



**BRAIN &
BEHAVIOR**
RESEARCH FOUNDATION

Awarding **NARSAD** Grants

ANNUAL REPORT 2015

CURES THROUGH RESEARCH

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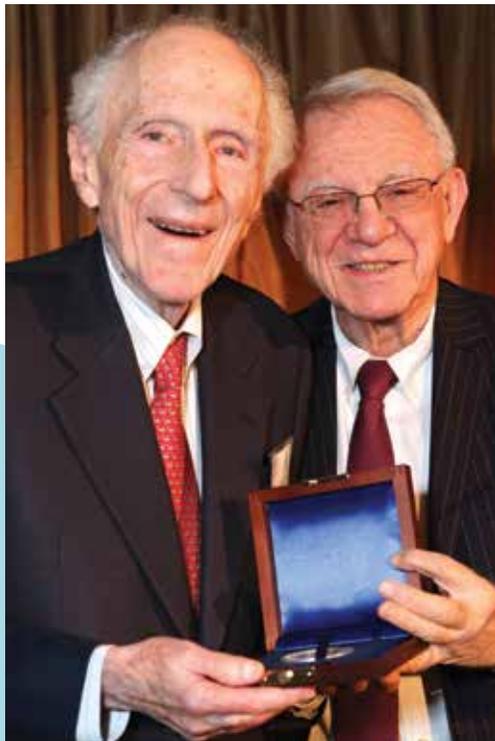




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Our Global Footprint

529 Institutions (including subsidiaries and affiliations)

329 In the U.S.

200 Outside of the U.S.

"The reach of the Brain & Behavior Research Foundation's Grants knows no borders. The impact of our effort is not only in the development of promising scientists, but also in the focus it brings to the challenge and urgent need of bringing hope and better lives to all those living with mental illness."

HERBERT PARDES, M.D.

President, Foundation Scientific Council
Executive Vice Chairman of the Board of Trustees
NewYork-Presbyterian Hospital

Institutions Added in 2015

- Ghent University
- Italian Institute of Technology
- University of Vienna, Ferris University
- National Scientific Council of Argentina (CONICET)
- Second University of Naples
- University of Cadiz
- University of Kansas
- University of Rennes, University of Basque Country
- University of Trento
- University of Tulsa

Grants

IN 2015

Young Investigators

- 712 Applications
- 191 Awarded
- 179 New Grantees
- 12 Prior Grantees

Independent Investigators

- 315 Applications
- 40 Awarded
- 16 New Grantees
- 24 Prior Grantees

Distinguished Investigators

- 181 Applications
- 15 Awarded
- 6 New Grantees
- 9 Prior Grantees

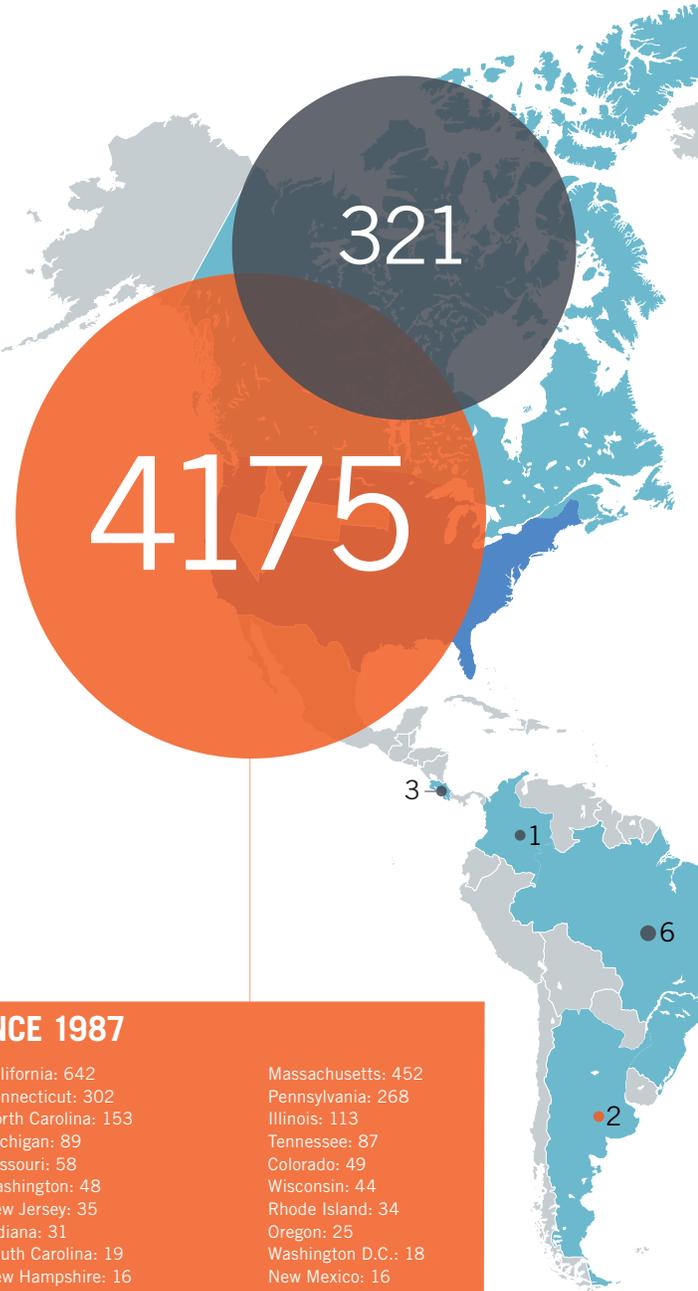
SINCE 1987

Total Amount Awarded

\$342 Million

Total Grants Awarded

- 5,000+ In total
- 4,100+ In the U.S.
- 900+ Outside of the U.S.



GRANTS BY STATE SINCE 1987

New York: 757	California: 642	Massachusetts: 452
Maryland: 306	Connecticut: 302	Pennsylvania: 268
Texas: 177	North Carolina: 153	Illinois: 113
Georgia: 93	Michigan: 89	Tennessee: 87
Ohio: 82	Missouri: 58	Colorado: 49
Iowa: 49	Washington: 48	Wisconsin: 44
Virginia: 38	New Jersey: 35	Rhode Island: 34
Minnesota: 33	Indiana: 31	Oregon: 25
Florida: 25	South Carolina: 19	Washington D.C.: 18
Alabama: 16	New Hampshire: 16	New Mexico: 16
Louisiana: 15	Kentucky: 13	Utah: 13
Arizona: 10	Mississippi: 10	Oklahoma: 7
Arkansas: 7	Nebraska: 6	Vermont: 5
Kansas: 4	Hawaii: 4	West Virginia: 4
Maine: 1	Delaware: 1	

Number of Grants in a Country
Orange indicates a new institution was added in 2015

DEAR FOUNDATION SUPPORTERS

Beginning in 1987, long before the venture capital tech boom and the Internet Bubble (1995–2000), the Brain & Behavior Research Foundation was providing seed money to neuroscientists to invest in “out of the box” research that the government and other sources were unwilling to fund. That same year the Foundation awarded \$250,000 in NARSAD Young Investigator Grants to its first 10 early career scientists at \$25,000 each to fund their promising research ideas. As of December 2015, we have awarded more than \$342 million in more than 5,000 grants, to more than 4,000 scientists in the United States and 34 other countries, in over 525 universities and medical centers.

The \$342 million in grants awarded by the Foundation since 1987 has resulted in over \$3 billion in additional research funding for these scientists.

We can measure our success through the multiplier effect. A survey of our grantees revealed:

- NARSAD Grants increase researchers ability to secure additional grant support
- NARSAD Grants result in subsequent funding (federal and private) of at least 10 times the amount invested by the Foundation

Government budgets are declining for basic research and many major pharmaceutical companies are backing away from neuropsychiatric research and development. The Foundation is unique in that it relies on private contributions of individuals and family foundations to accelerate funding of the most promising brain research to find better treatments and cures for mental illness. We seek answers in understanding how the brain functions and can malfunction; answers in developing preventative and early intervention techniques and answers in finding improved treatments for those whose illness has progressed. In 2015, the Foundation awarded a total of \$18.5 million to our Young Investigator, Independent Investigator and Distinguished Investigator Grantees.

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.

An independent measure of the success of our grants is in a recent RAND Europe analysis of the global mental health research funding landscape over the past five years. This report found that we are the top non-government mental health research funder mentioned in published articles.

The Foundation is a driving force in advancing what is known about mental illness and how to better treat, prevent and ultimately cure it. A few examples of research progress in 2015 include:

Gene Expression Analysis Points Toward Pathways Involved in Major Depression

Dr. Patrick Sullivan (2014 Lieber Prizewinner and 2010 Distinguished Investigator) and Dr. Dorret Boomsma (2011 Distinguished Investigator) identified 119 genes whose activity differs significantly in people with major depressive disorder. Whether stemming from inherited genetic factors and/or environmental influences, these gene expression changes help point scientists toward biological pathways likely to be involved in the disorder. The study also pointed to 19 genes whose expression was more likely to have returned to normal if an individual had recovered from an earlier depression.

Hopeful News on Comprehensive Team Treatment of Early Psychosis

Dr. Nina Schooler (Scientific Council Member and 1998 Distinguished Investigator), Dr. Kim Mueser (2003 Distinguished Investigator and 1988 Young Investigator) and five other grant recipients, along with other colleagues, demonstrated that early intervention and coordinated team care can make a real, positive difference in outcomes for first-episode psychosis patients. Over two years, the team treated 223 patients with a protocol called NAVIGATE, a first-episode intervention stressing low-dose antipsychotic medications; cognitive behavioral therapy to support resiliency and illness self-management skills; family psychoeducation and support; and provided employment and educational opportunities. The better outcomes suggest the importance of early and coordinated intervention after a first psychotic episode.

New Compounds Show Promise in Treating Schizophrenia Symptoms

Dr. Marc Caron, (Scientific Council Member, 2013 Lieber Prizewinner and 2005 Distinguished Investigator) found two new small-molecule drugs tested in mice alleviated some symptoms of schizophrenia-like behaviors, including social avoidance and cognitive performance. The team found that drugs called UNC9975 and UNC9994 influence the beta-arrestin communication pathway and reduced hyperactive movements, improved memory for novel stimuli, and made the test mice more social. The work shows that hitting other pathways in schizophrenia has the potential to treat symptoms in more individualized, fine-tuned ways.

We Support Scientists and Research in Its Early Stages

We understand that some outcomes may be groundbreaking, like our early support of the use of Clozaril for schizophrenia, transcranial magnetic stimulation for treatment resistant depression, deep brain stimulation for depression, and optogenetics, the breakthrough technology that uses light to control activity patterns in the brain. But all research generates new findings that can help advance the understanding of the brain. Foundation funded grants are like venture capital support for our scientists.

Most of our grants go to Young Investigators. By funding these scientists, you are supporting a career in brain research. We have a unique arrangement with the universities and institutions in which no overhead costs are taken from the grants given to our Young Investigators—every dollar goes to scientific research. With our Independent Investigators and Distinguished Investigators, institutions may only take up to eight percent maximum per year of overhead costs.

Because of the generous support of two family foundations which cover the Foundation's operating expenses, 100 percent of your contributions for research are invested in our grants leading to advances and breakthroughs in brain and behavior research. Your donations have a tremendous impact.

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 mission to alleviate the suffering of mental illness through scientific advances and understanding is based upon our steadfast commitment to patients, family members and friends. We believe that this past year more people were able to live happy, productive lives. This progress could not have been accomplished without the extraordinary dedication of our 165-member Scientific Council. Their volunteer effort is at the heart of the Foundation's achievements and the basis for its success in continuing to make advances in research.

But more still needs to be done and we are poised and ready. With your ongoing commitment we will continue to invest your contributions into promising ideas that get results. Results that in turn will improve lives. Thank you for your support.

With sincere thanks and regards,



A handwritten signature in black ink, appearing to read "Jeff Borenstein".

JEFFREY BORENSTEIN, M.D.
President and CEO



A handwritten signature in black ink, appearing to read "Stephen A. Lieber".

STEPHEN A. LIEBER
Chair, Board of Directors



A handwritten signature in black ink, appearing to read "Herb Pardes".

HERBERT PARDES, M.D.
President, Scientific Council



15

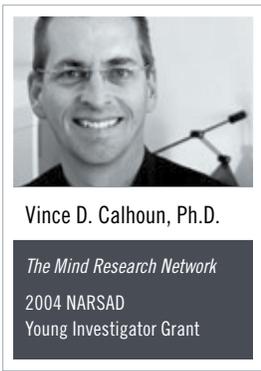
**MAJOR
DISCOVERIES**

in 2015

2015 was an exciting year in brain and behavior research thanks to you and the many others who generously support our grantees and the groundbreaking discoveries they are making.

Listed in Order of Publication

- 1 Long-Term Effects of Marijuana on the Brain
- 2 Lithium Linked to Lower Incidence of Dementia in Older People with Bipolar Disorder
- 3 Parent's History of Suicide Attempts Helps Predict Suicide Attempts in Their Children
- 4 Combined Drug Treatment Improved Results in Geriatric Depression
- 5 Omega-3 Relieves Depression Symptoms in People with Bodily Inflammation
- 6 Estrogen Drug Improves Cognition in Schizophrenia Patients
- 7 Gene Expression Analysis Points Toward Pathways Involved in Major Depression
- 8 Non-Invasive Stimulation Reworks Brain Waves, Improves Cognition
- 9 New Compounds Show Promise in Treating Schizophrenia Symptoms
- 10 Drug Helps Mice Respond Normally to Fear After Traumatic Experience
- 11 Watching Patient-Derived Brain Cells Take Shape in the Lab Reveals Autism Defect
- 12 Omega-3 Supplements Linked to Reduced Risk of Developing Psychosis
- 13 Size of Brain Structure May Predict Effectiveness of Ketamine
- 14 Distinguishing Childhood and Adult Forms of ADHD
- 15 Hopeful News on Comprehensive Team Treatment of Early Psychosis



1

BASIC RESEARCH: ADDICTION

Long-Term Effects of Marijuana on the Brain

Marijuana use is on the rise nationally, a fact that is not surprising in view of recent efforts

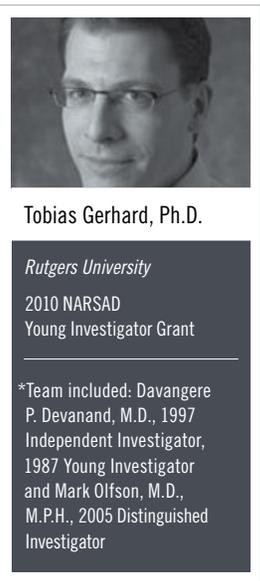
to legalize the drug in several states. Scientific Council member Nora Volkow, Director of the National Institute on Drug Abuse in Washington, D.C., has repeatedly warned of the harmful impact of heavy marijuana use on the brain, particularly among those who use the drug regularly beginning at a very young age, and among those who happen to be at elevated risk for psychotic illness.

Scientific studies of the long-term effects of marijuana on the brain have generated controversy, providing an inconsistent picture in part due to variations in research methods. With this in mind, a research team that included Vince D. Calhoun, Ph.D., recipient of a NARSAD Young Investigator grant in 2004, set out to perform a comprehensive study to characterize brain alterations associated with chronic marijuana use.

The team, led by Francesca Filbey, Ph.D., of the University of Texas at Dallas, measured the volume of the brain's grey matter brain-wide with structural magnetic resonance imaging, as well as abnormal grey matter regions and the integrity of the brain's white matter via diffusion tensor imaging. Subjects included 48 marijuana users and 62 matched control subjects who did not use the drug.

Reporting in the *Proceedings of the National Academy of Sciences*, the team found changes in grey matter volume and potential functional abnormalities in grey matter as well in connections within white matter. Specifically, they found that chronic use reduces grey matter volume in the brain's orbitofrontal cortex; increases structural and functional connectivity; and leads to neural alterations that are affected by the age of onset and duration of use.

These findings suggest chronic marijuana use results in complex neuroadaptive processes. Future long-term studies will be needed to determine whether there is a reversion to normal following prolonged abstinence from marijuana use.



2

BASIC RESEARCH/TREATMENT: BIPOLAR DISORDER

Lithium Linked to Lower Incidence of Dementia in Older People with Bipolar Disorder

People with bipolar disorder are thought to be more likely to develop dementia than those who don't have the disorder. Hence the importance of a finding by Tobias Gerhard, Ph.D., of Rutgers University, and colleagues*, who reported in 2015 that regular

treatment with lithium may reduce the risk of dementia in people with bipolar disorder.

Lithium is an effective mood stabilizer for people with bipolar disorder. It was approved by the U. S. Food and Drug Administration in the 1970s, but its use has declined in the last 20 years as alternative treatments, such as the anticonvulsants valproic acid (Depakote and others) and lamotrigine (Lamictal), have become available.

In the January 22, 2015 issue of the *British Journal of Psychiatry* Dr. Gerhard and team set forth the results of their analysis of data from more than 40,000 adults. They had examined Medicare and Medicaid records of patients over 50 years of age diagnosed with bipolar disorder. For those who took lithium more than 300 days during the prior year, dementia occurred less frequently than for those who took the drug less frequently or not at all during the same period. Using lithium sporadically or intermittently did not affect the incidence of dementia, nor did treatment with anticonvulsants regardless of how often they were used.

Lithium blocks an enzyme called GSK3, known to contribute to Alzheimer's disease. Scientists have suspected that the drug might protect broadly against neurodegeneration, but clinical evidence has been inconsistent. The Gerhard team's analysis is the largest to date of dementia among people taking lithium to treat bipolar disorder. According to Dr. Gerhard, the findings "strengthen the hypothesis that lithium exerts a protective effect on the development of dementia in patients with bipolar disorder, and support clinical trials to further investigate the neuroprotective effects of lithium."



J. John Mann, M.D.

Columbia University

Scientific Council Member

2008 NARSAD Distinguished Investigator Grant

*Team included:

David A. Brent, M.D.,
2001 Distinguished Investigator,

John G. Keilp, Ph.D.,
1998 and 1996 Young Investigator and

Nadine M. Melhem, Ph.D.,
2013 and 2004 Young Investigator

3

PREVENTION/DIAGNOSIS: SUICIDAL BEHAVIOR

Parent's History of Suicide Attempts Helps Predict Suicide Attempts in Their Children

As public health experts debate the best ways to reduce suicides—the 10th leading cause of death in the United States—new research by Foundation Scientific Council member and 2008 Distinguished Investigator grantee J. John Mann, M.D., and colleagues* calls attention to the importance of early intervention based on long-term risk factors.

In a study published in the February 2015 issue of *JAMA Psychiatry*, Dr. Mann and colleagues probed the extent to which suicidal behavior in a parent gets passed on to children. The team tracked 701 children of 334 people diagnosed with mood disorders for an average of six years to identify factors that predicted suicide attempts among the children.

The investigators found that having a parent who had attempted suicide made it nearly five times more likely that one of their children would make an attempt. It has been known that both genetic and non-genetic factors related to the predisposition for suicidal behavior, or to psychiatric illnesses that trigger suicidal behavior, are transmitted in families. This study sought to identify the factors responsible for familial transmission.

Suicide attempts were more likely among those children who, like their parents, were diagnosed with a mood disorder such as major depression or bipolar disorder. Such diagnoses are typically present at least a year before the first attempt. Most people diagnosed with depression do not attempt suicide because they do not have a predisposition to suicidal behavior. Independent of family history of depression, impulsive and aggressive behavioral traits among the children also made it more likely that they will attempt suicide.

The findings highlight the importance of three long-term risk factors a family history of suicide attempts, a family history of mood disorders, and a personal history of impulsive aggression.



Helen Lavretsky, M.D.

Semel Institute, University of California, Los Angeles

1999 NARSAD Young Investigator Grant

4

NEXT-GENERATION TREATMENTS: DEPRESSION (GERIATRIC)

Combined Drug Treatment Improved Results in Geriatric Depression

Helen Lavretsky, M.D., of the University of Southern California, was first author on an important paper reporting results of the first comprehensive and well-controlled trial to find out if the drug methylphenidate (Ritalin) can enhance clinical and cognitive outcomes in patients with geriatric depression. Their results appeared in *The American Journal of Psychiatry* on February 13, 2015.

The research team specifically set out to discover whether methylphenidate improved patients' response to the widely prescribed antidepressant citalopram (Celexa). They conducted a 16-week randomized double-blind placebo-controlled trial for geriatric depression in 143 older outpatients diagnosed with major depression. They compared results in three treatment groups of equal size: one group received methylphenidate plus placebo; a second, citalopram plus placebo; and a third, citalopram plus methylphenidate.

Daily doses ranged from 20 mg to 60 mg for citalopram and from 5 mg to 40 mg for methylphenidate. All groups showed significant improvement in depression severity and in cognitive performance. However, the improvement was more prominent in the citalopram plus methylphenidate group compared with the other two groups.

Additionally, the rate of improvement in the citalopram plus methylphenidate group was significantly higher than that in the citalopram plus placebo group in the first four weeks of the trial. The groups did not differ in cognitive improvement or number of side effects.

Combined treatment with citalopram and methylphenidate demonstrated an enhanced clinical response profile in mood and well-being, as well as a higher rate of remission, compared with either drug alone. All treatments led to an improvement in cognitive functioning, although augmentation with methylphenidate did not offer additional benefits, the team reported.

5



Mark H. Rapaport, M.D.

Emory University School of Medicine

1999 NARSAD Independent Investigator Grant



Andrew A. Nierenberg, M.D.

Massachusetts General Hospital
Scientific Council Member

2013 Foundation Colvin Prizewinner

2003 NARSAD Distinguished Investigator Grant

2000 NARSAD Independent Investigator Grant



David Mischoulon, M.D., Ph.D.

Massachusetts General Hospital

2000, 1998 NARSAD Young Investigator Grant

NEXT-GENERATION THERAPY: DEPRESSION

Omega-3 Relieves Depression Symptoms in People with Bodily Inflammation

In the March 24, 2015 issue of *Molecular Psychiatry*, Foundation Grantees found that certain fatty acids, including omega-3, worked better to reduce symptoms of depression in people with signs of elevated bodily inflammation, compared to people without those signs. The finding supports the use of fatty acids to treat some people with depression, although the research needs to be replicated in a trial with many more participants.

Omega-3 fatty acids are found in some green vegetables, vegetable oils, and fatty fish. They are recommended by some physicians as a way to protect against heart disease and stroke. In this study, 155 people with major depressive disorder were given either a placebo or one of two types of omega-3s: eicosapentaenoic acid (EPA) or docosahexaenoic acid (DHA), over an 8-week period. They were also tested to see whether they had any of 10 chemicals in their blood

indicating high inflammation levels. People with one or more indicators of high inflammation showed a greater reduction in depressive symptoms if taking EPA compared with DHA. But people who showed no indicators of high inflammation responded *less* to EPA than either DHA or placebo, indicating that taking EPA is not always helpful. While omega-3s like EPA with anti-inflammatory properties may help relieve symptoms in people whose depression is associated with inflammation, omega-3s may in fact interfere with depression treatment in people whose depression has other causes.

6



Cynthia S. Weickert, Ph.D.

University of New South Wales, Australia

2004 NARSAD Independent Investigator Grant

2001, 1999 NARSAD Young Investigator Grant

Team included:
Rhosel K. Lenroot, M.D., 2003 Young Investigator and Ans Vercammen, Ph.D., 2010 Young Investigator, along with Jayashri Kulkarni, MBBS, MPM, FRANZCP, Ph.D., 2000 Independent Investigator, and her husband and first author Thomas W. Weickert, Ph.D.

NEXT-GENERATION THERAPY: SCHIZOPHRENIA

Estrogen Drug Improves Cognition in Schizophrenia Patients

A team led by University of New South Wales researcher Cynthia S. Weickert, Ph.D., discovered in 2015 that the estrogen-like drug raloxifene—often prescribed for osteoporosis—can improve attention and memory in men and women with schizophrenia.

A growing body of evidence suggests that estrogen plays a beneficial role in the brain, supporting growth and protecting neurons

from damage. From work supported by her NARSAD Young Investigator Grants, Dr. Weickert and her colleagues[†] found that brain estrogen receptors are altered in some people with schizophrenia, blunting their ability to respond to estrogen's beneficial effects. Raloxifene stimulates estrogen receptors and can help overcome a blunted estrogen response. The drug also stimulates estrogen receptors in the brain and may guard against memory loss in aging, making it potentially useful for cognitive problems in schizophrenia patients.

Dr. Weickert and colleagues reported May 18, 2015 in the journal *Molecular Psychiatry* on the drug's effect in 98 people diagnosed with schizophrenia or schizoaffective disorder (which combines symptoms of schizophrenia and a mood disorder). All of the patients received a daily dose of raloxifene along with their usual antipsychotic medications in one phase of the clinical trial and a placebo in another phase.

After the first six-week period, patients taking raloxifene had improved scores on memory and attention compared to those taking placebo. Raloxifene treatment significantly improved attention and thought processing speed. It did not reduce the severity of schizophrenia symptoms any more than the placebo did, but both groups showed fewer symptoms overall during the study, and none of the patients had severe side effects from the treatment.



Patrick F. Sullivan, M.D.,
FRANZCP

University of North Carolina
School of Medicine and the
Karolinska Institute

2014 Lieber Prizewinner

2010 NARSAD Distinguished
Investigator Grant



Dorret I. Boomsma, Ph.D.

VU University Amsterdam,
Netherlands

2011 NARSAD Distinguished
Investigator Grant

7

BASIC RESEARCH: DEPRESSION

Gene Expression Analysis Points Toward Pathways Involved in Major Depression

While there is good evidence that genetics influences a person's likelihood of developing major depression, scientists have only just begun to uncover specific genetic variations that may increase risk. In a study published May 26, 2015 in *Molecular Psychiatry*, scientists led by Patrick F. Sullivan, M.D., at the University of North Carolina School of Medicine, sought out depression-relevant genes by measuring and comparing gene activity in the cells of more than 1,800 individuals. To date, this is the largest analysis of gene

expression in people with major depression.

Using blood samples collected as part of the Netherlands Study of Depression and Anxiety, Dr. Sullivan and Dr. Dorret Boomsma measured gene expression in the cells of 882 people with depression, 635 people who were not experiencing major depression at the time of the study but had in the past, as well as a control group of 331 people who reported no current or past depression.

They found 119 genes whose activity differed between the control group and people with current depression. Many of these were genes that affect immune function. This was consistent with other research suggesting a link between the immune system and mood disorders.

Two years after their initial analysis, Dr. Sullivan and colleagues collected additional data from a subset of the people in the study. This enabled them to compare gene activity between those who had recovered from their depression and those who didn't. Of the 119 depression-associated genes they had already identified, they found 19 genes whose activity also correlated with changes in depression—in these 19 genes, expression was more likely to have returned to normal among those who had recovered from their depression.



Sohee Park, Ph.D.

Vanderbilt University

2012 NARSAD Distinguished
Investigator Grant

2004 NARSAD Independent
Investigator Grant

1996, 1991 NARSAD
Young Investigator Grant

8

NEXT-GENERATION THERAPY: SCHIZOPHRENIA

Non-Invasive Stimulation Reworks Brain Waves, Improves Cognition

Transcranial direct current stimulation (tDCS) is an affordable and portable way to stimulate the brain. It can help induce normal neural activity and make

thought processes more flexible in people with schizophrenia, according to a study published online June 29, 2015 in *Proceedings of the National Academy of Sciences*.

The study suggests a drug-free and safe way of treating debilitating cognitive problems, for which antipsychotics are not completely effective.

Among the cognitive impairments present in schizophrenia are problems with learning from mistakes and adapting to changing conditions. In lab tests, people with schizophrenia may stick with wrong answers or strategies even if the outcome is not successful. They do not tend to slow down to reconsider their responses after making a mistake. These difficulties can interfere with learning at all levels.

“In order to optimally interact with our complicated environment, we constantly adjust our behavior,” explains Dr. Sohee Park. “People with schizophrenia have difficulty adjusting. This results in inflexibility of actions and thoughts. Importantly, they may not even notice their errors when they make them.”

Twenty minutes of low-voltage tDCS applied to the scalp over the medial prefrontal cortex improved error-monitoring and accuracy in a test of adaptive control in people with schizophrenia. After stimulation, specific brain waves measured by scalp electrodes were observed to “normalize,” by showing greater synchrony—in this respect more resembling patterns seen in healthy controls.

Scientific Council Member Cameron Carter, M.D. wrote: “these findings reinforce our growing understanding that the disordered brain is not locked away inside the skull but is indeed within our reach and accessible for neuromodulation.”



Marc G. Caron, Ph.D.

Duke University

Scientific Council Member

2013 Lieber Prizewinner

2005 NARSAD Distinguished Investigator Grant

9

NEXT-GENERATION THERAPY: SCHIZOPHRENIA

New Compounds Show Promise in Treating Schizophrenia Symptoms

Two new small-molecule drugs tested in mice can alleviate some symptoms of schizophrenia-like behaviors, including

movement abnormalities, social avoidance, and cognitive performance. This preliminary success in work toward better treatments for schizophrenia, was reported July 1, 2015 in *Neuropsychopharmacology*.

Currently used antipsychotic drugs block the dopamine D2 receptor, an important communication port for some neurons in the brain. These drugs are used mainly to treat schizophrenia's "positive" symptoms such as delusions and hallucinations. They are less effective, and often ineffective, in treating "negative" symptoms such as a lack of pleasure in everyday life, or concentration and memory problems (schizophrenia's "cognitive symptoms").

The research team, which included Marc G. Caron, Ph.D., and William C. Wetsel, Ph.D., a 1998 NARSAD Independent Investigator, both of Duke University Medical Center, decided to look for drug candidates that would block signaling pathways related to the dopamine D2 receptor that are not affected by existing antipsychotic medicines, in the hope that this might reveal novel ways to treat a wider variety of schizophrenia symptoms.

They tested two dopamine D2 receptor-targeting compounds called UNC9975 and UNC9994 that influence the beta-arrestin communication pathway. The research showed that the compounds could normalize schizophrenia-like symptoms in mice by reducing their hyperactive movements, improving their memory for novel stimuli and making them more social around other mice.

The new compounds also produced a much lower level of catalepsy—a rigid muscle side effect of schizophrenia treatment—than traditional antipsychotic drugs. Targeting different pathways connected to the dopamine D2 receptors may facilitate treating patients in more individualized, fine-tuned ways.



Kerry J. Ressler, M.D., Ph.D.

McLean Hospital,

Harvard Medical School

Scientific Council Member

2005, 2002 NARSAD

Young Investigator Grant

10

NEXT-GENERATION THERAPY: ANXIETY, POST-TRAUMATIC STRESS DISORDER

Drug Helps Mice Respond Normally to Fear After Traumatic Experience

In treating post-traumatic stress disorder (PTSD), the goal is to find ways to help patients "extinguish" abnormal and exaggerated fear responses that can continue long after a traumatic event. In a new study with mice, Kerry J. Ressler, M.D., Ph.D., and his colleagues showed that treatment with the corticosteroid drug dexamethasone can help the animals lose their PTSD-related fear response, possibly through the drug's effects on a gene called *Fkbp5*.

The findings, published online July 15, 2015 in the journal *Neuropsychopharmacology*, may reveal an opportunity to halt the disorder soon after people experience a traumatic event. Dr. Ressler, of Emory University, who in 2002 and 2005 received NARSAD Young Investigator Grants, and colleagues, trained a group of mice using sounds and mild electrical shocks to learn and then to inhibit a specific fear. Animals that had experienced a traumatic event before the fear training were more likely to inhibit or extinguish the fear if they were given a low dose of dexamethasone four hours beforehand to suppress the internal stress response. The fear was also more likely to remain "extinguished" 24 hours later in those same animals.

Dr. Ressler and colleagues also showed that the dexamethasone dose affected how *Fkbp5* is expressed in the amygdala, a part of the brain involved in regulating fear and anxiety. They suggest that dexamethasone may help to extinguish fear learning after a trauma through its effects on *Fkbp5*, specifically in that gene's role in helping regulate the response to stress.

The study adds to the body of research implicating *Fkbp5* in PTSD, including earlier reports by Dr. Ressler and others that have indicated certain mutations in the gene may be related to whether childhood victims of trauma grow up to develop PTSD as adults.



Flora M. Vaccarino, M.D., Ph.D.

Yale University

2011 NARSAD Distinguished Investigator Grant

2003, 2000, 1993, 1990 NARSAD Young Investigator Grant

Gianfilippo Coppola, Ph.D., 2013 Young Investigator, was also a member of the scientific team.

11

NEXT-GENERATION TECHNOLOGY/ BASIC RESEARCH: AUTISM

Watching Patient-Derived Brain Cells Take Shape in the Lab Reveals Autism Defect

Scientists using a new technology that involves reprogramming stem cells reported July 16, 2015 in *Cell* that overproduction of certain cell types during early development could lead to faulty wiring in the brains of people with autism. The study was led by Flora

M. Vaccarino, M.D., Ph.D., of Yale University and included Gianfilippo Coppola, Ph.D.*

To follow early brain development in cells with the same genetic makeup as those in people with autism, Dr. Vaccarino's team sampled skin cells from four people with the disorder and then reprogrammed them to redevelop as neurons. The scientists watched as the reprogrammed cells divided, became more specialized, and organized themselves into structures called organoids, composed of neurons at a developmental stage equivalent to the first trimester of human fetal development.

The team compared organoids derived from the cells of people with autism to a set derived from cells of the patients' fathers, who did not have autism. In the patient-derived organoids, they found an overabundance of inhibitory neurons which dampen the signals of other cells. Cells in the autism-derived organoids also divided more quickly than those in the organoids derived from the cells of unaffected individuals.

The researchers linked excessive numbers of inhibitory neurons at least in part to the over activity of a gene called FOXP1. When they grew new brain-like organoids from the same autistic individuals but this time artificially *decreasing* the activity of the FOXP1 gene, some of the key developmental defects did not appear. The normal balance of excitatory and inhibitory neurons was restored.

The findings suggest that measuring FOXP1 activity could help clinicians more accurately diagnose autism spectrum disorders. They also suggest that targeting FOXP1 may be an effective strategy for developing new drugs to treat autism.



Patrick McGorry, M.D., Ph.D., FRCP, FRANZCP

University of Melbourne, Australia

2015 Lieber Prizewinner

1998 NARSAD Distinguished Investigator Grant

12

NEXT-GENERATION TREATMENTS: PSYCHOSIS, SCHIZOPHRENIA, BIPOLAR DISORDER

Omega-3 Supplements Linked to Reduced Psychosis Risk

The Foundation's 2015 Lieber Prizewinner for schizophrenia research, Patrick McGorry, M.D.,

Ph.D., of the University of Melbourne, Australia, along with study leader Dr. G. Paul Amminger and colleagues, reported that a 12-week course of omega-3 polyunsaturated fatty acid (PUFA) supplements reduced the risk that young adults would develop schizophrenia or other psychiatric illnesses.

A decade ago, the same team conducted the first trial showing that omega-3 PUFAs prevented a first episode of psychotic disorder for up to one year. On August 11, 2015 they reported results of their new research in *Nature Communications*.

Several controlled trials have shown that supplementation with omega-3 PUFAs can reduce psychotic symptoms. Since these have no clinically relevant adverse effects and are considered beneficial to health, they are ideal candidates for prevention of psychosis," the team said.

The new study looked at the longer-term impact of the supplements, among 81 people aged 13 to 25 with early psychosis. After following the patients for an average of 6.7 years after treatment, 9.8% who received the omega-3 PUFAs had at some point developed a psychotic disorder, compared to 40% of those who received placebos.

The team investigated whether omega-3 PUFA supplementation reduced need for antipsychotic medication. The proportion of individuals who reported having been prescribed antipsychotic medication at follow-up was 29.4% (10/34) in the omega-3 PUFA group and 54.3% (19/35) in the placebo group.

It's not clear exactly how omega-3 PUFAs affect the development of psychosis. It has been postulated to reduce inflammation in the brain and aid the growth of new neurons.



Chadi Abdallah, M.D.

Yale University

2015 Klerman Prize
Honorable Mention

2014, 2012 NARSAD
Young Investigator Grant

Including:

Sanjay Mathew, M.D.,
2009 Independent
Investigator, 2006, 2001
Young Investigator and
Ramiro Salas, Ph.D., 2012
Young Investigator

13

NEXT-GENERATION DIAGNOSTIC/ TREATMENT: DEPRESSION

Size of Brain Structure May Predict Effectiveness of Ketamine

Among the symptoms experienced by people who develop post-traumatic stress disorder (PTSD) is “anxious arousal”—feeling tense or easily startled much of the time. New research published in the April 2015 issue of the journal *JAMA Psychiatry* linked these symptoms to a reduction in

the size of the amygdala, a structure deep in the brain that is associated with fear processing and emotion.

The team, led by Robert H. Pietrzak, Ph.D., of the Department of Veterans Affairs National Center for PTSD in Connecticut and included Chadi Abdallah, M.D. of Yale University, wanted to evaluate whether amygdala size correlates with certain clusters of symptoms, rather than the overall disorder.

The scientists used magnetic resonance imaging to assess the size of the hippocampus and the amygdala in 48 combat veterans who served in Iraq or Afghanistan, 23 of whom had been diagnosed with PTSD.

For each patient, the team correlated the size of the amygdala and hippocampus to the severity of each of five categories of symptoms: 1) anxious arousal; 2) dysphoric arousal (sleep difficulties), 3) re-experiencing (through dreams, flashbacks, or frightening thoughts), 4) avoidance (of reminders of the traumatic event) and 5) emotional numbness.

There was one significant correlation: in veterans with the most severe anxious arousal symptoms, the right amygdala was smaller than it was in other study participants. They also found that the right amygdala was smallest in veterans who had been exposed to the most severe combat.

The findings suggest that combat exposure may contribute to shrinking of the amygdala, which is in turn associated with increased anxious arousal.



Avshalom Caspi, Ph.D.

Duke University

2010 Ruane Prizewinner



Terrie E. Moffitt, Ph.D.

Duke University

2010 Ruane Prizewinner



Guilherme V. Polanczyk,
M.D., Ph.D.

University of São Paulo School
of Medicine, Brazil

2008 NARSAD
Young Investigator

14

BASIC RESEARCH/ NEXT-GENERATION DIAGNOSIS: ADHD

Distinguishing Childhood and Adult Forms of ADHD

Despite assumptions that adult ADHD is a childhood-onset neurodevelopmental disorder, no long-term study has described the childhood period of *adults* diagnosed with ADHD. A team led by Avshalom Caspi, Ph.D., the 2010 Ruane Prize winner, performed retrospective analyses of people with ADHD diagnosed in adulthood and compared them with analyses of people diagnosed in childhood.

The team, which also included Terrie E. Moffitt, Ph.D., co-winner with Dr. Caspi of the 2010 Ruane Prize, and Guilherme V. Polanczyk, M.D., Ph.D., of the University of São Paulo School of Medicine, Brazil, reported results in the *American Journal of Psychiatry* on October 1, 2015.

They found that during childhood, six percent of the group, mostly boys, was diagnosed with ADHD. But in adulthood, only three percent received an ADHD diagnosis, with males and females affected about equally. The great surprise was that almost none of those with adult ADHD were among the portion of the group that had been diagnosed during childhood. Ninety percent of adult ADHD cases lacked a history of childhood ADHD.

If this finding is replicated in other studies, i.e., if a childhood ADHD group and a demographically comparable adult ADHD group are found to comprise virtually non-overlapping sets, then it is possible, the researchers say, that adult ADHD is not a neurodevelopmental disorder that begins in childhood, as is widely believed, but may in fact be a separate condition with other causes.



Nina R. Schooler, Ph.D.

State University of New York
Downstate Medical Center

Scientific Council Member

1998 NARSAD Distinguished
Investigator Grant



Kim T. Mueser, Ph.D.

Boston University

2003 NARSAD Distinguished
Investigator Grant

1989, 1988 NARSAD
Young Investigator Grant

*Including
Mary F. Brunette, M.D., 2000
Young Investigator; Christoph
U. Correll, M.D.,
2007 Young Investigator;
Jennifer D. Gottlieb, Ph.D.,
2009 Young Investigator;
Robert K. Heinsen, Ph.D.,
1990 Young Investigator;
Delbert G. Robinson, M.D.,
2005 Independent
Investigator

NEXT-GENERATION TREATMENT: PSYCHOSIS, SCHIZOPHRENIA

Hopeful News on Comprehensive Team Treatment of Early Psychosis

There was hopeful news in 2015 for people suffering from psychosis. Early intervention and coordinated team care can make a real, positive difference in outcomes for first-episode psychosis patients; and there is a way of delivering such care that has been demonstrated to work effectively in a series of randomly selected community-based mental health clinics located in various places across the U.S.

These and other important related results are based on two years of treating patients in the NAVIGATE program, which was evaluated in the RAISE Early Treatment Program (ETP), organized by the National Institute of Mental Health (NIMH).

The research team, reporting October 20, 2015 in the *American Journal of Psychiatry*, was led by John M. Kane, M.D., of Hofstra North Shore-LIJ School of

When compared with 181 people with a similar history (a single episode of psychosis) who received the usual care offered in community care settings, 223 people who received the NAVIGATE treatment approach: 1) remained in treatment longer; 2) experienced greater improvement in quality of life, including interpersonal relationships; 3) experienced greater relief from overall symptoms as well as depression; and 4) improved more in involvement in work and school.

Two important observations based on two years of clinical testing of the NAVIGATE approach merit special attention. One was that earlier implementation of the full, coordinated treatment approach following a first episode of psychosis correlated directly with better outcome. A second notable observation: patients who received the full coordinated treatment needed lower doses of antipsychotic medication, on average, to maintain a good quality of life.

Medicine, and included seven recipients of NARSAD Grants, including Nina R. Schooler, Ph.D. and Kim T. Mueser, Ph.D.

At the heart of the program studied were comprehensive first-episode psychosis intervention that emphasizes low-dose antipsychotic medications, cognitive-behavioral therapy to increase resiliency and illness self-management skills for the patient, family psychoeducation and support and supported employment and education.

2015

INVESTMENTS in NARSAD Research Grants

Many of our grantees go on in their careers to serve in leadership positions in the mental health field.

Since 1987, the Foundation has awarded more than \$342 million to fund more than 5,000 grants to more than 4,000 leading scientists around the world.

NARSAD Grants Support The Most Promising Ideas in Brain Research:

- **Basic Research** to understand what happens in the brain to cause mental illness.
- **New Technologies** to advance or create new ways of studying or understanding the brain.
- **Next Generation Therapies** to reduce symptoms of mental illness and ultimately cure and prevent brain and behavior disorders.

In 2015 a record number of grant applications (more than 1,200) were submitted to the Foundation for consideration.

NARSAD Distinguished Investigator Grants

- Initiated in 1988.
- Enable outstanding scientists to pursue new, cutting edge ideas with the greatest potential for breakthroughs.
- \$100,000 for one year.
- More than \$38 million funded.

NARSAD Independent Investigator Grants

- Initiated in 1995.
- Support mid-career scientists during the critical period between initiation of research and receipt of sustained funding.
- Up to \$100,000 for two years.
- More than \$74 million funded.

NARSAD Young Investigator Grants

- Initiated in 1987.
- Help researchers launch careers in neuroscience and psychiatry and gather pilot data to apply for larger federal and university grants.
- Up to \$70,000 for two years.
- More than \$230 million funded.

OUR IMPACT: NARSAD Grant recipients have gone on to receive more than \$3 billion in additional research funding in next stage NIMH and NIH grants.

Distinguished INVESTIGATORS

181 Applications

15 Grants

\$1.5M Awarded

The NARSAD Distinguished Investigator Grants provide support for experienced investigators (full professor or equivalent) conducting neurobiological and behavioral research. One-year grants of \$100,000 each are provided for established scientists pursuing particularly innovative project ideas.

Distinguished Investigator Grants fund talented, established scientists with a record of outstanding research accomplishments. These research projects might provide new approaches to understanding or treating severe mental illness. If successful, the grants could result in later funding from other sources. These grants are among the most competitive in mental health research and demonstrate the power of investigator-initiated research to bring out new and creative ideas.



“We received a large number of outstanding proposals. Some deal with a specific research problem in one area of mental illness; many are relevant for a number of illnesses; some involve basic research that will serve as the basis of clinical or translational research; and others start from a translational or clinical foundation. We are able to see the growth of the field and the manifestations of the enhanced power of research related to mental illness that have come about with the remarkable support of the Brain & Behavior Research Foundation.”

JACK D. BARCHAS, M.D.

Chair, Distinguished Investigator Selection Committee

Founding Member of the Foundation’s Scientific Council

Chair and Barklie McKee Henry Professor of Psychiatry
Weill Cornell Medical College

Psychiatrist-in-Chief
Weill Cornell Medical Center, NewYork-Presbyterian Hospital and Payne Whitney Clinic

Basic Research

ADDICTION

Yavin Shaham, Ph.D.
National Institute on Drug Abuse

AUTISM SPECTRUM DISORDER

Daniel H. Geschwind, M.D., Ph.D.
University of California, Los Angeles

Nahum Sonenberg, Ph.D.
McGill University, Canada

DEPRESSION

Michel Barrot, Ph.D.
Centre National de la Recherche Scientifique and University of Strasbourg, France

Catherine G. Dulac, Ph.D.
Harvard University

BIPOLAR DISORDER

Alan Stewart Brown, M.D., M.P.H.
Columbia University

MENTAL ILLNESS: GENERAL

Bernice Ann Pescosolido, Ph.D.
Indiana University

SCHIZOPHRENIA

Moses V. Chao, Ph.D.
New York University

Paul J. Kenny, Ph.D.
Icahn School of Medicine at Mount Sinai

Anthony John Koleske, Ph.D.
Yale University

Jonathan S. Mill, Ph.D.
University of Exeter, United Kingdom

David L. Sulzer, Ph.D.
Columbia University

Next Generation Therapies

DEPRESSION

Jeffrey H. Meyer, M.D., Ph.D., FRCP(C)
University of Toronto, Canada

POST-TRAUMATIC STRESS DISORDER (PTSD)

Ismene L. Petrakis, M.D.
Yale University

SCHIZOPHRENIA

Edwin S. Levitan, Ph.D.
University of Pittsburgh

Independent INVESTIGATORS



ROBERT M. POST, M.D., PH.D.

Chair, Independent Investigator
Selection Committee

Foundation Scientific Council Member

Head, Bipolar Collaborative Network

Professor of Psychiatry

George Washington School of Medicine

315 Applications

40 Grants

\$3.9M Awarded

Ground-breaking scientists already proven in their field receive the NARSAD Independent Investigator Grant. These scientists seek to produce experimental results that will put them in a position to initiate major research programs. This support comes at the critical middle period in the investigators' careers—the phase between the initiation of research and the receipt of sustained funding. With proven success as highly productive scientists, they seek to make clinically relevant advances in the study and treatment of a range of brain and behavior disorders.

Independent Investigator Grants provide each scientist with up to \$50,000 per year for two years to support their work during the critical period between the start of the research and the receipt of sustained funding.

Basic Research

ATTENTION-DEFICIT HYPERACTIVITY DISORDER (ADHD)

Satinder K. Singh, Ph.D.
Yale University

BIPOLAR DISORDER (BD)

Tomas Hajek, M.D., Ph.D.
Dalhousie University, Nova Scotia

DEPRESSION

Chadi A. Calarge, M.D.
Baylor College of Medicine

Ming-Hu Han, Ph.D.

Icahn School of Medicine at Mount Sinai

Yingxi Lin, Ph.D.

Massachusetts Institute of Technology

MOOD DISORDERS

Samer Hattar, Ph.D.
Johns Hopkins University

Gregg D. Stanwood, Ph.D.

Florida State University

POST-TRAUMATIC STRESS DISORDER (PTSD)

Tanja Jovanovic, Ph.D.
Emory University

Bo Li, Ph.D.

Cold Spring Harbor Laboratory

Rajesh Narendran, M.D.

University of Pittsburgh

SCHIZOPHRENIA

Alan Anticevic, Ph.D.
Yale University

Murray J. Cairns, Ph.D.

University of Newcastle, Australia

Ana Luisa M. Carvalho, Ph.D.

University of Coimbra, Portugal

Michael Andrew Fox, Ph.D.

Virginia Tech

Wen-Jun Gao, M.D., Ph.D.

Drexel University College of Medicine

Jacob M. Hooker, Ph.D.

*Massachusetts General Hospital,
Harvard University*

Christopher Barnaby Nelson, Ph.D.

*Orygen Youth Health Research Centre (OYHRC),
University of Melbourne, Australia*

Francesco Papaleo, Ph.D.

Italian Institute of Technology

Kevin M. Spencer, Ph.D.

*VA Boston Healthcare System, Brockton,
Harvard University*

Joseph Ventura, Ph.D.

University of California, Los Angeles

Stanislav S. Zakharenko, M.D., Ph.D.

St. Jude Children's Research Hospital

Karen Zito, Ph.D.

*University of California,
Davis Medical Center*

SUICIDE

Daniel Paul Dickstein, M.D.

Brown University

TIC DISORDERS

Christopher J. Pittenger, M.D., Ph.D.

Yale University

New Technologies

DEPRESSION

Gilles R.C. Pourtois, Ph.D.

Ghent University, Belgium

Laura Rachel Stroud, Ph.D.

The Miriam Hospital, Brown University

MULTIPLE DISORDERS

Adam Kepecs, Ph.D.

Cold Spring Harbor Laboratory

Kirsty Millar, Ph.D.

University of Edinburgh, Scotland

Jason James Radley, Ph.D.

University of Iowa

SCHIZOPHRENIA

Judith Gault, Ph.D.

University of Colorado, Denver

Next Generation Therapies

AUTISM SPECTRUM DISORDER

Suzanne Paradis, Ph.D.

Brandeis University

BIPOLAR DISORDER

Jean-Martin Beaulieu, Ph.D.

Laval University, Québec

Christopher E. Ramsden, M.D.

*National Institute of Neurological Disorders
and Stroke*

DEPRESSION

Venetia Zachariou, Ph.D.

Icahn School of Medicine at Mount Sinai

MULTIPLE DISORDERS

Jay A. Gottfried, M.D., Ph.D.

Northwestern University

Sachin Patel, M.D., Ph.D.

Vanderbilt University

POST-TRAUMATIC STRESS DISORDER (PTSD)

Adriana Feder, M.D.

Icahn School of Medicine at Mount Sinai

Ilan Harpaz-Rotem, Ph.D.

Yale University

SCHIZOPHRENIA

Raymond Y. Cho, M.D., M.Sc.

*University of Texas Health Science Center
at Houston*

Dean Francis Salisbury, Ph.D.

University of Pittsburgh School of Medicine

Young INVESTIGATORS



HERBERT Y. MELTZER, M.D.

Chair, Young Investigator Grant
Selection Committee

Founding Member of the Scientific Council

Professor of Psychiatry and Behavioral
Sciences and of Physiology
*Northwestern University, Feinberg School
of Medicine*

Dr. Meltzer has reviewed more than
14,784 grant applications since 1987.

712 Applications

191 Grants

\$13.1M Awarded

NARSAD Young Investigator Grants cover a broad spectrum of mental illnesses and serve as catalysts for additional funding, providing researchers with “proof of concept” for their work. The Foundation awarded a total of \$13 million to its 2015 Young Investigators, strengthening its investment in the most promising ideas to lead advancements in understanding and treating brain and behavior disorders.

Young Investigator Grants provide each scientist with up to \$35,000 per year for two years totaling \$70,000 to enable promising investigators to either extend research fellowship training or begin careers as independent research faculty. Every Young Investigator gets support and guidance from a scientific mentor designated by the Scientific Council.

Basic Research

ADDICTION

Amit Agarwal, Ph.D.

Johns Hopkins University

Stephan Lammel, Ph.D.

University of California, Berkeley

Jocelyn Margaret Richard, Ph.D.

Johns Hopkins University

Benjamin Thomas Saunders, Ph.D.

Johns Hopkins University

Lucas Sjulson, M.D., Ph.D.

New York University

ATTENTION-DEFICIT HYPERACTIVITY DISORDER (ADHD)

Lisa Anne Briand, Ph.D.

Temple University

Joseph Stephen Ralker, Ph.D.

Florida International University

Shona Lee Ray-Griffith, M.D.

University of Arkansas for Medical Sciences

Karen E. Seymour, Ph.D.

Johns Hopkins University School of Medicine

Robert Whelan, Ph.D.

University College Dublin, Ireland

ANXIETY

Jiook Cha Ph.D.

Columbia University

Jacek Debiec, M.D., Ph.D.

University of Michigan

Edward Korzus, Ph.D.

Neuropsychiatric Institute & Hospital at the University of California, Los Angeles

Sabine Krabbe, Ph.D.

Friedrich Miescher Institute, Switzerland

Ekaterina Likhnik, Ph.D.

Columbia University

Dean Mobbs, Ph.D.

Columbia University

Ilya E. Monosov, Ph.D.

Washington University

AUTISM SPECTRUM DISORDER

Brendon M. Nacewicz, M.D., Ph.D.

University of Wisconsin-Madison

Kimberly Lynn Hills Carpenter, Ph.D.

Duke University Medical Center

Daniel H. Ebert, M.D., Ph.D.

Johns Hopkins University School of Medicine

Min Fu, Ph.D.

Duke University

Theofanis Karayannis, Ph.D.

New York University

Miranda M. Lim, M.D., Ph.D.

Portland VA Medical Center and Oregon Health and Science University

Olga Penagarikano, Ph.D.

University of the Basque Country, Spain

Susan B. Perlman, Ph.D.

University of Pittsburgh

Tyler K. Perrachione, Ph.D.

Boston University

Caroline Elizabeth Robertson, Ph.D.

Massachusetts Institute of Technology

Stephan J. Sanders, BMBS, Ph.D.

University of California, San Francisco

Nasim Vasli, Ph.D.

Centre for Addiction and Mental Health, University of Toronto, Canada

BIPOLAR DISORDER

Ezra Wegbreit, Ph.D.

Brown University

DEPRESSION

Agustin Anastasia, Ph.D.

Weill Cornell Medical College

David Bulkin, Ph.D.

Cornell University

Ramesh Chandra, Ph.D.

University of Maryland

Revathy U. Chottekalapanda, Ph.D.

The Rockefeller University

Esther M. Berrocso, Ph.D.

University of Cadiz, Spain

George Dragoi, M.D., Ph.D.

Yale University

Fernando S. Goes, M.D.

Johns Hopkins University

Olivia Engmann, Ph.D.

Icahn School of Medicine at Mount Sinai

Liisa Hantsoo, Ph.D.

University of Pennsylvania

Poornima A. Kumar, Ph.D.

McLean Hospital and Harvard University

Tara Anne LeGates, Ph.D.

University of Maryland School of Medicine

Kathryn M. Lenz, Ph.D.

Ohio State University

Byungkook Lim, Ph.D.

University of California, San Diego

Brittany Leigh Mason, Ph.D.

University of Texas Southwestern Medical Center at Dallas

Bradley Ress Miller, M.D., Ph.D.

Columbia University

Veronica Musante, Ph.D.

Yale University

Sarah Ordaz, Ph.D.

Stanford University

Jodi Lynn Pawluski, Ph.D.

University of Rennes, France

Marta Pecina, M.D., Ph.D.

University of Michigan

Joaquin Piriz, Ph.D.

National Scientific and Technical Research Council (CONICET), Argentina

Peter Rudebeck, Ph.D.

Icahn School of Medicine at Mount Sinai

Jonathan B. Savitz, Ph.D.

Laureate Institute for Brain Research

Neil Schwartz, Ph.D.

University of California, San Francisco

Desiree Rosa Maria Seib, Ph.D.

University of British Columbia, Canada

Marisa S.P. Toups, M.D.

University of Texas Southwestern Medical Center at Dallas

MULTIPLE DISORDERS

Todd Hancock Ahern, Ph.D.
Quinnipiac University

Samuel Alan Barnes, Ph.D.
University of California

Anna Verena Beyeler Ph.D.
Massachusetts Institute of Technology

Gwendolyn Gabrielle Calhoon, Ph.D.
Massachusetts Institute of Technology

Daniel Cavanaugh, Ph.D.
University of Pennsylvania

Catherine Christian, Ph.D.
University of Illinois

Joanna Molly Dragich, Ph.D.
Columbia University

Monica Dus, Ph.D.
University of Michigan

Christina Marie Gremel, Ph.D.
University of California, San Diego

Michael M. Halassa, M.D., Ph.D.
New York University

Gretchen L. Hermes, M.D., Ph.D.
Yale University

Kathryn Leigh Humphreys, Ph.D.
Tulane University

Katherine M. Nautiyal, Ph.D.
Columbia University

Ramin Pashale, Ph.D.
University of Wisconsin-Milwaukee

Robert Mark Richardson, M.D., Ph.D.
University of Pittsburgh

Nicolas W. Simon, Ph.D.
University of Pittsburgh

Nien-Pei Tsai, Ph.D.
University of Illinois at Urbana-Champaign

Taehong Yang, Ph.D.
University of California, San Francisco

Erika Yeh, Ph.D.
University of California, San Francisco

OBSESSIVE COMPULSIVE DISORDER

Patricia A. Gruner, Ph.D.
Yale University

Joshua L. Plotkin, Ph.D.
State University of New York at Stony Brook

POST-TRAUMATIC STRESS DISORDER (PTSD)

Mark Paul Brandon, Ph.D.
McGill University/Douglas Mental Health University Institute, Canada

Nikolaos P. Daskalakis, M.D., Ph.D.
Icahn School of Medicine at Mount Sinai

Diasynou Fioravante, Ph.D.
University of California, Davis Medical Center

Talya Greene, Ph.D.
University of Haifa, Israel

Dmitri Young, Ph.D.
University of California, San Francisco

Moriel Zelikowsky, Ph.D.
California Institute of Technology

SCHIZOPHRENIA

Renata Batista-Brito, Ph.D.
Yale University

Estefania Pilar Bello, Ph.D.
Columbia University

Francois Bourque, M.D.
McGill University/Douglas Mental Health University Institute, Canada

Michael Edward Cahill, Ph.D.
Icahn School of Medicine at Mount Sinai

Alana May Campbell, Ph.D.
University of North Carolina at Chapel Hill

Francesco Errico, Ph.D.
Ceinge Biotechnologie Avanzate, Italy

Ragy R. Girgis, M.D.
Columbia University

Jill R. Glausier, Ph.D.
University of Pittsburgh

Jacob Gratten, Ph.D.
University of Queensland, Australia

John A. Gray, M.D., Ph.D.
Davis Medical Center, University of California

Stephanie Mary Groman, Ph.D.
Yale University

Marc Aaron Heiser, M.D., Ph.D.
University of California, Los Angeles

Jonathan D. Hommel, Ph.D.
University of Texas Medical Branch at Galveston

Shantanu P. Jadhav, Ph.D.
Brandeis University

Abigail Susan Kalmbach, Ph.D.
Columbia University

Said Kourrich, Ph.D.
University of Texas Southwestern Medical Center at Dallas

Viviane Labrie, Ph.D.
Centre for Addiction and Mental Health, University of Toronto, Canada

Hanmi Lee, Ph.D.
Stanford University

Hiroshi Makino, Ph.D.
University of California, San Diego

Amanda McCleery, Ph.D.
University of California, Los Angeles

Alex S. Nord, Ph.D.
University of California, Davis

Gaurav H. Patel, M.D., Ph.D.
New York State Psychiatric Institute/Columbia University

Albert R. Powers, M.D.
Yale University

Matthew David Puhl, Ph.D.
McClean Hospital/Harvard University

Stephen Ripke, M.D., Ph.D.
Charite—University Medicine Berlin, Freie Universitat Berlin, Germany

Antonio Sanz-Clemente, Ph.D.
Northwestern University

Jeffrey N. Savas, Ph.D.
Northwestern University

Shushruth Shushruth, M.B.B.S., Ph.D.
Columbia University

Katharine Natasha Thakkar, Ph.D.
University Medical Center Utrecht, Holland

Marie-Eve Tremblay, Ph.D.
Laval University, Quebec, Canada

Christiaan H. Vinkers, M.D., Ph.D.
University Medical Center Utrecht, Holland

Gemma Margaret Williams, MBBCh
Cardiff University, UK

Ki-Jun Yoon, Ph.D.
Johns Hopkins University

OTHER DISORDERS EATING DISORDERS

Summer Fontaine Acevedo, Ph.D.
*Southwestern Medical Center of the
University of Texas in Dallas*

Elisa S. Na, Ph.D.
University of Michigan

NEW TECHNOLOGIES

AUTISM SPECTRUM DISORDER (ASD)
Kwanghun Chung, Ph.D.
Massachusetts Institute of Technology

DEPRESSION
Priti Balchandani, Ph.D.
Icahn School of Medicine at Mount Sinai

George M. Slavich, Ph.D.
University of California, Los Angeles

Mariano Soiza-Reilly, Ph.D.
INSERM, France

Amber Leaver, Ph.D.
University of California, Los Angeles

MULTIPLE DISORDERS

Renato Pollmanti, Ph.D.
Yale University

Daniel Schmidt, Ph.D.
University of Minnesota

POST-TRAUMATIC STRESS DISORDER (PTSD)

Tracy A. Butler, M.D.
New York University School of Medicine

SCHIZOPHRENIA
Jose Alejandro Cortes-Briones, Ph.D.
Yale University

Erik Michael DeBoer, Ph.D.
University of Pennsylvania

Edmund Lalor, Ph.D.
Trinity College Dublin, Ireland

Aviv Abraham Mezer, Ph.D.
Hebrew University, Israel

SUICIDE PREVENTION
Megan Lee Fitzgerald, Ph.D.
Columbia University

**OTHER DISORDERS
FRAGILE X**

Manish Saggar, Ph.D.
Stanford University

NEXT GENERATION THERAPIES

ADDICTION
David Louis Pennington, Ph.D.
*Northern California Institute for
Research and Education
University of California, San Francisco*

James J. Prisciandaro, Ph.D.
Medical University of South Carolina

ATTENTION-DEFICIT HYPERACTIVITY DISORDER (ADHD)

Merideth Alice Addicott, Ph.D.
Duke University

Hadi Hosseini, Ph.D.
Stanford University

ANXIETY

Dylan Grace Gee, Ph.D.
Weill Cornell Medical College

Catherine Alexandra Hartley, Ph.D.
Weill Cornell Medical College

Emily Sue Kappenman, Ph.D.
University of California, Davis Medical Center

Stephen Eric Nybo, Ph.D.
Ferris State University

Lauren M. Osborne, M.D.
Johns Hopkins University

Laura Sagliano, Ph.D.
Second University of Naples, Italy

Simona Scaini, Ph.D.
San Raffaele Vita-Salute University, Italy

Shari A. Steinman, Ph.D.
*New York State Psychiatric Institute, Columbia
University*

Richard Michiel van Rijn, Ph.D.
Purdue University

AUTISM SPECTRUM DISORDER
Marta Biagioli, Ph.D.
University of Trento, Italy

Julien Christian Roger Dubois, Ph.D.
California Institute of Technology

BIPOLAR DISORDER
Alexis Estelle Whitton, Ph.D.
Maclean Hospital/Harvard University

DEPRESSION

Melynda Diane Casement, Ph.D.
University of Pittsburgh

Evangelia G. Chryssikou, Ph.D.
University of Kansas

Laura K. Fonken, Ph.D.
University of Colorado

Brian M. Iacoviello, Ph.D.
Icahn School of Medicine at Mount Sinai

Dawn F. Ionescu, M.D.
*Massachusetts General Hospital and
Harvard University*

Clare Kelly, Ph.D.
Trinity College Dublin, Ireland

Donel M. Martin, Ph.D.
University of New South Wales, Australia

Mark J. Niciu, M.D., Ph.D.
National Institute of Mental Health

Darren Michael Opland, Ph.D.
Yale University

Leah H. Somerville, Ph.D.
Harvard University

Marie Spies, M.D.
University of Vienna, Austria

Oren Tene, M.D.
Tel Aviv University, Israel

Erin Christine Tully, Ph.D.
Georgia State University

Ryan Van Lieshout, M.D., Ph.D.
McMaster University, Canada

Christian Anthony Webb, Ph.D.
Maclean Hospital/Harvard University

MULTIPLE DISORDERS

Satoru Ikezawa, M.D., Ph.D.
*National Center of Neurology & Psychiatry,
Japan*

Nicole Rachel Kozloff, M.D.
*St. Michael's Hospital and the University of
Toronto, Canada*

Timothy Y. Mariano, M.D., Ph.D., M.Sc.
Brown University

Andrada Delia Neacsu, Ph.D.
Duke University Medical Center

Ueli Rutishauser, Ph.D.
*Cedars-Sinai Medical Center at the University
of California Los Angeles*

Antonios S. Zannas, M.D.,
Max-Planck Institute for Psychiatry, Germany

OBSESSIVE-COMPULSIVE DISORDER
George McConnell, Ph.D.
Duke University

**POST-TRAUMATIC STRESS DISORDER
(PTSD)**
Lynnette Astrid Averill, Ph.D.
Yale University

Isaac Galatzer-Levy, Ph.D.
New York University School of Medicine

Jamie Lynn Peters, Ph.D.
Medical University of South Carolina

Basant K. Pradhan, M.D.
*Cooper University Hospital & Cooper Medical
School of Rowan University*

SUICIDE PREVENTION
Emily B. Ansell, Ph.D.
Yale University

Haggai Sharon, M.D.
Tel Aviv University, Israel

SCHIZOPHRENIA

Anthony Olufemi Ahmed, Ph.D.
Weill Cornell Medical College

Lisa Anne Buchy, Ph.D.
University of Calgary, Canada

Sasja Noriko Duijff, Ph.D.
University Medical Center of Utrecht, Holland

Anne-Kathrin J. Fett, Ph.D.
Vrije Universiteit, Holland

Daniel John Foster, Ph.D.
Vanderbilt University Medical Center

David Gyllenberg, M.D., Ph.D.
University of Turku, Finland

Carol Jahshan, Ph.D.
University of California, Los Angeles

Heeyoung Lee, Ph.D.
University of Pittsburgh

Shupeng Li, M.D., Ph.D.
*Centre for Addiction and Mental Health,
University of Toronto, Canada*

Rachel L. C. Mitchell, Ph.D.
King's College London, UK

Nigel Craig Rogasch, Ph.D.
Monash University, Australia

Jerri M. Rook, Ph.D.
Vanderbilt University Medical Center

Douglas Ruderfer, Ph.D.
Icahn School of Medicine at Mount Sinai

OTHER DISORDERS
ANOREXIA
Sahib Khalsa, M.D., Ph.D.
University of Tulsa

Pei-an (Betty) Shih, Ph.D.
University of California

BORDERLINE PERSONALITY DISORDER
Vanessa Nieratschker, Ph.D.
University of Tübingen, Germany

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2016



JULY 12

Life Elevated: Examining Altitude-Related Effects on Mental Illness

Perry F. Renshaw, M.D., Ph.D.

University of Utah School of Medicine



AUGUST 9

Autism: Understanding the Causes and Developing Effective Treatments

Jacqueline N. Crawley, Ph.D.

University of California, Davis School of Medicine, Sacramento



SEPTEMBER 13

Living Well with ADHD: Scientific Guideposts to Improved Outcomes

Francisco Xavier Castellanos, M.D.

New York University Child Study Center



OCTOBER 18

A Beautiful Mind: John Nash, Schizophrenia, Game Theory and Recovery from Schizophrenia With and Without Medication

Herbert Y. Meltzer, M.D.

Northwestern University Feinberg School of Medicine



NOVEMBER 8

Could We Someday Prevent Schizophrenia Like We Prevent Cleft Palate?

Robert R. Freedman, M.D.

University of Colorado School of Medicine



DECEMBER 13

Neuroinflammatory Hypotheses of Depression

Yvette I. Sheline, M.D.

University of Pennsylvania



MODERATOR

Jeffrey Borenstein, M.D.

President & CEO, Brain & Behavior Research Foundation

Host of the Public Television Series *Healthy Minds*

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- 2 Nobel Prize Winners
- 4 Former Directors of the National Institute of Mental Health
- 4 Recipients of the National Medal of Science
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Fred H. Gage, Ph.D.
Aurelio Galli, Ph.D.
Mark S. George, M.D.
Elliot S. Gershon, M.D.
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Suzanne N. Haber, Ph.D.
Philip D. Harvey, Ph.D.
Stephan Heckers, M.D.
Nathaniel Heintz, Ph.D.
René Hen, Ph.D.
Fritz A. Henn, M.D., Ph.D.
Robert M.A. Hirschfeld, M.D.
L. Elliot Hong, M.D.
Steven E. Hyman, M.D.
Robert B. Innis, M.D., Ph.D.
Jonathan A. Javitch, M.D., Ph.D.
Daniel C. Javitt, M.D., Ph.D.
Lewis L. Judd, M.D.
Peter W. Kalivas, Ph.D.
Eric R. Kandel, M.D.
Richard S.E. Keefe, Ph.D.
Samuel J. Keith, M.D.
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James L. Kennedy, M.D.
Robert M. Kessler, M.D.
Kenneth K. Kidd, Ph.D.
Mary-Claire King, Ph.D.
Rachel G. Klein, Ph.D.
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Francis S. Lee, M.D., Ph.D.
Ellen Leibenluft, M.D.
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Pat Levitt, Ph.D.
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Husseini K. Manji, M.D., FRCP
J. John Mann, M.D.
John S. March, M.D., M.P.H.
Helen S. Mayberg, M.D.
Robert W. McCarley, M.D.
Bruce S. McEwen, Ph.D.
Ronald D.G. McKay, Ph.D.

James H. Meador-Woodruff, M.D.
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Richard J. Miller, Ph.D.
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Philip Seeman, M.D., Ph.D.
Yvette I. Sheline, M.D.
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Jim van Os, M.D., Ph.D., MRCPsych
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Mark von Zastrow, M.D., Ph.D.
Karen Dineen Wagner, M.D., Ph.D.
Daniel R. Weinberger, M.D.
Myrna M. Weissman, Ph.D.
Jon-Kar Zubieta, M.D., Ph.D.

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Led by Dr. Herbert Pardes, the founding President of our Scientific Council, the all-volunteer group of preeminent mental health researchers review more than 1,000 NARSAD Grant applications each year and select the most promising research ideas with the greatest potential to lead to breakthroughs.

The Foundation's Scientific Council is composed of 165 world renowned scientists representing every major discipline in brain and behavior research including two Nobel Prize winners, four former directors of the National Institute of Mental Health, four recipients of the National Medal of Science, 13 members of the National Academy of Sciences, 21 Chairs of Psychiatry and Neuroscience Departments at leading medical institutions, and 47 members of the National Institute of Medicine.

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

We welcome our newest members.



TED ABEL, PH.D. is the Brush Family Professor of Biology in the School of Arts and Sciences at the University of Pennsylvania. Dr. Abel is also Co-Director of the Biological Basis of Behavior Program and he directs an NIMH-funded pre-doctoral training program in behavioral and cognitive neuroscience. His laboratory's primary focus is on understanding the molecular and cellular basis of learning and memory as well as the role of sleep in memory storage. Using mouse models, Dr. Abel seeks to identify novel therapeutic approaches to treat cognitive deficits associated with many psychiatric and neurodevelopmental disorders. Dr. Abel has been a leader in applying molecular and genetic approaches to define how neural circuits mediate behavior, making creative use of genetically modified mouse lines to study the biological basis of behavior. He has published widely in journals that include *Nature*, *Neuron*, *Journal of Clinical Investigation* and *Journal of Neuroscience*. He is a Fellow of the American College of Neuropsychopharmacology, Editor-in-Chief of *Neurobiology of Learning and Memory*, and an Associate Editor of *Behavioral Neuroscience*.



DEANNA M. BARCH, PH.D. is the Gregory B. Couch Professor of Psychiatry and the Chair of the Department of Psychological & Brain Sciences at Washington University in Saint Louis, MO. She was the Editor of *Cognitive, Affective and Behavioral Neuroscience*, is currently Deputy Editor at *Biological Psychiatry* and is on the Editorial Boards of *Schizophrenia Bulletin*, *Current Directions in Psychological Science*, *Journal of Abnormal Psychology*, and *Clinical Psychological Science*. Dr. Barch is immediate past President of the Society for Research in Psychopathology, is on the DSM-V Revision Committee, is on the Steering Committee for the NIMH Research Domain Criteria initiative, and is a member of the NIMH Scientific Council. Her research is focused on understanding the interplay among cognition, emotion, and brain function to better understand the deficits in behavior and cognition found in illnesses such as schizophrenia and depression. She uses functional MRI, structural MRI, and cognitive neuroscience methods to examine neural basis of disturbances in cognitive control and emotional processing in individuals with schizophrenia and those at risk for the development of schizophrenia, as well as in individuals with mood disorders.

1995 & 2000 Young Investigator
 2006 Independent Investigator
 2013 Distinguished Investigator



EDWIN H. COOK, JR., M.D. is interested in the genetics of autism, attention-deficit hyperactivity disorder, obsessive-compulsive disorder, and the development of improved pharmacologic treatments of these disorders. As Director of The Laboratory of Developmental Neuroscience and Professor, Department of Psychiatry at The Conte Center for Computational Neuropsychiatric Genomics based at The University of Chicago, Dr. Cook and his team are dedicated to studying the developmental neurobiological basis of pediatric-onset neuropsychiatric disorders. They use neurochemical and molecular genetic research tools to develop new knowledge that may lead to improvement in clinical pharmacology. They began as a neurochemistry lab studying the relationship between hyperserotonemia and autistic disorder. The team is now working with collaborators on molecular genetic and clinical pharmacological studies of autism, attention-deficit hyperactivity disorder, childhood-onset obsessive-compulsive disorder, stuttering, adolescent depression, and pediatric and early onset bipolar mood disorder.



RAQUEL E. GUR, M.D., PH.D. is Professor of Psychiatry, Neurology and Radiology at the University of Pennsylvania's Perelman School of Medicine where she directs the Neuropsychiatry Section and the Schizophrenia Research Center and is Vice Chair of Research Development in the Department of Psychiatry. Her combined training in Neurology and Psychiatry has provided the tools to pursue an academic career working with basic and clinical neuroscientists to advance the understanding of schizophrenia. In directing these research endeavors, she has interacted with scientists of diverse backgrounds, conducted collaborative interdisciplinary research, mentored junior faculty and trainees, and has come to know many patients and their families. She is a member and has served in organizations including the Institute of Medicine of the National Academy of Sciences, the NIMH Council and the American Psychiatric Association task forces including the DSM-5 Psychosis work group. She is Past President of the Society of Biological Psychiatry and President of the American College of Neuropsychopharmacology. NIMH has supported her research efforts and she has over 440 publications in peer-reviewed journals.

1999 Distinguished Investigator
2009 Lieber Prize



TAKAO K. HENSCH, PH.D. is a joint professor of Neurology at Harvard Medical School at Boston Children's Hospital, and Professor of Molecular and Cellular Biology at Harvard's Center for Brain Science. Dr. Hensch's research focuses on critical periods in brain development. By applying cellular and molecular biology techniques to neural systems, his lab identified pivotal inhibitory circuits that orchestrate structural and functional rewiring of connections in response to early sensory experience. His work affects not only the basic understanding of brain development, but also therapeutic approaches to devastating cognitive disorders later in life. He currently directs the NIMH Silvio O. Conte Center for Basic Mental Health Research at Harvard. He serves on the editorial board of various journals, including *Journal of Neuroscience*, *Journal of Neurodevelopmental Disorders*, *Neural Development*, *Neuroscience Research*, *Frontiers in Neural Circuits* and *Neuron*.



AMANDA J. LAW, PH.D. is a Professor in the Departments of Psychiatry and Cell and Developmental Biology, the Dr. Nancy L. Gary Chair in Children's Mental Disorders Research and Director, Neurodevelopmental and Neuropsychiatric Genetics Lab at the University of Colorado, School of Medicine. The primary goal of Dr. Law's research is to identify and understand the role of genetic factors in psychiatric, neurodevelopmental and behavioral disorders. Her research focuses on understanding the molecular, cellular and biochemical mechanisms underlying genetic susceptibility to severe neurodevelopmental disorders, including schizophrenia; with a view to identifying affected neurobiological processes and cellular pathways for the development of next generation treatments. Dr. Law has focused her research on a multidisciplinary, translational neuroscience approach to understanding neurocognitive and neurodevelopmental disorders, combining studies of human postmortem brain tissue, human peripheral cell systems, primary cell culture models and transgenic animal models with neuropharmacology and clinical genetics.

2006 Young Investigator
2011 Sidney R. Baer, Jr. Prize



GARY LYNCH, PH.D. is a Professor, Psychiatry & Human Behavior and a Professor, Anatomy & Neurobiology at the School of Medicine at the University of California, Irvine. Dr. Lynch is one of the most cited authors in neuroscience, holds 25 patents, and co-founded two publicly traded companies. Dr. Lynch's work led the way to the modern theory of how synapses encode memory. This involves a change in the shape, and thus potency, of connections that is stabilized by a reorganization of the subsynaptic cytoskeleton. He is also the co-inventor of ampakines, a class of drugs that enhance memory and stimulate the production of growth factors. He is currently using ampakines in an attempt to reverse the negative effect of aging on the anatomy and physiology of brain cells.



KATHLEEN R. MERIKANGAS, PH.D. is a Senior Investigator and Chief of the Genetic Epidemiology Research Branch in the Intramural Research Program at the National Institute of Mental Health. The major areas of her research are: studies of the patterns and components of familial aggregation of mental disorders and familial mechanisms for comorbidity of mental and medical disorders; identification of early signs and risk factors for psychiatric disorders among high and low risk youth using prospective longitudinal high risk studies; and large-scale population-based studies of mental disorders including high risk designs and prospective longitudinal research. The major project underway in her research group is a community-based family study of affective spectrum disorders and their overlap with other mental disorders, especially anxiety disorders, and medical disorders such as migraine and cardiovascular disease. The goal of this research is to identify the endophenotypes that are closer to the biologic expression of genes underlying these disorders and environmental moderators of genetic expression. Findings from this research are likely to have important implications for targets of prevention and treatment of affective illness.



DOST ÖNGÜR, M.D., PH.D. is a native of Istanbul, Turkey, Dr. Öngür is currently Associate Professor of Psychiatry at Harvard Medical School and Chief of the Psychotic Disorders Division at McLean Hospital. His research is funded by the NIMH and focuses on MRI studies of brain abnormalities in individuals with schizophrenia, bipolar disorder, and related conditions as well as on the cardiovascular health of these patients. In recent years he has had a special focus on abnormal brain bioenergetics and white matter integrity as pathophysiologic factors in these common and severe conditions. In addition to his clinical responsibilities and research, Dr. Öngür has received awards for his teaching and mentorship and holds a K24 award from the NIMH.

2004 Young Investigator

2013 Independent Investigator



MARINA R. PICCIOTTO, PH.D. is the Charles B. G. Murphy Professor of Psychiatry and Professor in the Child Study Center, of Neuroscience and of Pharmacology; Deputy Chair for Basic Science Research, Department of Psychiatry at Yale University. Her research focuses on defining molecular mechanisms underlying behaviors related to psychiatric illness, with a focus on the function of nicotinic acetylcholine receptors in the brain. Her laboratory uses molecular genetic strategies to identify the role of individual molecules in behaviors related to depression, addiction, cognitive function and food intake. Dr. Picciotto is Treasurer of the Society for Neuroscience, Interim Editor in Chief of the *Journal of Neuroscience*, and serves as handling editor on the editorial board of several journals. She is a fellow of AAAS and a member of the National Academy of Medicine.

1996 Young Investigator
2004 Independent Investigator



GERARD SANACORA, M.D., PH.D. is currently a Professor of Psychiatry at Yale University and the Director of the Yale Depression Research Program. His work has concentrated largely on elucidating the pathophysiological mechanisms associated with mood and other neuropsychiatric disorders, and using this information to guide future treatment development. His basic science laboratory explores the effects of chronic stress on brain function, and examines the molecular, cellular and behavioral effects of newly developed treatment strategies. His clinical laboratory employs novel imaging methodologies to investigate the pathophysiology of neuropsychiatric disorders and is very active in clinical trial research. Dr. Sanacora has received the Anna-Monika Stiftung International Award for the investigation of the biological substrate and functional disturbances of depression in 2009 and the Joel Elkes Research Award for Outstanding contributions to Psychopharmacology from the American College of Neuropsychopharmacology in 2011.

1999 & 2001 Young Investigator
2007 Independent Investigator
2014 Distinguished Investigator
2003 & 2005 Klerman Honorable Mention



MATTHEW W. STATE, M.D., PH.D. is the Oberndorf Family Distinguished Professor and Chair of the Department of Psychiatry at the University of California, San Francisco School of Medicine. Dr. State is a child psychiatrist and human geneticist studying pediatric neuropsychiatric syndromes. His lab focuses on gene discovery as a launching point for efforts to illuminate the biology of these conditions and to develop novel and more effective therapies. He co-leads several international genomics collaborations, including the NIH-funded Autism Sequencing Consortium and has been the recipient of multiple awards, including recent induction into the Institute of Medicine and The AACAP George Tarjan Award for Contributions in Developmental Disabilities.

2012 Ruane Prize



SUSAN M. VOGLMAIER, M.D., PH.D. is an Associate Professor in the Psychiatry Department at the University of California, San Francisco School of Medicine. Dr. Voglmaier's lab has developed precise optical tools to investigate the mechanisms that control neurotransmitter release over the course of synapse development. The long-term goal of this line of research is to target specific differences in the membrane trafficking of synaptic vesicle proteins to normalize the balance of excitatory and inhibitory inputs in autism; and of subcortical pathways that carry sensory information that is compared with information about meaning, conveyed by cortical pathways, in schizophrenia circuits.

2007 Young Investigator



JARED W. YOUNG, PH.D. is an Assistant Professor of Psychiatry at the University of California San Diego. He is also affiliated with the Stein Institute for Research on Aging at UCSD. Dr. Young's primary interest is understanding causes of cognitive and behavioral dysfunction in serious mental illness with relevance to real world functioning. He developed and uses several cognitive and behavioral tests that can be conducted in rodents and humans so that mechanisms underlying deficient behaviors in humans can be disentangled using rodent studies. His primary interests include developing methodologies to assess putative cognitive therapeutics for schizophrenia patients, but he also collaborates with groups modeling behavior in bipolar disorder patients, as well as identifying genetic contributions to successful aging. Using these paradigms in both humans and animals provides the opportunity for bench-to-bedside translational research, increasing the likelihood of clinical success for treating the numerous behavioral and cognitive abnormalities seen in psychiatric disorders.

2008 & 2012 Young Investigator



L. TREVOR YOUNG, M.D., PH.D. is the Dean, Faculty of Medicine and Vice Provost, Relations with Health Care Institutions Centre for Addiction and Mental Health at the University of Toronto. He is a clinician-scientist who studies the molecular basis of bipolar disorder and its treatment. In his lab Dr. Young is focused on the processes that lead to long-term changes in brain structure and function in patients with bipolar disorder, and how mood-stabilizing drugs can alter those changes. He has supervised more than 30 research and clinical trainees. Dr. Young has received many awards including the Douglas Utting Award for outstanding contributions in the field of mood disorders, and the Canadian College of Neuropsychopharmacology Heinz Lehmann Award. He is a Distinguished Fellow of the American Psychiatric Association and he has led several large clinical programs including the Mood Disorders Program at Hamilton Psychiatric Hospital, which received the American Psychiatric Services Gold Achievement Award.

1989 Young Investigator
 1995 Independent Investigator
 2015 Colvin Prize

2015

**FOUNDATION
EVENTS**

Our Resilient Brain: Coping with Stress, Anxiety & Memory Loss

January 23, 2015

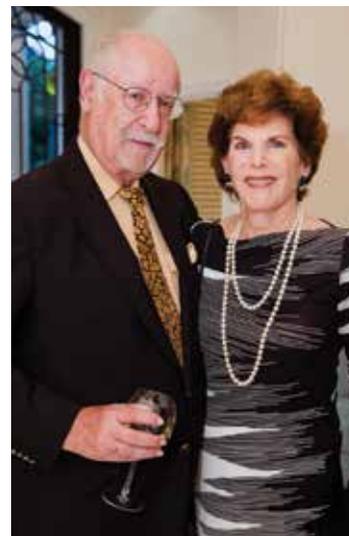
Dr. Kafui Dzirasa led a lively discussion about how stress and anxiety affect memory and how to best manage them in everyday life. Following his talk was an opportunity for questions and answers.



Drs. Kafui and Erika Dzirasa, Sandy and Jill Sirulnick, Dr. Jeff Borenstein



John and board member Suzanne Golden



Board member Bob and Fran Weisman

Discovery to Recovery: A Path to Healthy Minds Mental Health Conference

LOS ANGELES

March 10, 2015

This conference was designed to educate caregivers, family members, and people living with mental illness about the most innovative ideas, research and breakthroughs in neuroscience and psychiatry to better understand the causes and develop new ways to effectively treat brain and behavior disorders. A keynote address on living with bipolar disorder was given by Keith O'Neil, Former NFL Player & Super Bowl Champion.



Roberta Gundersen and Shelley Miller,
co-chairs the L.A. Committee



Dr. Fabio Macciardi



Dr. Lisa Monteggia

Women Breaking the Silence About Mental Illness

NEW YORK

June 15, 2015

The women's luncheon featured a conversation between Hearst Magazine's Editorial Director Ellen Levine and advocate, and author Lee Woodruff about depression, anxiety and the importance of removing the stigma from mental illness. The luncheon attracted more than 300 people and was held at the Metropolitan Club. More than \$150,000 was raised for brain and behavior research.



Above: Back Row: Haley Barrows, Carole Mallement (Committee Co-Chair), Harvey Mallement, Margaret Flanagan, Ellen Levine, Dr. Richard Levine, Melinda Fager
Front Row: John Golden, Suzanne Golden (Committee Co-Chair), Caroline Hirsch, Lee Woodruff



Ellen Levine and Lee Woodruff



Renee Steinberg and Dr. Jeff Borenstein

Klerman & Freedman Awards

NEW YORK

July 24, 2015

This evening honored the hallmark program of the Brain & Behavior Research Foundation—the NARSAD Young Investigator Grant program—that enables aspiring young scientists with innovative ideas to garner pilot data and generate “proof of concept” for their work. The Annual Klerman & Freedman Prizes recognize exceptional clinical and basic research conducted by NARSAD Young Investigator Grantees.

Six Young Investigator Grantees were honored for their outstanding contributions to mental health research at Le Parker Meridian Hotel. These researchers were chosen by a committee of the Foundation's Scientific Council for their exceptional NARSAD Grant projects in terms of insight and potential new approaches to the treatment of mental illness. Each investigator has demonstrated exceptional promise in the pursuit of deeper understanding of the human brain to ultimately result in *cures through research*.



Klerman & Freedman Awards

NEW YORK

July 24, 2015



Dr. Herbert Pardes and Dr. Alan Anticevic



Dr. Carrie McAdams



Dr. Michael Halassa



Above: Dr. Kristen Brennand
Below: Dr. Nandakumar Narayanan

Klerman Prizewinner

Alan Anticevic, Ph.D., of Yale University for his 2012 Grant Research Project: *Working Memory Dysfunction in Schizophrenia and in a Ketamine Model of Psychosis: Translating Computational Modeling to Neuroimaging*

Honorable Mentions

Chadi G. Abdallah, M.D., of Yale University, for his 2012 Grant Research Project: *Examining Glutamate/ Glutamine Cycling in the Frontal Brain of Depressed Patients During Ketamine Infusion*

Carrie J. McAdams, M.D., Ph.D., of the University of Texas Southwestern Medical Center at Dallas, for her 2012 Grant Research Project: *Neurodevelopment of Identity in Adolescent Anorexia Nervosa*

Freedman Prizewinner

Michael M. Halassa, M.D., Ph.D., of New York University, for his 2012 Grant Research Project: *Systematic Optogenetic Dissection of the Link Between Spindle Expression and Schizophrenia Etiology*

Honorable Mentions

Kristen J. Brennand, Ph.D., of the Icahn School of Medicine at Mount Sinai, for her 2012 Grant Research Project: *Modeling Schizophrenia Using Human Induced Pluripotent Stem Cells: Assessing the Contribution of Glutamatergic and Dopaminergic Neurons to Disease*

Nandakumar Narayanan, M.D., Ph.D., of the University of Iowa, for his 2012 Grant Research Project: *Prefrontal Dopamine and Temporal Control*

New York Mental Health Research Symposium

October 23, 2015

The 27th Annual New York Mental Health Research Symposium featured presentations by the nine 2015 Outstanding Achievement Prizewinners and two exceptionally promising Young Investigator Grantees and was held at The Kaufman Music Center.

Presentations Included



Rethinking Schizophrenia—from the Beginning
Robert R. Freedman, M.D.



Fetal Origins of Mental Illness and Wellness
Camille Hoffman, M.D., MSCS



Clinical Staging and Personalized Mental Health Care
Patrick McGorry, M.D., Ph.D., FRCP, FRANZP



Prediction and Prevention of Psychosis in Clinical High Risk Young People
Barnaby Nelson, Ph.D., MPPsych



Pathways to The Development of Novel Therapies for Psychiatric Disorders
Michael Berk, Ph.D., MBBCh, MMed, FF(Psych)SA, FRANZP



Gloria Neidorf Memorial Lecture: Looking Inside the Cell to Understand Bipolar Disorder and its Treatment
L. Trevor Young, M.D., Ph.D., FRCPC



Treating the Developing Versus Developed Brain
BJ Casey, Ph.D.



Deconstructing the Neurobiology of ADHD Via Open Neuroscience Approaches
Francisco Xavier Castellanos, M.D.



Exploring the Higher Brain Circuits Altered in Schizophrenia: Hope for Future Treatments
Amy F.T. Arnsten, Ph.D.



Personalized Medicine in The Genomic Era: Treating Schizophrenia with Precision
Jianping Zhang, M.D., Ph.D.



New Technologies to Monitor How Brain Cells Communicate—and Sometimes Miscommunicate
Markita Patricia Landry, Ph.D.



Symposium Moderator
Robert M.A. Hirschfeld, M.D.

The Outstanding Achievement Awards

NEW YORK

October 23, 2015

The Foundation celebrated its 28th Annual Awards Dinner at The Pierre Hotel in New York City. The evening's honorees included two remarkable humanitarians, one of the world's most prominent mental health advocates and nine exceptional scientists for their significant contributions to the advancement of our understanding of schizophrenia, mood disorders, child and adolescent psychiatry and cognitive neuroscience.

Lieber Prize for Schizophrenia Research

Robert Freedman, M.D.
Patrick McGorry, M.D., Ph.D., FRCP, FRANZCP

Colvin Prize for Mood Disorders Research

Michael Berk, Ph.D., MBCh, MMed, FF(Psych)SA, FRANZCP
L. Trevor Young, M.D., Ph.D., FRCPC

Ruane Prize for Child & Adolescent Psychiatric Research

BJ Casey, Ph.D.
Francisco Xavier Castellanos, M.D.

Goldman-Rakic Prize for Cognitive Neuroscience

Amy F. T. Arnsten, Ph.D.

Sidney R. Baer, Jr. Prize for Innovative & Promising Schizophrenia Research

M. Camille Hoffman, M.D., MSCS
Barnaby Nelson, Ph.D.

The Pardes Humanitarian Prize in Mental Health

This international Prize recognizes a physician, scientist or public citizen whose extraordinary contribution has made a profound and lasting impact by improving the lives of people suffering from mental illness and by advancing the understanding of mental health.

Honorees

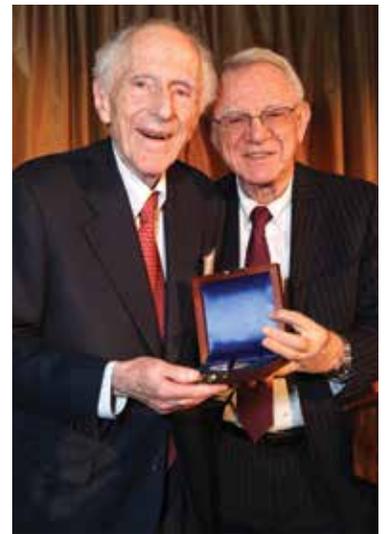
Beatrix A. Hamburg, M.D. and David A. Hamburg, M.D.

Honorary Prize

Rosalynn Carter, former First Lady of the United States



Pardes Humanitarian Prize



Dr. David A. Hamburg and Herbert Pardes



Dr. Barnaby Nelson, Marilyn Ann Hawke and Dr. Patrick McGorry and Drs. Michael and Lesley Berk



Drs. BJ Casey and Jeff Borenstein



Dr. Amy F. T. Arnsten

PARENTING

For the families of young people diagnosed with psychiatric disorders, it can be frightening, bewildering, and frustrating. The Brain & Behavior Research Foundation strives to provide helpful information and insights to those parents and family members who may be caring for children with mental illnesses. Beginning in 2015, the Foundation included in its *Quarterly* publication information that can be of practical use to families coping with the diagnosis of a behavioral disorder or mental illness.



Childhood Mental Illness

JUDITH L. RAPOPORT, M.D.

Chief, Child Psychiatry Branch
National Institute of Mental Health
Foundation Scientific Council Member

“Children have all sorts of experiences that can worry a parent,” said Judith L. Rapoport, M.D., a Foundation Scientific Council Member and Chief of the NIMH Child Psychiatry Branch. “[But] there’s an important rule of thumb: there is no ‘disorder’ until a problem begins to significantly interfere with a child’s quality of life. When fear or sadness or an inability to concentrate takes over and starts to interfere with the child’s life, either at home or at school, that’s when you should take action.”

Dr. Rapoport said parents can turn to local psychiatrists, psychologists, psychiatric social workers and family physicians if they think their child has a mental illness, which could include attention-deficit hyperactivity disorder (ADHD), anxiety, depression, or schizophrenia, among other conditions. She noted that there are a growing number of behavioral and pharmaceutical treatments that should be tailored to each child. “However, parents should know that they are not locked in to any one approach,” Dr. Rapoport added. “If a few months after you begin a therapy it doesn’t seem that you are getting anywhere you should reconsider and be open to trying a different approach.”

Dr. Rapoport also sought to reassure parents on some of the more common fears about childhood mental illness, such as the possibility of addiction to ADHD medication, or the likelihood of developing childhood-onset schizophrenia. Studies show that the ADHD medicine Ritalin, for example, is not addictive in children with ADHD and does not lead to a tendency to abuse drugs later in life, she said. Similarly, she noted that childhood-onset schizophrenia and bipolar disorder are extremely rare.

Rapoport acknowledged that a child’s mental illness can affect the family as a whole. “Following a diagnosis, the first thing parents need to do is make sure that everyone in the family gets on the same page,” she said, adding that occasional meetings with a family therapist can help. And as the stigma of these illnesses lessens, parents are finding more support groups, school district officials and other community caretakers who can join them in helping children with psychological disorders.



Misconceptions about Childhood Suicide

DAVID SHAFFER, M.D.

Irving Philips Professor of Child Psychiatry
The College of Physicians & Surgeons, Columbia University

Chief, Division of Child and Adolescent Psychiatry
Columbia University Medical Center

2006 Ruane Prize for Outstanding Achievement in Child and
Adolescent Psychiatric Research

Parents may worry about a stray remark about suicide or dangerous behavior among pre-pubescent children, but suicidal thoughts and completed suicides are very rare among young children, said David Shaffer, M.D., Chief of the Division of Child and Adolescent Psychiatry at Columbia University Medical Center. Instead, parents should consider the risk factors for suicide among adolescents, while avoiding some common misconceptions about suicide in this age group.

“...Here are things that you do worry about: risk factors that exist within the family—a family history of suicide; if the kid is drinking a lot, getting drunk—alcohol is a major stimulus of suicide; if there are available methods in the household—a gun collection for example; if there’s any evidence that the child has poor emotional control—if he loses his temper very frequently, or easily gets upset; further, if there are crises, or significant ‘challenges’—it could be an examination, or having to appear in court, or it could be a planned separation by the parents. Such looming events often serve as a marker for a planned suicide,” Dr. Shaffer explained.

There are widespread misconceptions that suicidality “is a permanent mood state,” or that people intending to commit suicide can’t be stopped, Dr. Shaffer said, noting that studies do not support either contention. There is some evidence that adolescents may be influenced to consider suicide in emulation of a famous person or someone in their peer group, he noted, but most people do not act on these feelings.

“But when you have a role model, a famous person who commits suicide, and the press coverage depicts it as a tragedy, and not a crime, it glamorizes the act,” Dr. Shaffer suggested. “I think the moral is, the less talk about suicide, the better. Rather than the reverse. I think most of our work on press coverage supports that.”

Dr. Shaffer said the most important thing parents can do when their child is talking about or threatening suicide “is not to immediately start a dialogue on life and death, but to try and get some understanding of the event that is either looming or has taken place, that is worrying the kid. And then try to work through some options and also to demonstrate support.”



Coping with Anxiety Disorders

DANIEL S. PINE, M.D.

Chief, Section on Development and Affective Neuroscience
National Institute of Mental Health Intramural Research Program
Foundation Scientific Council Member

Although there is “no convincing evidence” that rates of anxiety disorders among children and teens are on the rise, pediatricians and therapists have become increasingly better at identifying and treating the disorders, said Daniel S. Pine, M.D., Chief of the Section on Development and Affective Neuroscience at the NIMH Intramural Research Program.

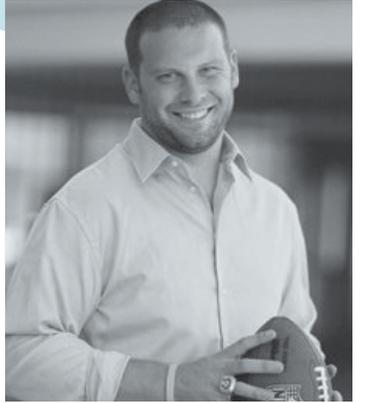
Like everyone else, children experience some anxiety as a normal part of life, but Dr. Pine said parents should look for three things to know whether their child’s anxiety has become abnormal. “The first and probably the most important thing we look at is whether there is impairment— anxiety that interferes with a person’s ability to function and leads to avoidance,” he said. After that, parents and physicians should look to whether the anxiety causes extreme stress or lasts for weeks or months. There are “no firmly established mechanisms” linking substance abuse and anxiety, Dr. Pine added, but the two disorders may occur together in some teens.

Cognitive behavioral therapy (CBT) and selective serotonin reuptake inhibitor (SSRI) medications seem to be equally effective in treating childhood anxiety, Pine said. “The best study that compared them directly in kids found one is no better than the other, and that combining the two works better than using one or the other alone.” He cautioned, however, that CBT should be delivered by a trained therapist.

Encouraging parents are the key in helping children with anxiety disorders manage their condition, Pine said. “These are parents who can help their kids face the situations that make their children most afraid, and encourage their kids to not avoid the things they’re afraid of. They are parents who look for situations and circumstances and experiences where kids are going to have to deal with their anxiety,” he noted. “Those kids tend to do better with their anxiety compared to kids whose parents are doing absolutely everything they can to prevent their kids from ever getting anxious.”

DISCOVERY TO RECOVERY STORIES OF PRODUCTIVE LIVES

People living with mental illness often face numerous challenges in managing their day to day life. Inspired by their unique stories of grace and determination, we acknowledge these challenges and recognize the capacity for families and individuals to persevere and often live productive lives. With the help of both science and the unwavering support of family and friends voice is given to the often silent, closeted and misunderstood illnesses of the brain.





Battling the Dragon of Mental Illness

Instilling Hope in Others and in Themselves

Madelin Weiss and Cory Gould have devoted their careers to helping people with mental illness. The two women have never met; their backgrounds and home towns are very different. But both have walked in the shoes of the people they serve. Since childhood, Madelin and Cory have dealt with harrowing mental illnesses that threatened to destroy any hope of a fulfilling future for either.

From age 8, Madelin experienced paralyzing anxiety and depression. Panic attacks made her fearful of going out, “afraid she wouldn’t be able to get back home.” Diagnosed with bipolar disorder at age 11, Cory had completed high school by age 16, but “my smarts didn’t save me from depression,” she says.

Madelin was first misdiagnosed with schizophrenia and given medications that didn’t work. She barely made it through high school and failed twice to get through college. “I spent most of two years in bed,” she says, “getting up only to go to therapy.” She finally found a wonderful therapist and a psychiatrist who prescribed medications that helped her.

For Cory a serious suicide attempt at age 20 turned out to be a “life changer.” She swallowed three times the dose of phenobarbital that should have been lethal. But instead of dying, she woke up a couple of days later, itching all over and thinking how grossly incompetent she was; she couldn’t even kill herself. Then she concluded that there must be mysteries in the universe, and decided to live.

For Madelin and Cory, mental illness is a life-long challenge. Cory pictures her illness as “this ugly little dragon on a chain sleeping in a corner of her brain. Every once in a while, it pulls on the chain, and her vision clouds. I have to pay attention to the early warning signs. I’ve become expert at managing my illness.” As recently as two years ago, Madelin—who calls depression “an outside force from within”—suffered symptoms severe enough for her to have to stop work. But despite the setbacks and constant vigilance, both women are grateful for the advances in research that have made it possible for them to live productive lives.

Today, Madelin, 64, holds a master’s degree in social work. She is the Associate Executive Director of PIBLY Residential Programs, in the Bronx, New York, where she oversees rehabilitative and support services for several hundred people with mental illnesses. Cory, 58, has a master’s degree in psychology and psychotherapy. She is the go-to mental health professional at Gifford Medical Center in Randolph, Vermont, and a co-founder of the Vermont chapter of the American Foundation for Suicide Prevention.



A Downward Spiral Leads to Uplift

Former NFL Player Helps Others After Facing His Diagnosis

Dreams and reality were always at odds for Keith O'Neil. With a former NFL player for a father and an early love for the game, he always longed to play professional football. But severe anxiety clouded that vision. "I couldn't sleep at night," he recalls. "My mind would just keep going." Around age 12, he began having suicidal thoughts. His parents knew he was moody, but because he would snap out of it, they never suspected an underlying illness. His symptoms receded in high school and resumed in college, while playing college football. Keith turned to alcohol to cope.

Post college his NFL dream came true when he joined the Dallas Cowboys and an old reality resurfaced—constant anxiety. When the Indianapolis Colts picked him up in 2005, Keith realized another dream: playing under revered coach Tony Dungy. But his anxiety worsened. He couldn't stop thinking about the playbook, yet kept forgetting plays. He worried about days ahead and days past. Keith spoke to Coach Dungy not only about his present mental state but also his lifelong anxiety. Dungy rallied his staff to help. Keith began taking anti-anxiety medication and played on the 2006 Colts Championship Super Bowl team.

His new reality soon came crashing down. In 2010 his wife's miscarriage triggered a severe manic episode. Following a few days of euphoria, he became paranoid and delusional. Friends and family urged him to seek psychiatric help. Within a week, he was diagnosed with bipolar 1 disorder and began medication. He still faced an uphill battle. Coping with the reality of his illness and medication side effects, Keith sank into an 18-month-long depression that persisted even after the birth of his son in 2012. That summer, Keith met Dr. Steven Dubovsky, a psychiatrist at the University of Buffalo. Dr. Dubovsky prescribed lithium, oxcarbazepine (Trileptal) and aripiprazole (Abilify), which "really made all the difference in the world," says Keith. "I still deal with my moods but I'm as healthy as I can get."

In October 2013, he founded 4th And Forever, a nonprofit organization dedicated to raising awareness, providing education, and funding research for mental illness. Through 4th And Forever, Keith is realizing a new dream—easing the way for others and reducing the stigma surrounding mental illness. "I want to do something to help, to say 'I went through this and it is okay to talk about it.'"

DONORS

We are truly grateful for the generosity of caring individuals, foundations, and members of the community that make our work possible.

Research Partners Program

Our Research Partners Program enables donors to select and support a scientist's project from amongst the most promising, cutting-edge proposals in mental illness research. Sponsoring one year of support for a Young Investigator is \$35,000; an Independent Investigator, \$50,000; and a Distinguished Investigator, \$100,000.

Our Research Partners Program has continued to grow and provide a unique opportunity for critical philanthropic support.

We are deeply grateful to all Research Partners for their vision and leadership.

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Edmund and Victoria Hornstein	Harold LeRoy-New	James J. Murphy, Jr.	Lori Savage
Kim Howie	Howard Lester	Stephanie Murphy	Jacob Saxe
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Kevin Hughes	Karen Levin	Gregory D. Morris	Kai and Malia Schmelzer
Reagan Hughes	Carol G. Levinbook	Anne K. Muellerleile	Joel M. Schneider
Ryan Hunt	Daniel and Sherry Levy	James J. Murphy, Jr.	Shayna H. Schor
Maryellen Hunter	Jack Levy	Stephanie Murphy	David Schwartz
Joan Hursen	Taylor A. Levy	Julie Kindsfater and William Murray	Aaron Schwirian
Angela Hurtado	Bo Li, Ph.D.	William Murray	Julia Scullion
Kenneth Hyacinthe	Constance and Stephen Lieber	Daryl Musick	Randal D. Seweryniak
Chase Iacofano	Linda	Kylie Mussay	Bill Sharp and family
Becca Ickowicz	Jemina Linnama	Anne Myers	Shelby
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Louis Innamorato	Dennis Loesch	Grace Nagaur	The members of the Shenandoah Club
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Jill Isenstadt	Adam Long and Jill Justice	Gary Nesenson	Carolyn Sienkiewicz
Peter Izzo	Spencer Lucas	Lee Newton	Dr. and Mrs. Mark Silver
Eric T. Jager	Dr. Michael Lynch	David Novick	Eli Silverman
Thomas Jandris	Shaune MacLean	Victor Ochoa	Gail Silverton
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Dr. Kevin Johns	Harvey Mallement	Joshua D. Okun	Isabel and Marvin Slomowitz
Andy Johnson		Matthew Oleszczak	Huan Song
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		Lewis Opler, M.D., Ph.D.	Penelope A. Spangler
		Nieves A. Ortiz	
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Christina Weiss
Geoffrey Wells
The Wells Family
Barbara B. White
Ben Widlus
Martin S. Willick, M.D.
Brigid Willson

Chris Winslow
The Women's Committee: Brain &
Behavior
Research Foundation
Leland D. Wood
The Woodward Family
Judith G. Wortman
The Wright Family
Michael Yelenosky
Young Widows
Eliza Young
Hayley Young
Alex Zeigler
Jane Zemba

Memorial Tributes

A loved one
John R. Abela
John B. Abrams
Marc D. Abrams
Vincent Acampora
Lary Adamson
Carlo A. Adan
Jean M. Ahern
Nicholas R. Albers
Janet P. Alexander
Mia S. Alexander
Lynn Allen
Lori L. Altshuler, M.D.
Helen E. Amatangelo
Mr. Vincent S. Amoroso, Jr.
Silas E. Anderson, Jr.
Ted Anderson
Christopher Andrusz
Christina E. Angelo
Lester Angert
Louis Applebaum
John A. Armbruster
Bonnie Arno
Anthony P. Arsneault
David J. Artino
Daryl Attwood, Sr.
John Attwood
Robert Attwood
Marion L. (Sue) Aughter
Jeri A. Austin
Mary Ayling
Patricia A. Backman
Gina M. Bailey
Gregory T. Bak
Robert P. Banghart
Story Bannister
Scott R. Bartlett
Matthew R. Barton
Carl A. Basak
Wesley A. Baylor
Doris I. Bebell
Meredith W. Beck
Scott Beery
William D. Belter
Ronald Berger
Blake Bergers
Patricia I. Berndt
Herbert Betz

Kevin M. Bezonsky
Deepak Bhasin
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John Boorum
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Mr. Boswell
Amanda Bowers
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Alfred H. Chapman
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Andrew S. Christie
Glennys Christie
Ruth G. Clark
Michael Clateman
Pattie C. Clayton
Philip J. Clements
Gary L. Cole, Sr.
Akilah B. Coleman
Oliver D. Colvin, Jr.
Janene A. Conte
Ryan J. Cook
Grace Cook-Blasingame
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Trocar Flook	Mary Lou Harriott	Andy King	Roman Makuch
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Matthew T. Fox	Stewart G. Harrison	Tyler S. Kirschner	Sol Malkoff
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Jonathan Mitchell	Jay R. Peshkin	Joan Rucks	Brandon T. Steimel
Michelle Mogan-Winiarski	Peter	Chris Rudder	Joyce Stein
Diane Mohageg	Marilyn Peters-Dornan	Melanie Rumuly Worth	Kolne M. Stella
Neil Molberger	Dixon Pfefferkorn	Angela S.	Myron Stepack
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Gregory A. Monk	Debra Phillips	Agis Salpukas	Anita B. Stevens
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Irene Moran's Brother	Parker E. Phillips II	Elaine Samson	Kathryn Stitz
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Linda Morrison	Sybil Pierce	Brent R. Scanlon	Mary J. Strub-Caulkins
Ellen Mosher	Barbara Pirto	Sterling A. Schiffman	Kenneth E. Stutzman
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Joel Nelson	Chris G. Reese	Bruce B. Shaffer	Ethel M. Toepel
Michael E. Nelson	Marci S. Reller	Me-Ira Shaindel bat	Gordy Tomalty
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Norita Norton	Dr. Sun Hong Rhie	Harriet Shetler	Donald Trybula
Russ Nugent	Carmella Rice	Sylvia Shick	Alexandros Tsaoussis-Maddock
Hubert Nutt	Kenneth A. Rice	Tonya Shipman-Bennitt	Amanda Tucci
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Aaron Ohabi	William L. Ricketts	David Silbar	Leon E. Tuttle
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Susan Okun	Gregory L. Ridpath	Benjamin Silver	Nicolas D. Valeriano
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Sean T. Olwell	Kelsey G. Riggs	Elias T. Slaman	Ginny Van Nattan
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Todd W. Orton	Jan Ritchie	Andrew D. Smith	Elizabeth A. Varkoly
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Barbara W. Page	David M. Robel	Wayne Smith	Lenore R. Vitale
Pat Palma	Lauren Robinson-Kieves	Mary Smith-Lawrence	Mark Von Dusseldorp
Pamela	Robert Rocheleau	Linda Snow	Ann Wade-Granfield

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Wiggles the dog
Margaret Wills
Angela Wilson
Pauletta Wilson
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Richard K. Wilson
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Ralph Wise
Doug Wistner
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Keith C. Worrell
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Peter W. Zartman
Andrew W. Zeh
Maria Zeier
Rita Zerr
Barry L. Zimmerman
George D. Zuckerman

Community Partners

Team Up For Mental Health

\$50,000+

9th Annual Chrissy's Wish Memorial Golf Outing

Linda & Mario Rossi
Manorville, NY

Hike for Mental Health

Leo Walker & Tom Kennedy
Appalachian Trail & Nationwide

\$25,000+

5th Annual Let The Sun Shine Run/Walk

Kathy & Curt Robbins
Cold Spring, MN

\$10,000+

Wedding of Julie & Guneet Kochar

Overland, KS

\$5,000+

Horizon Group Properties Mall Fundraising

Gary Skoien & Connie Dyer
Rosemont, IL

Team Daniel: Running for Recovery from Mental Illness

Drs. Ann & Robert Laitman
Orlando, FL & Armonk, NY

\$1,000+

A Day At The Beach

Arlene O'Rourke
Hampton Bays, NY

Remember Johnny Charity Event

Summer Reid
Orange, CA

NAMI Eastside Support Group

Dr. Tom B. Coles
Harper Woods, MI

Gaming Against Mental Illness

David O'Keefe
Trenton, NJ

Cynthia Crawford Birthday Party

Newport News, VA

Running for Research

Jennifer Spangler
Midlothian, VA

Fair Lawn High School 1st Annual

"Live to Laugh" Fundraiser

Jed Downey
Fair Lawn, NJ

Wedding of Mary Hofert & Anna Flaherty

Honolulu, HI

Power Planeteers

Jee Ramos
Fresno, CA

"REVOFEV: The Lost Something" Film

Chase Iacofano
Denver, CO

Chefwich

Lauren Bohlig
Portland, OR

Taking Strides Against Mental Illness

Harryet, Rebecca, and Stuart Ehrlich
Wayne, NJ

Dave Green Memorial Golf Classic

John Hagerty
Glenn Dale, MD

Ribbons for Research

Linda & Frank Kilpatrick
Manhattan Beach, CA

\$500+

Next to Normal: A Benefit Concert

Zachary Wobensmith
New York, NY

Kettlebell Swings for Kasia

Rory Pollack
Robbinsville, NJ

Texas A&M University Flash Zombie 5K

Alyssa Tigner
College Station, TX

BadNewsBaron Twitch

Matthew Anderson
Allen, TX

Stop the Stigma Dine & Donate/Ribbon Sale

Sydney Edelson
Fort Washington, PA

COMMUNITY

Partners

With the support of family, friends and your community, you can make a difference in the fight against mental illness and the stigma it bears. When you raise money to support the Brain & Behavior Research Foundation, you not only fund the most progressive and promising brain and behavior research, but you help chip away at the crippling effect that stigma has on these illnesses. The Foundation relies on the generosity of the community to help fund leading brain and behavior research.

In 2015, local community fundraising events raised \$216,000 to support brain and behavior research.



Ninth Annual Chrissy's Wish Memorial Golf Outing MANORVILLE, NY

Chrissy's Wish was established in memory of Christina Rossi and to honor the millions of people who continue to live with mental illnesses. All proceeds are donated to the Brain & Behavior Research Foundation. As a result of the fundraisers of the past seven years, together with matched funds, Chrissy's Wish has raised more than \$480,000 for the Foundation.

"Chrissy's greatest wish was to find peace of mind. Let's bring this wish to life. By supporting Chrissy's Wish you can help bring an end to the devastating mental disorders that strike so many our friends and family members."

LINDA AND MARIO ROSSI, CRISSY'S PARENTS

HIKE for Mental Health APPALACHIAN TRAIL AND NATIONALLY ACROSS THE U.S.

Share the joy of hiking. Bring hope to those battling mental illness.

HIKE for Mental Health was born of a single vision: a world in which everyone, including those who suffer from mental illness, can find the simple joy of living. It's mission is to increase public awareness of the challenges and suffering faced by those afflicted by mental illness and their families; increase public appreciation for and responsible use of wilderness trails; and to raise funds to prevent and alleviate the pain caused by mental illness while maintaining and preserving wilderness trails.



Let the Sun Shine Run/Walk to Benefit the Brain & Behavior Research Foundation COLD SPRING, MN

This event was created to honor the memory of Jonathon James Robbins. Jonathon was diagnosed with schizophrenia and depression and committed suicide on April 28, 2010 at the age of 22.

"This world WILL be a better place because of Jonathon's death; not for us who loved him, but for all those other families out there who still have hope that a cure or better faster-acting medicine can help their loved ones."

KATHY ROBBINS, JONATHON'S MOM



2015

FINANCIAL SUMMARY

2015 Financial Summary

We are pleased to report on the financial position and results of the Brain & Behavior Research Foundation for 2015. We are appreciative and thankful for the commitment of Foundation leadership, dedicated staff, volunteers and our strong donor support base that allows the Foundation to perform its vital work. We remain indebted to the Foundation Scientific Council, our distinguished research leaders covering virtually every major discipline within brain and behavior science, who volunteer their expertise to select and recommend the most promising grant projects to fund.

In 2015, contributions continued to increase and bequests continued to provide major support for which we are deeply grateful to all of our supporters for their generosity. We again acknowledge the extraordinary bequest from the late Oliver D. Colvin, Jr. that continues to support our efforts at the Foundation. Together, all these donations further the Foundation's mission to alleviate the suffering caused by mental illness by awarding grants that will lead to advances and breakthroughs in scientific research.

With another strong year of results, we continue to move forward with our focus of accelerating research accomplishments to help those living with mental illness to live full and productive lives. During 2015, the Foundation awarded additional NARSAD Grants to bring the total investment in mental health research to more than \$342 million since inception.

We acknowledge, with great thanks and appreciation, the generosity of the two family foundations who have underwritten, once again, the Foundation's operating expenses. This allows for contributions targeted for research to go directly to funding NARSAD Grants. The financial report shown herein has been summarized from our 2015 audited financial statements. The Foundation's complete audited financial statements and our most recent IRS Form 990 are available online at bbrfoundation.org or contact our office at 800.829.8289 for copies of the material.

Combined Statement of Financial Position

	DECEMBER 31, 2015	DECEMBER 31, 2014
ASSETS		
Cash and cash equivalents	\$14,408,546	\$22,350,676
Investments, at fair value	20,664,680	11,164,075
Contributions receivable	–	1,436,500
Other receivables	17,038	12,009
Pledges receivable, net	505,583	780,440
Prepaid expenses and other assets	28,612	21,415
Assets held in charitable remainder trusts	1,363,469	1,460,182
Fixed assets, net	48,577	81,617
Security deposits	77,110	77,110
	\$37,113,615	\$37,384,024
LIABILITIES AND NET ASSETS		
Liabilities		
Accounts payable and accrued expenses	\$198,788	\$209,211
Grants payable	22,943,344	20,093,716
Accrued compensation	61,919	50,295
Annuities payable	791,216	871,832
Charitable gift annuities payable	301,807	317,912
	Total Liabilities	\$24,297,074
		\$21,542,966
Net Assets		
Unrestricted	(3,606,221)	(1,081,384)
Unrestricted – board designated endowment	11,509,262	11,509,262
	Total Unrestricted	\$7,903,041
		\$10,427,878
Temporarily restricted	-	499,680
Permanently restricted	4,913,500	4,913,500
	Total Net Assets	\$12,816,541
		\$15,841,058
	\$37,113,615	\$37,384,024

Combined Statement of Activities

	YEAR ENDED DECEMBER 31, 2015	YEAR ENDED DECEMBER 31, 2014
SUPPORT AND REVENUE		
Contributions	\$11,608,273	\$7,816,588
Special Events, net	509,498	584,805
Contribution of services	1,807,051	1,389,537
Bequests	8,847,835	21,683,838
Net realized and unrealized (losses) gains on investments	(405,214)	1,184,440
Net (depreciation) appreciation of assets held in charitable remainder trusts	(96,713)	55,885
Dividend and interest income	423,681	322,676
Total Support and Revenue	\$22,694,411	\$33,037,769
EXPENSES		
Program Services		
Research grants and awards	18,441,870	22,681,953
Scientific advancement	2,293,164	1,747,843
Program support	2,544,177	2,101,977
Total Program Services	\$23,279,211	\$26,531,773
Supporting Services		
Fundraising*	903,798	793,219
Administration*	1,535,919	1,346,579
Total Supporting Services	\$2,439,717	\$2,139,798
Total Expenses	\$25,718,928	\$28,671,571
Change in Net Assets	(3,024,517)	4,366,198
Net Assets, beginning of year	15,841,058	11,474,860
End of Year Net Assets	\$12,816,541	\$15,841,058

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



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Investing in Breakthroughs To Find a Cure

100% of donor contributions for research are invested in our grants leading to advances and breakthroughs in brain and behavior research. This is made possible by the generous support of two family foundations which cover all of the Foundation's operating expenses.

OUR 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.

HOW WE DO IT:

The Foundation funds the most innovative ideas in neuroscience and psychiatry to better understand the causes and develop new ways to treat brain and behavior disorders.

These disorders include depression, bipolar disorder, schizophrenia, autism, attention-deficit hyperactivity disorder, anxiety, borderline personality disorder, chemical dependency, obsessive-compulsive disorder and post-traumatic stress disorders.

OUR CREDENTIALS:

Since 1987, we have awarded more than \$342 million to fund more than 5,000 grants to more than 4,000 scientists around the world.

OUR VISION:

To bring the joy of living to those affected by mental illness—those who are ill and their loved ones.

SIGN UP FOR ENEWS: bbrfoundation.org/signup

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