The Brain Health Institute (BHI) at Rutgers, The State University of New Jersey, was established in 2014 to become an internationally recognized center for basic, translational, and clinical research into the biological bases of human brain function and dysfunction.
New tools are transforming neuroscience, and these afford an unprecedented opportunity to create novel treatments for central nervous system disorders. Neuroscience has been identified by Rutgers University as one of five signature areas for future focus and development.

The Brain Health Institute (BHI) is the home for the overall Rutgers neuroscience initiative and is a growing interdisciplinary institute consisting of more than 300 principal investigators with neuroscience laboratories across campuses of Rutgers University and Rutgers Health. BHI is led by inaugural Director, Dr. Gary Aston-Jones, the Murray and Charlotte Strongwater Endowed Chair in Neuroscience and Brain Health, and Distinguished Professor of Psychiatry.
The BHI will develop neuroscience at Rutgers to become a highly translational and internationally preeminent research enterprise, to advance new treatments for debilitating nervous system disorders. We are dedicated to enhancing scientific collaborations, growing and integrating cutting-edge basic and clinical research, developing robust educational programs, and providing state-of-the-art infrastructure for brain research.

**MISSION**

The mission of BHI is to grow, support and coordinate neuroscience across Rutgers University’s dynamic and diverse neuroscience communities to:

- Create research programs focused on understanding the biological underpinnings of the central nervous system’s function and dysfunction.
- Develop treatments for disorders using novel neuroscience tools.
- Establish a rich neuroscience resource that provides education to the public, clinicians, faculty, and students, as well as state, national, and international health officials.

**VISION**

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HISTORY

The BHI includes more than 300 faculty engaged in neuroscience and brain health-related research at Rutgers. The research programs span multiple disciplines with faculty across 33 departments and seven schools of various campuses of Rutgers University and Rutgers Health (RH). BHI has staff offices in the RWJMS Research Building (School of Public Health Building), Busch campus, Piscataway, NJ.

DIRECTOR

In 2014, Dr. Gary Aston-Jones was recruited to Rutgers as the inaugural Director of the BHI and the Murray and Charlotte Strongwater Endowed Chair in Neuroscience and Brain Health. Dr. Aston-Jones is a Distinguished Professor of Psychiatry in the Robert Wood Johnson Medical School, reporting to both the Chancellor of Rutgers Health (RH) and the Chancellor of Rutgers-New Brunswick.
FOCUS AREAS

The BHI has identified four focus areas of outstanding strength within Rutgers that are primed for further development. BHI has created new Centers of Excellence to further grow basic, clinical, and translational research in each focus area.

NEURODEVELOPMENT

Rutgers has multiple experts who study neurodevelopmental processes at the cellular, circuit, or behavioral levels. Researchers in the neurodevelopmental focus area study neurodevelopmental disorders including autism, Tourette’s, attention deficit-hyperactivity disorder, and schizophrenia. BHI developed the Rutgers University Center for Autism Research, Education and Services (RUCARES) to coordinate and grow research in autism-related disorders.

NEURODEGENERATION & INJURY

Exceptional strengths exist at Rutgers in neurodegeneration and injury, including numerous labs that study epilepsy, multiple sclerosis, Parkinson's disease, Alzheimer disease, and spinal and traumatic brain injury. BHI launched the Krieger-Klein Alzheimer Research Center to understand and develop new therapies for this devastating disease.

MOTIVATIONAL & AFFECTIVE NEUROSCIENCE

Rutgers has very strong basic and clinical research programs in addiction, substance use disorders, feeding disorders and obesity, and serious emotional disorders including depression and anxiety. To address such problems, BHI created the Rutgers Addiction Research Center (RARC).

COGNITIVE & SENSORY NEUROSCIENCE

World-renowned Rutgers scientists work on cellular and psychological aspects of cognition as well as on computational modeling of the neural processes underlying cognitive disorders. Sensory neuroscience is also an area of tremendous strength at Rutgers. Deficits in the cognitive and sensory systems are common in many neurological and neuropsychiatric disorders. The Computational Cognitive Neuropsychiatry Center (CCNP) and Center for Advanced Human Brain Imaging Research (CAHBIR) were developed by BHI to solve these complex problems in human behavior. BHI is now developing a new Rutgers Hearing and Balance Research Center, as well as a new Rutgers Center for Pain Research, to extend such efforts to sensory processing and related disorders.

The five existing and two developing Research Centers in BHI are described in more detail next:
The BHI recruited Dr. Danielle Dick in 2022 as the inaugural director of the RARC. The RARC, the country’s largest comprehensive addiction research center, is a multidisciplinary home for addiction-related activities across Rutgers, bringing together researchers, clinicians, and community members dedicated to tackling addiction. Its research spans basic science, prevention and intervention, treatment and recovery, and public policy, encompassing substance use disorders, gambling, social media, and gaming, eating disorders, and more.
The BHI launched the RUCARES to coordinate and foster basic and clinical research focused on diagnosing and supporting individuals with autism spectrum disorder (ASD). The goal is to develop a world-class autism research center engaged in (i) cutting-edge basic research to identify mechanisms and biomarkers, (ii) developing novel interventional behavioral therapies, and (iii) creating new technologies and services to support both pediatric and adult ASD patient population. BHI recruited Dr. Wayne Fisher as the inaugural director of the center to coordinate, nurture, and grow autism-related research and clinical activities across Rutgers and New Jersey.

CSH-RUCARES
The CSH-RUCARES is a collaboration between RUCARES and Children’s Specialized Hospital (CSH), focusing on diagnosing, treating, and supporting children and adults with ASD. The collaboration provides care and research for ASD individuals with significantly challenging behaviors throughout their lifespan. Dr. Fisher leads the NJ Autism Center of Excellence (NJACE) funded by the NJ Governor’s Council for Medical Research and Treatment of Autism, which extends the RUCARES mission across the state.

SEVERE BEHAVIOR PROGRAM
The Severe Behavior Program, a service line of CSH-RUCARES, is led by Director Brian Greer, PhD. This program provides intensive and highly specialized services to children and adolescents with ASD and other developmental disabilities who display dangerous behavior such as aggression, self-injury, property destruction and pica and pose a significant risk to self, others, or the environment and who cannot be safely managed or effectively treated in a less-intensive program.

The CSH-RUCARES Severe Behavior Program works to improve the quality of life for children with severe behavior disorders and their families and offers services including evaluation, outpatient, half-day, and full-treatment programs as well as parent training. The CSH-RUCARES treatment programs are located at 888 Easton Avenue in Somerset, NJ.
The BHI recruited Dr. David H. Zald to be the inaugural director of the Center for Advanced Human Brain Imaging Research (CAHBIR), whose goal is to achieve high-quality human neuroscience research using state-of-the-art neuroimaging techniques. The mission has been to incorporate the latest brain scanning and neuromodulation methods so that researchers can push the boundaries of what we can learn about how the human brain functions in health and disease.

**INITIATIVES AND GOALS**

- Build an intellectual community of neuroimaging researchers.
- Integrate neuromodulation of the human brain with measures of human brain activity to measure the causal effects of activity in one brain region on the functioning of the rest of the brain.
- Explore a wide range of human brain disorders ranging from addiction psychiatry to Alzheimer disease to understand mechanistic processes that contribute to illness and help develop new diagnostic and treatment methods.
- Use human neuroimaging data to aid in biomarker development and decision making that can improve treatment outcomes.

**RESEARCH**

Research at the center aims to expand the integration of human brain neuroimaging with the clinical research being conducted by other centers at Rutgers to better understand biomarkers related to neurological and psychiatric disorders and how these have prognostic value. Specific projects focus on biomarkers associated with aging and dementia, substance use disorders and affective disorders. An additional focus is the integration of machine learning techniques to improve the ability to predict clinical characteristics based on multi-modal neuroimaging data. In 2024, CAHBIR added new EEG and transcranial magnetic stimulation core facilities that can be used for both investigational and interventional human brain research studies.
The BHI recruited Dr. Michal Schnaider Beeri as the inaugural director of the new Herbert and Jacqueline Krieger Klein Alzheimer Research Center (KKARC) in 2023. Hon. Herbert C. Klein, a Rutgers alumnus and former state and U.S. congressman, donated $7.25M to BHI to help develop the center, establish two Endowed Chairs in Alzheimer disease (AD) and neurodegeneration research held by Dr. Michal Beeri (BHI/RWJMS) and Dr. Luciano D’Adamio (BHI/NJMS). These gifts also supported the recruitment of Dr. Hyung Jin Ahn (BHI/NJMS) and several additional faculty in the near future. The mission of KKARC is to find treatments and interventions to prevent, identify, delay and treat Alzheimer disease. The focus is on the earliest signs of cognitive decline, long before Alzheimer disease manifests fully. The research includes basic animal as well as clinical research, and is grounded in a patient-oriented approach, where every research project is driven by the desire to improve the lives of individuals and their families facing the challenges of cognitive decline.

RESEARCH COMMUNITY

The goal is to cultivate a dynamic Alzheimer’s disease and related dementias (ADRD) research community, providing a supportive framework for collaboration and advancement among Rutgers scientists. Through pilot grants, ongoing translational work in progress meetings integrating basic and clinical scientists, and annual prizes for young investigators, we aim to foster an environment where ideas thrive and lead to novel discoveries to prevent, treat and cure ADRD.

THREE-PILLAR STRATEGY

- **Epidemiology**: The center will assess the epidemiology, or the distribution and determinants of ADRD, in various populations and examine the early biomarkers of ADRD, using neuroimaging, blood analysis, and cognitive assessments, to better understand Alzheimer’s pathology and the best interventions to target the progression of Alzheimer’s symptoms.

- **Clinical Trials**: The center will develop clinical trials for novel medications and lifestyle interventions and evaluate the safety and efficacy of these interventions in diverse participant populations.

- **Translational Research**: The goal is to grow basic science research in ADRD using various preclinical model systems and optimize translation of mechanistic insights gained from the preclinical research into innovative therapies and interventions, accelerating their progression into human clinical trials.
Connecting psychiatric disorders to the function of the biological organ that supports them, the brain, is a great challenge. This is, in part, due to the great complexity of the brain and to the difficulty linking specific aspects of neural structure and functioning to mental experience and complex human behaviors of the sort affected by mental illness.

Advances in theoretical cognitive and computational neuroscience provide a new, often quantitative and precise, understanding of how multiple aspects of brain function support complex processes such as perception, memory, decision-making and executive control. Because these mechanisms contribute heavily to evaluation, anxiety, mood, control and compulsion, they provide a promising new theory-based foundation for a neuroscientific understanding of these illnesses. Indeed, alterations in such functions have been identified as ‘endophenotypes’ that are common to many disorders.

Computational psychiatry is well-suited for the identification and characterization of endophenotypes and promises to provide a new level of biological understanding of these disease-related dysfunctions. The CCNP has a human behavior testing core facility on Rutgers Busch Campus in Piscataway. The core facility allows for researcher-friendly and rapid collection of data from human participants across the psychiatric spectrum performing cognitive neuroscience-based tasks.
Create centers of research excellence that focus efforts of collaborating scientists to tackle important problems in brain health. BHI has created five centers to date, and others are in development.

Partner with Rutgers Schools and Departments to recruit highly qualified faculty to complement and strengthen brain research in our four focus areas. To date, BHI has recruited nearly 40 new tenured or tenure-track faculty to Rutgers.

Support PhD and postdoctoral trainee programs to provide travel to scientific meetings, trainee recruitment, and provide educational opportunities.

Host Postdoc Recruitment Events for PhD or MD/PhD students and current post-docs looking for postdoctoral training in basic, translational, or clinical research in neuroscience and connect them with Rutgers faculty.

Provide Pilot grant funding for novel projects that have principal investigators from different Rutgers campuses and schools to foster interdisciplinary collaborations and help investigators convert pilot grant projects to larger projects funded by extramural awards.

Formed six working groups in across the four focus areas as well as for junior faculty and trainees in order to engage and empower Rutgers neuroscience faculty and trainees to develop new initiatives to grow neuroscience and brain health research.

Organize focus area workshops that bring together neuroscientists across Rutgers to share their work and seek collaborations.

Hold an Annual Symposium that brings together faculty, post-docs, students, and staff from neuroscience labs at Rutgers and neighboring institutions.

Host a Plenary Seminar series that brings prominent neuroscientists from other institutions to speak at various Rutgers campuses.

Maintain a comprehensive website that is kept current with information and resources including a searchable faculty expertise directory, funding opportunities, upcoming neuroscience events, etc., and announce events and achievements on social media, and via a monthly newsletter.
Donor support plays an essential role in enabling BHI scientists make new biomedical and health related discoveries. Our scientists rely on external funding support from the government, state, corporations, and private philanthropic investors who understand the value and importance of basic, clinical, and translational neuroscience research.

With your support, we can help facilitate neuroscience research at Rutgers that will lead to novel therapies and cures for neurological and neuropsychiatric disorders. Your support also helps us train the next generation of highly skilled neuroscientists and physicians. You can visit our website to learn more about how you can support BHI and its centers. To discuss ways that you can help support the Rutgers Brain Health Institute, please contact BHI at 732.235.6074 or bhi@bhi.rutgers.edu. You can also contact Hailey Lemasters, Associate Director of Development, Corporate Foundation Relations at Rutgers, at 908.645.3471 or hailey.lemasters@rutgersfoundation.org
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