

Tulane Brain Institute

Creating a new era of **discovery**, **learning** and **public influence**

in the brain sciences

Five-Year Report 2016 – 2021

FROM THE DIRECTOR

In the five years since it was founded, the Tulane Brain Institute has fostered a new era of interdisciplinary collaboration in the neurosciences at Tulane. Today, there are 60 faculty members of the Brain Institute working across the University to advance the understanding of the brain and brain disorders. Our faculty include scientists, engineers, and clinical researchers and represent three campuses, four schools,



and 19 departments. The boundary-crossing research being conducted through the institute has grown exponentially, resulting in myriad discoveries being made by top faculty and allows our undergraduate and graduate students to participate in the institute's significant work.

The Tulane Brain Institute was founded in 2016 as an interdisciplinary entity to coordinate and elevate neuroscience-related endeavors across Tulane. Our vision was to create a new era of discovery, learning and public influence in the brain sciences at Tulane and advance the Tulane Brain Institute to national prominence. I am happy to report that we are well on our way to realizing this vision. In these pages, we highlight activities and achievements of our first five years.

On behalf of our faculty, students and staff, I share gratitude for every grant and philanthropic gift received. I am confident that with scholars working together across disciplines, and philanthropists supporting our work, the Tulane Brain Institute is poised to achieve even greater success by its 10th anniversary.

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Jill M. Daniel, PhD Gary P. Dohanich Professor of Brain Science Professor, Department of Psychology Director, Tulane Brain Institute





Tulane Brain Institute Five-Year Report 2016-2021

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Understanding the brain is the ultimate interdisciplinary work.

- TULANE PRESIDENT MIKE FITTS

GIVING TO THE TULANE BRAIN INSTITUTE Our vision is to create a new era of discovery, learning, and public influence in brain sciences at Tulane. Donations can help us realize this vision. To give online, please go to giving.tulane.edu and direct your gift to the Brain Institute. For more information on giving opportunities, or if you would like to give to a specific initiative such as supporting faculty and their research, the training and education of our students, or community outreach programs, please contact Elise Curole in the Office of Advancement, at 504.247.1478 or ecurole@tulane.edu. Thank you.

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Growth in Research

NIH funding doubles in five years

In the past five years, NIHfunded research at the Brain Institute has doubled, a remarkable accomplishment that illustrates the power of interdisciplinary collaborative research. Brain Institute faculty currently serve as principal investigators (PIs) on \$90 million in National Institutes of Health grants, compared to \$45 million in 2016. There has been a 44 percent increase in the number of faculty holding NIH funding and an increase in the size of each grant per PI (currently the average NIH funding per investigator is \$3.5 million compared with \$2.5 million in 2016).

BRAIN INSTITUTE INITIATIVES LEAD TO \$22 MILLION IN FUNDING

In more evidence of the Brain Institute's success, new research initiatives directly led to \$22 million in grant funding. In a notable success, activities of the Brain Institute Cognitive and Brain Aging Working Group led to a new \$14.6 million NIH Program Project Grant. The large collaborative project that includes researchers from the School of Science and Engineering, the School of Medicine and the School of Public Health and Tropical Medicine, will determine how cardiovascular and metabolic health affects the ability of menopausal estrogen therapy to impact brain aging. In another success, the Marko Spark Fund Awards, \$50,000 faculty seed grants given annually for five years, resulted in \$6 million of new funding. Finally, Tulane Brain Institute Research Awards, led to \$414,000 in new NIH funding.

In 2017, the Brain Institute was awarded one of the first-ever Louisiana Board of Regents Comprehensive Departmental Enhancement Grants. Reviewers ranked the Brain Institute proposal number one of 39. This five-year \$1 million grant supports annual purchases of major instrumentation that are the cornerstones of the Uptown Cell & Molecular Imaging Core Lab and the Downtown Human Research & Data Analysis Core Lab.

Brain Institute study seeks insight into panic disorder and PTSD

Panic disorder is one of the most common mental disorders in the United States, with nearly 5 percent of the population suffering attacks that cause extreme disruption in their daily lives.

JONATHAN FADOK, an assistant professor of psychology at Tulane, received a \$2.24 million grant from the National Institutes of Health to conduct research that will lead to the identification of neurobiological mechanisms through which the brain reacts to fearful stimuli. The grant allows Fadok and his team at the Tulane Brain Institute to develop a method that allows for the monitoring of behavioral transitions between defensive responses. "The goal of our grant is to understand how the brain controls fear reactions," Fadok said.





NIH TAPS TULANE NEUROSCIENTIST TO LEAD EFFORT TO STANDARDIZE RESEARCH IN GENETIC AGING

The National Institutes of Health awarded a \$2.9 million grant to Tulane University neuroscientist **Dr. Stacy Drury** to lead a research network that will set methodological standards for studying a part of the chromosome that scientists increasingly recognize as an important biological marker of aging and age-related diseases.

Drury launched the Telomere Research Network to establish best practices for measuring telomere length in population-based studies. Telomeres are the caps at the end of chromosomes that keep them from shrinking when cells replicate. Shorter telomeres are linked to higher risks for heart disease, obesity, cognitive decline, diabetes, mental illness and poor health outcomes in adulthood.

"We are charged with bringing together all of the international experts in the field and becoming a central focus for this research across the globe," said Drury, the Remigio Gonzalez, MD, Professor of Child Psychiatry at Tulane University School of Medicine.



Brain Institute researcher studying link between stress and mental health disorders

Tulane neuroscience professor Jeffrey Tasker was awarded a \$2.1 million grant to study the effects of stress on the brain and how severe stress contributes to the development of mental health disorders.

The five-year grant from the National Institutes of Health is allowing Tasker and his Brain Institute team to explore how stress signals can lead to changes in brain circuitry, brain chemistry and behavior. "What I hope comes from our research is a better understanding of the changes in brain circuits caused by severe stress that can cause or contribute to chronic mental health disorders," said Tasker, the Catherine and Hunter Pierson Chair in Neuroscience.

Tulane Brain Institute researchers focus on epilepsy, autism and schizophrenia

Tulane University's Laura Schrader, a cell and molecular biology associate professor and Brain Institute member, received a two-year grant from the National Institutes of Health to study the role of a Shox2, a protein in the brain important for development and function of the thalamus.

Schrader is exploring Shox2's potential link to epilepsy, autism and schizophrenia.

Brain Institute professor receives NIH grant for Alzheimer's research

There are 5.7 million people living with Alzheimer's disease, according to Alzheimers.org, and the dreaded disease has caused more deaths than both breast and prostate cancer combined. Finding a cure is paramount.

ANDREA ZSOMBOK, a

Tulane associate professor of physiology, received a \$334,000 supplement to her existing National Institutes of Health (NIH) grant that supports research into the brain's role in diabetes. Diabetes is associated with an increased risk for all dementias, including Alzheimer's disease.



TULANE TEAM RESEARCHING WAYS TO END OPIOID ADDICTION

Michael J. Moore, professor of biomedical engineering in the Tulane School of Science and Engineering, is part of a \$945 million National Institutes of Health project called the HEAL Initiative, or Helping to End Addiction Long-term Initiative.

In 2016, an estimated 50 million U.S. adults suffered from chronic pain and in 2018, an estimated 10.3 million people 12 years and older misused opioids, including heroin.

Moore's share of the project is \$1.2 million. He is teaming up with Jeffrey Tasker, the Catherine and Hunter Pierson Chair in Neuroscience, and James Zadina, director of the Neuroscience Laboratory at the Veterans Administration Medical Center and a professor of medicine at the Tulane School of Medicine.

Excellence in Education

The Brain Institute gives the Neuroscience Program an administrative home

In addition to its research mission, the Brain Institute is unique because it oversees the education of about 450 students enrolled in the interdisciplinary Neuroscience Program at the undergraduate, master's and doctoral levels. With the founding of the Brain Institute, the Neuroscience Program gained a true administrative home for the first time in its 30-year history. The Brain Institute provides our students with the structure and support of a department while maintaining the intellectual benefits of true interdisciplinary education.



A PROFESSOR WHO INSPIRES

Some faculty have the unique ability to connect with students in a way that motivates them to search for knowledge. For Wayne Teetsel, that teacher was **Gary Dohanich**, who was a founder of Tulane's interdisciplinary neuroscience undergraduate major and master's program and 30-year faculty member in the Department of Psychology.

Teetsel created a professorship in Dohanich's honor, the Gary P. Dohanich Professorship in Brain Science. "A good educator does more than just teach," says Wayne Teetsel, a 1987 psychology major and 1990 masters in business administration graduate. "They inspire. That's what Gary does. He inspires. I've taken that desire to learn into my everyday life. And I'm so grateful for that."

Undergraduates conduct research in labs across Tulane

Brain Institute faculty from across the university are committed to our undergraduates and welcome them into their labs. In fact, Study.com, which list the Tulane neuroscience major as among the top 12 in the country, highlights the research opportunities for undergraduates as a distinctive feature. The Brain Institute sponsors the TULANE UNDERGRADUATE RESEARCH IN NEUROSCIENCE (TURN) Summer Program, which provides stipends to undergraduates to work full-time during the summer in Brain Institute faculty labs. The program includes weekly research meetings with faculty mentors and students and culminates in a scientific poster session. In the future, we hope to open TURN to undergrads from across the country.

Engaging the Community

Programs support patients and families affected by brain disorders

The Tulane Brain Institute supports community engagement activities that link its members to patients and caregivers affected by brain disease or injury.

A focus of the efforts to support patients and families impacted by brain disorders is our sponsorship of the Tulane Stroke Survivors Support Group, which provides a multidisciplinary resource for stroke survivors as well as for family members and caregivers. A major component of the support is the Brain Institute Stroke Companion Program in which specially trained neuroscience undergraduate students engage in a variety of activities with hospitalized patients, providing companionship and support as individuals learn old skills all over again. The support was made possible by a fund created by <u>Mathilda Cochran</u> in memory of her husband Michael D. Cochran, a 1963 Tulane graduate.

The Brain Institute works closely with the local Alzheimer's Association and is a sponsor of the annual Walk to End Alzheimer's. Faculty and students staff informational booths at the event. Additionally, Brain Institute members have helped manage TrialMatch, a program that connects individuals with ongoing clinical trials.

The Brain Institute supports activities of local chapters of the National Alliance on Mental Illness, the American Heart Association, and Autism Speaks.

Activities bring neuroscience to the community

Beyond the lab and classroom, the Tulane Brain Institute is actively involved in bringing neuroscience to the community through programming of special events and engaging in K-12 outreach.

A highlight of our community engagement initiative is the TULANE BRAIN INSTITUTE DISTINGUISHED LECTURE SERIES, which brings internationally renowned neuroscientists to campus to interact with Tulane faculty and students and to provide a lecture on their work to the broader Tulane and New Orleans communities. In 2019, Nobel Prize winning neuroscientist Dr. Edvard Moser delivered the inaugural lecture.

The institute also works to bring neuroscience to New Orleans schools. Working in collaboration with the studentrun Tulane University Neuroscience Association, the Brain Institute hosts the Louisiana Brain Bee, which is part of an international neuroscience competition for teenagers. The Brain

Institute supports brain-literacy activities at the Louisiana Children's Museum and local libraries during the national Brain Awareness Week and sponsors awards for Outstanding Research in Neuroscience at the Greater New Orleans Science and Engineering Fair.

Philanthropic Support



GIFTS ASSOCIATED WITH THE BRAIN INSTITUTE TOTAL OVER \$18 MILLION

The rapid growth and success of the Tulane Brain Institute is in large part due to the generosity of alumni, parents, and friends. Of this total philanthropic support, \$15.5 million in donations have been received since our founding. Significant commitments ranging from \$100,000 to \$5 million have established eight endowed funds. These funds will provide support in perpetuity for the Brain Institutes's important work.

Additional currentuse and endowed gifts have provided support for infrastructure development, core facilities, research initiatives, faculty and student programming, and community engagement activities. Gifts have also funded new endowed chair positions and professorships for Brain Institute faculty, including two Presidential Chairs in Neuroscience.

Philanthropy has allowed the institute to flourish over the past five years and securing future support will certainly enable us to reach even greater heights in the future.

Marta and Bill Marko provide lead gift to Tulane Brain Institute

A Tulane alumnus and his wife made the lead gift to help start the Tulane Brain Institute. Marta and Bill Marko say they support the Tulane Brain Institute because it has an immediate impact on an area that means much to them. Marta's parents both were diagnosed with Alzheimer's disease. The generous gift has helped spark new collaboration and interdisciplinary research at the Brain Institute.

"We love what Tulane as a university is doing and we've been really impressed with everyone involved," she says. "There is no 'I' or 'me,' it's a collective process."



Tulane alumni couple establish Brain Institute Presidential Chair

MARCELA VILLAREAL DE PANETTA AND BERNARD J. PANETTA II have established the Panetta Family Presidential Chair Endowed Fund to support a professor in an interdisciplinary area of academic study associated with the Tulane Brain Institute. The Panettas have requested that the initial chair holder be a scholar whose research focuses on hormone-brain interactions in response to trauma and violence.

Priddy Family Foundation grants \$1 Million to Tulane Brain Institute

The Priddy Family Foundation, led by Robert and Kikie Priddy, gave \$1 million to the Brain Institute to endow and establish the Priddy Family Spark Research Endowed Fund. The fund provides competitive awards to faculty for research support that advances the research priorities of the Brain Institute.

Tulane University

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