new directions in our lab. Four years later, my group has 10 trainees all studying different ways by which the immune system impacts brain development, learning, and disease.

How do your interactions with people living with mental illness affect your research and vice-versa?

As a practicing psychiatrist and psychotherapist, I see how mental illness impacts my patient's lives, and importantly, how it impacts their families, friends, and colleagues. The tools we already have to treat symptoms of mental illness have made a huge difference for many. However, I also see how much patients want to get better, and how difficult this can sometimes be. We need to do more, and I strongly believe that cures for mental illness will emerge from a deeper scientific understanding of the brain.

What has BBRF support meant to your career?

BBRF research has provided key funding to support my research exploring how the brain and immune systems interact. And since research can always go in many different directions (often following the funding), I think that being a part of the community of BBRF has helped me to keep the big picture of treating mental illness in mind.

In the best possible scenario, how would your work impact the people living with mental illness and their families?

My dream would be new treatments that promote the brain's healthy ability to make new synaptic connections. These treatments could be combined with psychotherapy and other behavioral interventions to encourage stable and long-lasting positive changes in brain circuits.

"My BBRF grant provided seed funding to enable a new research direction as I was just starting my lab. This was crucial to the publication of my first senior-author paper and to obtaining additional independent funding. BBRF support enabled us to focus our future research on how the immune system shapes healthy brain development and how immune function is altered in mental illnesses."

Scientist Spotlight with: Nolan R. Williams, M.D.

2019 BBRF Klerman Prize for Exceptional Clinical Research 2018 & 2016 BBRF Young Investigator

Dr. Nolan Williams is an Assistant Professor within the Department of Psychiatry and Behavioral Sciences and the Director of the Stanford Brain Stimulation Lab at Stanford University. Dr. Williams is working to understand how TMS can be used to treat depression, OCD, Tourette's Syndrome, and other mental illnesses, especially in people who haven't responded well to other therapeutic or pharmaceutical treatments.

What is the current state of your BBRF-funded research?

I was grateful to receive two BBRF Young Investigator awards. The first, in 2016, made possible research that I conducted to investigate the brain mechanisms through which the rapid-acting antidepressant, ketamine, exerts its therapeutic effects. This research pointed to a link to the body's opioid system. We were able to show that opioid receptor activation plays a significant role in the anti-suicidality effects of ketamine—the research for which I was honored with the Klerman Prize. Extensions of these initial findings have been funded by the NIH.

My second BBRF Young Investigator grant has led to another research paper that is being written up. This research concerns the use of a form of non-invasive brain stimulation called Stanford Accelerated Intelligent Neuromodulation Therapy (SAINT) as a rapid-acting antidepressant in people who haven't been helped by other forms of treatment. I have a NIMH Brains R01 grant pending for this work.

How do your interactions with people living with mental illness affect your research and vice-versa?

My interactions with people with mental illness are the interactions that shaped and defined my career. Pushing forward the idea that mental illnesses are illnesses of brain networks defines that work and helps those I work with to see their affliction in a different light.

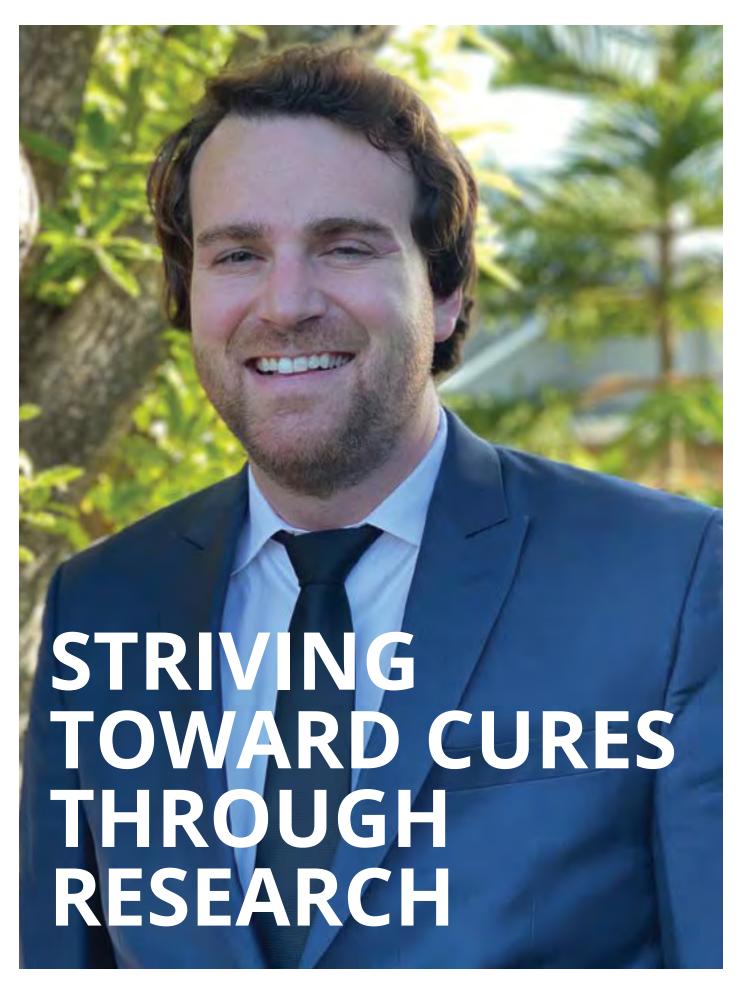
"I am grateful to be mentored by several members of the Scientific Council including Mark George, Alan Schatzberg, and Rob Malenka. I very much hope to continue to help in the development of new therapies for treatment-resistant patients in the coming years."

What has BBRF support meant to your career?

I'm most thankful for 2016 BBRF Young Investigator grant, which helped fund the launch of my lab. It has made possible the work that I have done thus far.

In the best possible scenario, how would your work impact the people living with mental illness and their families?

We are working to get a method we have developed termed SAINT onto psychiatric inpatient units to treat suicidal depression. Right now, only 1.5% of people who meet the eligibility criteria for electroconvulsive therapy (ECT) actually receive it. These are people typically who have not responded to multiple forms of conventional antidepressant therapy. ECT is often perceived as a last resort. Many eschew it for fear of its side effects, which can involve autobiographical memory loss for some. The other 98.5% of individuals who are eligible for ECT leave the hospital with the same medications that are available in outpatient clinics and no other biological treatments for their illnesses. So we are hopeful that our new treatment approach can reach and improve the lives of some of these people who are in pain. SAINT uses MRI scanning to guide an accelerated form of theta-burst TMS (brain stimulation), with the aim of generating a rapid antidepressant effect in these highly treatmentresistant patients.



International Mental Health Research Symposium

November 1, 2019 Kaufman Music Center, New York, NY

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

The nine BBRF 2019 Outstanding Achievement Award winners shared new breakthroughs and insights on the use of rapid acting anti-depressants for treatment resistant depression, schizophrenia, ADHD, stigma, and cognitive neuroscience at this year's symposium.

The event was moderated by Robert M. A. Hirschfeld, M.D. of the BBRF Scientific Council and drew more than 250 people.

Presentations included:

Early Life Determinants of Schizophrenia & Other Psychiatric Disorders

Alan S. Brown, M.D., M.P.H.

Columbia University Irving Medical Center / New York State Psychiatric Institute

Thalamo-Cortical Interactions in Cognition

Christoph Kellendonk, Ph.D.

Columbia University Irving Medical Center / New York State Psychiatric Institute

Preventing Schizophrenia - 'Thinking the Unthinkable' John J. McGrath, M.D., Ph.D.

The University of Queensland / Queensland Centre for Mental Health Research

Decision Making & Neuropsychiatry: What Can We Learn from the Decisions We Make?

James P. Kesby, Ph.D.

The University of Queensland

The Shape of Discovery: Ketamine for Treatment Resistant Depression

Dennis S. Charney, M.D.

Icahn School of Medicine at Mount Sinai

Following the lunch break, a keynote presentation,
New Thoughts About Mental Illness: Implications
for Discovery & Treatment, was given by the winner
of the 2019 Pardes Humanitarian Prize in Mental Health,
William T. Carpenter, Jr., M.D., Professor of Psychiatry
& Pharmacology at the Maryland Psychiatric Research
Center, University of Maryland School of Medicine.

The symposium presentations then continued with: Resilient Brains: Adaptive Brain Mechanisms in Bipolar Disorder

Sophia Frangou, M.D., Ph.D., F.R.C.Psych *Icahn School of Medicine at Mount Sinai*

Ketamine: Imagining New Ways to Treat Depression John H. Krystal, M.D.

Yale University

Developmental Psychopathology & Stigma Reduction: A Synthesis

Stephen P. Hinshaw, Ph.D.

University of California, Berkeley / University of California, San Francisco

Harnessing Hippocampal Neurogenesis to Improve Cognition and Mood

René Hen, Ph.D.

Columbia University / New York State Psychiatric Institute



L to R: Dr. Robert Hirschfeld, Dr. Alan Brown, Dr. John Krystal, Dr. René Hen, Dr. John McGrath, Dr. Dennis Charney, Dr. James Kesby, Dr. Stephen Hinshaw, Dr. William Carpenter, Dr. Sophia Frangou, and Dr. Herbert Pardes



Dr. Jeffrey Borenstein and Stephen Lieber Photos this page by Chad David Kraus

Thank you to our Sponsors:





Dr. Robert M.A. Hirschfeld

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 of those facing mental health challenges, and bringing them the joy of living.

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..

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



Dr. William T. Carpenter, Jr; Dr. Herbert Pardes; Cynthia Germanotta; and Dr. Jeffrey Borenstein.



WINNERS

2019

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

Honorary Tribute: Cynthia Germanotta & Born This Way *Foundation*

Judge Steven Leifman Honorary Tribute: Suzanne and Bob Wright

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

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

Honorary Tribute: Rosalynn Carter

Herbert Pardes, M.D.

In 2019 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.

Breaking the Silence About Mental Illness Luncheon May 1, 2019, New York, NY

Tipper Gore, advocate, artist, philanthropist and former Second Lady of the United States, was the speaker at the "Breaking the Silence About Mental Illness Luncheon," which kicked off BBRF's celebration of Mental Health Awareness Month.

The event, co-chaired by Carole Mallement and Virginia Silver, who are BBRF Board Members, along with Beth Elliot and Sheila Scharfman, was attended by more than 300 people.

The BBRF Luncheon series is designed to pay tribute to the brave people who are willing to speak candidly and personally about mental illness and use their experiences as an inspiration to galvanize all of the necessary resources needed to speak out, remove stigma, and break the silence about mental illness.



FRONT ROW L-R: Carol Atkinson, Lillian Clagett, Dr. Jeffrey Borenstein, Tipper Gore, Dr. Herbert Pardes, Lilian Sicular. MIDDLE ROW L-R: Beth Elliott, Sheila Scharfman, Carole Mallement, Ellen Levine. BACK ROW L-R: Rob Elliott, Patricia Specter, Barbara Toll, Judy Daniels, Nancy Gabel, Michaela Keohane, Dr. Nancy Wexler.

Photo by Chad David Kraus Photography.

BBRF MULTIMEDIA PROGRAMMING



In addition to supporting research, we believe it is crucial to share research findings with the public. Two ways that we work to educate the general public are through our television series, "Healthy Minds" with Dr. Jeffrey Borenstein, and our "Meet the Scientist" monthly webinar series.

"Healthy Minds," demonstrates that with help, there is hope. The Emmy-nominated series aims to remove the stigma of mental illness, educate the public and offer a message of hope through personal stories and experts sharing the latest information on research, prevention, diagnosis and treatment.

The current season examined some of the most pressing public health issues including the latest research on anxiety, depression, chemical dependency and the opioid crisis, youth and the criminal justice system, and cultural sensitivity in mental health care.

Listing of Season Six Episodes:

- Treatment Resistant Depression & Rapid-Acting **Antidepressants**
- Transcranial Magnetic Stimulation (TMS)
- · Anxiety In Children, Teens & Young Adults
- Youth Mental Wellness
- Stem Cell Research & Mental Health
- Chemical Dependency & the Opioid Epidemic

- Crisis Text Line
- Youth & The Criminal Justice System
- Minority Issues In Mental Health Care
- Intersection of Mental & Physical Health
- Helping People Who Are Homeless
- Resilience: The Science of Mastering Life's Challenges

Season 6 is available for viewing on the BBRF website.

"The goal of 'Healthy Minds' is to inspire conversations about mental illness and provide understandable information and resources for our viewers. People should not suffer in silence."

- Dr. Jeffrey Borenstein

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 online 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.

January 8, 2019

Brain Plasticity: The Effects of Antidepressants on Major Depression J. John Mann, M.D.

February 12, 2019

Early Detection and Prevention of Psychotic Disorders: Ready for "Prime Time"?

Jeffrey A. Lieberman, M.D.

March 12, 2019

The Biology of Addiction Eric J. Nestler, M.D., Ph.D.

April 9, 2019

Circadian Rhythms & Bipolar Disorder Colleen Ann McClung, Ph.D.

May 14, 2019

Crossing the Goal Line; Bringing Ketamine Treatments to the Clinic

Gerard Sanacora, M.D., Ph.D.

June 11, 2019

The Search for Novel Treatment Targets for Obsessive Compulsive Disorder Susanne E. Ahmari, M.D., Ph.D.

July 9, 2019

Searching for Biomarkers of Stress-Related Mental Illness & Suicidality Lynnette A. Averill, Ph.D.

August 13, 2019

Combining TMS with Psychotherapy for Treating Depression & OCD Sarah H. Lisanby, M.D.

September 10, 2019

Choline: A New Prenatal Supplement to Improve a Child's Mental Health M. Camille Hoffman, M.D., MSc

October 15,2019

Deep Brain Stimulation for Treatment-Resistant Depression: A Progress Report Helen S. Mayberg, M.D.

November 12, 2019

Integrating Virtual Reality into Psychotherapy for Anxious Youth Michelle Pelcovitz, Ph.D.

December 10, 2019

Changing the Way the World Thinks About Eating Disorders Cynthia Bulik, Ph.D.



Your support this year enabled us to fund more than \$15.2 million to leading scientists undertaking the challenges of brain and behavior research.

Since our founding in 1987, in partnership with donors around the world, BBRF has invested more than \$408 million and funded more than 5,900 grants to more than 4,800 scientists worldwide.

We deeply appreciate and are inspired by all of our donor's passion and commitment to advance psychiatric research.



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, with a primary emphasis to 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 that 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 will select which BBRF Grants will be funded by this Endowment.

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



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

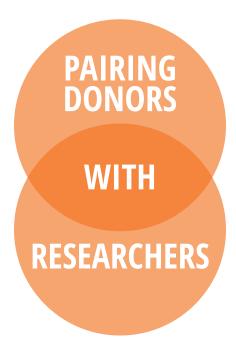
Better treatments came too late for my brother, Stewart, who lost his battle with schizophrenia, and too late for my father, Ken, who suffered from depression. But we believe that with ongoing research, it will not be too late for millions of other people thanks to BBRF. We know this because we have 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.



Kelly & Jack Scott Scott-Gentle Foundation





Dr. Pieter Naude

Many BBRF donnors 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 who have been selected by the BBRF Scientific Council to receive a grant can be chosen by a donor as a part of our Research Partners Program.

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.

JAN ABRAMS

Jan Abrams Investigators

Young Investigator Daniel Arthur Abrams, Ph.D. Stanford University

Young Investigator Eunice Y. Yuen, M.D., Ph.D. Yale University

ANONYMOUS

Young Investigator Desmond Jay Oathes, Ph.D. University of Pennsylvania

ANONYMOUS

Young Investigator Gustavo Adolfo Angarita, M.D. Yale University

Young Investigator Andre M. M. Sousa, Ph.D. Yale University

BARBARA AND MICHAEL BASS

Barbara and Michael Bass Investigator

Young Investigator Sarah E. Canetta, Ph.D. Research Foundation for Mental Hygiene, *Inc. / NYSPI Columbia University*

JANET AND DONALD BOARDMAN

Janet and Donald Boardman Investigator

Young Investigator Jessica A. Bernard, Ph.D. Texas A&M University

RONALD AND KATHY CHANDONAIS

Patrick A. Coffer Investigator

Young Investigator Benjamin C. Reiner, Ph.D. University of Pennsylvania

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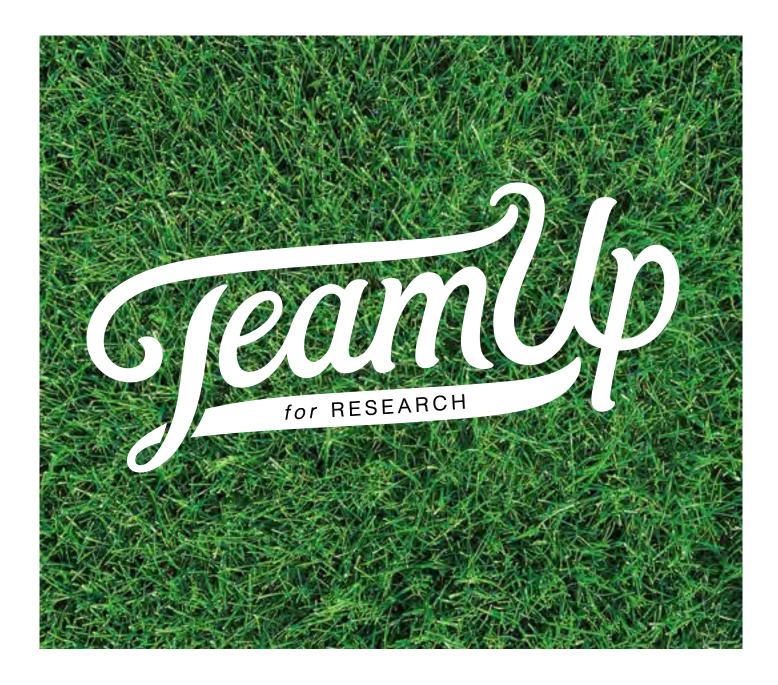
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lackson Marx

Oscar Marx

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Sonia Miller
Tamara Miller
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Lalaina Miner
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Ilana Neenan
Davina Nelson
Lars Nelson
Sandra (Sandy) Nemtzow
Alexander Neufuss
Neuroscientists
Bob Newton

Nataline

Bob Newton
Brittney Nguyen
Jamie Nicole
Kristen Nicole
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Mary Niles
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Rubye E. Noble-Evans' brother Ariel Noel-Driver

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Dallas Nolen
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Sean D.O. Smith

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Those researchers dedicated to identifying the root causes of

Bipolar Disorder.

Those who have suffered from being

a victim of a traumatic past.

Christopher Timmis

Liv Tipton Kristen Tizon Lindia Tiuatia Kristin Tocci

Bosworth M. Todd, Jr. **Emerson Tom** Alexandra Tomko Kathee Tomlinson Nikoleta Tomova Tom's Birthday Allyson Tomsky

Isabella Ton Fonda Tong Vittorio and Maria Tosti Marie Toy (for Levi)

Howard Trachtman Alejandra Tresaco Deborah Trybendis-Rau

Ya-Ju Tsai Jami Tsames

Kamen Tsvetkov Alex Tucker

Robin Turnbull-Huffmon

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Scotty Zwang

Memorial Tributes

A close family friend who suffered from mental illness.

A Friend's son A loved one Frances Abbott Michael Abbott

Richard Hilstad "Hil" Lee Abbott

Dr. Tyson K. Abbott

Cory Abell

John "Jed" B. Abrams

Melvyn Abramsky Sandy Ackermann Trace Adams

Elizabeth Adams-Addorio

Cecilia I. Adamski Yung Hei Ahn Nihal Akar Tom Aldridge Stanley Alexander

All those who have been killed by a

mentally ill individual. Connor Allard Janice M. Allison Helen S. Amatangelo Vincent S. Amoroso, Jr.

Matthew Anderson

Shirley A. Anderson's twin sister, Sharon

Silas E. Anderson Susan K. Anderson Robert W. Andrews Mary E. Anger Katherine Ansaldi James E. Anson Ziv Anukov

Alexandria A. Armstrong Anthony "Tony" P. Arsneault

Carla Artopiades **Edward Arvey** Estelle Arvey John Ascolese Michael Atkinson Elizabeth C. Attwood Christopher I. Awn John J. Awn, Jr.

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Cynthia L. Barazowski-Kassel Neil "The Warrior" Gregory Barber

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Becky Batt Dr. Michael Bauer Matthew Beaney Donald Beck James Bell

Sherrill Benjamin

Chester Charles Bennington (Linkin Park)

lan Beran

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Shoshana Bat Yisrael-Berkowitz

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Soujanya Bhumkar's friend

Zach Bianchi Mary Bieber

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Prem Jajoo Sabrina I. James G. Reed Jameson

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loey

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Keith Sevcik's twin brother

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Alison R. Smith

leff Smith Lexi Smith's sister Zachary R. Smith Mary Smith-Lawrence

Chris E. Sorensen Kelly L. Sorensen Nathan A. Soukup

Brand Southwell Peter Spacciapoli Louis A. Spadaccini Mary Sparks-Wooten Jennifer Spears-Hammer

leffrey T. Sramek Doretha St. Clair Andrew St. Dennis Jesse M. St. John Samuel R. Stack lan |. Stancato Brian A. Stapleton John A. Stapleton Andrew Starkey lustin Stawinski Brandon M. Steele

Marilyn D. Steinfeld, LCSW, MA, CGP

Brody Stevens Donald F. Stieber, Jr. Phillip Stiles Steven G. Stingley Kevin T. Stoddard Evelyn Stoddard-Crane Gary "Piedra" B. Stone William I. Stone Amy M. Strahan Mary J. Strub-Caulkins

Bill Stuesse

Kenneth E. Stutzman Michael D. Sugarman **Donald Summers** lacob Suter David M. Swoboda **Ernest Szeto** Andrew Taddy Ganson P. Taggart Jeffery R. Taillac Lily Tanaka Shobhit Taneja Joyce Tate H. Vonn Taylor Jared Taylor Gerald P. Tchir

Carole M. Teague Shawn C. Temple D. Thomas' mother

Camilla "Cammie" L. Thompson

Tal Thompson Sean Thornton Thomas Thornton

Those that fought and lost their lives.

Nicholas Tindall Ethel M. Toepel Leanne Townsend Dr. Eugene Trachtman

Jerry Traw Samuel P. Trice Richard Trommer Philip R. Trosko Donald Trybula

Alexandros Tsaoussis-Maddock

Amanda Tucci Kate Tucker Vernon W. Tuller Colette Turk-Elliott

Craig Turner

Kimberly Turner-Wilhelm Christian M. Unger Kim Valdivia Justin Vallejo Glenn Van Coevering

Charles Varkoly Varun

Police Sgt. Alexander Vazquez

Allen E. Vincent Keith A. Vinskofski Dr. Dale Vitale Annmarie Viviani Gregory Von Burg Paul Von Burg Ken Vorisek Chad Wadum William F. Wagner, Jr. Boyd E. Walker Ryan Walker

Ian Walker Kamp's brother

Marjorie "Susan / Sue" S. Wallace-Darnell

Dr. William Wanago

Eric R. Ward Martha I. Warehime Joshua Warnick Clarence Waskey, Jr. Spencer Watson Leonard Watts John Ways

Amy L. Weakley Jody Weaver James M. Weber Susan Weems Susan Weinberg Thomas M. Weintz Adam Weisman Jenna T. Welch Donna L. Welty Thomas I. Wendt Heidi A. Westhoven

Scott Weston Robert Wetzel Randy White

Katherine White-Radler John A. Wiederkehr II Michael G. Wieman Ronna D. Wilbert Henry M. Wile

John R. Wilkinson Justin Wilkinson **Dorothy Williams** Robin Williams Shawn B. Williams Andrea Williams-Barnes Katelyn A. Willmonton Margaret Wills

Edwin "Eddie" L. Wilson III

Kimberly A. Wilson Matthew I. Wilson Peter B. Wilson Richard K. Wilson Stephen J. Wilson Timothy "Timo" Wilson Betty J. Winberg

Mischa R. Wines Stuart I. Winston Renee L. Wirostek Donna M. Wise-Brownell

Douglas Wistner Clare E. Wojtusik Cheryl E. Wolfe June Wolfe Farrell J. Wolfson Jonathan Wolman Pond Wongkom

Bernard Wortman, Ph.D. Laura Wren-Polansky

Susan M. Zach Neal Zafran

Cynthia Zajaczkowski

Anna Zarski Peter W. Zartman Andrew W. Zeh Maria Zeier

Heather Zettlemoyer Edward N. Ziegler Gladys P. Ziegler Barry L. Zimmerman Chris Zimmermann Justin Zirbes

Getting the Word Out by Broadening Our Public Awareness and Connecting on Social Media

BBRF works to increase awareness about mental health among the general public and to provide hope that new and better psychiatric treatments are being developed by scientists globally. We maintain a strong social media presence in order to communicate and engage with people around the world.



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5,947 Subscribers

Hours watched in 2019



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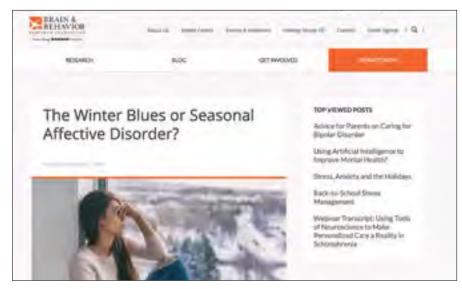
2,711 Group Members

BBRF Website

In 2019:

- · More than 2 million pages were viewed on our website (+27%)
- More than 1 million people visited the website (+40%)
- More than 420,000 people browsed the research articles published online

Monthly blog posts authored by Dr. Jeffrey Borenstein appear on the BBRF website blog such as:



BY THE NUMBERS SINCE 1987

AWARDED TO SCIENTISTS

-08+MILLION

GRANTS

The breakdown of our grants since 1987

4,682 Young Investigators

828 **Independent Investigators**

426 Distinguished Investigators

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181 ACTIVE SCIENTIFIC COUNCIL MEMBERS (AND 12 EMERITUS MEMBERS)

The all-volunteer Foundation Scientific Council is composed of leading experts across disciplines in brain & behavior research who review grant applications and recommend the most promising ideas to fund.

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- 11 Members of the National Academy of Sciences
- 4 Recipients of the National Medal of Science
- 3 Directors of the National Institute of Mental Health
- **Nobel Prize Winner**

Financial Summary*

Consolidated Statement of Financial Position

		DECEMBER 31, 2019	DECEMBER 31, 2018
ASSETS			
Cash and cash equivalents		\$8,063,589	\$5,850,675
Investments, at fair value		19,797,453	14,957,266
Contributions receivable		139,805	708,183
Pledges receivable, current portion		2,210,000	2,010,000
Prepaid expenses and other assets		72,644	89,385
	Total Current Assets	30,283,491	23,615,509
Assets held in charitable remainder trusts		1,500,421	1,287,823
Fixed assets, net		25,053	38,546
ledges receivable, net-less current portion		6,263,110	3,817,651
	Total Assets	\$38,072,075	28,759,529

LIABILITIES AND NET ASSETS			
Liabilities			
Accounts payable and accrued expenses		\$79,548	\$60,639
Grants payable		19,481,669	19,863,771
Accrued compensation		100,258	102,095
Annuities payable		767,679	680,513
Charitable gift annuities payable		172,450	181,616
	Total Liabilities	20,601,604	20,888,634
Net Assets			
Net assets without donor restrictions		8,410,779	2,957,395
Net assets with donor restrictions		9,059,692	4,913,500
	Total Net Assets	17,470,471	7,870,895
	Total Liabilities and Net Assets	\$38,072,075	\$28,759,529

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

Consolidated Statement of Activities

	YEAR ENDED DECEMBER 31, 2019	YEAR ENDED DECEMBER 31, 2018
SUPPORT AND REVENUE		
Contributions	\$16,069,353	\$15,556,817
Special events, net	345,041	381,244
Contribution of services	1,977,786	1,908,417
Bequests	9,206,115	2,330,941
Net realized and unrealized gains (losses) on investments	3,734,593	(450,793)
Net appreciation (depreciation) of assets held in charitable remainder trusts	212,598	(178,707)
Dividend and interest income	239,655	280,034
Total Support and Revenue	31,785,141	19,827,953

EXPENSES			
Program Services			
Research grants and awards		14,797,331	14,052,583
Scientific advancement		2,268,335	1,986,729
Program support		2,487,570	2,530,355
	Total Program Services	19,553,236	18,569,667
Supporting Services			
Fundraising**		889,015	908,528
Administration**		1,743,314	1,758,414
	Total Supporting Services	2,632,329	2,666,942
	Total Expenses	22,185,565	21,236,609
Change in Net Assets		9,599,576	(1,408,656)
Net Assets, beginning of year		7,870,895	9,279,551
	Net Assets, end of year	\$17,470,471	\$7,870,895

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



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